



City of Arvada

City Council Agenda

OCTOBER 18, 2021
CITY COUNCIL CHAMBERS
Regular Business

Councilmembers:

Marc Williams, Mayor
Dot Miller, Mayor Pro-Tem
Bob Fifer, At large
Nancy Ford, District 1
David Jones, District 4
John Marriott, District 3
Lauren Simpson, District 2

Staff Members Usually Present:

Mark Deven, City Manager
Lorie Gillis, Deputy City Manager
Rachel Morris, City Attorney
Don Wick, Director of Public Works
Sharon Israel, Director of Utilities
Ryan Stachelski, Dir. of Community & Economic Development
Bryan Archer, Director of Finance
Rob Smetana, Manager of City Planning & Development
Ben Irwin, Chief Communications Manager
Kristen Rush, City Clerk

Info: 720-898-7550

CITY COUNCIL MEETING – CITY COUNCIL CHAMBERS 6:00 PM

1. Call to Order - 6:00 PM
2. Moment of Reflection and Pledge of Allegiance - Councilmember Ford
3. Roll Call of Councilmembers
4. Approval of Minutes
 - A. October 4, 2021 City Council Meeting
5. Recognitions and Communications
 - A. Proclamation Recognizing Judge Mark Randall - Presented by Mayor Williams
6. Presentations - None
7. Public Comment on Issues not Scheduled on Agenda - Three Minute Limit
8. New Business
 - A. Consent Agenda
 1. R21-124 A Resolution Adopting the Amended Administrative Fee Schedule for Building Safety Division Permits and Services Pursuant to Chapter 18, Buildings and Building Regulations, of the Arvada City Code
 2. R21-125 A Resolution Adopting the Amended Fee Schedule for Rights-of-Way Work Permits and Services Pursuant to Chapter 78, Public Improvements, of the Arvada City Code

3. R21-126 A Resolution Adopting the Amended Fee Schedule for Land-Use Pursuant to Chapter 74, Planning and Development, of the Arvada City Code

B. Resolutions

1. R21-127, A Resolution Approving and Adopting the 2021 Jefferson County Multi-Hazard Mitigation Plan
2. R21-128 A Resolution Authorizing a Memorandum of Understanding Between the Colorado Attorney General and the City of Arvada for Distribution of Opioid Settlement Funds, Related Settlement Participation Forms, and a Colorado Subdivision Escrow Agreement with the Colorado Municipal League

C. Ordinances (First Reading)

1. CB21-037 An Ordinance Amending Various Sections of Chapter 102, Utilities, of the Arvada City Code Pertaining to Water Users Rates and Bimonthly Service Charges (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)
2. CB21-038 An Ordinance Amending Section 102-206 of Chapter 102, Utilities, of the Arvada City Code Pertaining to Wastewater Users Rates and Bimonthly Service Charges (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)
3. CB21-039 An Ordinance Rezoning Certain Land Within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005 (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

9. Other

- A. Motion to Cancel November 1 and November 22, 2021 City Council Meetings

10. Public Hearings - 6:15 PM

- A. R21-129 A Resolution Setting Forth Certain Findings of Fact and Conclusions as to the Annexation of Certain Land into the City of Arvada, Colorado, Northeast corner of Indiana Street and West 82nd Avenue, Also known as 8200 Indiana Street
- B. CB21-032 An Ordinance Annexing Certain Land into the City of Arvada, at the Northeast Corner of Indiana Street and West 82nd Avenue, Approximately Located at 8200 Indiana Street in the County of Jefferson and State of Colorado (Ordinance No. 4779)
- C. CB21-033 An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street (Ordinance No. 4780)
- D. Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street
- E. PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street.
- F. CB21-034 An Ordinance Certifying the City of Arvada Mill Levy for 2021 for the Board of County Commissioners for Jefferson and Adams Counties (Ordinance No. 4781)
- G. CB21-035 An Ordinance Appropriating Funds for Fiscal Year 2022 (Ordinance No. 4782)
 1. R21-130 A Resolution Adopting the Budget for Fiscal Year 2022
 2. R21-131 A Resolution Adopting the 2022 Capital Improvement Fund Budget and Allocating for Specific Projects in 2022

3. R21-132 A Resolution Adopting the Pay Plan for Fiscal Year 2022

- H. CB21-036 An Ordinance Authorizing The City of Arvada to Enter an Intergovernmental Agreement With Apex Park and Recreation District and Jefferson County School District R-1, for Meyers Pool Replacement Project (Ordinance No. 4783)

11. Public Comment - Five Minute Limit
12. Reports from City Council
 - A. Council Committee Reports
13. Reports from City Manager
 - A. Review of Future Workshops and Presentations
14. Reports from City Attorney
15. Adjournment



SUMMARY OF MINUTES OF THE MEETING OF THE ARVADA CITY COUNCIL HELD OCTOBER 4, 2021

1. Call to Order - 6:00 p.m.

This Arvada City Council meeting was held in the City Council Chambers and remotely using webinar technology. Mayor Williams, Mayor Pro Tem Miller, Councilmember Ford, Councilmember Fifer, Councilmember Jones and Councilmember Marriott were present in the council chambers.

Members of the public were given notice with instructions on how to participate with public comment.

2. Moment of Reflection and Pledge of Allegiance

3. Roll Call of Councilmembers

Those Present: Mayor Marc Williams, Mayor Pro Tem Dot Miller, Councilmember Bob Fifer, Councilmember Nancy Ford, Councilmember Jones, Councilmember John Marriott

Councilmember Fifer moved to excuse Councilmember Simpson from the meeting.

The following votes were cast on the Motion

Those voting yes: Williams, Miller, Fifer, Ford, Jones, Marriott

Those Absent: Simpson

The Motion was Approved

Also Present: Lorie Gillis, Deputy City Manager; Rachel Morris, City Attorney; Ryan Stachelski, Director of Community and Economic Development; Bryan Archer, Director of Finance and Kristen Rush, City Clerk.

4. Approval of Minutes of the September 13, 2021 and September 20, 2021 City Council Meeting

The minutes stand approved.

5. Recognition and Communication – none

6. Presentations – none

7. Public Comment - none

8. New Business

A. Consent Agenda -

1. R21-121

A Resolution Accepting a Bargain and Sale Deed from Jefferson Center Metropolitan District No. 2 Conveying Two Parcels of Land

- Containing the Ranson Underground Water Storage Tank and Distribution Pump Station
2. R21-122 A Resolution Authorizing the Dedication of a Fire Access Easement to the Arvada Fire Protection District for Access to the Arvada Water Treatment Plant and the Raw Water Pump Station Located at 17935 B West 64th Parkway, Arvada, Colorado 80007

Councilmember Marriott moved that R21-121, A Resolution Accepting a Bargain and Sale Deed from Jefferson Center Metropolitan District No. 2 Conveying Two Parcels of Land Containing the Ranson Underground Water Storage Tank and Distribution Pump Station; R21-122, A Resolution Authorizing the Dedication of a Fire Access Easement to the Arvada Fire Protection District for Access to the Arvada Water Treatment Plant and the Raw Water Pump Station Located at 17935 B West 64th Parkway, Arvada, Colorado 80007, be approved.

The following votes were cast on the Motion

Those voting yes: Williams, Miller, Fifer, Ford, Jones, Marriott

Those Absent: Simpson

The Motion was Approved

B. Resolutions –

1. R21-123 A Resolution Requesting the Subordination of Jefferson County's Reversionary Interest as to a Limited Area on Certain Real Property Near Van Bibber Creek Owned by the City of Arvada for the Installation, Operation, and Maintenance of Public Service Company of Colorado Underground Utility Lines Necessary for the Service of the Sabell Development

Lorie Gillis, Deputy City Manager, reviewed this item with council.

Councilmember Marriott moved that R21-123, A Resolution Requesting the Subordination of Jefferson County's Reversionary Interest as to a Limited Area on Certain Real Property Near Van Bibber Creek Owned by the City of Arvada for the Installation, Operation, and Maintenance of Public Service Company of Colorado Underground Utility Lines Necessary for the Service of the Sabell Development, be approved.

The following votes were cast on the Motion

Those voting yes: Williams, Miller, Fifer, Ford, Jones, Marriott

Those Absent: Simpson

The Motion was Approved

C. Ordinances (First Reading)

1. CB21-032 An Ordinance Annexing Certain Land into the City of Arvada, at the Northeast Corner of Indiana Street and W 82nd Avenue, Approximately Located at 8200 Indiana Street in the County of

- Jefferson and State of Colorado (Public Hearing to be set for October 18, 2021 at 6:15 p.m.)
2. CB21-033 An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street (Public Hearing to be set for October 18, 2021 at 6:15 p.m.)
 3. CB21-034 An Ordinance Certifying the City of Arvada Mill Levy for 2021 for the Board of County Commissioners for Jefferson and Adams Counties (Public Hearing to be set for October 18, 2021 at 6:15 p.m.)
 4. CB21-035 An Ordinance Appropriating Funds for Fiscal Year 2022 (Public Hearing to be set for October 18, 2021 at 6:15 p.m.)
 5. CB21-036 An Ordinance Authorizing The City of Arvada to Enter into an Intergovernmental Agreement With Apex Park and Recreation District and Jefferson County School District R1, for Meyers Pool Replacement Project.

Mayor Pro Tem Miller moved that CB21-032, An Ordinance Annexing Certain Land into the City of Arvada, at the Northeast Corner of Indiana Street and W 82nd Avenue, Approximately Located at 8200 Indiana Street in the County of Jefferson and State of Colorado; CB21-033, An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street; CB21-034, An Ordinance Certifying the City of Arvada Mill Levy for 2021 for the Board of County Commissioners for Jefferson and Adams Counties; CB21-035, An Ordinance Appropriating Funds for Fiscal Year 2022; CB21-036, An Ordinance Authorizing The City of Arvada to Enter into an Intergovernmental Agreement With Apex Park and Recreation District and Jefferson County School District R1, for Meyers Pool Replacement Project, be approved on first reading, ordered published in full, and a public hearing set for October 18, 2021 at 6:15 p.m.

The following votes were cast on the Motion

Those voting yes: Williams, Miller, Fifer, Ford, Jones, Marriott

Those Absent: Simpson

The Motion was Approved

9. Other – none
10. Public Hearings –
 - A. CB21-030 An Ordinance Repealing, Retitling, And Reenacting Section 2-31, Compensation of Councilmembers and The Mayor, of Article II, City Council, of Chapter 2, Administration, of the Arvada City Code (Ordinance No. 4777)

Mayor Williams opened the public hearing on CB21-030.

Rachel Morris, City Attorney, reviewed this ordinance with council.

No one wishing to speak for or against, the public hearing was closed.

Mayor Pro Tem Miller moved that R21-030, An Ordinance Repealing, Retitling, And Reenacting Section 2-31, Compensation of Councilmembers and The Mayor, of Article II, City Council, of Chapter 2, Administration, of the Arvada City Code, be approved on final reading, numbered 4778 and ordered published by title only.

The following votes were cast on the Motion

Those voting yes: Williams, Miller, Fifer, Ford, Jones

Those voting no: Marriott

Those Absent: Simpson

The Motion was Approved

- B. CB21-031 An Ordinance Authorizing an Additional Appropriation to the Community Development Fund for Fiscal Year 2021 (Ordinance No. 4778)

Mayor Williams opened the public hearing on CB21-031.

Lorie Gillis, Deputy City Manager, reviewed this ordinance with council.

No one wishing to speak for or against, the public hearing was closed.

Councilmember Ford moved that R21-031, An Ordinance Authorizing an Additional Appropriation to the Community Development Fund for Fiscal Year 2021, be approved on final reading, numbered 4778 and ordered published by title only.

The following votes were cast on the Motion

Those voting yes: Williams, Miller, Fifer, Ford, Jones, Marriott

Those Absent: Simpson

The Motion was Approved

12. Public Comment - Five Minute Limit - none

13. City Council Reports

- A. Councilmember Marriott complimented the Olde Town Business Improvement District for supporting all of the businesses in Olde Town this past year and a half.
- B. Councilmember Fifer reported on the Transportation Advisory Committee.
- C. Councilmember Ford reminded everyone that the Festival of Scarecrows will be this Saturday, October 9 from 10 a.m. to 2 p.m. in Olde Town
- D. Mayor Williams complimented all of the Art that has been painted on the streets in Olde Town.
- E. Councilmember Jones complimented the Parks Department for cleaning up all of the graffiti in Daybreak Park on Saturday.

14. City Manager Reports - none
15. City Attorney Reports – none
16. Adjournment at 6:25 p.m.

Marc Williams, Mayor

SEAL:

Kristen R. Rush, City Clerk



REPORT TO CITY COUNCIL

AGENDA ITEM
5.A.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: Proclamation Recognizing Judge Mark Randall - Presented by Mayor Williams

Report in Brief

City Council will issue a Proclamation recognizing Judge Mark Randall for Receiving the Colorado Judicial Institute's 2021 Judicial Excellence for Colorado Award.

Prepared by:

Chris Koch, CCO Admin

Reviewed by:

Toni Riebschlager, Law Office Administrator 9/28/2021

Approved by:

Rachel Morris, City Attorney 9/29/2021

Lorie Gillis, Deputy City Manager 10/4/2021

Mark Deven, City Manager 10/6/2021

Enclosure, exhibits & attachments required to support the report

Proclamation



CITY OF ARVADA

WHEREAS, Judge Mark Randall grew up in Arvada, Colorado. His father worked at the First National Bank in historic Old Town Arvada. Randall's first job was shredding papers and polishing the brass on the doors of the bank. He even met his wife Linda when she worked as a clerk at the bank. The judge credits his father with teaching him the importance of being involved in the community; and

WHEREAS, Judge Randall received his undergraduate degree from Creighton University in 1985 and his Juris Doctor from the University of Denver in 1988. He spent twenty-three years as a Colorado district attorney, including three years as the Legislative Director of the Colorado District Attorney's Council. He served as a Chief Deputy District Attorney for the First Judicial District. While working as a DA, his son Connor was diagnosed with a heart condition that ultimately required two heart transplants. After meeting other transplant families, Randall began drafting an organ donor protocol for homicide cases with Donor Alliance, the DA's Council, and the Coroner's Association, so coroners did not feel the need to rule out organ donation just because it was a criminal case. This protocol still helps to ensure successful prosecution of murderers while freeing up many organs to be released for transplantation – saving lives and giving some sense of meaning to victim's families; and

WHEREAS, In 2011, Randall was appointed as a Jefferson County Judge. In his courtroom, he is known for using plain language that everyone can understand. He is highly regarded for giving judicial proceedings a sense of dignity, treating participants with respect, demonstrating compassion for those who appear before him and being a good listener. Judge Randall is committed to serving his community and to issuing just rulings while upholding the law; and

WHEREAS, Outside the courtroom, Judge Randall is active in community organizations, including a local animal rescue group, and in professional organizations committed to improving the practice of law and the administration of justice. He currently serves as the Chair of the Jefferson County Community Corrections Board, as a member of the Standing Committee of the statewide Division of Probation Services and the Supreme Court Model Criminal Jury Instructions Committee, as an instructor in the Advanced New Judge Orientation Program, and as a judge in the Mock Trial Tournament for area high schools.

NOW, THEREFORE BE IT RESOLVED that the Arvada City Council wishes to recognize Judge Mark Randall for his many accomplishments while serving the State of Colorado, the First Judicial District and his service to the community.

Dated this 18th day of October, 2021

Marc Williams, Mayor

David Jones, Councilmember

John Marriott, Councilmember

Lauren Simpson, Councilmember

Dot Miller, Mayor Pro Tem

Bob Fifer, Councilmember

Nancy Ford, Councilmember



REPORT TO CITY COUNCIL

AGENDA ITEM
8.A.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: Consent Agenda

Report in Brief

8.A.1. R21-124 A Resolution Adopting the Amended Administrative Fee Schedule for Building Safety Division Permits and Services Pursuant to Chapter 18, Buildings and Building Regulations, of the Arvada City Code

8.A.2. R21-125 A Resolution Adopting the Amended Fee Schedule for Rights-of-Way Work Permits and Services Pursuant to Chapter 78, Public Improvements, of the Arvada City Code

8.A.3. R21-126 A Resolution Adopting the Amended Fee Schedule for Land-Use Pursuant to Chapter 74, Planning and Development, of the Arvada City Code

Suggested Motion: Moved by: _____

I move that the Consent Item(s), Number(s) R_____ be (Removed from the Consent Agenda and Heard Upon Item _____) (Referred to a Workshop) (Postponed Indefinitely).

YES _____ NO _____ ABSENT _____

That All/Remaining Consent Items be (Approved) (Rejected).

YES _____ NO _____ ABSENT _____

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Enclosure, exhibits & attachments required to support the report



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.1.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-124 A Resolution Adopting the Amended Administrative Fee Schedule for Building Safety Division Permits and Services Pursuant to Chapter 18, Buildings and Building Regulations, of the Arvada City Code

Report in Brief

The resolution updates the Administrative Fee Schedules for the Building Inspection Division Building Permits and Inspections. The fee schedule is effective January 1, 2022.

The Arvada team recommends that the City Council approve R21-124, A Resolution Adopting the Amended Administrative Fee Schedule for Building Safety Division Permits and Services Pursuant to Chapter 18, Buildings and Building Regulations, of the Arvada City Code.

Financial Impact

Depending on the number and types of permits processed in 2022, these changes should have an impact of approximately 4-5% increase in fees. Use tax collections would increase approximately 20% assuming permit activity remains the same.

Background

The Building Permit Fee Schedule is being updated in accordance with Ordinance Chapter 18 requirements, following the standard methodology established in 2016, using national valuation estimates and regional modifiers for the Denver area. Because of significant increases in material costs and valuations, the fee calculator is being adjusted to moderate the increase in calculated fees. Flat fees are also being adjusted.

Discussion

Per our standard annual update process, the International Code Council August 2021 Valuation table has been modified by the 2021 RS Means Building Construction Cost multiplier for the Denver area. The Use Tax calculation will remain unchanged from 2020 as will the material cost estimate of 58% of the total valuation.

As a result of this update, the per-square-foot cost shown in Table 18-2 of the Building Permit Fee Schedule will increase between 19% and 22% for all residential and commercial categories and types of construction, which is significantly higher than we've seen in the past years; however, this does reflect the labor and material increases seen in many goods and services and throughout many industries. This square foot valuation will have a proportional impact on use tax collected on building permits. To moderate the effect the new valuations have on permit fees, our team is proposing modifications to the fee calculator in Table 18-1 of the Building Permit Fee Schedule. Depending on the size and type of building, the proposed fee increases generally range from 2-8% with the larger increases occurring for permits with small square footages and/or lower overall valuations. The base permit fee of \$26.00, which has been unchanged for many years, is proposed to increase to \$34.00 or the equivalent of 30 total minutes of administrative and inspection time. This fee remains modest enough to encourage customers to obtain permits and inspections and ensure safe installations for even the smallest projects.

The goal of these changes is to have an increase in total permit fees to be 4-5% for 2022, which will offset the overall increase in cost to provide Building Division services. For an illustration of these changes to various sizes and types of projects, please see the Sample Fees sheet. In addition to the changes in Tables 18-1 and 18-2, the flat rate fees noted in Tables 18-3 through 18-5 have been reviewed and an increase of approximately 4% - 5%% (rounded) is also being proposed for these fees as well. Fees for most licenses will remain the same. Please note that our team is recommending Plumbing License fees be eliminated, similar to Electrical License fees, as local licensing for both is a verification of current/valid State licenses.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

The recommended action aligns with the Community and Economic Development Priority Area within the City Council Strategic Plan.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R21-124, A Resolution Adopting the Amended Administrative Fee Schedule for Building Safety Division Permits and Services Pursuant to Chapter 18, Buildings and Building Regulations, of the Arvada City Code.

Suggested Motion:

I move that R21-124, A Resolution Adopting the Amended Administrative Fee Schedule for Building Safety Division Permits and Services Pursuant to Chapter 18, Buildings and Building Regulations, of the Arvada City Code, be (adopted) (rejected).

Prepared by:

Josie Suk, Development Systems and Administrative Manager

Reviewed by:

Approved by:

Brita Van Horne, Deputy Director of Community & Economic Development 9/22/2021

Ryan Stachelski, Director of Community and Economic Development 9/22/2021

Gail Walker, Legal Specialist-Contracts 9/23/2021

Emily Grogg, Senior Assistant City Attorney 9/23/2021

SUBJECT: R21-124 A Resolution Adopting the Amended Administrative Fee Schedule for Building Safety Division Permits and Services Pursuant to Chapter 18, Buildings and Building Regulations, of the Arvada City Code

PAGE: 3
ITEM: 8.A.1.

Rachel Morris, City Attorney

10/6/2021

Lorie Gillis, Deputy City Manager

10/6/2021

Mark Deven, City Manager

10/7/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-124

A RESOLUTION ADOPTING THE AMENDED ADMINISTRATIVE FEE SCHEDULE
FOR BUILDING SAFETY DIVISION PERMITS AND SERVICES PURSUANT TO
CHAPTER 18, BUILDINGS AND BUILDING REGULATIONS, OF THE ARVADA CITY
CODE

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF
ARVADA, COLORADO:

Section 1. Administrative Fee Schedule for Building Safety Division Permits and Services pursuant to Chapter 18, Buildings and Building Regulations of the Arvada City Code, which is in substantially the same form as that attached below, is hereby amended.

Section 2. Any prior version of said Fee Schedules inconsistent with that set forth below is amended to conform herewith.

Section 3. The Fee Schedules set forth herein shall be effective January 1, 2022.

Section 4. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By:_____

ADMINISTRATIVE FEE SCHEDULE
FOR
BUILDING SAFETY DIVISION PERMITS AND SERVICES AS
REFERENCED IN CHAPTER 18 OF THE ARVADA CITY CODE
EFFECTIVE JANUARY 1, 2022

	<u>Page</u>
Building Permits (Table 18-1)	1
Building Valuation (Table 18-2)	2
Miscellaneous Inspections and Other Fees (Table 18-3)	3
Foundation Only Permits (Table 18-4)	4
Miscellaneous Permits – Residential (Table 18-5)	4
Roofing Valuation – Estimated (Table 18-6)	5
Plan Review (Table 18-7)	6
Temporary Certificate of Occupancy (Table 18-8)	7
Contractor Licensing (Table 18-9)	7

BUILDING PERMITS
Table 18-1

Total Valuation	Fee
\$1.00 to \$500.00	\$34.00
\$501.00 to \$2,000.00	\$34.00 for the first \$500.00 plus \$3.05 for each additional \$100.00 or fraction thereof, to and including \$2,000.00
\$2,001.00 to \$25,000.00	\$79.75 for the first \$2,000.00 plus \$14.00 for each additional \$1,000.00 or fraction thereof, to and including \$25,000.00
\$25,001.00 to \$50,000.00	\$401.75 for the first \$25,000.00 plus \$10.10 for each additional \$1,000.00 or fraction thereof, to and including \$50,000.00
\$50,001.00 to \$100,000.00	\$654.25 for the first \$50,000.00 plus \$7.00 for each additional \$1,000.00 or fraction thereof, to and including \$100,000.00
\$100,001.00 to \$500,000.00	\$1,004.25 for the first \$100,000.00 plus \$5.60 for each additional \$1,000.00 or fraction thereof, to and including \$500,000.00
\$500,001.00 to \$1,000,000.00	\$3,244.25 for the first \$500,000.00 plus \$4.85 for each additional \$1,000.00 or fraction thereof, to and including \$1,000,000.00

\$1,000,001.00 and up	\$5,669.25 for the first \$1,000,000.00 plus \$3.45 for each additional \$1,000.00 or fraction thereof.
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Combination permit defined. A permit that is issued to the general contractor or the primary contractor and includes the subcontractor's valuation and fees as a part of the permit. Only a combination permit shall be issued where more than one category of work, such as building, electrical, plumbing, or HVAC, is involved. Exception: The building official may allow separate permits to be issued when a general contractor is not required for the scope of work involved, or when the building official finds good cause.

Separate commercial permits. When work is done by a subcontractor and is not part of a combination permit, the valuation used to determine the permit fee will be based on the actual contract value of the work being done. If the work is part of a combination permit and the subcontractor's contract value is unknown, the value will be assumed to be ten (10) percent of the overall combination permit valuation for each contractor.

Residential combination permits for single family detached or attached homes. When a combination permit is issued for a new single-family dwelling unit, the fee assessed for the electrical, heating, and plumbing subcontractors shall be equal to thirty (30) percent of the calculated building permit fee.

BUILDING VALUATION

Table 18-2^{a,b,c,d,e}

Numbers represent estimated dollar cost per square foot (.09 m²) of construction.

90.6% of August 2021 ICC Building Valuation table, as per RS Means Building Construction Cost Data, 79th annual addition, 2021	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
A-1 Assembly, theaters, with stage	270.48	261.32	254.52	244.21	229.30	222.67	236.35	213.22	205.52
A-1 Assembly, theaters, without stage	247.80	238.63	231.84	221.52	206.62	199.98	213.67	190.54	182.83
A-2 Assembly, nightclubs	211.45	205.14	200.09	191.89	180.87	175.89	185.06	163.67	158.08
A-2 Assembly, restaurants, bars, banquet halls	210.54	204.23	198.28	190.99	179.06	174.98	184.16	161.86	157.17
A-3 Assembly, churches	250.82	241.65	234.85	224.54	210.04	204.46	216.68	193.96	186.25
A-3 Assembly, general, community halls, libraries, museums	209.85	200.68	192.98	183.57	167.76	162.03	175.71	151.68	144.88
A-4 Assembly, arenas	246.89	237.73	230.02	220.62	204.81	199.08	212.76	188.73	181.93
A-5 Assembly, amusement/stadiums	218.28	210.32	203.31	193.32	176.61	169.82	185.71	155.38	148.27
B Business	218.28	210.32	203.31	193.32	176.61	169.82	185.71	155.38	148.27
E Educational	229.36	221.52	215.69	206.40	192.67	182.94	199.29	168.41	163.16
F-1 Factory and industrial, moderate hazard	129.12	123.04	116.15	111.72	100.20	95.42	106.93	82.56	77.41
F-2 Factory and industrial, low hazard	128.21	122.14	116.15	110.81	100.20	94.51	106.02	82.56	76.50
H-1 High Hazard, explosives	120.54	114.47	108.48	103.15	92.79	87.10	98.36	75.15	--
H234 High Hazard	120.54	114.47	108.48	103.15	92.79	87.10	98.36	75.15	69.09
H-5 HPM	218.28	210.32	203.31	193.32	176.61	169.82	185.71	155.38	148.27
I-1 Institutional, supervised environment	217.75	210.29	204.04	195.81	180.09	175.12	196.06	161.46	156.62
I-2 Institutional, hospitals	365.66	357.70	350.70	340.70	323.03	--	333.09	301.80	--
I-2 Institutional, nursing	253.94	245.98	238.98	228.98	212.91	--	221.37	191.68	--

homes									
I-3 Institutional, restrained	248.23	240.26	233.26	223.26	208.00	200.30	215.65	186.77	177.84
I-4 Institutional, day care facilities	217.75	210.29	204.04	195.81	180.09	175.12	196.06	161.46	156.62
M Mercantile	157.72	151.41	145.46	138.17	126.93	122.86	131.33	109.73	105.05
R-1 Residential, hotels	219.95	212.49	206.23	198.00	182.02	177.05	198.26	163.39	158.55
R-2 Residential, multiple family	184.23	176.77	170.51	162.28	147.35	142.38	162.54	128.73	123.88
R-3 Residential, one- and two-family	171.54	166.90	162.60	158.59	153.97	148.39	155.90	142.84	134.39
R-4 Residential, care/assisted living facilities	217.75	210.29	204.04	195.81	180.09	175.12	196.06	161.46	156.62
S-1 Storage, moderate hazard	119.64	113.56	106.67	102.24	90.98	86.20	97.45	73.34	68.19
S-2 Storage, low hazard	118.73	112.66	106.67	101.34	90.98	85.29	96.55	73.34	67.28
U Utility, miscellaneous	94.25	88.92	73.77	80.09	72.22	66.84	76.60	56.93	54.26
Basement Finish – Added Cost	--	--	--	--	--	--	--	--	27.49
Canopies (banks, gas stations)	--	--	--	--	--	--	--	--	52.49
Carports	--	--	--	--	--	--	--	--	22.68
Decks	--	--	--	--	--	--	--	--	24.04
Deck (with patio cover)	--	--	--	--	--	--	--	--	30.24
Sunspaces	--	--	--	--	--	--	--	--	52.90
Offices (tenant finish)	41.28	41.28	41.28	41.28	41.28	41.28	41.28	41.28	41.28
R-2, R-3 Detached Garage Monolithic Slab	--	--	--	--	--	--	--	--	34.99

- Private garages attached or with a full foundation – use Utility, miscellaneous
- Commercial open or enclosed parking garages - use S-2 Storage, low hazard
- Unfinished basements (all use groups) = \$19.25 per SF
- Add 0.5 percent to total cost for each story over three
- Deduct 20 percent for shell-only buildings

Buildings or structures not listed above shall be valued at contract price submitted by the contractor or actual value as submitted by the architect.

USE TAX CALCULATION

Use Tax calculations are based on the building valuation, using 58% materials and 42% labor. The source for the materials / labor split is RS Means Building Construction Cost Data 2021, City Cost Indexes for the Denver, Colorado area.

MISCELLANEOUS INSPECTIONS AND OTHER FEES

Table 18-3

Temporary construction power	\$51.00
Residential service change	\$51.00
Detached signs	\$47.00
Attached signs	\$25.50
Electrical fee for signs (not required for disconnect/reconnect of electrical for replacement signs)	\$47.00
Fences exceeding 6' in height based on actual valuation	Use Table 18-1

Commercial cell sites based on actual valuation	Use Table 18-1
Permit fees for temporary membrane structures, tents, and canopies	\$68.00 per installation/event
Inspections outside of normal business hours (minimum charge - two (2) hours)	\$68.00 per hour*
Reinspection fees assessed under provisions of Chapter 18 of the Arvada City Code	\$68.00*
Inspections for which no fee is specifically indicated (minimum charge one-half (1/2) hour)	\$68.00 per hour*
Additional plan review required by changes, additions or revisions to plans (minimum charge - one-half (1/2) hour).	\$68.00 per hour*
Issuance of new permit following suspension or abandonment of previously permitted work (minimum charge - one (1) hour)	\$68.00 per hour*
Issuance of new permit for change of contractor on existing job (minimum charge – one (1) hour)	\$68.00 per hour*
Use of outside consultants for plan checking and inspections, or both	Actual costs (including administrative and overhead costs)

* Or the total hourly cost to the city, whichever is the greatest. This cost shall include supervision, overhead, equipment, hourly wages, and benefits of the employees involved.

Fees for other miscellaneous permits and commercial work shall be based on actual contract value of the work as per Table 18-1.

FOUNDATION ONLY PERMITS

Table 18-4

One- and two-family buildings	\$243.00
Multifamily buildings	\$364.00
Commercial buildings	\$607.00

MISCELLANEOUS PERMITS– RESIDENTIAL *

Table 18-5

Air Conditioners**	\$47.00
Awnings	\$47.00
Demolition	\$58.00 (minor-interior) \$116.00 (major-building)

Electric Wind Generator	\$47.00
Evaporative Coolers/Heat Pumps	\$47.00
Furnace Replacement**	\$47.00
Gas Logs/Inserts	\$47.00
Hot Tubs & Above-Ground Pools (In-Ground Pools--use Table 7-19a)	\$47.00
House Moving	\$193
Lawn Sprinklers	\$47.00
Replacement Windows (no structural alterations) (if structural alterations use Table 18-1)	\$47.00
Residential Elevator or Dumbwaiter/Chairlift	\$116.00
Retaining Walls Greater than 4' or Supporting a Surcharge	\$47.00
Roofing	Use Table 18-1
Siding	\$47.00
Solar Hot Water	\$47.00
Solar Photovoltaic Panels	\$47.00
Water Heaters**	\$47.00
Wood Burning Stoves	\$47.00

* The permit fees assessed under Table 18-1 cover the cost of all permit fees related to the specific permit type.

Exception: Minor electric wiring is included, but a service change or upgrade is not included in this permit fee.

** If permit application includes installation of more than one appliance listed in Table 18-5, the fee is \$70.50.

Fees for plumbing permits, mechanical permits, electrical permits, and other miscellaneous permits and commercial work shall be based on actual contract amount of the work as determined by Table 18-1.

ROOFING VALUATION *

Table 18-6

3-tab	\$160.00per 100 sf (9.3 m ²)
Shakes (untreated)	\$375.00per 100 sf (9.3 m ²)
Light-weight tile roofs	\$375.00per 100 sf (9.3 m ²)

Dimensional shingles	\$215.00per 100 sf (9.3 m ²)
Other, special roofs and treated shakes	Use actual contract amount**

*The valuation used for calculating roofing permit fees shall be determined by the actual contract amount, excluding the tear-off, or if the amount is unknown, by applying the above estimated costs per 100 sf (9.3 m²).

** If the contractor/homeowner submits a copy of the contract or proof of actual material cost, with the material cost clearly identified, the contract amount used to calculate the permit fee will be calculated using 58% as the material cost and 42% as the labor cost.

PLAN REVIEW FEES

Table 18-7

The plan review fees specified in this section are separate fees from other permit fees assessed in this administrative fee schedule and are in addition to those other permit fees.

Plan review fee (residential)	65% of building permit fee (Use Table 18-1 and 18-3)
Plan review fee (modifications to existing single-family dwellings)	\$34.00
Electrical, plumbing, mechanical, fire protection or elevator permit (not part of combination permit)	50% of total permit fee (Use Table 18-1 and 18-3)
Commercial buildings	65% of building permit fee (Use Table 18-1 and 18-3)
Additional plan review (incomplete/changed submittal documents)	Use Table 18-3
Deferred submittals items as defined in section 18-40 of the Arvada City Code	Use Table 18-3

Plan review fees for "stock" or "repeat" plans (stock or repeat plans are plans of buildings that have been reviewed and are subsequently built in multiple locations) shall be assessed as follows:

One- and two-family buildings	\$180.00
Multifamily buildings	\$210.00

TEMPORARY CERTIFICATE OF OCCUPANCY FEES

Table 18-8

For all buildings or portions thereof – original TCO	\$200.00*
--	-----------

For all buildings or portions thereof – extension TCO	\$200.00*
---	-----------

* \$100.00 will be refunded if a certificate of occupancy is issued prior to the thirty (30) day expiration of the temporary certificate of occupancy or any extensions thereof.

CONTRACTOR LICENSING FEES
Table 18-9

Class I-B Builder's Unlimited License	\$200.00
Class II-B Builder's License	\$150.00
Class III-B Builder's Miscellaneous License	\$75.00
Class IV-B Builder's Subcontractor's License	\$75.00
Class V-B Homeowner's "Limited" Building License	\$75.00
Class VI-P Plumbing License (Registration of CO State Licensed Plumbing Contractors)	No Fee
Class VII-M Mechanical License	\$75.00
Class VIII-D Building Moving License	\$75.00
Class IX-R Builders Roofing License	\$75.00
Limited License	50% of regular license fee
Registration of (CO State Licensed) Electrical Contractors	No Fee

Underlined indicates new material
~~Strikeover~~ indicates deleted material

ADMINISTRATIVE FEE SCHEDULE
FOR
BUILDING SAFETY DIVISION PERMITS AND SERVICES AS
REFERENCED IN CHAPTER 18 OF THE ARVADA CITY CODE
EFFECTIVE JANUARY 1, 202~~2~~1

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Building Permits (Table 18-1)	1
Building Valuation (Table 18-2)	2
Miscellaneous Inspections and Other Fees (Table 18-3)	3
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Roofing Valuation – Estimated (Table 18-6)	5
Plan Review (Table 18-7)	6
Temporary Certificate of Occupancy (Table 18-8)	7
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BUILDING PERMITS
Table 18-1

Total Valuation	Fee
\$1.00 to \$500.00	\$ 34.00 <u>26.00</u>
\$501.00 to \$2,000.00	\$ 34.00 <u>26.00</u> for the first \$500.00 plus \$ 3.05 <u>3.37</u> for each additional \$100.00 or fraction thereof, to and including \$2,000.00
\$2,001.00 to \$25,000.00	\$ 79.75 <u>76.55</u> for the first \$2,000.00 plus \$ 14.00 <u>15.49</u> or each additional \$1,000.00 or fraction thereof, to and including \$25,000.00
\$25,001.00 to \$50,000.00	\$ 401.75 <u>432.82</u> for the first \$25,000.00 plus \$ 10.10 <u>11.17</u> for each additional \$1,000.00 or fraction thereof, to and including \$50,000.00
\$50,001.00 to \$100,000.00	\$ 654.25 <u>712.07</u> for the first \$50,000.00 plus \$ 7.00 <u>7.74</u> for each additional \$1,000.00 or fraction thereof, to and including \$100,000.00
\$100,001.00 to \$500,000.00	\$ 1,004.25 <u>1,099.07</u> for the first \$100,000.00 plus \$ 5.60 <u>6.20</u> for each additional \$1,000.00 or fraction thereof, to and including \$500,000.00

\$500,001.00 to \$1,000,000.00	\$3,244.25 3,579.07 for the first \$500,000.00 plus \$4.85 5.25 for each additional \$1,000.00 or fraction thereof, to and including \$1,000,000.00
\$1,000,001.00 and up	\$5,669.25 6,204.07 for the first \$1,000,000.00 plus \$3.45 4.04 for each additional \$1,000.00 or fraction thereof.

Combination permit defined. A permit that is issued to the general contractor or the primary contractor and includes the subcontractor's valuation and fees as a part of the permit. Only a combination permit shall be issued where more than one category of work, such as building, electrical, plumbing, or HVAC, is involved. Exception: The building official may allow separate permits to be issued when a general contractor is not required for the scope of work involved, or when the building official finds good cause.

Separate commercial permits. When work is done by a subcontractor and is not part of a combination permit, the valuation used to determine the permit fee will be based on the actual contract value of the work being done. If the work is part of a combination permit and the subcontractor's contract value is unknown, the value will be assumed to be ten (10) percent of the overall combination permit valuation for each contractor.

Residential combination permits for single family detached or attached homes. When a combination permit is issued for a new single-family dwelling unit, the fee assessed for the electrical, heating, and plumbing subcontractors shall be equal to thirty (30) percent of the calculated building permit fee.

BUILDING VALUATION

Table 18-2^{a,b,c,d,e}

Numbers represent estimated dollar cost per square foot (.09 m²) of construction.

^{90.694} 3% of August 2021 ¹⁰ ICC Building Valuation table, as per RS Means Building Construction Cost Data, 79 th annual addition, 2021 ¹⁰	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
A-1 Assembly, theaters, with stage	226.29 270.48	218.63 261.32	212.96 254.52	204.34 244.21	191.89 229.30	186.34 222.67	197.78 236.35	178.45 213.22	172.01 205.52
A-1 Assembly, theaters, without stage	207.34 247.80	199.68 238.63	194.00 231.84	185.39 221.52	172.93 206.62	167.39 199.98	178.82 213.67	159.50 190.54	153.06 182.83
A-2 Assembly, nightclubs	175.26 211.45	170.33 205.14	166.28 200.09	159.50 191.89	150.59 180.87	146.43 175.89	153.97 185.06	136.30 163.67	131.77 158.08
A-2 Assembly, restaurants, bars, banquet halls	174.35 210.54	169.41 204.23	164.45 198.28	158.59 190.99	148.77 179.06	145.52 174.98	153.06 184.16	134.47 161.86	130.86 157.17
A-3 Assembly, churches	209.70 250.82	202.04 241.65	196.37 234.85	187.75 224.54	175.63 210.04	170.98 204.46	181.19 216.68	162.20 193.96	155.76 186.25
A-3 Assembly, general, community halls, libraries, museums	175.48 209.85	167.82 200.68	161.23 192.98	153.52 183.57	140.16 167.76	135.53 162.03	146.96 175.71	126.72 151.68	121.20 144.88
A-4 Assembly, arenas	206.43 246.89	198.77 237.73	192.18 230.02	184.47 220.62	171.11 204.81	166.48 199.08	177.91 212.76	157.67 188.73	152.15 181.93
A-5 Assembly, amusement/stadiums	206.43 218.28	198.77 210.32	192.18 203.31	184.47 193.32	171.11 176.61	166.48 169.82	177.91 185.71	157.67 155.38	152.15 148.27
B Business	182.84 218.28	176.17 210.32	170.31 203.31	161.95 193.32	147.81 176.61	142.28 169.82	155.58 185.71	130.04 155.38	124.24 148.27
E Educational	191.64 229.36	185.01 221.52	179.70 215.69	171.95 206.40	160.22 192.67	152.11 182.94	166.04 199.29	140.10 168.41	135.81 163.16
F-1 Factory and industrial, moderate hazard	107.37 129.12	102.43 123.04	96.75 116.15	92.98 111.72	83.57 100.20	79.67 95.42	89.11 106.93	68.74 82.56	64.78 77.41
F-2 Factory and industrial, low hazard	106.46 128.21	101.52 122.14	96.75 116.15	92.07 110.81	83.57 100.20	78.76 94.51	88.20 106.02	68.74 82.56	63.87 76.50
H-1 High Hazard, explosives	100.42 120.54	95.48 114.47	90.71 108.48	86.03 103.15	77.74 92.79	72.92 87.10	82.16 98.36	62.90 75.15	0.00 --

H234 High Hazard	100.42 120.54	95.48 114.47	90.71 108.48	86.03 103.15	77.74 92.79	72.92 87.10	82.46 98.36	62.90 75.15	58.03 69.09
H-5 HPM	182.84 218.28	176.17 210.32	170.31 203.31	161.95 193.32	147.81 176.61	142.28 169.82	155.58 185.71	130.04 155.38	124.24 148.27
I-1 Institutional, supervised environment	180.62 217.75	174.43 210.29	169.01 204.04	162.43 195.81	149.08 180.09	144.99 175.12	162.57 196.06	134.19 161.46	129.95 156.62
I-2 Institutional, hospitals	306.34 365.66	299.68 357.70	293.82 350.70	285.45 340.70	270.66 323.03	--	279.08 333.09	252.89 301.80	--
I-2 Institutional, nursing homes	212.84 253.94	206.18 245.98	200.32 238.98	191.95 228.98	178.50 212.91	--	185.58 221.37	160.73 191.68	--
I-3 Institutional, restrained	207.90 248.23	201.24 240.26	195.38 233.26	187.01 223.26	174.23 208.00	167.79 200.30	180.64 215.65	156.46 186.77	148.84 177.84
I-4 Institutional, day care facilities	180.62 217.75	174.43 210.29	169.01 204.04	162.43 195.81	149.08 180.09	144.99 175.12	162.57 196.06	134.19 161.46	129.95 156.62
M Mercantile	130.51 157.72	125.58 151.41	120.61 145.46	114.75 138.17	105.34 126.93	102.10 122.86	109.22 131.33	91.05 109.73	87.44 105.05
R-1 Residential, hotels	182.33 219.95	176.14 212.49	170.72 206.23	164.14 198.00	150.56 182.02	146.47 177.05	164.28 198.26	135.67 163.39	131.43 158.55
R-2 Residential, multiple family	152.72 184.23	146.53 176.77	141.11 170.51	134.53 162.28	122.08 147.35	117.99 142.38	134.67 162.54	107.19 128.73	102.95 123.88
R-3 Residential, one- and two-family	142.28 171.54	138.42 166.90	134.97 162.60	131.55 158.59	126.85 153.97	123.50 148.39	129.39 155.90	118.73 142.84	111.81 134.39
R-4 Residential, care/assisted living facilities	180.62 217.75	174.43 210.29	169.01 204.04	162.43 195.81	149.08 180.09	144.99 175.12	162.57 196.06	134.19 161.46	129.95 156.62
S-1 Storage, moderate hazard	99.51 119.64	94.56 113.56	88.88 106.67	85.11 102.24	75.91 90.98	72.01 86.20	81.25 97.45	61.07 73.34	57.12 68.19
S-2 Storage, low hazard	98.59 118.73	93.65 112.66	88.88 106.67	84.20 101.34	75.91 90.98	71.10 85.29	80.34 96.55	61.07 73.34	56.20 67.28
U Utility, miscellaneous	77.30 94.25	72.87 88.92	68.16 73.77	65.09 80.09	58.44 72.22	54.60 66.84	62.12 76.60	46.28 56.93	44.09 54.26
Basement Finish – Added Cost	--	--	--	--	--	--	--	--	22.91 27.49
Canopies (banks, gas stations)	--	--	--	--	--	--	--	--	44.11 52.49
Carports	--	--	--	--	--	--	--	--	18.90 22.68
Decks	--	--	--	--	--	--	--	--	20.03 24.04
Deck (with patio cover)	--	--	--	--	--	--	--	--	25.20 30.24
Sunspaces	--	--	--	--	--	--	--	--	44.08 52.90
Offices (tenant finish)	34.69 41.28	34.69 41.28	34.69 41.28	34.69 41.28	34.69 41.28	34.69 41.28	34.69 41.28	34.69 41.28	34.69 41.28
R-2, R-3 Detached Garage Monolithic Slab	--	--	--	--	--	--	--	--	29.16 34.99

- f. Private garages attached or with a full foundation – use Utility, miscellaneous
- g. Commercial open or enclosed parking garages - use S-2 Storage, low hazard
- h. Unfinished basements (all use groups) = ~~\$16.04~~19.25 per SF
- i. Add 0.5 percent to total cost for each story over three
- j. Deduct 20 percent for shell-only buildings

Buildings or structures not listed above shall be valued at contract price submitted by the contractor or actual value as submitted by the architect.

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Use Tax calculations are based on the building valuation, using 58% materials and 42% labor. The source for the materials / labor split is RS Means Building Construction Cost Data 2021~~0~~, City Cost Indexes for the Denver, Colorado area.

MISCELLANEOUS INSPECTIONS AND OTHER FEES

Table 18-3

Temporary construction power	\$51.00 49.00
Residential service change	\$51.00 49.00
Detached signs	\$47.00 45.00
Attached signs	\$25.50 24.50
Electrical fee for signs (not required for disconnect/reconnect of electrical for replacement signs)	\$47.00 45.00
Fences exceeding 6' in height based on actual valuation	Use Table 18-1
Commercial cell sites based on actual valuation	Use Table 18-1
Permit fees for temporary membrane structures, tents, and canopies	\$68.00 65.00 per installation/event
Inspections outside of normal business hours (minimum charge - two (2) hours)	\$68.00 65.00 per hour*
Reinspection fees assessed under provisions of Chapter 18 of the Arvada City Code	\$68.00 65.00*
Inspections for which no fee is specifically indicated (minimum charge one-half (1/2) hour)	\$68.00 65.00 per hour*
Additional plan review required by changes, additions or revisions to plans (minimum charge - one-half (1/2) hour).	\$68.00 65.00 per hour*
Issuance of new permit following suspension or abandonment of previously permitted work (minimum charge - one (1) hour)	\$68.00 65.00 per hour*
Issuance of new permit for change of contractor on existing job (minimum charge – one (1) hour)	\$68.00 65.00 per hour*
Use of outside consultants for plan checking and inspections, or both	Actual costs (including administrative and overhead costs)

* Or the total hourly cost to the city, whichever is the greatest. This cost shall include supervision, overhead, equipment, hourly wages, and benefits of the employees involved.

Fees for other miscellaneous permits and commercial work shall be based on actual contract value of the work as per Table 18-1.

FOUNDATION ONLY PERMITS Table 18-4

One- and two-family buildings	\$243.00 233.00
Multifamily buildings	\$364.00 348.00
Commercial buildings	\$607.00 581.00

MISCELLANEOUS PERMITS– RESIDENTIAL *

Table 18-5

Air Conditioners**	\$47.00 <u>45.00</u>
Awnings	\$47.00 <u>45.00</u>
Demolition	\$58.00 <u>56.00</u> (minor-interior) \$116.00 <u>112.00</u> (major-building)
Electric Wind Generator	\$47.00 <u>45.00</u>
Evaporative Coolers/Heat Pumps	\$47.00 <u>45.00</u>
Furnace Replacement**	\$47.00 <u>45.00</u>
Gas Logs/Inserts	\$47.00 <u>45.00</u>
Hot Tubs & Above-Ground Pools (In-Ground Pools--use Table 7-19a)	\$47.00 <u>45.00</u>
House Moving	\$193 <u>184.00</u>
Lawn Sprinklers	\$47.00 <u>45.00</u>
Replacement Windows (no structural alterations) (if structural alterations use Table 18-1)	\$47.00 <u>45.00</u>
Residential Elevator or Dumbwaiter/Chairlift	\$116.00 <u>111.00</u>
Retaining Walls Greater than 4' or Supporting a Surcharge	\$47.00 <u>45.00</u>
Roofing	Use Table 18-1
Siding	\$47.00 <u>45.00</u>
Solar Hot Water	\$47.00 <u>45.00</u>
Solar Photovoltaic Panels	\$47.00 <u>45.00</u>
Water Heaters**	\$47.00 <u>45.00</u>
Wood Burning Stoves	\$47.00 <u>45.00</u>

* The permit fees assessed under Table 18-1 cover the cost of all permit fees related to the specific permit type.

Exception: Minor electric wiring is included, but a service change or upgrade is not included in this permit fee.

** If permit application includes installation of more than one appliance listed in Table 18-5, the fee is ~~\$70.50~~67.50.

Fees for plumbing permits, mechanical permits, electrical permits, and other miscellaneous permits and commercial work shall be based on actual contract amount of the work as determined by Table 18-1.

ROOFING VALUATION ***Table 18-6**

3-tab	\$ 160.00 154.00 per 100 sf (9.3 m ²)
T-Loek	\$154.00 per 100 sf (9.3 m²)
Shakes (untreated)	\$ 375.00 358.00 per 100 sf (9.3 m ²)
Light-weight tile roofs	\$ 375.00 358.00 per 100 sf (9.3 m ²)
Dimensional shingles	\$ 215.00 205.00 per 100 sf (9.3 m ²)
Other, special roofs and treated shakes	Use actual contract amount**

*The valuation used for calculating roofing permit fees shall be determined by the actual contract amount, excluding the tear-off, or if the amount is unknown, by applying the above estimated costs per 100 sf (9.3 m²).

** If the contractor/homeowner submits a copy of the contract or proof of actual material cost, with the material cost clearly identified, the contract amount used to calculate the permit fee will be calculated using 58% as the material cost and 42% as the labor cost.

PLAN REVIEW FEES**Table 18-7**

The plan review fees specified in this section are separate fees from other permit fees assessed in this administrative fee schedule and are in addition to those other permit fees.

Plan review fee (residential)	65% of building permit fee (Use Table 18-1 and 18-3)
Plan review fee (modifications to existing single-family dwellings)	\$34.00 32.50
Electrical, plumbing, mechanical, fire protection or elevator permit (not part of combination permit)	50% of total permit fee (Use Table 18-1 and 18-3)
Commercial buildings	65% of building permit fee (Use Table 18-1 and 18-3)
Additional plan review (incomplete/changed submittal documents)	Use Table 18-3
Deferred submittals items as defined in section 18-40 of the Arvada City Code	Use Table 18-3

Plan review fees for "stock" or "repeat" plans (stock or repeat plans are plans of buildings that have been reviewed and are subsequently built in multiple locations) shall be assessed as follows:

One- and two-family buildings	\$ 180.00 175.00
Multifamily buildings	\$ 210.00 200.00

TEMPORARY CERTIFICATE OF OCCUPANCY FEES

Table 18-8

For all buildings or portions thereof – original TCO	\$200.00*
For all buildings or portions thereof – extension TCO	\$200.00*

* \$100.00 will be refunded if a certificate of occupancy is issued prior to the thirty (30) day expiration of the temporary certificate of occupancy or any extensions thereof.

CONTRACTOR LICENSING FEES

Table 18-9

Class I-B Builder's Unlimited License	\$200.00
Class II-B Builder's License	\$150.00
Class III-B Builder's Miscellaneous License	\$75.00
Class IV-B Builder's Subcontractor's License	\$75.00
Class V-B Homeowner's "Limited" Building License	\$75.00
Class VI-P Plumbing License (<u>Registration of CO State Licensed Plumbing Contractors</u>)(3-year)	<u>No Fee</u> \$150.00
Class VII-M Mechanical License	\$75.00
Class VIII-D Building Moving License	\$75.00
Class IX-R Builders Roofing License	\$75.00
Limited License	50% of regular license fee
<u>Registration of (CO State Licensed) Electrical Contractors</u>	<u>No Fee</u>

[illegible]



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.A.2.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-125 A Resolution Adopting the Amended Fee Schedule for Rights-of-Way Work Permits and Services Pursuant to Chapter 78, Public Improvements, of the Arvada City Code

Report in Brief

The resolution updates the fee schedule for rights-of-way permits and services, effective January 1, 2022.

The Arvada team recommends that the City Council approve R21-125, A Resolution Adopting the Amended Permits Fee Schedule for Rights-of-Way Work Permits and Services Pursuant to Chapter 78, Public Improvements, of the Arvada City Code.

Financial Impact

There is no cost to the City for this change. This change increases the amount of permit fees collected to more accurately align with the impact that work in public rights-of-way has on public infrastructure and traffic. Depending on the number and types of permits processed in 2022, these changes should have an impact of approximately 6-7% increase in fees.

Background

The Rights-of-Way Administrative Fees schedule is being updated, as required by Ordinance, including an increase of approximately 6-7% to cover the additional cost to provide these permitting and inspection services.

Discussion

Similar to past assessments that used the RS Means paving cost data for the Denver Metro Area (the methodology used for calculating Building Division Fees), the proposed changes used national valuation estimates for skilled labor, common labor, and construction cost indices with regional modifiers for the Denver area to reflect the additional cost to provide these services. The changes for permit types range from an increase of approximately 3-9% for 2022, which will offset the overall increase in cost to provide these services. Using 2021 fees collected by permit type, the 2022 fee schedule updates would result in 6-7% increase in fees collected.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A.

Strategic Alignment

This action aligns with the Infrastructure and Community and Economic Development Priority Areas of the City Council Strategic Plan.

Alternative Courses of Action

N/A.

Recommendation for Action

The Arvada team recommends that the City Council approve R21-125, A Resolution Adopting the Amended Permits Fee Schedule for Rights-of-Way Work Permits and Services Pursuant to Chapter 78, Public Improvements, of the Arvada City Code.

Suggested Motion:

I move that R21-125, A Resolution Adopting the Amended Fee Schedule for Rights-of-Way Work Permits and Services Pursuant to Chapter 78, Public Improvements, of the Arvada City Code, be (approved) (rejected).

Prepared by:
Jacqueline Rhoades, Civil Engineer III

Reviewed by:

Approved by:

Jacqueline Rhoades, Civil Engineer III	9/29/2021
Don Wick, Director of Public Works	9/30/2021
Bryan Archer, Director of Finance	9/30/2021
Tammy Hedlund, Legal Specialist	10/4/2021
Erika Pierce, Litigation Paralegal	10/4/2021
Jessica Morales, Assistant City Attorney	10/5/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/7/2021
Mark Deven, City Manager	10/7/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-125

A RESOLUTION ADOPTING THE AMENDED FEE SCHEDULE FOR RIGHTS-OF-WAY
WORK PERMITS AND SERVICES PURSUANT TO CHAPTER 78, PUBLIC
IMPROVEMENTS, OF THE ARVADA CITY CODE

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF
ARVADA, COLORADO:

Section 1. The City Council hereby adopts the Amended Fee Schedule for rights-of-way work permits and services pursuant to Chapter 78, Public Improvements, of the Arvada City Code as set forth below and any prior version of said administrative fee schedule inconsistent with that set forth below is amended to conform.

Section 2. The Fee Schedule set forth herein shall be effective January 1, 2022.

Section 3. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

FEE SCHEDULE*
FOR
RIGHTS OF WAY WORK PERMITS AND SERVICES AS
PURSUANT TO CHAPTER 78, PUBLIC IMPROVEMENTS, OF THE ARVADA CITY CODE
EFFECTIVE JANUARY 1, 2022

Municipal General Contractor's License	\$200.00
Sewer Main	\$.58/LF (\$58.00 min)
Water Main	\$.58/LF (\$58.00 min)
Fire line	\$.58/LF (\$58.00 min)
Wet Tap	\$58.00/EA
Water Service	\$58.00/EA
Sewer Service	\$58.00/EA
Irrigation Service	\$58.00/EA
Water Service Disconnect	\$58.00/EA
Sewer Service Disconnect	\$58.00/EA
Storm Sewer - Public	\$.58/LF (\$55.00 min)
Storm Sewer - Private	\$.58/LF (\$55.00 min)
Irrigation Main	\$.58/LF (\$55.00 min)
Combination Curb, Gutter, & Walk	\$.46/LF (\$55.00 min)
Bike Trail	\$.46/LF (\$55.00 min)
Detached Walk	\$.46/LF (\$55.00 min)
Vertical Curb & Gutter	\$.46/LF (\$55.00 min)
Structure (Surface Area - medians, pavers, retaining walls, etc.)	\$1.40/SF (\$55.00 min)
Crossspan/Curb Cut	\$70.00/EA
Paving	\$.17/SY (\$55.00 min)
Asphalt Patch	\$.17/SY (\$55.00 min)
Street Subgrade	\$.17/SY (\$55.00 min)
Street Subbase	\$.17/SY (\$55.00 min)
ADA Ramps	\$70.00/EA
Milling	\$.17/SY (\$55.00 min)
Inlets - Public	\$58.00/EA
Inlets - Private	\$58.00/EA
Vaults - Public	\$58.00/EA
Manhole	\$58.00/EA
Outlet Structures - Private	\$58.00/EA
Minimum Permit Fee	\$58.00/EA
Reinspection Fee	\$68.00/EA
Overtime Fee	\$100.00/hr. - 2 hours minimum
Fire Hydrant	\$58.00/EA
Degradation Fee	\$18.00/LF of trench (plus 20LF of required resurfacing)
Overhead Utility - Private	\$.24/LF (\$58.00 min)

Underground Utility - Private (gas mains, electrical, cable, telecom, etc.)	\$.24/LF (\$58.00 min)
Boring	\$.24/LF (\$58.00 min)
Coring	\$58.00/EA
Test Hole (concrete)	\$58.00/EA
Test Hole (street)	\$58.00/EA
Test Hole (Landscaping)	\$17.00/EA
Bore Pit	\$17.00/EA
Signage	\$12.00/EA (\$58.00 min)
Street Light	\$12.00/EA (\$58.00 min)
Permanent Traffic Control Structures (i.e. Guardrail, sound wall, etc...)	\$.24/LF (\$58.00 min)
Permanent Traffic Control Structures (i.e. bollards, delineators, etc...)	\$11.00/EA (\$58.00 min)
Striping	\$0.12/LF (\$58.00 min)
Pavement Markings	\$12.00/EA (\$58.00 min)
Traffic Signal/Electronic Device Installation/Modification	0.65% of the cost of improvement
Traffic Control Plan Review - Single Service	\$58.00/EA
Traffic Control Plan Review - Local Street**	\$88.00/EA
Traffic Control Plan Review - Collector Street**	\$120.00/EA
Traffic Control Plan Review - Arterial Street**	\$288.00/EA

*Additional fees apply for work without permits pursuant to Section 78-294 of the Arvada City Code. **Roadway classification to be determined by City Traffic Engineer.

REDLINE/STRIKEOVER VERSION

FOR INFORMATION ONLY -- NOT PART OF THE ADMINISTRATIVE FEE SCHEDULE

Underlined indicates new material

~~Strikeover~~ indicates deleted material

FEE SCHEDULE*
FOR
RIGHTS OF WAY WORK PERMITS AND SERVICES AS
PURSUANT TO CHAPTER 78, PUBLIC IMPROVEMENTS, OF THE ARVADA CITY CODE
EFFECTIVE JANUARY 1, 202~~1~~4

Municipal General Contractor's License	\$200.00
Sewer Main	\$. 58 <u>5</u> /LF (\$5 8 <u>5</u> .00 min)
Water Main	\$. 58 <u>5</u> /LF (\$5 8 <u>5</u> .00 min)
Fire line	\$. 58 <u>5</u> /LF (\$5 8 <u>5</u> .00 min)
Wet Tap	\$5 8 <u>5</u> .00/EA
Water Service	\$5 8 <u>5</u> .00/EA
Sewer Service	\$5 8 <u>5</u> .00/EA
Irrigation Service	\$5 8 <u>5</u> .00/EA
Water Service Disconnect	\$5 8 <u>5</u> .00/EA
Sewer Service Disconnect	\$5 8 <u>5</u> .00/EA
Storm Sewer - Public	\$. 58 <u>5</u> /LF (\$55.00 min)
Storm Sewer - Private	\$. 58 <u>5</u> /LF (\$55.00 min)
Irrigation Main	\$. 58 <u>5</u> /LF (\$55.00 min)
Combination Curb, Gutter, & Walk	\$. 46 <u>4</u> /LF (\$55.00 min)
Bike Trail	\$. 46 <u>4</u> /LF (\$55.00 min)
Detached Walk	\$. 46 <u>4</u> /LF (\$55.00 min)
Vertical Curb & Gutter	\$. 46 <u>4</u> /LF (\$55.00 min)
Structure (Surface Area - medians, pavers, retaining walls, etc.)	\$1. 40 <u>3</u> 2/SF (\$55.00 min)
Crossspan/Curb Cut	\$ 70 <u>6</u> 6.00/EA
Paving	\$. 17 <u>6</u> /SY (\$55.00 min)
Asphalt Patch	\$. 17 <u>6</u> /SY (\$55.00 min)
Street Subgrade	\$. 17 <u>6</u> /SY (\$55.00 min)
Street Subbase	\$. 17 <u>6</u> /SY (\$55.00 min)
ADA Ramps	\$ 70 <u>6</u> 6.00/EA
Milling	\$. 17 <u>6</u> /SY (\$55.00 min)
Inlets - Public	\$5 8 <u>5</u> .00/EA
Inlets - Private	\$5 8 <u>5</u> .00/EA
Vaults - Public	\$5 8 <u>5</u> .00/EA
Manhole	\$5 8 <u>5</u> .00/EA
Outlet Structures - Private	\$5 8 <u>5</u> .00/EA
Minimum Permit Fee	\$5 8 <u>5</u> .00/EA
Reinspection Fee	\$6 8 <u>5</u> .00/EA

Overtime Fee	\$ 100.00 97.50 /hr. - 2 hours minimum
Fire Hydrant	\$ 585.00 /EA
Degradation Fee	\$ 187.00 08 /LF of trench (plus 20LF of required resurfacing)
Overhead Utility - Private	\$. 242 /LF (\$ 585.00 min)
Underground Utility - Private (gas mains, electrical, cable, telecom, etc.)	\$. 242 /LF (\$ 585.00 min)
Boring	\$. 242 /LF (\$ 585.00 min)
Coring	\$ 585.00 /EA
Test Hole (concrete)	\$ 585.00 /EA
Test Hole (street)	\$ 585.00 /EA
Test Hole (Landscaping)	\$ 176.00 /EA
Bore Pit	\$ 176.00 /EA
Signage	\$ 121.00 /EA (\$ 585.00 min)
Street Light	\$ 121.00 /EA (\$ 585.00 min)
Permanent Traffic Control Structures (i.e. Guardrail, sound wall, etc...)	\$. 242 /LF (\$ 585.00 min)
Permanent Traffic Control Structures (i.e. bollards, delineators, etc...)	\$11.00/EA (\$ 585.00 min)
Striping	\$0. 121 /LF (\$ 585.00 min)
Pavement Markings	\$ 121.00 /EA (\$ 585.00 min)
Traffic Signal/Electronic Device Installation/Modification	0.65% of the cost of improvement
Traffic Control Plan Review - Single Service	\$ 585.00 /EA
Traffic Control Plan Review - Local Street**	\$ 882.00 /EA
Traffic Control Plan Review - Collector Street**	\$ 1210.00 /EA
Traffic Control Plan Review - Arterial Street**	\$ 28875.00 /EA

*Additional fees apply for work without permits pursuant to Section 78-294 of the Arvada City Code. **Roadway classification to be determined by City Traffic Engineer.



REPORT TO CITY COUNCIL RESOLUTION

**AGENDA ITEM
8.A.3.**

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-126 A Resolution Adopting the Amended Fee Schedule for Land-Use Pursuant to Chapter 74, Planning and Development, of the Arvada City Code

Report in Brief

The resolution updates the Administrative Schedules for Land-Use fees.

The Arvada team recommends that the City Council approve R21-126, A Resolution Adopting the Amended Fee Schedule for Land-Use Pursuant to Chapter 74, Planning and Development, of the Arvada City Code.

Financial Impact

Depending on the number and type of permits processed in 2022, these changes should have a proportional impact of an approximate six percent increase in fees collected assuming development review activity remains at 2021 levels.

Background

This action will set fees in accordance with the revised Section 74-31, Land-Use Fees, of the Arvada City Code.

Discussion

The proposal includes an approximately six percent increase in most of the fees to address the increased labor cost, as well as moving closer to having the fees cover 100 percent of the cost of providing development and land use review services.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

The recommended action aligns with the Community and Economic Development Priority Areas within the City Council Strategic Plan.

Alternative Courses of Action

N/A.

Recommendation for Action

The Arvada team recommends approval of R21-126, A Resolution Adopting the Amended Fee Schedule for Land-Use Pursuant to Chapter 74, Planning and Development, of the Arvada City Code.

Suggested Motion:

I move that R21-126, A Resolution Adopting the Amended Fee Schedule for Land-Use Pursuant to Chapter 74, Planning and Development, of the Arvada City Code, be (adopted) (rejected).

Prepared by:

Josie Suk, Development Systems and Administrative Manager

Reviewed by:

Approved by:

Robert Smetana, Manager of City Planning and Development	9/27/2021
Ryan Stachelski, Director of Community and Economic Development	9/27/2021
Gail Walker, Legal Specialist-Contracts	9/28/2021
Emily Grogg, Senior Assistant City Attorney	9/30/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/7/2021
Mark Deven, City Manager	10/7/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-126

A RESOLUTION ADOPTING THE AMENDED FEE SCHEDULE FOR LAND-USE
PURSUANT TO CHAPTER 74, PLANNING AND DEVELOPMENT, OF THE ARVADA
CITY CODE

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF
ARVADA, COLORADO:

Section 1. The City Council hereby adopts the Amended Fee Schedule for land-use pursuant to Chapter 74, Planning and Development, of the Arvada City Code as set forth below and any prior version of said administrative fee schedule inconsistent with that set forth below is amended to conform herewith.

Section 2. The Fee Schedule set forth herein shall be effective January 1, 2022.

Section 3. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By:_____

Application Type	Fees (Based on Development Size)			
	Less Than 1 Acre	1 to less than 5 Acres	5 to less than 30 Acres	30 Acres or More
Alternative Sign Program	\$530.00	\$795.00	\$1,060.00	\$1,060.00
Appeal	\$3335.00 regardless of acreage			
Annexation or disconnection	\$1,275.00	\$1,670.00	\$2,225.00	\$2,755.00
Certificate of Compliance (Design Review Committee Referral)	\$265.00	\$370.00	\$370.00	\$370.00
Certificate of Compliance (Administrative Review)	\$80.00	\$160.00	\$160.00	\$160.00
Code Compliance Administration	\$100.00 Violation beyond first deadline			
	\$200.00 Violation beyond second deadline			
	\$300.00 Violation beyond third deadline			
	\$300.00 Repeat offender summons			
	\$300.00 Nuisance hearing			
Comprehensive Plan Amendment	\$530.00	\$1,060.00	\$1,600.00	\$2,120.00
Conditional Use Permit	\$530.00	\$795.00	\$1,060.00	\$1,060.00
Development Plan Inspection Fee (Re-Inspection fees are charged at the same rate)	\$80.00 per single family regardless of acreage. \$160.00 per multi-family, commercial or industrial regardless of acreage.			
Fence Review Fee	\$26.50 regardless of acreage			
Floodplain Development Permit Fee	\$30.00 Fence/shed/miscellaneous \$75.00 Garage, deck, or interior improvements less than 50% of existing building value \$75.00 Fill or grading only \$100.00 Building footprint expansion \$200.00 Any improvement greater than or equal to 50% of existing building value \$400.00 New building construction \$400.00 Floodplain analysis/CLOMR/LOMR			
Floodplain Variance	\$400.00 regardless of acreage			

Food Truck Vending	\$50.00 per year			
Height Exception	\$825.00 regardless of acreage			
Major Modification	\$530.00	\$795.00	\$1,060.00	\$1,060.00
Major Subdivision Concept Plan	\$555.00	\$1,110.00	\$1,640.00	\$2,170.00
Major Subdivision Final Plat or Amendment	\$830.00	\$1,535 plus \$240.00 per acre	\$1,670.00 plus \$200.00 per acre	\$1,960.00 plus \$190.00 per acre
Major Subdivision Preliminary Plat	\$820.00	\$1,535.00 plus \$265.00 per acre	\$1,750.00 plus \$245.00 per acre	\$2,170.00 plus \$225.00 per acre
Master Development Plan	\$820.00	\$1,640.00	\$1,910.00	\$2,170.00 plus \$15.00 per acre
Minor Modification, Individual Standard	\$165.00 regardless of acreage			
Minor Modification - Site Plan, Final Development Plan or Final Plat	\$330.00	\$550.00	\$820.00	\$1,110.00
Minor Subdivision Plat	\$820.00	\$1,220.00 plus \$240.00 per acre	\$1,300.00 plus \$200.00 per acre	\$1,640.00 plus \$200.00 per acre
Out of City Utility Request	\$530.00	\$780.00	\$1,060.00	\$1,325.00
PUD Development Plan or Amendment	\$545.00	\$1,535.00 plus \$265.00 per acre	\$1,750.00 plus \$240.00 per acre	\$2,050.00 plus \$215.00 per acre
PUD Final Development Plan	\$785.00	\$1,450.00 plus \$250.00 per acre	\$1,675.00 plus \$210.00 per acre	\$1,900.00 plus \$190.00 per acre
PUD Final Development Plan Amendment	\$500.00	\$750.00	\$1,000.00	\$1,250.00

PUD Sketch Plan	\$515.00	\$1,035.00	\$1,550.00	\$2,050.00
Public Hearing Sign Deposit	\$100.00 per sign			
Revocable Encroachment License	\$350.00 regardless of acreage			
Short Term Rental	\$100.00 regardless or acreage			
Sign Review Fee	\$50.00 regardless of acreage			
Site Plan	\$775.00	\$1,450.00 plus \$230.00 per acre	\$1,650.00 plus \$215.00 per acre	\$2,050.00 plus \$205.00 per acre
Site Plan Amendment	\$500.00	\$750.00	\$1,000.00	\$1,250.00
Special Event Permit (Non-Profit Agencies are Exempt)	\$100.00 regardless of acreage			
Special District	\$3,500.00 regardless of acreage			
Telecommunications Facility (Free-Standing)	\$2,575.00 regardless of acreage			
Telecommunications Facility (Administrative Review)	\$750.00 regardless of acreage			
Transient Merchant Permit	Ambulatory: \$15.00/day; \$75.00/month; \$250.00/year Entertainment: \$15.00/day; \$75.00/month Entertainment with Vending: \$15.00/day; \$75.00/month Food: \$75.00/month; \$250.00/year Merchandise (except ambulatory): \$75.00/month; \$250.00/year Personal services: \$15.00/day; \$75.00/month Regardless of acreage			

Vacation	\$1,035.00 regardless of acreage			
Variance	\$310.00	\$515.00	\$515.00	\$515.00
Vested Right (Early Vested Right)	\$1,000.00	\$1,250.00	\$1,500.00	\$2,000.00
Vested Right (Statutory Vested Right)	\$500.00 regardless of acreage			
Zoning or Rezoning	\$515.00	\$1,275.00	\$1,550.00	\$2,050.00
Zoning Verification Letter	\$50.00 regardless of acreage			

Application Type	Fees (Based on Development Size)			
	Less Than 1 Acre	1 to less than 5 Acres	5 to less than 30 Acres	30 Acres or More
Alternative Sign Program	\$ 50 30.00	\$7 50 95.00	\$1,0 00 60.00	\$1,0 00 60.00
Appeal	\$3 15 335.00 regardless of acreage			
Annexation or disconnection	\$1,2 00 75.00	\$1, 57 5670.00	\$2, 100 225.00	\$2, 600 755.00
Certificate of Compliance (Design Review Committee Referral)	\$2 50 65.00	\$3 50 70.00	\$3 50 70.00	\$3 50 70.00
Certificate of Compliance (Administrative Review)	\$7 58 0.00	\$1 56 0.00	\$1 56 0.00	\$1 56 0.00
Code Compliance Administration	\$100.00 Violation beyond first deadline			
	\$200.00 Violation beyond second deadline			
	\$300.00 Violation beyond third deadline			
	\$300.00 Repeat offender summons			
	\$300.00 Nuisance hearing			
Comprehensive Plan Amendment	\$5 03 0.00	\$1,0 00 60.00	\$1, 56 00.00	\$2, 00 120.00
Conditional Use Permit	\$5 03 0.00	\$7 50 95.00	\$1,0 00 60.00	\$1,0 00 60.00
Development Plan Inspection Fee (Re-Inspection fees are charged at the same rate)	\$7 58 0.00 per single family <u>regardless of acreage</u> . \$1 56 0.00 per multi-family, commercial or industrial <u>regardless of acreage</u> .			
Fence Review Fee	\$ 25.00 26.50 regardless of acreage			
Floodplain Development Permit Fee	\$30.00 Fence/shed/miscellaneous \$75.00 Garage, deck, or interior improvements less than 50% of existing building value \$75.00 Fill or grading only \$100.00 Building footprint expansion \$200.00 Any improvement greater than or equal to 50% of existing building value \$400.00 New building construction \$400.00 Floodplain analysis/CLOMR/LOMR			
Floodplain Variance	\$400.00 regardless of acreage			

Food Truck Vending	\$50.00 per year			
Height Exception	\$ 780 <u>825</u> .00 regardless of acreage			
Major Modification	\$ 50 <u>30</u> .00	\$ 750 <u>95</u> .00	\$1, 000 <u>60</u> .00	\$1, 000 <u>60</u> .00
Major Subdivision Concept Plan	\$ 52 <u>55</u> .00	\$1, 05 <u>11</u> 0.00	\$1, 556 <u>40</u> .00	\$2, 05 <u>17</u> 0.00
Major Subdivision Final Plat or Amendment	\$ 785 <u>830</u> .00	\$1, 450 <u>535</u> plus \$ 234 <u>40</u> .00 per acre	\$1, 575 <u>670</u> .00 plus \$ 192 <u>00</u> .00 per acre	\$1, 859 <u>60</u> .00 plus \$ 189 <u>00</u> .00 per acre
Major Subdivision Preliminary Plat	\$ 775 <u>820</u> .00	\$1, 450 <u>535</u> .00 plus \$ 250 <u>65</u> .00 per acre	\$1, 67 <u>50</u> .00 plus \$ 230 <u>45</u> .00 per acre	\$2, 05 <u>17</u> 0.00 plus \$ 212 <u>50</u> .00 per acre
Master Development Plan	\$ 775 <u>820</u> .00	\$1, 556 <u>40</u> .00	\$1, 809 <u>10</u> .00	\$2, 05 <u>17</u> 0.00 plus \$ 105 <u>.00</u> per acre
Minor Modification, Individual Standard	\$ 156 <u>5</u> .00 regardless of acreage			
Minor Modification - Site Plan, Final Development Plan or Final Plat	\$ 31 <u>30</u> .00	\$ 52 <u>50</u> .00	\$ 775 <u>820</u> .00	\$1, 05 <u>11</u> 0.00
Minor Subdivision Plat	\$ 775 <u>820</u> .00	\$1, 452 <u>20</u> .00 plus \$ 234 <u>40</u> .00 per acre	\$1, 225 <u>300</u> .00 plus \$ 192 <u>00</u> .00 per acre	\$1, 556 <u>40</u> .00 plus \$ 192 <u>00</u> .00 per acre
Out of City Utility Request	\$ 50 <u>30</u> .00	\$ 75 <u>80</u> .00	\$1, 000 <u>60</u> .00	\$1, 250 <u>325</u> .00
PUD Development Plan or Amendment	\$ 514 <u>5</u> .00	\$1, 450 <u>535</u> .00 plus \$ 250 <u>65</u> .00 per acre	\$1, 67 <u>50</u> .00 plus \$ 234 <u>40</u> .00 per acre	\$2, 05 <u>17</u> 0.00 plus \$ 215 <u>30</u> .00 per acre
PUD Final Development Plan	\$ 785 <u>830</u> .00	\$1, 450 <u>535</u> .00 plus \$ 250 <u>65</u> .00 per acre	\$1, 675 <u>750</u> .00 plus \$ 212 <u>00</u> .00 per acre	\$ 1,900 <u>2,000</u> .00 plus \$ 192 <u>00</u> .00 per acre

PUD Final Development Plan Amendment	\$ 50 30.00	\$7 58 0.00	\$1,0 06 0.00	\$1, 250 325.00
PUD Sketch Plan	\$5 14 5.00	\$1, 035 100.00	\$1, 556 40.00	\$2, 051 70.00
Public Hearing Sign Deposit	\$100.00 per sign			
Revocable Encroachment License or Permit	\$3 57 0.00 regardless of acreage			
Short Term Rental	\$1 01 0.00 regardless or acreage			
Sign Review Fee	\$5 05 .00 regardless of acreage			
Site Plan	\$ 775 820.00	\$1, 450 535.00 plus \$2 34 0.00 per acre	\$1, 67 50.00 plus \$2 12 5.00 per acre	\$2, 051 70.00 plus \$2 01 5.00 per acre
Site Plan Amendment	\$ 50 30.00	\$7 58 0.00	\$1,0 06 0.00	\$1, 250 325.00
Special Event Permit (Non-Profit Agencies are Exempt)	\$1 01 0.00 regardless of acreage			
Special District	\$3, 57 00.00 regardless of acreage			
Telecommunications Facility (Free-Standing)	\$2, 575 730.00 regardless of acreage			
Telecommunications Facility (Administrative Review)	\$7 58 0.00 regardless of acreage			

Transient Merchant Permit	Ambulatory: \$15.00/day; \$75.00/month; \$250.00/year Entertainment: \$15.00/day; \$75.00/month Entertainment with Vending: \$15.00/day; \$75.00/month Food: \$75.00/month; \$250.00/year Merchandise (except ambulatory): \$75.00/month; \$250.00/year Personal services: \$15.00/day; \$75.00/month Regardless of acreage			
Vacation	\$1,035 <u>100</u> .00 regardless of acreage			
Variance	\$31 <u>30</u> .00	\$51 <u>45</u> .00	\$51 <u>45</u> .00	\$51 <u>45</u> .00
Vested Right (Early Vested Right)	\$1,00 <u>60</u> .00	\$1,250 <u>325</u> .00	\$1,50 <u>90</u> .00	\$2,00 <u>120</u> .00
Vested Right (Statutory Vested Right)	\$50 <u>30</u> .00 regardless of acreage			
Zoning or Rezoning	\$51 <u>45</u> .00	\$1,275 <u>350</u> .00	\$1,556 <u>40</u> .00	\$2,051 <u>70</u> .00
Zoning Verification Letter	\$50 <u>5</u> .00 regardless of acreage			



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.B.1.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-127, A Resolution Approving and Adopting the 2021 Jefferson County Multi-Hazard Mitigation Plan

Report in Brief

FEMA Region VIII has completed its review of the 2021 Jefferson County Multi-Hazard Mitigation Plan Update (HMP) and has determined that it meets the requirements established by the Federal Disaster Mitigation Act. Therefore, upon adoption of the 2021 Jefferson County HMP, the City of Arvada will be eligible to apply for the following pre-and post-disaster funding opportunities:

- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance (FMA)
- Building Resilient Infrastructure & Communities (BRIC)
- Rehabilitation of High Hazard Potential Dam (HHPD)

These grant funds are made available to states and local governments and can be used to implement the long-term hazard mitigation measures specified within various city plans, including the City of Arvada annex of the HMP, before and after a major disaster declaration. The HMP is considered a living document and as awareness of additional hazards develops, and new strategies and projects are conceived to offset or prevent losses due to natural disasters, revisions will be made. As per FEMA requirements, the HMP will be evaluated on an annual basis and formally updated every five years.

The Arvada team recommends that the City Council approve R21-127, A Resolution Approving and Adopting the 2021 Jefferson County Multi-Hazard Mitigation Plan.

Financial Impact

Authorization of this resolution adopting the 2021 Jefferson County Multi-Hazard Mitigation Plan will ensure Arvada's eligibility for future federal grant funding in the event of a disaster declaration. The planning project was funded through a grant awarded to Jefferson County by the State of Colorado. The project is complete and no additional funds are being requested.

Background

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from disasters or hazardous events. Studies have found that hazard mitigation is extremely cost-effective, with every dollar spent on mitigation saving an average of \$6 in avoided future losses.

The Federal Emergency Management Agency (FEMA) requires that hazard mitigation plans be updated every five years for the jurisdictions to be eligible for federal mitigation assistance. This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002 (44 CFR §201.6) and finalized on October 31, 2007. All sections of the 2016

Jefferson County Hazard Mitigation Plan, including the City of Arvada annex, were reviewed and updated to address natural and human-caused hazards for the purpose of saving lives and reducing losses from future disasters or hazard events.

This plan builds on almost 20 years of mitigation planning in Jefferson County, starting with participation in the 2003 Denver Regional Council of Governments Hazard Mitigation Plan (HMP). Jefferson County developed its first stand-alone HMP in 2010, updated the plan in 2016, and has again updated it in 2021. This plan is a comprehensive update to the 2016 plan.

An electronic copy of the entire [2021 Jefferson County Multi-Hazard Mitigation Plan](#) Update will be made available on Jeffco.us and Arvada.org.

[2021 Jefferson County Multi-Hazard Mitigation Plan - City of Arvada Annex](#)

Discussion

This Plan will serve as a blueprint for coordinating and implementing hazard mitigation policies, programs, and projects in Jefferson County and its municipalities. It provides a list of mitigation goals and related actions that may assist Jefferson County and its municipalities in reducing risk and preventing loss from future hazard events. Proactive mitigation planning will help reduce the cost of disaster response and recovery to the community and its property owners by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption. The Jefferson County planning area, including the City of Arvada, is committed to reducing future disaster impacts and maintaining eligibility for federal funding.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

Approval of this Resolution aligns with the Infrastructure and Organizational and Service Effectiveness Priority Areas of the City Council Strategic Plan. The following Principle closely aligns with the recommended action:

Supports a resilient workforce and community that is able to withstand stresses and shocks, while maintaining essential functions and recovering quickly, effectively, and equitably.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R21-127, A Resolution Authorizing the Adoption of the 2021 Jefferson County Multi-Hazard Mitigation Plan.

Suggested Motion:

I move that R21-127, A Resolution Approving and Adopting the 2021 Jefferson County Multi-Hazard Mitigation Plan, be (approved) (rejected).

Prepared by:

Melissa Ryder, Community Resilience Coordinator

Reviewed by:

Gail Walker, Legal Specialist-Contracts 9/21/2021

Approved by:

Rachel Morris, City Attorney 10/7/2021

Lorie Gillis, Deputy City Manager 10/7/2021

Mark Deven, City Manager 10/7/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-127

A RESOLUTION APPROVING AND ADOPTING THE 2021 JEFFERSON COUNTY
MULTI-HAZARD MITIGATION PLAN

WHEREAS, natural hazards in the Front Range region have historically caused significant disasters with loss of life and property and natural resources damage; and

WHEREAS, the Federal Disaster Mitigation Act of 2000 requires jurisdictions to prepare and adopt a natural hazard mitigation plan in order to be eligible for future pre-disaster and post-disaster federal funding for mitigation purposes; and

WHEREAS, the Jefferson County Multi-Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, the Arvada City Council recognizes the importance of reducing or limiting vulnerability to disasters caused by natural hazards for the overall good and welfare of the community; and

WHEREAS, the City of Arvada has actively participated in the creation of the Jefferson County Multi-Hazard Mitigation Plan that establishes a comprehensive, multi-jurisdictional plan to identify natural hazards and to develop strategies and improvements to mitigate natural hazards; and

WHEREAS, the City of Arvada is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the actions in the Plan; and

WHEREAS, the Arvada City Council hereby finds and determines it to be in the best interests of the City of Arvada to adopt the 2021 Jefferson County Multi-Hazard Mitigation Plan.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The City of Arvada hereby approves and adopts its designated portion of the 2021 Jefferson County Multi-Hazard Mitigation Plan, (the Plan) contingent upon approval by the Colorado Division of Homeland Security and Emergency Management and the Federal Emergency Management Agency.

Section 2. The City of Arvada may pursue available funding opportunities for implementation of the proposals designated in the Plan.

Section 3. The City of Arvada will, subject to and upon receipt of such funding or other necessary resources, seek to implement proposals contained in its section of the mitigation strategy as set forth in the Plan.

Section 4. The City of Arvada will continue to participate in updating and revising the Plan over a five-year cycle.

Section 5. The City of Arvada will encourage Arvada businesses, community groups, and organizations to participate in the updates and revisions of the Plan.

Section 6. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____



Jefferson County

Hazard Mitigation Plan

State Review Draft

July 2021



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Annex B – City of Edgewater

Annex C – City of Golden

Annex D – City of Lakewood

Annex E – City of Wheat Ridge

Annex F – Town of Morrison

Annex G – Arvada Fire Protection District

Annex H – Elk Creek Fire Protection District

Annex I – Evergreen Fire Rescue

Annex J – Fairmount Fire Protection District

Annex K – Foothills Fire Protection District

Annex L – Genesee Fire Protection District

Annex M – Golden Gate Fire Protection District

Annex N – Indian Hills Fire Protection District

Annex O – Inter-Canyon Fire Protection District

Annex P – North Fork Fire Protection District

Annex Q – West Metro Fire Protection District

Annex R – Lookout Mountain Water District

Annex S – Denver Water

Annex T – Jefferson Conservation District

Annex U – Town of Lakeside (not updated)

Annex V – Town of Mountain View (not updated)

Annex W – Pleasant View Metro District (not updated)

Appendices

Appendix A – Approval and Adoption

Appendix B – Hazard Mitigation Planning Committee

Appendix C – Planning Process Documentation

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Appendix E – Mitigation Alternatives

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Appendix G – Definitions and Acronyms

Appendix H – Map of Critical Facilities (Not For Public Release)

DRAFT

1 Introduction

1.1 Executive Summary

The following jurisdictions have prepared and adopted this 2021 update of the Jefferson County Hazard Mitigation Plan (HMP):

- Jefferson County
- City of Arvada
- City of Edgewater
- City of Golden
- City of Lakewood
- Town of Morrison
- City of Wheat Ridge
- Arvada Fire Protection District
- Elk Creek Fire Protection District
- Evergreen Fire Protection District
- Fairmount Fire Protection District
- Foothills Fire Protection District
- Genesee Fire Protection District
- Golden Gate Fire Protection District
- Indian Hills Fire Protection District
- Inter-Canyon Fire Protection District
- Jefferson Conservation District
- Lookout Mountain Water District
- North Fork Fire Protection District
- West Metro Fire Protection District
- Denver Water

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from disasters or hazardous events. Studies have found that hazard mitigation is extremely cost-effective, with every dollar spent on mitigation saving an average of \$6 in avoided future losses. The Federal Emergency Management Agency (FEMA) requires that hazard mitigation plans be updated every five years for the jurisdictions to be eligible for federal mitigation assistance. All sections of the 2016 Jefferson County Hazard Mitigation Plan were reviewed and updated to address natural and human-caused hazards for the purpose of saving lives and reducing losses from future disasters or hazard events.

This Plan will serve as a blueprint for coordinating and implementing hazard mitigation policies, programs, and projects in Jefferson County. It provides a list of mitigation goals and related actions that may assist Jefferson County and its municipalities in reducing risk and preventing loss from future hazard events. The impacts of hazards can often be lessened or even avoided if appropriate actions are taken before events occur. By reducing exposure to known hazard risks, communities will save lives and property and minimize the social, economic, and environmental disruptions that commonly follow hazard events.

This Plan was also developed to maintain Jefferson County's and participating jurisdictions' eligibility for federal disaster assistance, specifically the Federal Emergency Management Agency's (FEMA), Hazard Mitigation Assistance (HMA) grants including the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), and Building Resilient Infrastructure and Communities (BRIC) grant program, as well as the Rehabilitation of High Hazard Potential Dam (HHPD) grant program.

Section 1 contains the Plan Introduction and Executive Summary.

Section 2 Community Profile describes the planning area, consisting of Jefferson County and the participating jurisdictions listed above, with updated information on demographics, social vulnerability, and changes in development. It includes an assessment of programs and policies currently in place across the County to reduce hazard impacts or that could be used to implement hazard mitigation activities, and identifies opportunities to enhance those capabilities.

Section 3 Planning Process describes the process followed to update the Plan. A broad range of public and private stakeholders, including agencies, local businesses, nonprofits, and other interested parties were invited to participate. Public input was sought throughout the planning process including online surveys and public review of the draft Plan.

Section 4 Hazard Identification and Risk Assessment identifies the natural and human-caused hazards of greatest concern to the County, and describes the risk from those hazards. The information generated through the risk assessment helps communities to prioritize and focus their efforts on those hazards of greatest concern and those assets or areas facing the greatest risk(s). The best available information on

the impacts of changing weather conditions were taken into account for each hazard. The hazards profiled in the 2021 Plan and their assessed significance are shown in the following table.

Table 1-1 Hazards Identification Summary

Hazard	Geographic Extent	Probability of Future Occurrence	Potential Severity/Magnitude	Overall Significance
Avalanche	Negligible	Unlikely	Negligible	Low
Cyber Attack	Significant	Likely	Limited	Medium
Dam Failure	Significant	Occasional	Critical	High
Drought	Extensive	Likely	Critical	Medium
Earthquake	Significant	Unlikely	Catastrophic	Medium
Erosion and Deposition	Significant	Likely	Critical	Medium
Expansive Soils	Extensive	Likely	Limited	Medium
Extreme Temperatures	Extensive	Likely	Limited	Low
Flood	Limited	Likely	Critical	High
Hailstorm	Significant	Likely	Critical	High
Landslide/Debris/Rockfall	Limited	Likely	Limited-Negligible	Medium
Lightning	Limited	Highly Likely	Limited	Medium
Pandemic	Extensive	Occasional	Critical	High
Severe Winter Storms	Extensive	Likely	Critical	High
Subsidence	Limited	Occasional	Limited	Medium
Tornado	Limited	Likely	Limited	Medium
Wildfire	Significant	Highly Likely	Critical	High
Windstorm	Significant	Highly Likely	Limited	Medium

Section 5 Mitigation Strategy describes what the County and jurisdictions will do to reduce their vulnerability to the hazards identified in Section 4. It presents the goals and objectives of the mitigation program, and details a broad range of targeted mitigation actions to reduce losses from hazard events.

Section 6 Plan Implementation and Maintenance details how the Plan will be implemented, monitored, evaluated, and updated, as well as how the mitigation program will be integrated into other planning mechanisms.

Following the base plan, annexes for each participating jurisdiction go into greater detail about how the risk from natural and human-caused hazards varies across the planning area, and lists each jurisdictions' identified mitigation actions.

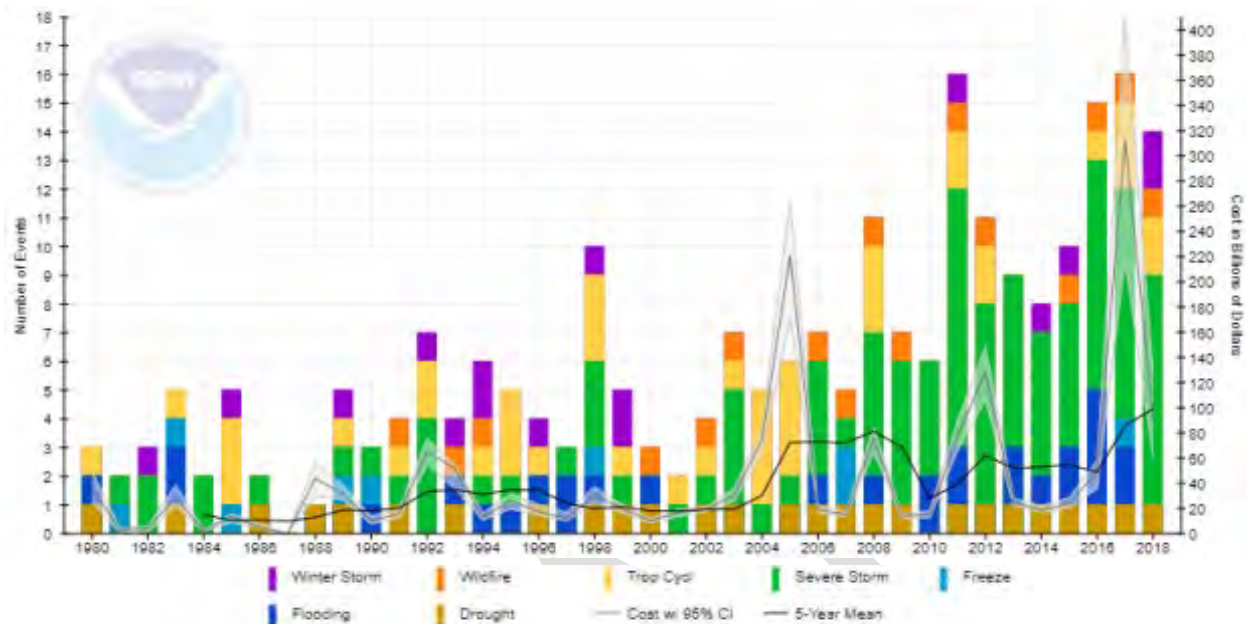
It is important that local decision-makers stay involved in mitigation planning to provide new ideas and insight for future updates to the Jefferson County Hazard Mitigation Plan. As a long-term goal, the Hazard Mitigation Plan and the mitigation strategies identified within will be fully integrated into daily decisions and routines of local government. This will continue to require dedication and hard work, and to this end, this Plan update continues efforts to further strengthen the resiliency of Jefferson County.

1.2 Background

Each year in the United States, disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. Additional expenses to insurance companies and

nongovernmental organizations are not reimbursed by tax dollars, making the costs of disasters several times higher than calculated amounts. Figure 1-1 shows the number and type of natural disasters in the US that have done more than one billion dollars in damage, showing how the frequency and cost of major disasters have risen over the past several decades.

Figure 1-1 Billion-Dollar Disasters in the US, 1980-2018



Source: NOAA

However, some types of hazards are predictable, and much of the damage caused by these events can be mitigated through the use of various zoning, construction and permitting vehicles and other preventative actions. Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. Hazard mitigation is defined by FEMA as “any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event.” The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of \$6 in avoided future losses in addition to saving lives and preventing injuries, as illustrated in Figure 1-2.

This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002 (44 CFR §201.6) and finalized on October 31, 2007. Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA. While the act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

Figure 1-2 Financial Benefits of Hazard Mitigation

	ADOPT CODE	ABOVE CODE	BUILDING RETROFIT	LIFELINE RETROFIT	FEDERAL GRANTS
Overall Benefit-Cost Ratio	11:1	4:1	4:1	4:1	6:1
Cost (\$ billion)	\$1/year	\$4/year	\$520	\$0.6	\$27
Benefit (\$ billion)	\$13/year	\$16/year	\$2200	\$2.5	\$160
 Riverine Flood	6:1	5:1	6:1	8:1	7:1
 Hurricane Surge	not applicable	7:1	not applicable	not applicable	not applicable
 Wind	10:1	5:1	6:1	7:1	5:1
 Earthquake	12:1	4:1	13:1	3:1	3:1
 Wildland-Urban Interface Fire	not applicable	4:1	2:1	not applicable	3:1

Copyright © 2019 The National Institute of Building Sciences

Source: National Institute of Building Sciences, Natural Hazard Mitigation Saves: 2019 Report

This plan builds on almost 20 years of mitigation planning in Jefferson County, starting with participation in the 2003 Denver Regional Council of Governments (DRCOG) Hazard Mitigation Plan. Jefferson County developed its first stand-alone HMP in 2010, updated the plan in 2016, and has again updated it in 2021.

This plan is a comprehensive update to the 2016 plan. Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to the community and its property owners by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption. The Jefferson County planning area is committed to reducing future disaster impacts and maintaining eligibility for federal funding.

1.3 Purpose and Scope

Jefferson County and the participating jurisdictions have prepared this multi-hazard mitigation plan to better protect the people and property of the County from the effects of hazard events. This plan demonstrates the community's commitment to reducing risks from hazards and serves as a tool to help decision-makers direct mitigation activities and resources. This plan was also developed to position Jefferson County and its participating jurisdictions for the eligibility of certain federal mitigation funding assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance grant programs (HMA), which include Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA). This plan also aligns with the planning elements of the National Flood Insurance Program's Community Rating System (CRS), which provides for lower flood insurance premiums in CRS-participating communities.

Jefferson County remains dedicated to implementing the actions and strategies outlined in this updated Hazard Mitigation Plan. The Plan will be maintained regularly to address changes in hazards or vulnerabilities, and will be updated within the next five years.

2 Community Profile

2.1 Geography and Climate

Situated in the north-central part of Colorado, west of the City of Denver, Jefferson County is split between foothills on the west and plains on the east. The majority of the population is located in the northern portion of the county, while the southern portion is dominated by Pike National Forest. The county is 773 square miles in size, and 653 square miles are unincorporated areas. The landscape is comprised of approximately 72% mountains and 28% plains. The ecologies located in the County include prairies, and forests. This area includes a significant intermix between developed and forest areas, which increases the wildfire risks in those regions. Table 2-1 breaks down land ownership in the County.

Table 2-1 Jefferson County Land Ownership

Land Ownership	Acres	% of Total
Private Lands	289,480	58.4%
Conservation Easement	9,737	2.0%
Federal Lands	111,966	22.6%
Forest Service	103,248	20.8%
BLM	355	0.1%
National Park Service	0	0.0%
Military	3,093	0.6%
Other Federal	5,270	1.1%
State Lands	10,412	2.1%
State Trust Lands*	3,087	0.6%
Other State	7,325	1.5%
Tribal Lands	0	0.0%
City, County, Other	83,542	16.9%
Total	495,399	

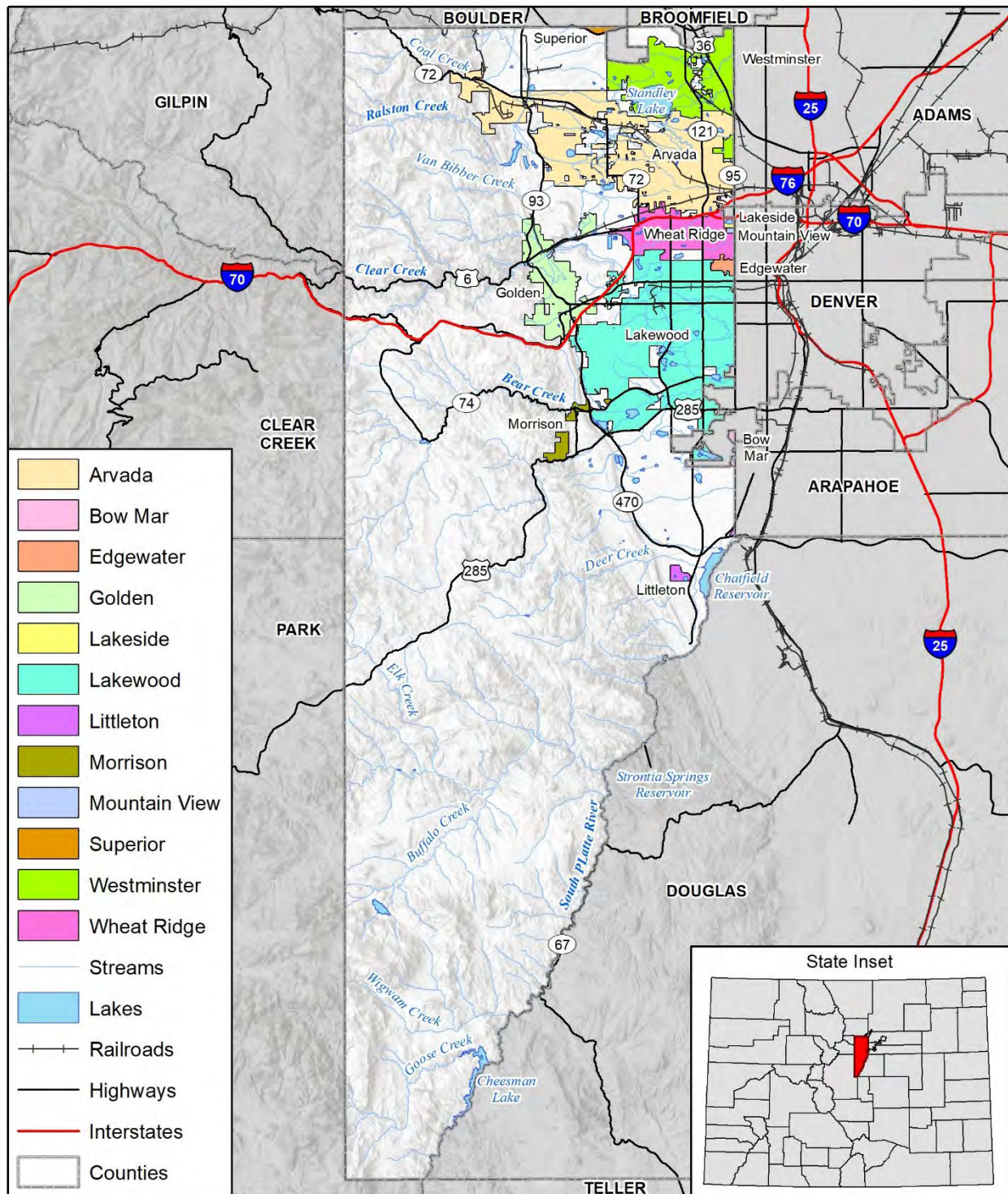
Source: U.S. Geological Survey Protected Areas Database of the United States (PADUS)

Approximately 40% of the unincorporated areas of the County are reserved as parks, open space, and open land. Jefferson County is home to three state parks: Golden Gate Canyon State Park, Staunton State Park, and Chatfield State Park offer a variety of activities, trails, boating, and other events. The County also has a robust network of open space parks (Jefferson County Open Space, or JCOS) with 27 regional park units, 252 miles of trails, and 56,000 acres preserved. Additionally, the Denver Mountain Park system includes 10,271 acres in Jefferson County.

Jefferson County is marked by some distinctive geologic features. The hogback formations, rock formations that rise sharply just at the base of the foothills, provide a steep valley between the formation and the formal foothill regions, are unique in appearance, and easily identified by travelers. One of the most notable elements of the hogback is the Dinosaur Ridge formation, where fossils and dinosaur tracks are easily accessible. Other notable geologic features include Green Mountain, North and South Table Mountains, and Red Rocks Amphitheater and Park. Several large reservoirs are located in the County as well, including, Blunn, Chatfield, Bear Creek, Ralston, Marston, Bow Mar, Sloan, and Standley Lake. The site of the former Rocky Flats facility is also located in the County and is now a National Wildlife Refuge (US Fish and Wildlife Service).

Jefferson County's climate is fairly temperate but demonstrates four distinct seasons. The average temperature in July (the hottest month) is 74°F and in January (the coldest month) is 30°F. The county averages 15.4 inches of precipitation and 60.3 inches of snow. There are periods of extreme temperature variations, but they are generally accompanied by other climactic considerations such as drought or winter storms. A base map of Jefferson County is shown in Figure 2-1. Figure 2-2 shows the various fire protection districts that serve the County.

Figure 2-1 Jefferson County Base Map

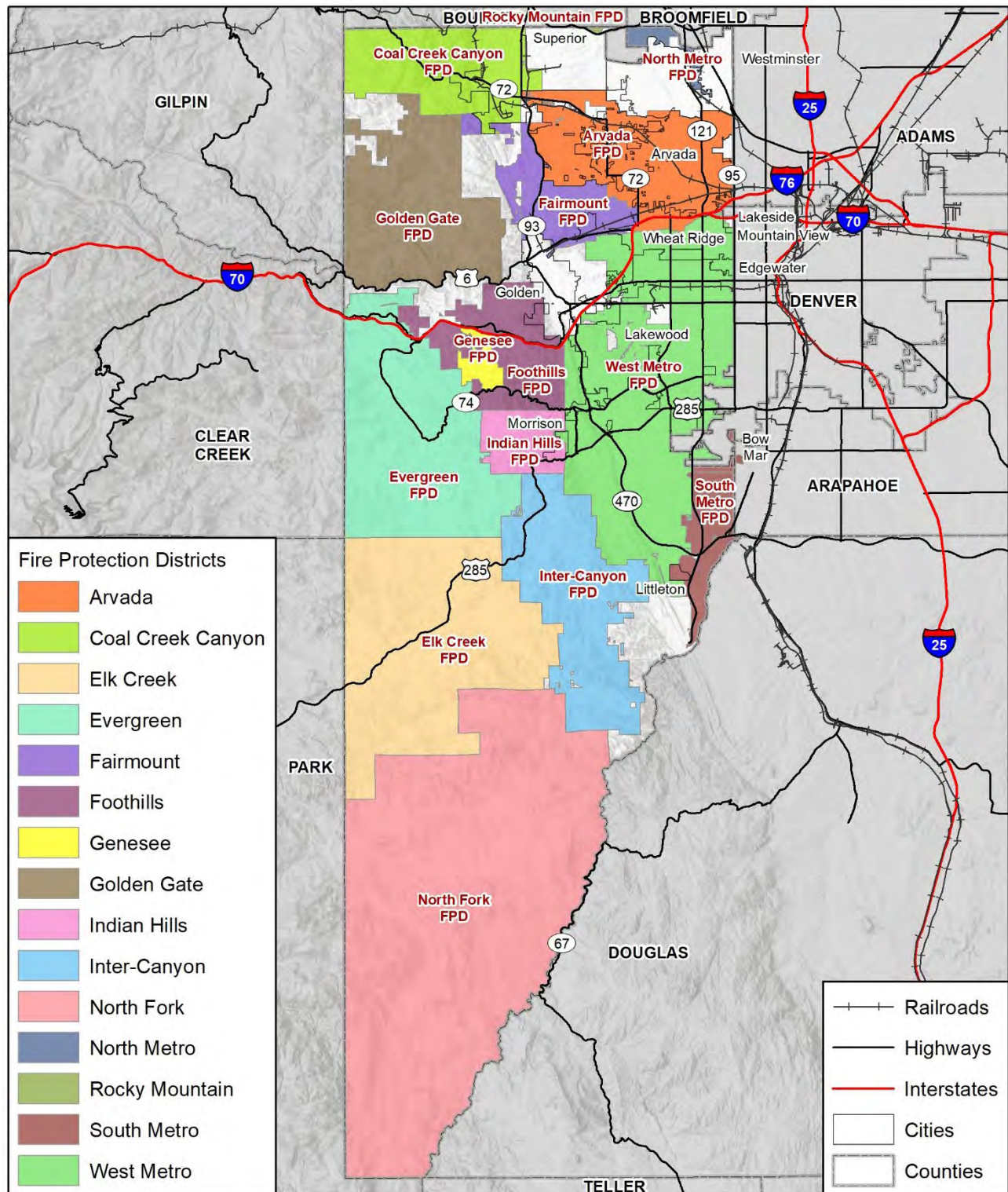


Map compiled 1/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT

0 5 10 Miles



Figure 2-2 Jefferson County Fire Protection Districts



2.2 Population

Jefferson County has grown by an estimated 39,969 residents since the 2010 U.S. Census, totaling 574,798 people in 2019. This equals an average yearly growth rate of 0.6% for this 9-year period. The majority of the population resides in the unincorporated areas of the county and the cities of Westminster, Lakewood, Arvada, and Littleton. Population estimates for 2015 and 2019 are provided in Table 2-2.

Table 2-2 Jefferson County Population

Jurisdiction	2015 Population (est.)	2019 Population (est.)	% Change 2015 to 2019
Arvada	111,658	118,746	6.35%
Edgewater	5,237	5,328	1.74%
Golden	19,780	20,693	4.62%
Lakewood	147,836	155,146	4.94%
Morrison	394	415	5.33%
Wheat Ridge	30,863	31,331	1.52%
Unincorporated	236,566	243,139	2.78%
Total	552,334	574,798	4.07%

Source: Quickfacts.census.gov

Select Census and American Community Survey demographic and social characteristics for Jefferson County are shown in Table 2-3, with comparisons to the State and the Country summarized in Table 2-4. Characteristics are for the entire County.

Table 2-3 Jefferson County Demographic and Social Characteristics, 2015-2019

Jefferson County	2015	2019	% Change
Population	552,334	574,798	4.07%
Median Age	40.4	40.3	-0.2%
Total Housing Units	232,477	240,956	3.6%
Housing Occupancy Rate	95.9%	96.4%	0.5%
% of Housing Units with no Vehicles Available	4.3%	3.9%	-9.3%
Median Home Value	\$279,500	\$397,700	42.3%
Unemployment Rate	4.1%	3.6%	-12.2%
Mean Travel Time to Work (minutes)	27	28	3.7%
Median Household Income	\$70,164	\$82,986	18.3%
Per Capita Income	\$37,065	\$44,119	19.0%
% of Individuals Below Poverty Level	8.5%	7.1%	-16.5%
% Without Health Insurance	14.2%	5.5%	-61.3%
# of Households	222,892	232,284	4.2%
Average Household Size	2.4	2.4	0.0%
% of Population Over 25 with High School Diploma or Higher	94.0%	94.5%	0.5%
% of Population Over 25 with Bachelor's Degree or Higher	41.6%	45.2%	8.7%
% with Disability	9.6%	10.0%	4.2%
% Speak English less than "Very Well"	3.1%	3.0%	-3.2%

Source: US Census and American Community Survey

Table 2-4 Jefferson County Demographic and Social Characteristics Compared to the State and the Nation

Demographic & Social Characteristics (as of 2019)	County	Colorado	U.S.
Median Age	40.3	36.7	38.1
Housing Occupancy Rate	96.4%	90.0%	87.9%
% of Housing Units with no Vehicles Available	3.9%	5.1%	8.6%
Median Home Value	\$397,700	\$343,300	\$217,500
Unemployment	3.6%	4.3%	5.3%
Mean Travel Time to Work (minutes)	28	25.8	26.9
Median Household Income	\$82,986	\$72,331	\$62,843
Per Capita Income	\$44,119	\$38,226	\$34,103
% of Individuals Below Poverty Level	7.1%	10.3%	13.4%
% Without Health Insurance	5.5%	7.6%	5.1%
Average Household Size	2.40	2.56	2.62
% of Population Over 25 with High School Diploma or Higher	94.5%	91.7%	88.0%
% of Population Over 25 with bachelor's degree or Higher	45.2%	40.9%	32.1%
% with Disability	10.0%	10.6%	12.6%
% Speak English less than "Very Well"	3.0%	5.8%	8.4%

Source: US Census and American Community Survey.

2.3 Social Vulnerability

Local vulnerability to disasters depends on more than the relationship between a place and its exposure to hazards. Social vulnerability to disasters refers to the characteristics and situation of a person or group that influence their capacity to anticipate, cope with, resist, or recover from the impact of a hazard. It is determined by a number of pre-existing social and economic characteristics, including race, age, income, renter status, or institutionalized living. Very often, the impacts of hazards fall disproportionately on the most underserved or marginalized people in a community – people with low income, children, people who are aging, people with disabilities, and minorities. During emergencies, for example, self-evacuation can be difficult or nearly impossible for individuals who are disabled or institutionalized. Additionally, the willingness of an individual/family to invest in residential mitigation actions is often limited if their home is a rental and they are averse to investing money in long-term mitigation activity. Not only do conditions like these limit the ability of some communities to get out of harm's way, they also decrease the ability of communities to recover from and thrive in the aftermath of a disaster event.

The term social vulnerability is used here to describe communities more vulnerable to a risk or hazard, such as high vulnerability due to wildfires or floods based upon geography, topography, hydrology or weather. Referencing people themselves directly with the term vulnerable can cause individual community members to be seen with a deficit lens, leaving the impression that the vulnerability is a result of the lack of responsibility and/or adequate planning of the individual. Instead, vulnerability occurs when the system that the individual is part of fails to provide equitable accessibility to resources or services, known as access and functional needs, for the individual to survive, respond to, and recover from an event. Barriers that may be exacerbated by certain social and economic factors – including race, age, income, renter status, or institutionalized living – directly affect a community's ability to prepare for, respond to, and recover from hazards and disasters. The concept of social vulnerability helps explain why communities often experience a hazard event differently, even when they experience the same amount of physical impacts or property loss.

For the 2021 plan update, the concept of social vulnerability has been introduced into the hazard risk analysis to more effectively identify hazard risk experienced by the most vulnerable residents and communities within the county. The social vulnerability assessment is designed to improve local decision making, hazard prioritization, and emergency management activities. By incorporating social vulnerability

into the risk assessments of individual hazards, local communities can identify more vulnerable areas and tailor their mitigation actions to accommodate all members of their community, including the most sensitive groups.

Social vulnerability analysis is particularly useful in the context of hazard mitigation planning because it can reveal disparities within a community that make a difference when it comes to the ability of residents to mitigate, prepare, evacuate, mobilize resources, and recover from disasters. Areas on the map that have medium to high social vulnerability represent areas where age, poverty, race/ethnicity, or special needs factors may make it more difficult for people to prepare, respond, and recover from hazard events. Social vulnerability information can also be used to help communities design effective and appropriate local risk communication and hazard mitigation outreach activities.

The Center for Disease Control and Prevention (CDC) has developed a social vulnerability index (SoVI) as a way to measure the resilience of communities when confronted by external stresses such as natural or human-caused disasters or disease outbreaks. The SoVI is broken down at the census tract level and provides insight into particularly vulnerable populations to assist emergency planners and public health officials identify communities more likely to require additional support before, during, and after a hazardous event. The SoVI index combines four main themes of vulnerability, which are in turn broken down into subcategories for a total of 15 vulnerability factors. Table 2-5 displays those 15 factors and shows how Jefferson County compares to other counties in Colorado and nationally. The rankings show the percentage of counties that Jefferson County is more vulnerable than, i.e. – high numbers reflect greater relative vulnerability.

Table 2-5 Social Vulnerability in Jefferson County

Variable	Ranking Compared to Colorado Counties	Ranking Compared to US Counties	Relative Vulnerability
Socioeconomic status	13%	2%	Low
Below poverty	16%	6%	Low
Unemployment	32%	21%	Low
Income	11%	3%	Low
No high school diploma	29%	5%	Low
Household composition and disability	32%	2%	Low
Age 65 or older	38%	26%	Below Average
Age 17 or younger	49%	25%	Below Average
Disability	29%	6%	Low
Single-parent households	40%	21%	Low
Minority status and language	46%	67%	Above Average
Minority	49%	59%	Above Average
Speaking English "less than well"	44%	69%	Above Average
Housing and transportation	21%	20%	Low
Multi-unit structures	81%	95%	High
Mobile homes	3%	4%	Low
Crowding	17%	30%	Below Average

Variable	Ranking Compared to Colorado Counties	Ranking Compared to US Counties	Relative Vulnerability
No vehicle	40%	21%	Low
Group quarters	43%	35%	Below Average
Overall Social Vulnerability	24%	6%	Low

Source: CDC SoVI Data

Figure 2-3 displays the overall SoVI data for Jefferson County broken down by census tract. Figure 2-4 through Figure 2-7 breaks the data down by the four main themes described above. Most of the areas with the highest level of social vulnerability are in the northeastern portions of the County in the metro area, where the majority of the population is concentrated.

Additional information on the CDC's Social Vulnerability Index can be found at <https://svi.cdc.gov>.

Figure 2-3 Jefferson County Overall Social Vulnerability

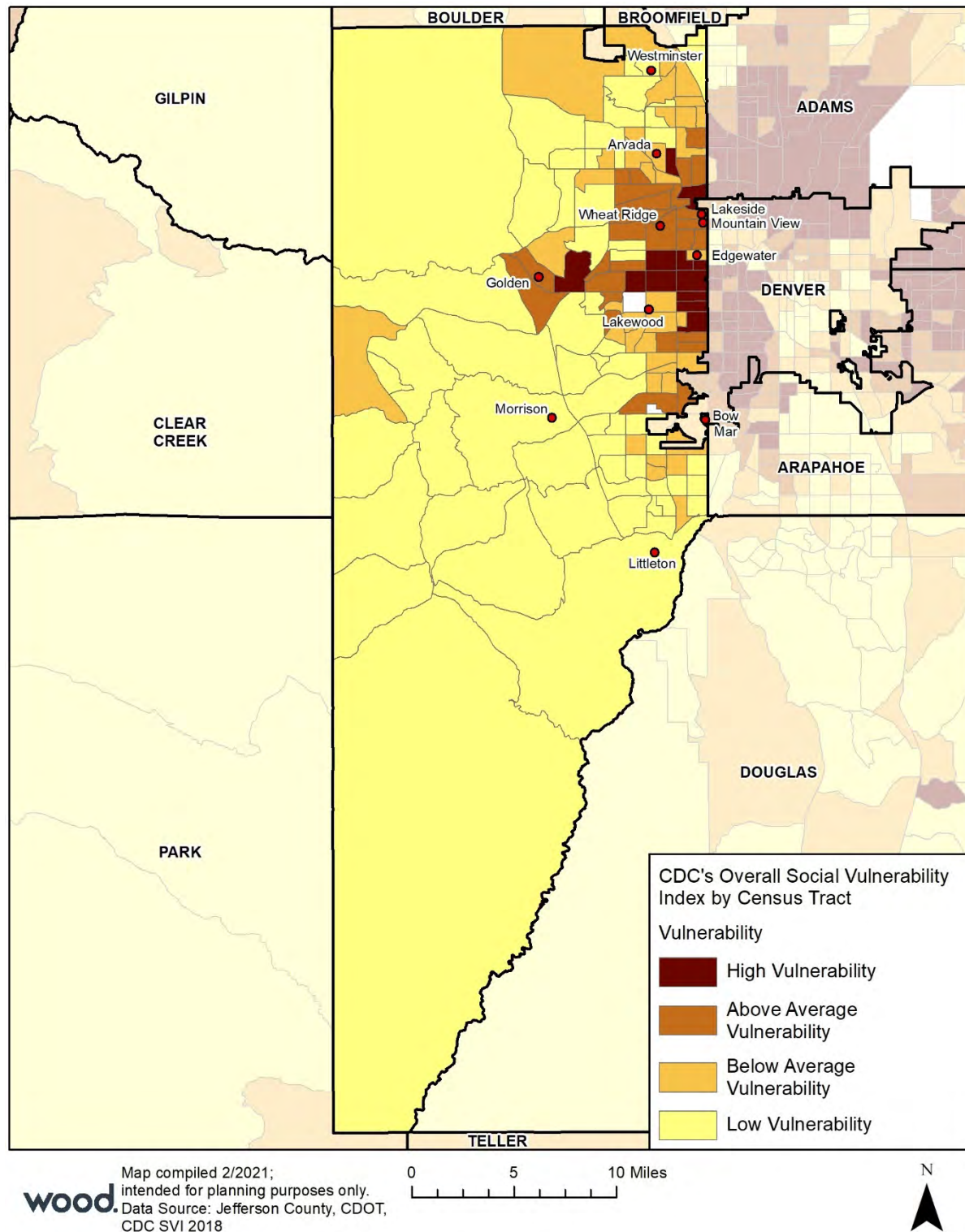
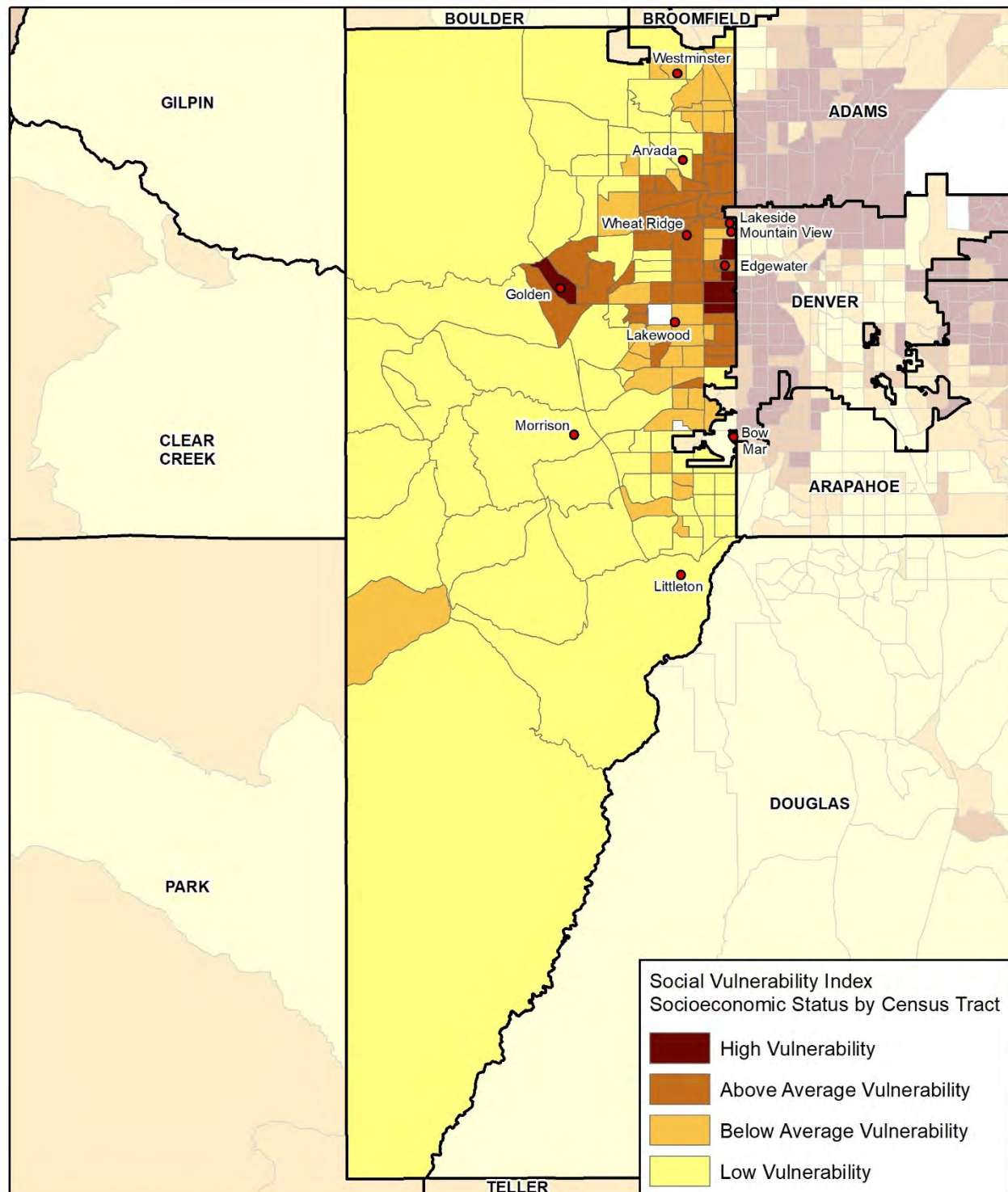


Figure 2-4 Jefferson County Socioeconomic Vulnerability

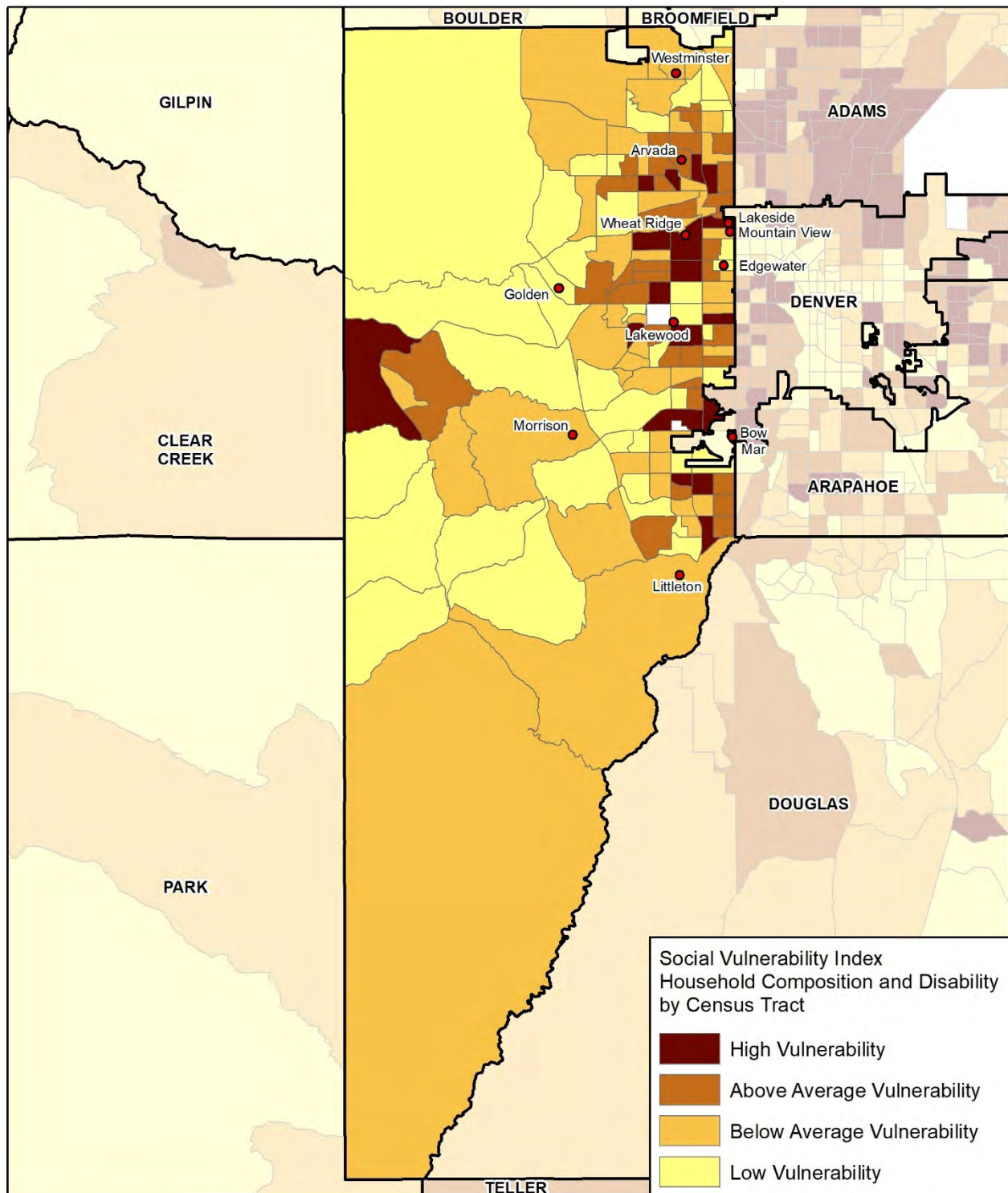


wood Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
CDC SVI 2018

0 5 10 Miles



Figure 2-5 Jefferson County Household Composition and Disability Vulnerability



wood
Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
CDC SVI 2018

0 5 10 Miles



Figure 2-6 Jefferson County Minority Status and Language Vulnerability

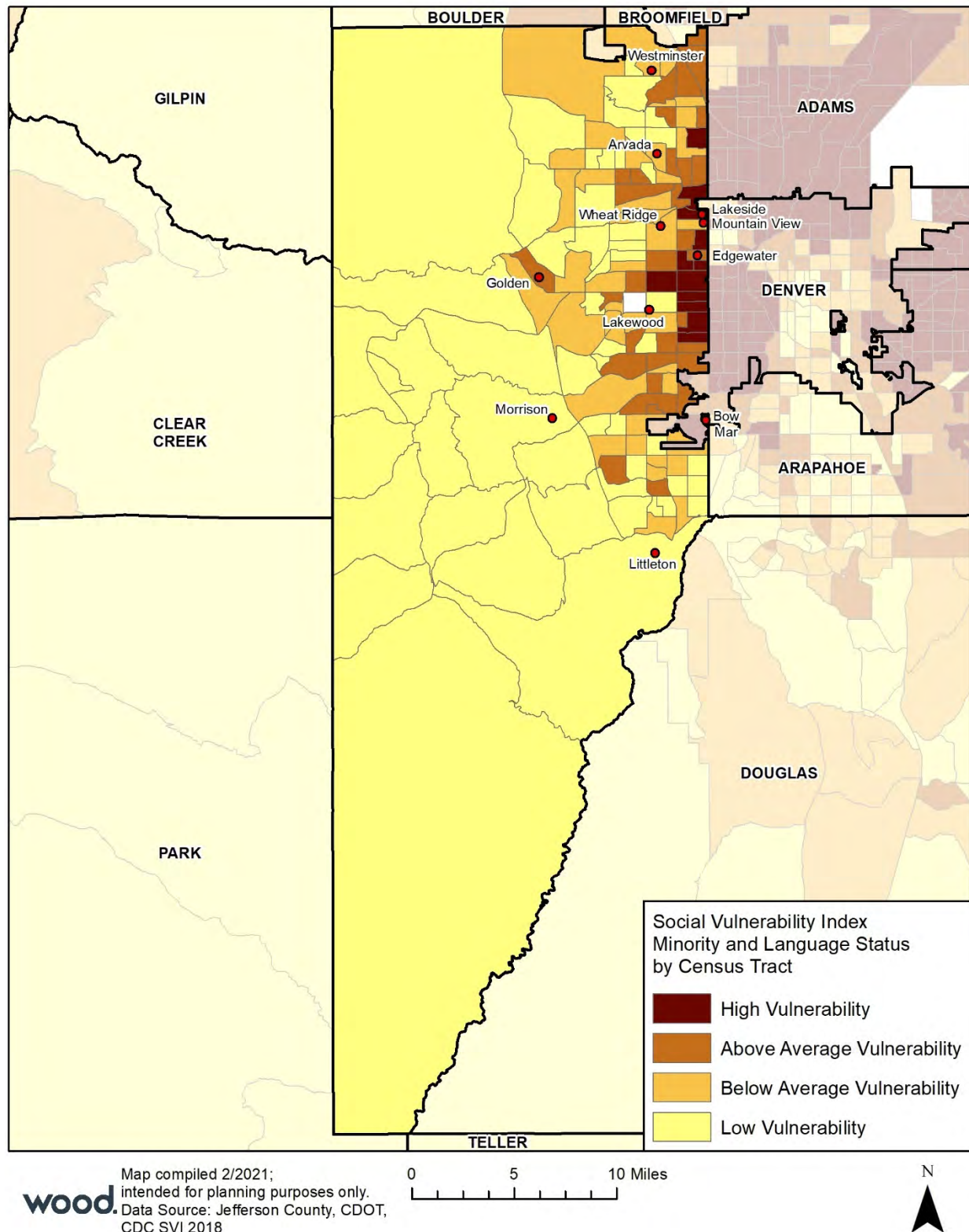
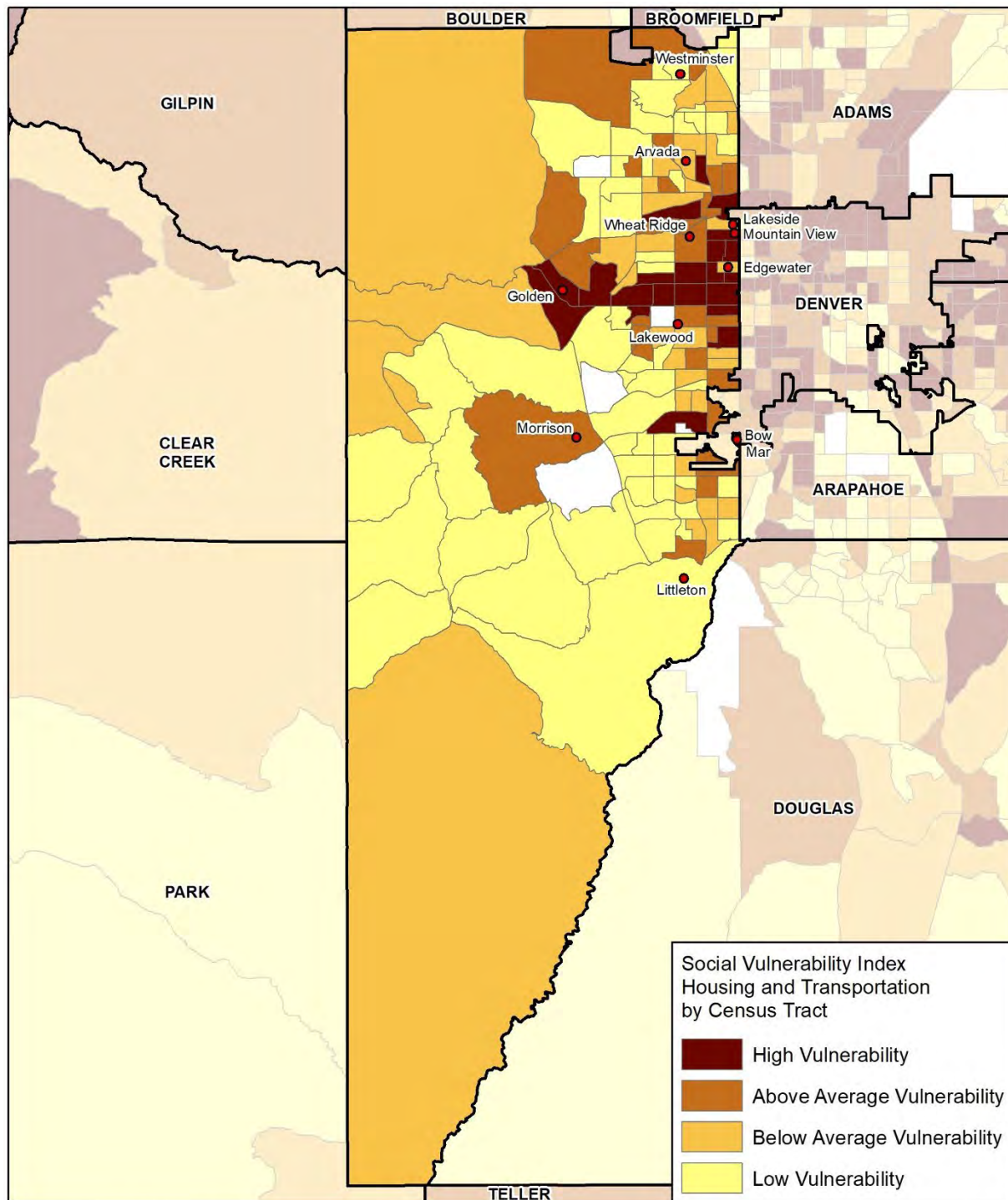


Figure 2-7 Jefferson County Housing and Transportation Vulnerability



wood Map compiled 2/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
CDC SVI 2018

0 5 10 Miles



2.4 History

Jefferson County has a history rich in people, events and progress. Taking the name of the third U.S. President Thomas Jefferson, the County was formally organized in 1861 by the Colorado Territorial Legislature. The need for an organized local government began in the late 1850s when droves of gold-seeking settlers came west. In 1858, when gold was discovered in the Rocky Mountains, there were fewer than 200 settlers in the area. An influx of nearly 35,000 people arrived two years later, lured by the glitter of gold. The first provisional governor of Jefferson Territory was Robert W. Steele, who lived at Mount Vernon. County offices were located in Loveland Hall until 1877 when the first Jefferson County Courthouse was built. Commissioners in 1862 were paid \$3 per day for their meetings plus mileage to the meeting hall. The City of Golden served as the capital for the Colorado Territory from 1862 to 1867.

The county tax in 1862 was 6 mills and the school tax was 2.5 mills. County taxes for that year amounted to \$1,594.61. By comparison, in 1996 Jefferson County's mill levy was 25.584 and property taxes alone exceeded \$96,000,000. In the early years, farmers and ranchers thrived by supplying food and supplies to the mining towns scattered throughout the mountains. Mining occurred along the Hogback in Idledale, on Lookout Mountain, and in Genesee. Contemporary elements within the County include a variety of industries. Some of these are aerospace engineering from companies such as Lockheed Martin, environmental engineering from Ball Corp., the Coors brewery, the Colorado School of Mines, local grocery chains, and numerous private, locally owned, or large corporate businesses. Many of these, such as the School of Mines and Coors Brewery, were established in the late 1800s and are nearly as old as the territory itself. Dinosaur Ridge, where fossils were first discovered in 1877, remains a prominent and archaeologically significant resource. Mount Olivet Cemetery, which opened in 1892 and was called "The New City of the Dead", remains one of the largest cemeteries in Colorado and is still active.

2.5 Economy

According to the Jefferson County Economic Development Corporation, as of 2020, the top employers in the county are:

• Lockheed Martin	6,200 employees
• St. Anthony Hospital	2,400 employees
• Terumo BCT	2,400 employees
• Lutheran Medical Center/SCL Health	2,300 employees
• MillerCoors Brewing	2,080 employees
• National Renewable Energy Lab	1,750 employees
• Ball Corporation	1,700 employees
• FirstBank Holding Co. of Colorado	1,480 employees
• Coorstek	1,300 employees
• HomeAdvisor	1,130 employees

Select economic characteristics for Jefferson County from the 2018-2019 American Community Survey Estimates are shown in Table 2-6. Characteristics for Jefferson County are for the entire County.

Table 2-6 Jefferson County Economic Characteristics

Characteristic	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
Individuals below poverty level (%)	7.1	5.8	9.6	15.8	9.1	3.2	12.9
Median home value (\$)	\$397,700	\$384,500	\$408,500	\$522,200	\$364,800	\$541,700	\$383,900
Median household income (\$)	\$82,986	\$84,717	56,028	\$72,349	\$66,740	\$105,536	\$57,659
Per capita income (\$)	\$44,119	\$42,921	\$33,529	\$39,184	\$38,612	\$40,900	\$33,956
Housing Occupancy Rate (%)	96.4	96.9	95.8	94.6	96.5	94.4	95.8
Unemployment rate (%)	3.6	3.8	4.8	4.6	3.5	2.1	3.7

Source: US Census American Community Survey

2.6 Land Use and Development Trends

A key strategy for reducing future losses in a community is to avoid development in known hazard areas and to enforce the development of safe structures in other areas. The purpose of this strategy is to keep people, businesses, and buildings out of harm's way before a hazard event occurs.

Countywide, there have been 8,501 new buildings constructed between 2015 and 2020. Thousands of these new structures have been constructed in areas exposed to one or more hazards. As discussed below in Section 2.7, the County and jurisdictions have land-use regulations in place that require mitigation when building in floodplains and geologic hazard areas, reducing the vulnerability of these new structures. Table 2-7 and Table 2-8 summarize this trend in greater detail.

Table 2-7 New Structures Built in Hazard Areas, 2015 to 2020

Hazard	New Structures
1% Chance Flood	21
0.2% Chance Flood	71
Local Flood Layers	9
Dam Inundation	784
Landslide	0
Rockfall	0
Slope Failure	3
Subsidence	1,392
Dipping Bedrock	1,297
Total	3,577

Source: Wood analysis based on Jefferson County Assessor's Office, Colorado Geological Survey, FEMA NFIP Floodplain data, Colorado DWR Dam Safety

Table 2-8 New Structures Built in Wildfire Zones, 2015 to 2020

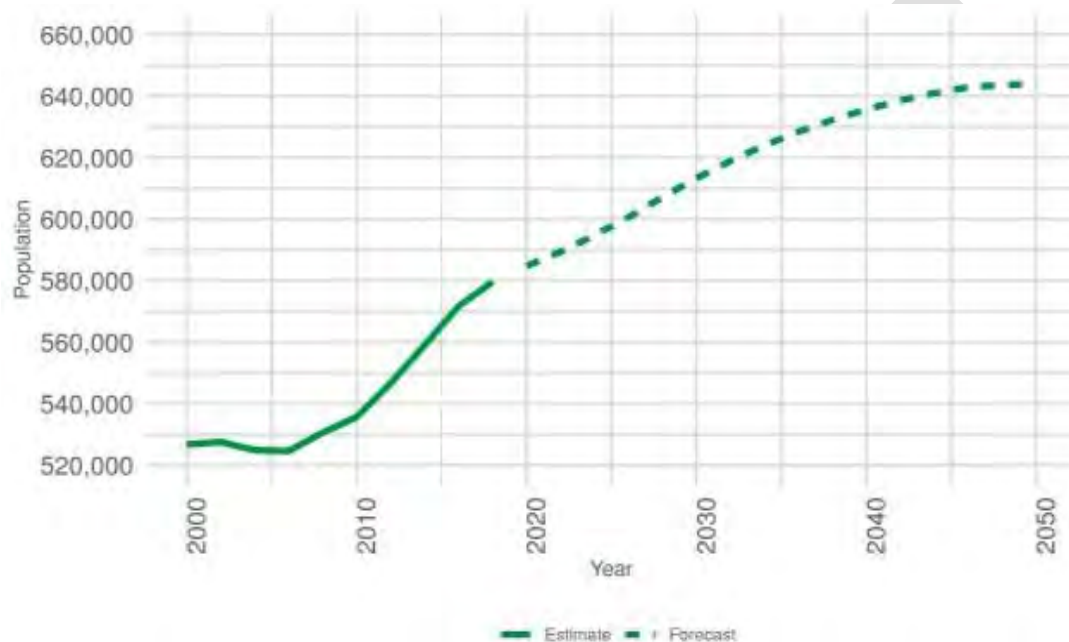
Wildfire Risk	New Structures
Lowest	2,022
Low	663
Moderate	2,948
High	589

Wildfire Risk	New Structures
Highest	15
Total	6,237

Source: Wood analysis based on Jefferson County Assessor's Office, Colorado State Forest Service

According to the Colorado State Demography Office, between 2020 and 2030 Jefferson County's population is projected to grow at an average of 0.7% a year, with the overall growth rate expected to slow to 0.27% between 2030 and 2040. The county's population is projected to be 643,945 by 2050. Figure 2-8 shows the population forecast for the next 30 years.

Figure 2-8 Jefferson County Population Forecast, 2000 to 2050



Source: Colorado State Demography Office

2.7 Capabilities Assessment

The following section assesses the County's and jurisdictions' existing capabilities to pursue hazard mitigation. The capability assessment analyzes Jefferson County's capabilities that can be leveraged to mitigate hazards. Combining the risk assessment with the mitigation capability assessment results in the County's "net vulnerability" to disasters, and more accurately focuses the goals, objectives, and proposed actions of this plan.

The HMPC used a two-step approach to conduct this assessment for the County and jurisdictions. First, an inventory of common mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

This assessment is divided into four sections: regulatory mitigation capabilities; administrative and technical mitigation capabilities; fiscal mitigation capabilities; and mitigation outreach and partnerships. Additional information on jurisdiction capabilities can also be found in the Annexes.

2.7.1 Regulatory Mitigation Capabilities

Table 2-9 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in Jefferson County. Excerpts from

applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities. Because many of these capabilities do not apply to non-municipal jurisdictions, information on their mitigation capabilities are described in their annexes.

Table 2-9 Regulatory Mitigation Capabilities

Regulatory Tool (ordinances, codes, plans)	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
General or Comprehensive plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zoning ordinance	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Subdivision ordinance	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Growth management ordinance	Yes	No	No	Yes	Yes	No	Yes
Floodplain ordinance	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Floodplain Management Plan	Yes	No	No	No	No	Yes	No
Other special purpose ordinance (stormwater, steep slope, wildfire)	Yes	Yes	No	Yes	Yes	Yes	Yes
Building code	Yes 2018	Yes 2018	Yes 2015	Yes 2018	Yes 2015	Yes 2020	Yes 2018
BCEGS Ratings (1-10, 1 being best)	4/3	4/3	No	4/4	4/3	5/5	5/4
Fire department ISO rating	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Erosion or sediment control program	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Storm water management program	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site plan review requirements	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Capital improvements plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Economic development plan	No	Yes	Yes	Yes	Yes	Yes	Yes
Local emergency operations plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Community Wildfire Protection Plan (CWPP)	Yes 2012	No	No	Yes 2007	Yes 2006*	No	No
Other special plans	Yes	Yes	No	Yes	Yes	No	Yes
National Flood Insurance Program	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Community Rating System	Yes: 5	Yes: 5	No	Yes: 7	Yes: 6	Yes: 8	Yes: 5
Flood insurance study or other engineering study for streams	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Elevation certificates (for floodplain development)	Yes	Yes	No	Yes	Yes	Yes	Yes

Regulatory Tool (ordinances, codes, plans)	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
Other							

Source: HMPC. * Covered under West Metro Fire CWPP

Jefferson County Comprehensive Master Plan

Jefferson County adopted its first Comprehensive Master Plan in 1961, with the most recent update completed in 2017 and another plan update currently ongoing. Since then, master planning in Jefferson County has taken many different approaches, but all of the approaches have recognized that good planning involves evaluating a multitude of different factors when making land use decisions, such as transportation, geologic hazards and compatibility. The Land Use chapter of the Development Review section (Page 18) includes: guidelines for all development, infill and redevelopment, business and industry, housing, mixed-use, community uses, livestock, renewable and alternative energy, extractive resources, solid wastes and hazardous materials, activity centers, and site design. The Development Review section also addresses physical constraints. Physical constraints are those physical features that due to safety or cost concerns may potentially restrict where and how development occurs. For purposes of this Plan, physical constraints include geologic hazards and constraints, floodplains, wetlands, wildfire, radiation, landfills, abandoned mines, and wildlife. The overall vision projects a balance of residential, commercial, community, recreational, agricultural and open land uses, which protects and maintains the quality of the mountain and plains environment, provides economic vitality for current and future generations, respects private property rights, and maintains Jefferson County as a place of choice to live, work, and recreate.

This balance protects and maintains the quality of the mountain and plains environment, provides economic vitality for current and future generations, and maintains Jefferson County as a place of choice to live, work, and recreate. The plan identifies that location, availability and the convenience of goods and services is an important element in the quality of life, and that a balance of such key services as an educated workforce, schools, commercial services, and recreational and employment opportunities are vital. Well-planned retail and service levels provide a source of community identity. The roads, rivers, and trails that connect homes, offices, stores, schools, and parks are the conduits for social interaction that knit together a community. Ensuring that residential areas are balanced by commercial and service centers can contribute to an orderly pattern of development and sense of place.

The general land use management goal is to encourage diversity of residential, commercial, community, recreational, and open land uses. The plan identifies Urban and Non-Urban Interface development with an objective to accommodate higher intensity uses in areas with adequate infrastructure and minimal hazards and provide decreasing land use intensity where constraints exist and as distance to services increases. There are policies that protect important wildlife habitats and avoid development or mitigate impacts in severe wildfire areas, such as steep forested canyons and slopes greater than 30%. The plan includes provisions for infill and redevelopment, which supports adaptive reuse of historical and outdated buildings; and future growth, which complements the existing community character with efforts to accommodate anticipated growth in the Denver metro area over the next 30 years. The policy states that the County should incorporate land planning techniques that manage resources effectively.

In addition, the Comprehensive Master Plan includes goals and policies oriented towards several long-range planning issues to guide the County's future growth and development. One such issue is environmental stewardship. This section integrates hazard mitigation with the goal to "protect people and property from hazardous conditions and events", which includes specific policies intended to mitigate the impacts of geologic hazards, flood, wildfire, and hazardous materials. Other goals and policies seek to support water conservation measures which supports mitigation of drought risk, such as the goal to "promote the education of residents, businesses, and appropriate agencies about water issues affecting the County".

The Water Quality policy implements State law (CRS 30-28-133(3)) which requires that local governments “shall not approve an application for a development permit unless...the applicant has satisfactorily demonstrated that the proposed water supply will be adequate.”

The ongoing update to the comp plan will further these efforts by specifically including water usage policies based on input from the public in 2019.

Building Codes

The Jefferson County Building Department enforces building codes in Jefferson County. Listed below are the codes effective January 2019.

- 2018 International Building Code
- 2018 International Residential Code
- 2018 International Fuel Gas Code
- 2018 International Mechanical Code
- 2018 International Plumbing Code
- 2018 International Existing Building Code
- 2018 International Energy Conservation Code
- 2020 National Electrical Code

In addition, the County has adopted an addendum to the 2018 Jefferson County Code Supplement - Appendix Z - Special Building Construction Regulations in Wildfire Zone 1 - Effective Date January 1, 2020. All adopted building codes can be accessed at <https://www.jeffco.us/2055/Adopted-Building-Codes>. Local fire districts have individual authority to enforce fire code standards beyond the County's requirements.

Climatic and Geographic Design Criteria: The updated Climatic and Geographic Design Criteria for 2018 includes building standards for wind design (including wind speeds, special wind regions, and wind-borne debris), snow load, seismic design, temperature extremes, and flood hazards. The code contains provisions for additional criteria to be established by the local jurisdiction.

Wildfire: Jefferson County has two wildfire hazard overlay zones that have mitigation requirements for construction. The wildfire hazard overlay zones line generally follow what is called the “mountain front.” The State Forest Service concurs that this line indicates the predominant change from plain to mountain topography. The canyons are within wildfire zone 1 because of the chimney-effect of the terrain. The location of the wildfire zone line recognizes vegetation, slope, fire department accessibility, water supply, response time and infrastructure.

R901.1.1.1 Buildings located in more than one Wildfire Zone: A building or structure which is located partly in one Wildfire Zone and partly in another shall be considered to be in the Wildfire Zone in which more than one-half of its total floor area is located.

R901.1.1.2 Moved buildings: Any building or structure moved within or into any Wildfire Zone shall be made to comply with all the requirements for new buildings in that Wildfire Zone.

R901.1.2.1 General: Buildings hereafter erected, constructed, enlarged, altered, repaired or moved into Wildfire Zone 1 shall comply with the following: 2015 IRC Supplement Jefferson County, Colorado Page 20 of 35

R901.1.3.2 Roof coverings, material Zone 2: Except where this code requires greater protection, roof coverings for new buildings, structures or additions, roof coverings utilized for re-roofing shall be Class A, Class B or Class C, or any other roof covering permitted by this code.

Community Wildfire Protection Plans (CWPPs)

In addition to the building codes and wildfire zones, the County has a number of Community Wildfire Protection Plans (CWPPs) that assess wildfire risk and provide specific recommendations for mitigation based on scientifically sound wildfire management principles. In general, these plans are consistent with the National Fire Plan (2000) and the Healthy Forests Restoration Act (2003) both of which are federal level frameworks for wildfire hazard evaluation and strategic planning. There are several plans which are undergoing an update as of the drafting of this plan.

The following jurisdictions and communities in Jefferson County have CWPPs in place:

- Jefferson County CWPP, ALL (2012)
- City of Golden CWPP (2007)
- Coal Creek Canyon Fire Protection District CWPP (2008)
- Elk Creek Fire Protection District CWPP (2005)
- Evergreen Fire Protection District CWPP (2020)
- Fairmount Fire Protection District CWPP (2007)
- Foothills Fire Protection District CWPP (2020)
- Genesee Fire Protection District CWPP (2008)
- Golden Gate Fire Protection District CWPP (2011)
- Indian Hills Fire Protection District CWPP (2007)
- Inter-Canyon Fire Protection District CWPP (2007)
- Lower North Fork CWPP (2007)
- North Fork Fire Protection District CWPP (2011)
- South Platte CWPP (2007)
- West Metro Fire Protection District CWPP (2006)

Slash Collection Program

Slash is debris, from nature, such as tree limbs, pruning's and pine needles. If not removed, slash can add to potential fire hazards. Wildfires have become more common in Jefferson County and clearing this debris can prevent fire damage to structures and spread of wildfire. In 2015, the County expanded its slash collection program which helps homeowners to mitigate fire risk by collecting and removing loads of slash at predetermined collection sites around the County. The cost to drop off a single truckload is \$20 (2015) and is used to partially cover the administrative costs of the program. Locations and dates of collection sites are updated and posted at: <https://www.jeffco.us/2493/Slash-Collection>

Foundations and Soils Investigation

The Designated Dipping Bedrock Area is determined by the Planning and Zoning Department. The building codes identify specific pier length, as well as diameter and support penetration for building in dipping bedrock areas. The codes also identify specifications for foundation walls and structural basement floors.

Flood Loads

Planning and Zoning Department approval required pursuant to other County regulations.

Floodplain Management

In accordance with the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973, Jefferson County has applied and subsequently qualified for participation in the National Flood Insurance Program. Jefferson County joined the NFIP on August 5, 1986 and the Community Rating System (CRS) on October 1, 2005. Detailed information on the Jefferson County and its communities' participation in CRS can be found below in Section 2.7.4.

The County requires developments that impact floodplains to comply with the floodplain regulations of the Zoning Resolution and Regulation. Although in many circumstances it may be desirable to leave the floodplain in its natural state, it is evident that development in areas encumbered by floodplains often results in alterations within the floodplain limits. The County has adopted floodplain regulations as part of its Zoning Resolution and Regulation. These regulations should be referenced when alterations within floodplains are proposed.

Stormwater Management

Jefferson County is responsible for the stormwater quality that drains from property into the storm sewer system and discharges to state waters. As part of the Stormwater Phase II Regulations, Jefferson County must apply to the State of Colorado Department of Public Health and Environment for a Municipal Separate Storm Sewer System (MS4) Permit. The five-year permit was first granted to Jefferson County in March 2003. Under this permit, Jefferson County is mandated to improve the quality of stormwater.

Jefferson County has created stormwater management regulations. These regulations together with all future amendments are known as the “Jefferson County Storm Drainage Design and Technical Criteria” adopted March 24th, 2009 and referenced in the Jefferson County Land Development Regulation. The criteria apply to all lands within the unincorporated areas of the County, including all public lands. A revision to this document was published on December 17, 2019. Policies and technical criteria not specifically addressed in these criteria will follow the provisions of the Mile High Flood District “Urban Storm Drainage Criteria Manual.”

Stormwater runoff is a by-product of urbanization. Drainage planning is required for all new developments. These plans define major drainage facilities, including those that are required public improvements for new developments. Drainage reports and plans, construction drawings, specifications, and as-built information will be submitted and approved as required by the Regulation and Building Permit Procedure. AutoCAD example drawings are available from the County at:

<https://www.jeffco.us/2629/Storm-Drainage-Design-Technical-Criteria>

For drainage basins less than five square miles, a two-hour storm distribution without area adjustment of the point rainfall values will be used for the Colorado Urban Hydrograph Profile. For drainage basins between five and ten square miles, a two-hour storm distribution is used but the incremental rainfall values are adjusted for the large basin area in accordance with suggested procedures in the NOAA Atlas for Colorado.

Wildfire Hazard Overlay District Zoning Resolution – Section 39 of Jefferson County Zoning Resolution (2020)

This District is intended to promote the public health, safety and welfare of the citizens of Jefferson County, minimize the risk of loss of life and property in Wildfire Hazard Overlay Zone District; encourage and regulate prudent land use in the Wildfire Hazard Overlay Zone District so as not to increase the danger to the public health, safety and property; reduce the demands for public expenditures for relief and protection of structures and facilities permitted in the Wildfire Hazard Overlay Zone District; regulate buildings and structures so as to minimize the hazard to public health, safety, welfare, and to public or private property.

No building permit may be issued for a new dwelling, the replacement of an existing dwelling, or for additional space of 400 square feet or more (cumulatively measured) from May 21, 2002, the date of this regulation's adoption, until written evidence has been submitted and approved by the Zoning Administrator or his/her appointed designee stating that the following have been satisfied:

- Defensible space and associated fuel break thinning's have been created around the dwelling, or a wildfire mitigation site plan has been reviewed and a special exception granted by the Board of Adjustment for the property for which a building permit has been requested.
- Access standards as specified in the General Provisions and Regulations section of the Zoning Resolution have been satisfied.

Grading, Erosion, and Sediment Control Regulation – Section 17 of the Jefferson County Land Development Regulation

Grading, erosion, and sediment control plans shall be submitted as required by the Submittal Requirements Section in accordance with the following standards.

- The existing and final contours shall be shown at 2-foot intervals for subdivisions within the plains area and contours at 5-foot intervals for subdivisions within the mountain areas including the method utilized to obtain all contour intervals. Contours shall be accurate to within 0.5 contour. Elevations shall be based on USGS sea level datum. The USGS quad maps shall not be accepted as evidence for topographic contours.
- Grading, erosion and sediment control plans shall be prepared in accordance with and in compliance with the standards in the Land Disturbance Section of the Zoning Resolution.
- Grading, erosion and sediment control plans must include the following:
 - Plans for all private and public streets/roads in accordance with the Roadway Design and Construction Manual and the Circulation Section.

- Conceptual driveway plans if existing slopes exceed 30%.
 - Overlot grading plans for all non-residential, multi-family, manufactured home developments, and single-family residential developments with lot sizes under ½ acre. Overlot grading plans are not required for single-family residential lots over ½ acre in size if the developer is not proposing Overlot grading, grading is not required and/or shown on the drainage plan, and the slopes in the buildable areas do not exceed 30%. Overlot grading plans must be consistent with the grading and basin boundaries shown on the drainage plan.
 - Plans for all drainage improvements including but not limited to detention/ water quality facilities, drainage channels, storm sewer, and outlet protection.
 - Grading, erosion and sediment control plans for each lot in residential developments with lot sizes under ½ acre shall be prepared in accordance with and in compliance with the Notice of Intent standards in the Land Disturbance Section of the Zoning Resolution.
- Approvals: The Planning and Zoning Division shall approve the plans prior to development approval. The Jefferson Conservation District shall approve the seed mix and mulching rates.

The intent of these specifications is to ensure excavation and grading occur according to the approved plan and to establish minimum materials, methods, and standards to be used in the construction of site grading fills for support of residences and other structures, embankments or excavations for streets, roads, drainage channels, structures, or other purposes. The work covered by these specifications includes excavation, embankment, grading, compaction, clearing and grubbing, removal of topsoil, trees, stumps, vegetation, removal and/or resetting of minor obstructions, and any other work incidental to the construction of site grading fills.

Geologic and Geotechnical Regulations – Section 25 of the Jefferson County Land Development Regulation

The geologic and geotechnical standards were adopted to protect lots, tracts, and structures from geologic hazards, including, but not limited to, dipping bedrock, rockfall, potentially unstable slopes, swelling soils, and subsidence. Buildable areas within lots, tracts, and areas designated for streets/roads and drainage improvements shall be:

- Reasonably free from geologic hazards or adequately mitigated from geologic hazards.
- Free of adverse soil conditions, constructed away from adverse soil conditions, or constructed in areas where adverse soil conditions have been abated.
- All areas which fall within the Dipping Bedrock Overlay District shall be subject to the restrictions in the Dipping Bedrock Overlay District of the Jefferson County Zoning Resolution.

Detailed grading plans shall be submitted which show overburden soil or fill at least ten (10) feet thick beneath the anticipated level of the bottom of the structure foundation(s) and the top of bedrock. If deep (pier) foundations are proposed, the Zoning Administrator may require a review of such plans by the Engineering Advisory Board.

Or: If ten (10) feet of overburden or fill are not proposed, detailed engineering plans shall be submitted to the Engineering Advisory Board. The alternate mitigation plans shall contain the information necessary to determine that potential hazards can be adequately mitigated by other methods.

Land Disturbance Regulation – Section 16 of the Jefferson County Zoning Resolution

The purpose of the Land Disturbance Section is to:

- Enhance the quality of water in the County's drainage ways and surface waters;
- Protect life, property, and the environment from loss, injury, and damage by stormwater runoff, erosion, sediment transport, ponding, flooding, landslides, accelerated soil creep, settlement and subsidence, excessive dust, and other potential hazards caused by grading, construction activities, and denuded soils;
- Allow a temporary land use for land disturbance activities; and
- Establish performance standards to:
 - Define grading, drainage, erosion and sediment control, and waste disposal requirements;
 - Ensure mitigation of adverse impacts; and (orig. 10-12-04)

- Ensure the reclamation of disturbed land. (orig. 10-12-04)

All land disturbance activities must conform to the performance standards as detailed in this Section. These standards apply whether or not a grading permit or Notice of Intent is required.

It shall be unlawful for any person, firm or corporation to do or authorize any land disturbance in the unincorporated area of Jefferson County without first obtaining a grading permit from the County or submitting a Notice of Intent to the County to authorize temporary land disturbance activities unless specifically exempted by this section. The applicant, the landowner, and the contractor are responsible if a land disturbance activity is undertaken in contravention of the performance standards, or if a land disturbance activity is undertaken beyond the scope of the grading permit or Notice of Intent without County approval. Land disturbance activities must be completed in compliance with the approved plans.

Roadway Design and Construction Regulations

Jefferson County has adopted a Major Thoroughfare Plan based on traffic volumes, existing land use and anticipated growth. The Major Thoroughfare Plan designates streets/roads as freeway, parkway, arterial (principal and minor), or collector.

Jefferson County has also adopted a Roadway Design and Construction Manual (2009) that provides geometric standards for construction, reconstruction and rehabilitation of roadway and transportation facilities. The County also supplies AutoCAD format drawings for template examples on the County website.

2.7.2 Administrative/Technical Mitigation Capabilities

Table 2-10 identifies the County personnel responsible for activities related to mitigation and loss prevention in Jefferson County.

Table 2-10 Administrative and Technical Mitigation Capabilities

Personnel Resources	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
Planner/engineer with knowledge of land development/land management practices	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Planner/engineer/scientist with an understanding of natural hazards	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Resiliency Planner	No	Yes	No	No	Yes	Yes	No
Transportation Planner	Yes	Yes	Yes	No	Yes	Yes	Yes
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Personnel skilled in GIS	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Full time building official	Yes	Yes	Yes	Yes	Yes	No	Yes
Floodplain manager	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emergency manager	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grant writer	Yes	Yes	No	No	Yes	Yes	No

Personnel Resources	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
Other personnel	Yes	Yes	No	Yes	No	Yes	Yes
GIS Data Resources (Hazard areas, critical facilities, land use, building footprints, etc.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mass/Emergency Notification Systems (Reverse 9-11, etc.)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other	Sustainability Coordinator, Operations Coordinator (assigned to emergency ops, stormwater, debris management) & Forester (Forest health and fuel mitigation)			Homeless Navigator – Homeless liaison to mitigate and facilitate impacts to the homeless population		Town Clerk	Parks & Recreation and Public Works Staff

Source: HMPC

2.7.3 Fiscal Mitigation Capabilities

Table 2-11 identifies financial tools or resources that the County and municipalities have used in the past to fund mitigation activities, and highlights resources that may not have been used but are available for future use.

Table 2-11 Financial Capabilities That Have Been Used to Fund Mitigation Activities

Financial Resources	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
Community Development Block Grants	Yes	Yes	No, but available	No, but available	No, but available	Yes	Yes
Capital improvements project funding	Yes	Yes	Yes	No, but available	No, but available	Yes	Yes
Authority to levy taxes for specific purposes	Yes	No	No, but available	No, but available	No, but available	Yes	Yes
Fees for water, sewer, gas, or electric services	No	Yes	Yes	No, but available	No, but available	Yes	No
Stormwater Service Fees	No	Yes	No	Yes	Yes	No	No
Impact fees for new development	Yes	Yes	No	No, but available	No	Yes	Yes

	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
Financial Resources							
Incur debt through general obligation bonds	Yes	No	No, but available	No, but available	No, but available	Yes	Yes
Incur debt through special tax bonds	Yes	No	No, but available	No, but available	No	Yes	Yes
Incur debt through private activities	No	Yes	No	No, but available	No	Yes	Yes
Withhold spending in hazard prone areas	No	No	No	No, but available	No	Yes	No

Source: HMPC

2.7.4 Other Mitigation Efforts

Public Education and Outreach

Successful sustained mitigation depends upon robust collaboration between the public and private sector, different levels of government, municipal jurisdictions, departments, agencies, and community groups within Jefferson County. The participating jurisdictions have several active public education programs to educate the public about hazards and actions they can take to mitigate against those hazards, as shown in

Table 2-12 Education & Outreach Capabilities

	Jefferson County	Arvada	Edgewater	Golden	Lakewood	Morrison	Wheat Ridge
Education & Outreach Capabilities							
Local Citizen Groups That Communicate Hazard Risk	Yes	Yes	No	Yes	Yes	Yes	No
Firewise	Yes	No	No	Yes	No	No	No
StormReady	Yes	Yes	No	Yes	Yes	No	No
Other?		Yes ^{1,2}			Yes ²	Yes ³	No

Notes: 1- Ready, Set, Go! Program; 2 –Community Emergency Response Team (CERT); 3 – Annual Public Works pick up slash and limbs for residents free of charge, Annual Town Clean-Up Day where access to dumpsters is provided to residents free of charge for the disposal of any/all trash including tree limbs, etc.

Wildland Risk Reduction Task Force

To ensure a thoughtful, collaborative approach to addressing the risk of wildfires in Jefferson County, in November 2019 the Board of County Commissioners established the Jefferson County Wildfire Risk Reduction Task Force. Members represent community leaders, fire rescue districts, county government, law enforcement, business, forestry, water districts, and others – as well as geographic diversity. After in-depth discussion and a prioritization process, task force members identified three goals:

- Mitigation
- Community education (to raise awareness about mitigation)
- Revenue streams (to fund more mitigation)

Other issues such as fire suppression, evacuation routes and emergency notification also were raised.

The Task Force's recommendations report *Working Together to Reduce the Risk of Wildfire in Jefferson County* released on November 10, 2020, opens by noting that "Investment upfront in mitigation and community education can save lives, property and firefighting costs later." The Task Force Mitigation Team identified defensible space and forest management as key mitigation activities, and made a number of recommendations. Implementing these recommendations has been adopted as Objective 3g, and several recommendations been incorporated into the Mitigation Action Plan in Section 5.4.

National Flood Insurance Program (NFIP) and the Community Rating System (CRS)

Jefferson County has been mapped for flood hazards and participates in the National Flood Insurance Program (NFIP). Details of local jurisdiction participation status, policy and claims data from the NFIP's Community Information System (CIS) are shown in Table 2-13.

Table 2-13 Communities Participating in the FEMA NFIP

CID	Community	Initial FIRM Identified	Current Effective Map Date	Policies in Force	Total Coverage	# of Claims Paid	Total Losses Paid
080087	Jefferson County	08/05/1986	01/15/2021	409	\$111,193,700	138	\$1,407,173
085072	City of Arvada	07/01/1974	01/15/2021	359	\$95,813,400	71	\$66,412
080089	City of Edgewater	08/15/1989	02/05/2014	32	\$8,709,500	27	\$51,637
080090	City of Golden	05/18/1985	12/20/2019	88	\$25,874,000	14	\$48,938
085075	City of Lakewood	12/31/1974	02/05/2014	344	\$104,242,800	157	\$649,523
080092	Town of Morrison	12/01/1982	02/05/2014	7	\$2,481,300	2	\$1,232
085079	City of Wheat Ridge	05/26/1972	02/05/2014	219	\$54,870,100	45	\$97,251
Total				1,458	\$403,184,800	454	\$1,022,166

Source: FEMA, Current as of April 1, 2021

In addition to participating in the NFIP, Jefferson County, the Cities of Arvada, Golden, Lakewood, and Wheat Ridge, and the Town of Morrison all participate in the Community Rating System (CRS). CRS is a voluntary program for NFIP participating communities focused on reducing flood damages to insurable property and encouraging a comprehensive approach to floodplain management. The CRS provides incentives in the form of insurance premium discounts to communities that go above and beyond the minimum floodplain management requirements and develop extra measures to reduce flood risk. There are 10 CRS classes, and the classification determines the insurance premium discount for policyholders, as shown in Table 2-14.

Table 2-14 CRS Premium Discounts

Class	Discount	Class	Discount	SFHA (Zones A, AE, A1-A30, V, V1-V30, AO, and AH): Discount varies depending on class. SHFA (Zones A99, AR/A, AR/AE, AR/A1-A30, AR/AH, and AR/AO): 10% discount for Classes 1-6; 5% discount for Classes 7-9. Non-SFHA (Zones B, C, X, D): 10% discount for Classes 1-6; 5% discount for Classes 7-9. In determining CRS premium discount, all AR and A99 Zones are treated as non-SFHAs.
1	45%	6	20%	
2	40%	7	15%	
3	35%	8	10%	
4	30%	9	5%	
5	25%	10	--	

Source: FEMA CRS Coordinators Manual

All CRS participating communities start out with a Class 10 rating (which provides no premium discount). Class 1 requires the most credit points and offers the largest premium discount. Within the CRS program,

there are 18 activities recognized as measures for eliminating local exposure to flooding. Credit points are assigned to each activity, which have been organized under four main categories:

- Public Information
- Mapping and Regulation
- Flood Damage Reduction
- Flood Preparedness

The participating communities and their relative CRS classes and discounts are summarized in Table 2-15 below. Since 2010, the County has made significant progress in implementing flood capabilities, which is reflected in the updated Community Rating System (CRS) classification. Unincorporated Jefferson County went from CRS 9 to 6 in 2014, a 3 class increase which results in a 20% discount (previously 5%) for flood insurance policies in SFHA, and 10% premium reduction (previously 5%) for non-SFHA policies.

Table 2-15 Current CRS Participation and Summary Information

Community	Current Rating	Policies	Total Premiums	Discount	Current Annual Saving
Jefferson County	5	409	\$373,384	25%	\$82,904
Arvada	5	359	\$491,302	25%	\$138,434
Wheat Ridge	5	219	\$237,721	25%	\$62,731
Lakewood	6	344	\$339,271	20%	\$57,588
Golden	7	88	\$90,692	15%	\$12,041
Morrison	8	7	\$61,036	10%	\$6,782

Source: FEMA CRS

Code RED

Jefferson County participates in the Code RED emergency communications network which is a service that places calls, texts and/or emails to subscribers within the direct path of the storm in the event of a severe weather alert from the National Weather Service. Notifications are sent in an effort to provide residents extra time to prepare that could save lives. Types of alerts include tornado warnings, severe thunderstorm warnings, flash flood warnings, tsunami warnings and winter storm warnings.

2.7.5 Opportunities for Enhancement

Based on the capability assessment, Jefferson County has several existing mechanisms in place that already help to mitigate hazards, including numerous planning tools and many available funding mechanisms. The tables above show a consistently high level of capabilities across the County and participating jurisdictions, to include adoption of building codes, floodplain regulations, and CRS participation.

There are also opportunities for the County to expand or improve on its capability to further protect the community. Opportunities include the continuation of incorporating updated risk information into updates of the County's Comprehensive Plan and other regulatory documents. As well as ensuring risk information is taken into consideration in the Land Use Code updates and during the development review process. Jefferson County has a very active Local Emergency Planning Committee (LEPC), which can help coordinate mitigation goals and programs.

The HMPC recognizes that lack of implementation of the 2016 Plan over the past five years has limited the effectiveness of a sustained mitigation program. The County and jurisdictions have committed to improving this going forward, as described in Section 6.

An additional opportunity for capability enhancement includes leveraging ongoing recovery efforts to implement a focus on working with impacted community members to further identify ways to create equitable processes and policies for disaster management and decrease barriers to resources for marginalized and underserved communities that are traditionally disproportionately affected by a crisis.

Another opportunity being considered to reduce flood losses is for jurisdictions within Jefferson County that participate in the Community Rating System (CRS) to work towards increasing their rating. As discussed in Table 2-13, there are already several jurisdictions, including Jefferson County, who are participants in the CRS program. For each jurisdiction, the annual savings to their flood insurance policyholders is shown in Table 2-15 above.

Table 2-16 shows the potential annual savings to policyholders for each CRS Rating, along with the current ratings and savings for comparison. Improving a communities standing in the CRS program must be based on balancing those benefits against the staff time and jurisdictional commitments required to achieve and maintain certification, however, as summarized below the potential savings for each community could be in the tens of thousands of dollars.

Table 2-16 Potential Benefits of CRS Ratings By Jurisdiction

Community	Class 9 Annual Savings	Class 8 Annual Savings	Class 7 Annual Savings	Class 6 Annual Savings	Class 5 Annual Savings	Class 4 Annual Savings	Class 3 Annual Savings	Class 2 Annual Savings	Class 1 Annual Savings
Jefferson County	\$18,096	\$33,667	\$49,237	\$67,333	\$82,904*	\$98,475	\$114,046	\$129,617	\$145,187
Arvada	\$28,706	\$55,713	\$82,720	\$111,427	\$138,434*	\$165,441	\$192,448	\$219,455	\$246,462
Edgewater	\$2,589	\$4,927	\$7,264	\$9,853	\$12,190	\$14,528	\$16,865	\$19,202	\$21,539
Golden	\$4,505	\$8,273*	\$12,041	\$16,546	\$20,314	\$24,082	\$27,850	\$31,617	\$35,385
Lakewood	\$15,200	\$28,794	\$42,388	\$57,588*	\$71,182	\$84,776	\$98,369	\$111,963	\$125,557
Morrison	\$3,391	\$6,782*	\$10,173	\$13,564	\$16,954	\$20,345	\$23,736	\$27,127	\$30,518
Wheat Ridge	\$13,986	\$25,572	\$37,159	\$51,145	\$62,731*	\$74,318	\$85,904	\$97,491	\$109,077

Source: FEMA, as of 4/19/2021; * indicates current savings based on 2020 CRS status.

3 Planning Process

Requirements §201.6(b) and §201.6(c)(1) of the 2000 Disaster Mitigation Act (DMA): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- 1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*
- 2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and*
- 3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

3.1 Background on Mitigation Planning in Jefferson County

The primary purpose of the Jefferson County Hazard Mitigation Plan (HMP) update is to reduce or eliminate long-term risk to people and property from natural and human-caused hazards and their effects on the Jefferson County planning area. Recognizing the importance of hazard mitigation planning, Jefferson County and the cities of Arvada, Lakewood and Wheat Ridge participated in the 2003 Denver Regional Council of Governments (DRCOG). In order to develop a more specific risk assessment, goals, and mitigation projects, the County and the jurisdictions noted previously, developed their own Jefferson County specific multi-jurisdictional plan in 2009-2010 with an additional ten jurisdictions participating in the planning process. In 2015-2016 the plan underwent a comprehensive five-year update as required by the DMA.

The Hazard Mitigation Plan (HMP) underwent a comprehensive update in 2021. The planning process followed during the update was similar to what was used in the original plan development. This planning process utilized the input from a multi-jurisdictional Hazard Mitigation Planning Committee (HMPC). A consultant, Wood Environment & Infrastructure Solutions, Inc (Wood) was hired to assist with the update in 2021. The plan update process is described further in this section and documented in Appendix C.

Jefferson County and its communities has been an integral constituent in nurturing partnerships across boundaries for decades. This proactive approach established the County as a leader to the Front Range communities for hazard mitigation and overall emergency management program planning. This plan builds from the accumulated efforts of previous planning mechanisms that clearly align with the planning regulations set forth by the Disaster Mitigation Act of 2000 (DMA).

3.2 What's New in the Plan Update

Requirements §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

This HMP update involved a comprehensive review and update of each section of the 2016 plan and includes an assessment of the progress of the participating communities in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan. Only the information and data still valid from the previous plan was carried forward as applicable into this HMP update.

One significant change to the 2021 plan update process was the inclusion of five new participating jurisdictions, each listed below under Section 3.3 Local Government Participation. Three jurisdictions (Lakeside, Mountain View, and Pleasant View Metropolitan District) that participated in 2016 chose not to participate in the 2021 plan update due to other priorities and limited resources.

Wood developed a summary of each section in the plan and guided the HMPC through the elements that needed updating during the kickoff meeting in December 2020. This included analyzing each section using FEMA's local plan update guidance (2013) as well as guidance from the National Flood Insurance (NFIP) Community Rating System (CRS), to ensure that the plan met the latest requirements. The HMPC and Wood determined that nearly every section of the plan would need revision to align the plan with the latest FEMA planning guidance and requirements. A summary of the changes in this plan update is highlighted in the table below.

Table 3-1 Jefferson County Hazard Mitigation Plan Update Highlights

Plan Section	Summary of Plan Review, Analysis, and Updates
1. Introduction	Added an Executive Summary section. Verified/updated purpose, scope, etc. Updated Background.
2. Community Profile	Updated demographic, social & economic data, including the results of any recent annexations or new development. Expanded on social vulnerability analysis. Moved capability assessment section here (previously in Risk Assessment) and update data using Plan Update Guide.
3. Planning Process	Described and documented the planning process for the 2021 update, including coordination among agencies and integration with other planning efforts. Updated summary of changes. Described any changes in jurisdictional priorities. Described any changes in participation in detail. Described 2021 public participation process.
4. Risk Assessment	Revisited 2016 hazards list for possible modifications including possible human-caused hazards. Reviewed hazards from current Colorado State Hazard Mitigation Plan for consistency. Updated list of disaster declarations to include 2016-2021 data. Updated hazards data to include 2016-2021 data. Updated past occurrences for each hazard to include 2016-2021 data. Incorporated new hazard studies since 2016 and/or CWPPs/wildfire risk mapping. Added information on impacts of climate change on hazard frequency and severity. Updated critical facilities data. Provided/Updated replacement cost details to critical facilities, as data permits. Updated development and land use trends to include Census data, state, county, and local data sources. Updated historic and cultural resources. Updated current property values using 2021 Assessor's data. Estimated flood losses using the latest flood hazard mapping and building counts and values. Updated NFIP data, CRS information, and Repetitive Loss data. Incorporated new hazard loss estimates since 2016, as applicable. Examined changes in growth and development will be examined; especially changes in the context of hazard-prone areas and how the changes may affect loss estimates and vulnerability. Conducted a HAZUS-MH Level I earthquake vulnerability analysis. Updated information regarding specific vulnerabilities to hazards, including maps and tables of specific assets at risk, specific critical facilities at risk, and specific populations at risk including social vulnerability. Updated maps in plan where appropriate Moved Capability Assessment to community profile section and update.
5. Mitigation Strategy	Updated based on the results of the updated risk assessment, completed mitigation actions, and implementation obstacles and opportunities over the last five years.

Plan Section	Summary of Plan Review, Analysis, and Updates
	Reviewed goals and objectives to determine if they are still representative of the County's mitigation strategy, and update/revise as needed. Reviewed mitigation actions from the 2016 plan and develop a status report for each; identify if action has been completed, deleted, or deferred. Updated section on progress made since 2016 to include activities other than 2016 actions. Identified and detail new mitigation actions for all participating jurisdictions. Identified projects that have been submitted for funding and those that will be likely candidates for this funding.
6. Plan Maintenance	Moved to Planning Process section; Kept adoption resolutions in Appendix.
Jurisdictional Annexes	Updated previous participants' annexes with recent Census data. Updated past event history and hazard loss estimates. Added new maps and updated old maps as needed. Updated mitigation actions from 2016 and added new mitigation actions.
Appendices	Updated as needed

3.3 Local Government Participation

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

The DMA planning regulations and guidance requires each local government seeking FEMA approval of its mitigation plan must participate in a planning process effort in the following ways:

- Participate in the process as part of the Hazard Mitigation Planning Committee (HMPC),
- Differentiate geographical locations or jurisdictions within the planning area where the hazard risk differs from that facing the entire planning area,
- Identify mitigation projects, specific to each jurisdictional entity, to be eligible for funding, and
- Engage the governing body for formal adoption of the plan.

For the Jefferson County HMPC, "participation" meant:

- Attending and participating in the HMPC meetings,
- Providing available data requested of the HMPC,
- Reviewing and providing comments on the plan drafts,
- Collecting and providing other requested data (as available);
- Managing administrative details;
- Making decisions on plan process and content;
- Identifying mitigation actions for the plan;
- Reviewing and providing comments on plan drafts; including annexes
- Informing the public, local officials, and other interested parties about the planning process, and providing opportunity for them to comment on the plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan by the governing boards.

The County and all jurisdictions with annexes to this plan seeking FEMA approval met all of these participation requirements. In most cases, one or more representatives for each jurisdiction attended the HMPC meetings described in Appendix B and also brought together a local planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on plan drafts. Appendix C provides additional information and documentation of the planning process.

3.4 The 10-Step Planning Process

Wood established the planning process for Jefferson County's plan using DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-phase process:

1. Organize Resources
2. Assess Risks
3. Develop the Mitigation Plan
4. Implement the Plan and Monitor Progress

Into this four-phase process, Wood integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the modified 10-step process used for this plan meets the funding eligibility requirements of the Hazard Mitigation Assistance grants (including Hazard Mitigation Grant Program, Building Resilient Infrastructure and Communities grant, High Hazard Potential Dams grant, and Flood Mitigation Assistance grant), Community Rating System, and the flood control projects authorized by the U.S. Army Corps of Engineers (USACE). Jefferson County, the City of Arvada, Golden, Lakewood, Wheat Ridge, and the Town of Morrison participate in the CRS, and thus could potentially earn planning credits from the development of this plan. Table 3-2 shows how the modified 10-step process fits into FEMA's four-phase process, and how these elements correspond to the tasks in the FEMA "Mitigation Planning Handbook."

Table 3-2 Jefferson County Hazard Mitigation Planning Process

FEMA's 4-Phase DMA Process	Modified 10-Step CRS Process	FEMA Local Mitigation Planning Handbook Tasks
1) Organize Resources		
201.6(c)(1)	1) Organize the Planning Effort	1: Determine the planning area and resources
201.6(b)(1)	2) Involve the Public	2: Build the planning team - 44 CFR 201.6 (C)(1)
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies	3: Create an outreach strategy - 44 CFR 201.6(b)(1)
		4: Review community capabilities - 44 CFR 201.6 (b)(2)&(3)
2) Assess Risks		
201.6(c)(2)(i)	4) Identify the Hazards	5: Conduct a risk assessment - 44 CFR 201.6 (C)(2)(i) 44 CFR 201.6(C)(2)(ii)&(iii)
201.6(c)(2)(ii)	5) Assess the Risks	
3) Develop the Mitigation Plan		
201.6(c)(3)(i)	6) Set Goals	6: Develop a mitigation strategy - 44 CFR 201.6(c)(3)(i); 44 CFR 201(c)(3)(ii) and 44 CFR 201.6(c)(3)(iii)
201.6(c)(3)(ii)	7) Review Possible Activities	
201.6(c)(3)(iii)	8) Draft an Action Plan	
4) Implement the Plan and Monitor Progress		
201.6(c)(5)	9) Adopt the Plan	7: Review and adopt the plan

FEMA's 4-Phase DMA Process	Modified 10-Step CRS Process	FEMA Local Mitigation Planning Handbook Tasks
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan	8: Keep the plan current
		9: Create a safe and resilient community - 44 CFR 201.6(c)(4)

3.4.1 Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

The Jefferson County Sheriff's Office of Emergency Management (OEM) worked to establish the framework and organization for the development of the plan update. This process began with the FEMA planning grant application in 2018. Participating jurisdictions indicated their commitment to participate as evidenced by executing a letter of commitment as a component of the FEMA planning grant. Award of the grant in October 2019 allowed the planning consultant, Wood, to be procured through a competitive bid process.

Wood worked with the County to get organized for the plan update. Organizational efforts were initiated with the County and participating jurisdictions in December 2020 to inform and educate the plan participants of the purpose and need for updating the countywide hazard mitigation plan. An initial meeting between Wood and County OEM was held to discuss the organizational aspects of this plan update process. Invitations to the kickoff meeting for this plan update were extended to key County departments, the eight incorporated communities, and representatives from special districts for the County and municipalities, as well as to other federal, state, and local stakeholders that might have an interest in participating in the planning process. Representatives from participating jurisdictions and HMPC members to the 2016 plan were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. The list of initial invitees is included in Appendix C.

Key stakeholders were identified including representatives from the various county departments, each municipal jurisdiction, and other state and local government agencies. An email was sent from County OEM to describe the upcoming mitigation planning efforts and invite potential members to participate in a kickoff meeting where the HMPC would be formally organized. Suggested representation from each municipality included city/town manager, emergency manager, floodplain manager, public works/engineering, building department and fire department/district representative. Table 3-3 lists the HMPC participants and their respective jurisdiction in the development of the plan. Other stakeholders that participated in the planning process are discussed under Planning Step 3: Coordinate with Other Departments and Agencies.

In the 2020-2021 plan update, the following communities and jurisdictions participated in the process.

Lead Jurisdiction

- Jefferson County

Municipalities

- City of Arvada
- City of Edgewater
- City of Golden
- City of Lakewood
- City of Wheat Ridge
- Town of Morrison

Special Districts

- Denver Water
- Arvada Fire Protection District (New)
- Elk Creek Fire Protection District (New)

- Evergreen Fire Protection District
- Fairmount Fire Protection District
- Foothills Fire Protection District (New)
- Genesee Fire Protection District (New)
- Golden Gate Fire Protection District (New)
- Indian Hills Fire Protection District
- Inter-Canyon Fire Protection District (New)
- Jefferson Conservation District
- Lookout Mountain Water District
- North Fork Fire Protection District
- West Metro Fire Protection District

The Town of Bow Mar, Town of Lakeside, Town of Mountain View, and Pleasant View Metropolitan District elected not to participate in the Jefferson County multi-jurisdictional planning process. The City of Westminster has its own hazard mitigation plan and did not participate in the Jefferson County multi-jurisdictional planning process since the City lies within both Jefferson and Adams County. The Town of Superior has a portion of their Town in Jefferson County but opted to participate in the Boulder County Hazard Mitigation Plan. The City of Littleton also has a small area in Jefferson County but participated in the Arapahoe County Multi-Hazard Mitigation Plan update.

The Disaster Mitigation Act requires that each jurisdiction participate in the planning process and officially adopt the multi-jurisdictional hazard mitigation plan. A planning committee was created that includes representatives from each participating jurisdiction, departments of the County, and other local, state, and federal organizations responsible for making decisions in the plan and agreeing upon the final contents. Kickoff meeting attendees discussed potential participants and made decisions about additional stakeholders to invite to participate on the HMPC.

The HMPC contributed to this planning process by:

- Providing facilities for meetings,
- Attending meetings,
- Collecting data,
- Managing administrative details,
- Making decisions on plan process and content,
- Submitting mitigation action implementation worksheets,
- Reviewing and editing drafts, and
- Coordinating and assisting with public involvement and plan adoptions

The HMPC was comprised of two groups, a Steering Committee that led the planning and decision-making efforts throughout the planning process, and a Working Group comprised of additional local staff that provided information to the Steering Committee. The Steering Committee is the group responsible for the 10-Step CRS planning process outlined in the 2017 CRS Coordinator's Manual. The Working Group supported the overall HMP process by providing information and data to the CRS Steering Committee for consideration and decision-making. Membership and participation in both the Steering Committee and Working Group are listed in Appendix B.

The HMPC communicated during the planning process with a combination of meetings, phone interviews, and email correspondence. All meetings were held virtually due to social distancing requirements associated with the ongoing COVID-19 pandemic. A folder on Google Drive was hosted by Wood and a SharePoint site hosted by the County were both used to share drafts of the plan and its annexes for jurisdictional review and input. Three planning meetings with the Planning Team were held during the plan's development between December 2020 and February 2021. The meeting schedule and topics are listed in the following table; all 10 planning process steps were covered in these three meetings. Agendas, meeting summaries, and attendance records for each of the meetings are included in Appendix C.

Table 3-3 Schedule of HMPC Meetings

Meeting Type	Meeting Topic	CRS Steps	Meeting Date(s)
HMPC #1 Kick-off Meeting	Introduction to DMA and the planning process Overview of current HMP; Organize Resources: the role of the HMPC, planning for public involvement, coordinating with other agencies/stakeholders Introduction to Hazard Identification	1,2,3	December 7, 2020
HMPC #2 Risk Assessment	Risk assessment overview and work session Development of mitigation goals and objectives;	2,4,5,6	January 11, 2021
HMPC #3 Mitigation Strategy and Goals Update	Identification, prioritization, and status update of mitigation actions; Discussion of process to monitor, evaluate, and update plan	7,8,9,10	February 11, 2021

HMPC Meeting #1 – Kickoff Meeting

On December 7, 2020, the HMPC convened virtually with 85 people participating, to kick off the plan update process. Wood presented information on the scope and purpose of the plan update, participation requirements of HMPC members, and the proposed project work plan and schedule. Plans for public involvement (Step 2) and coordination with other agencies and departments (Step 3) were discussed. Wood also introduced the hazard identification requirements and data. The HMPC discussed past events and impacts and future probability for each of the hazards required by FEMA for consideration in a local hazard mitigation plan. The HMPC made two revisions to the hazards list from the 2016 plan, adding Pandemic and Cyber Attacks. Each jurisdiction provided updates to the plan and their respective annexes via a plan update guide and mitigation action tracker.

HMPC Meeting #2 – Risk Assessment Update

On January 11, 2021, the HMPC convened virtually to review and discuss the results of the risk and vulnerability assessment update (Steps 4 and 5). There were 81 members of the HMPC and stakeholders were present for the discussion. Wood presented the results the risk assessment for natural and human-caused hazards. The group went through each hazard together and discussed the results as well as shared any local insight to inform the HIRA update. Refer to the meeting summary in Appendix C for notes related to each hazard discussed. Some of this discussion was also related to the reviewing and updating the 2015-2016 goals.

HMPC Meeting #3 – Mitigation Strategy and Goals Update

The HMPC convened virtually on February 11, 2021 with 69 people participating to update the plan's mitigation strategy. The group finalized the plan's goals and objectives (Step 6) and discussed the criteria for mitigation action selection and prioritization using a worksheet provided by Wood. The group reviewed each possible new mitigation action and additional details were provided by the Planning Team (Step 7). The meeting ended with a review of the next steps and planning process schedule. Wood provided the Planning Team with a link to an online form to submit new mitigation actions. During the Planning Team review of the full plan, each member was provided a handout on prioritizing new mitigation actions and asked to focus on prioritizing each new mitigation action for their jurisdiction.

Planning Step 2: Involve the Public

Involving the public assures support from the community at large and is a part of the planning process. At the kickoff meeting, strategies to involve the public were discussed for soliciting public input on the mitigation plan and developed an outreach strategy by consensus. The fact that the process was conducted during the COVID-19 pandemic, with attendant restrictions on public gatherings, made it difficult to use many traditional outreach methods such as in-person public gatherings or discussions at other forums. The HMPC adapted by leveraging virtual meetings and other online messaging, which in

many cases resulted in greater public attendance and involvement than more traditional face-to-face meetings. An online public survey was developed by Wood and shared with the Planning Team to share through their respective public information channels. In addition to the online public survey, two virtual public workshops were held in January and June 2021.

These outreach efforts are summarized in Table 3-4 and discussed below.

Table 3-4 Summary of Public Outreach and Involvement Efforts

Event/Effort	Message	Dates	Methods Advertised
Online Public Survey	Personal experience with hazard events; public perception of hazard significance; what mitigation measures should be pursued.	January 6, - January 31, 2021	Website posting, Facebook, Twitter
Public Workshop #1 (virtual)	Overview of mitigation planning and plan update process; introduction to hazards and risk assessment; mitigation goals and objectives.	January 21, 2021	Website posting, Facebook, Twitter, YouTube
Public Workshop #2 (virtual)	Overview of draft plan; solicitation of feedback.	June 8, 2021	Website posting, Facebook, Twitter, YouTube
Public Review Draft	Public review and comment on the draft plan.	June 7-25, 2021	Website posting, Facebook
Virtual Public Room	Virtual room for the public to educate the public on mitigation planning and the 2021 plan update, as well as providing opportunities to review and comment on the draft plan.	June 7-25, 2021	Website posting, Facebook
YouTube	Videos of public workshops posted.	Ongoing	NA
Website notices	Notices of process, survey, public workshops, and public review draft posted at Jeffco.us	December 2020 – June 2021	NA
Facebook posts	Updates on process, survey, public workshops, and public review draft posted on County Facebook page.	December 2020 – June 2021	NA
Twitter posts	Updates on process, survey, public workshops, and public review draft posted on County Twitter account.	December 2020 – June 2021	NA
Newspaper article	Arvada Press article "Working Together to Reduce Wildfire Risk in Jefferson County"	March 16, 2021	NA

Online Public Survey

During the plan update's initial drafting stage, an online public survey was used to gather public input to the Planning Team. The survey provided an opportunity for public input during the planning process, prior to finalization of the plan update. The survey gathered public feedback on concerns about hazards and input on mitigation strategies to reduce their impacts. The survey was released on January 6, 2021 and closed on January 31, 2021. The Planning Team provided links to the public survey by distributing it using social media, email, and posting the link on websites. A link to the survey was also posted on some of the participating jurisdictions' websites as well as through social media posts; screenshots from both can be found in Appendix C. A total of 953 people filled out the survey online. Results showed that the public perceives the most significant hazards to be wildfire, drought, hailstorm and pandemic/public health. Question 4 of the survey asked the public's opinion on what mitigation actions that should have the highest priority in the updated hazard mitigation plan; wildfire fuels treatment projects, forest health/watershed protection, water conservation, evacuation route development and public health incident preparedness were cited as the most popular mitigation actions. This information was shared with the Planning Team during the update of the mitigation strategy to consider when evaluating hazard rankings

and as a source of potential mitigation ideas. A summary of all the survey data and documentation of the public feedback can be found in Appendix D.

Figure 3-1 Hazard Mitigation Planning Survey Link on Jefferson County Twitter



Online Public Workshops

Two online public workshops were held during the planning process to inform the public, receive input to integrate into the plan update, and keep the public updated on the progress being made in the planning process. Both workshops were held virtually as webinars due to social distancing requirements associated with the ongoing COVID-19 pandemic.

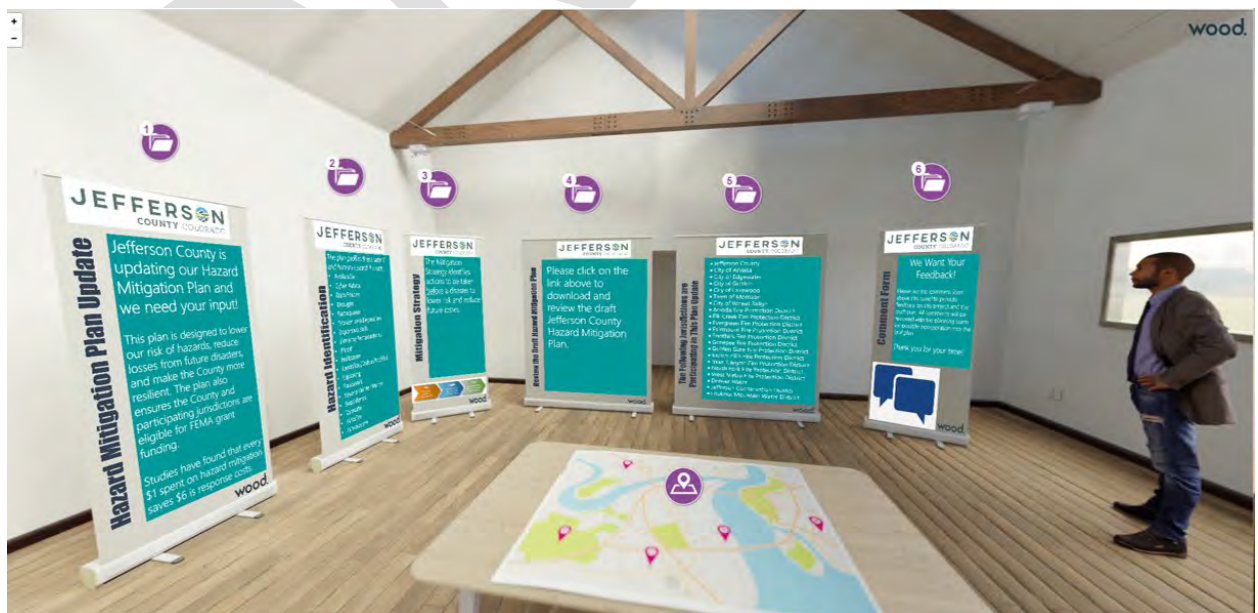
The workshop took place on January 14, 2021 through Zoom. The workshop introduced the public to the hazard mitigation planning process for the County's Plan Update and answered any questions and gather public input to be integrated into the plan update. In addition, it was an opportunity to help staff identify risks, hazards and vulnerabilities from the public's perspective. In total 26 individuals participated in the virtual workshop. Members of the public were able to submit comments verbally or via the chat function. The Planning Team received four comments from the meeting that helped to inform the Planning Team on the public initial thoughts on hazard mitigation and hazards in their community. A recording of the meeting was subsequently posted on Jefferson County's YouTube channel, where it has an additional 128 views as of July 1st, 2021.

The second virtual public workshop was held on June 8, 2021, again conducted via Zoom. Eight members of the public attended this meeting, which gave an update on the planning process, reviewed the results of the public survey, and introduced the updated Plan. The purpose, contents, and key components of the updated plan were described, and participants were encouraged to review and comment on the draft plan. A recording of the meeting was subsequently posted on Jefferson County's YouTube channel, where it has an additional 10 views as of July 1st, 2021.

Figure 3-2 Public Meeting #1 Screenshot, January 14, 2021

Public Review Period

Following the HMPC draft review a public review draft of the plan was prepared. The public was given an opportunity to provide input on this draft of the complete plan prior to its submittal to the State and FEMA. A virtual public engagement room was created for people to learn about the plan, download and review copies of the draft plan and annexes, and upload comments and feedback using an online survey tool. The draft plan and annexes were also made available on the County's emergency management web page from June 7th–25th, 2021. The comment period was advertised extensively through the jurisdictions' websites and social media accounts. The City of Arvada also made the plan available through their Speak Up Arvada platform. A total of eleven comments were received, which are included in Appendix B. The comments were reviewed with the Planning Team and used to inform revisions to the draft Plan.

Figure 3-3 Virtual Public Engagement Room

Planning Step 3: Coordinate with Other Departments and Agencies

Requirements §201.6(b): [T]he planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

There are numerous organizations whose goals and interests interface with hazard mitigation in Jefferson County. Coordination with these organizations and other community planning efforts is vital to the success of this plan update. The Jefferson County Office of Emergency Management invited other local, state, and federal departments and agencies to the kickoff meeting to learn about the hazard mitigation planning initiative. Many of the agencies participated throughout the planning process in meetings described in Step 1: Organize the Planning Effort.

Stakeholders include local and regional agencies involved in hazard mitigation activities or those beyond the County and local government that have the authority to regulate development. Stakeholders could participate in various ways, either by contributing input at HMPC meetings, being aware of planning activities through an email group, providing information to support the effort, or reviewing and commenting on the draft plan. Based on their involvement in other hazard mitigation planning efforts, and status in the County, representatives from the following agencies and organizations were invited to participate as stakeholders in the process; an asterisk indicates they participated in HMPC meetings:

- Special Districts
 - Mile High Flood District*
 - Evergreen Metropolitan District*
- Neighboring county/municipality emergency management and floodplain management
 - Adams County*
 - Arapahoe County
 - Boulder County
 - Broomfield County*
 - Clear Creek County
 - Denver City and County
 - o Denver Mountain Parks*
 - Douglas County
 - Gilpin County*
 - Park County
 - Westminster, City of*
- Nonprofits
 - Consolidated Mutual Water Company
- State Agencies
 - Colorado Division of Homeland Security and Emergency Management*
 - Colorado Division of Fire Prevention and Control (DFPC)*
 - Colorado Department of Parks and Wildlife*
 - o Chatfield State Park*
 - Colorado Division of Water Resources – Dam Safety*
- Federal Agencies
 - US Forest Service*
- Universities
 - Colorado State University Extension

* Participated in HMPC meetings

The majority of the listed stakeholders were invited to participate through an email from the Jefferson County Emergency Manager on November 17, 2020, which included an invitation to the kickoff meeting. A complete list of agencies and persons invited to the kick off meeting, plus the invitation itself, can be referenced in Appendices B & C. As part of the public review and comment period for the draft plan, key agencies were again specifically solicited to provide any final input to the draft plan document. This input was solicited both through membership on the HMPC and by direct emails to key groups and associations to review and comment on the plan. As part of this targeted outreach, these key stakeholders were also specifically invited to attend the HMPC and public meeting to discuss any outstanding issues and to provide input on the draft document and final mitigation strategies.

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. Phone calls and emails were used during plan development to directly coordinate with key individuals representing other regional programs.

The HMPC also used technical data, reports, and studies from the following agencies and groups, just to name a few:

- Colorado Water Conservation Board
- Colorado Geological Survey
- FEMA
- Mile High Flood District

Appendix F References provides a detailed list of references used in the preparation of this plan update. Specific references relied on in the development of this plan are also sourced throughout the document as appropriate.

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to these groups to actively participate on the HMPC. Specific participants from these groups are detailed in Appendix B. Others assisted in the process by providing data directly as requested or through data contained on their websites or as maintained by their offices. Further, as part of the public outreach process, all groups were invited to attend the public meetings and to review and comment on the plan prior to submittal to DHSEM and FEMA. In addition, as part of the review of the draft plan, key agency stakeholders were contacted, and their comments specifically solicited.

This process was accomplished as part of planning tasks two and three in the FEMA Local Mitigation Planning Handbook.

Incorporation of Existing Plans and Other Information

The coordination and synchronization with other community planning mechanisms and efforts are vital to the success of this plan. To have a thorough evaluation of hazard mitigation practices already in place, appropriate planning procedures should also involve identifying and reviewing existing plans, policies, regulations, codes, tools, and other actions are designed to reduce a community's risk and vulnerability from natural hazards. Jefferson County uses a variety of mechanisms to guide growth and development. Integrating existing planning efforts, mitigation policies, and action strategies into this plan establishes a credible, comprehensive document that weaves the common threads of a community's values together. The development of this plan involved a comprehensive review of existing plans, studies, reports, and initiatives from Jefferson County and each participating municipality.

The following table includes a comprehensive list of the documents reviewed and how they informed the HMP update.

Table 3-5 Incorporated Plans, Studies, and Reports

Plan	How Incorporated
Jefferson County Comprehensive Master Plan (CMP) 2013	Used as baseline for update and incorporated into Community Profile, Planning Process, Risk and Vulnerability Assessment, Capabilities Assessment, Mitigation Strategy, and Implementation
Jefferson County Comprehensive Master Plan Findings for 2019 Update	Informed growth and development trends and demographics for Community Profile.
Jefferson County Emergency Preparedness Guide (2018)	Incorporated into Risk and Vulnerability Assessment
Jefferson County Open Space Master Plan 2014-2019	Incorporated into Community Profile, Capabilities Assessment and Wildfire Vulnerability Assessment
Individual Community Land Use Plans (12 separate documents)	Incorporated data into Jurisdictional Annexes for Future Planning and Development patterns
Jefferson County Economic Profile, JeffCo Economic Development Corporation 2015	Incorporated into Community Profile and Risk and Vulnerability Assessment
County Community Wildfire Protection Plan (2012)	Incorporated into Community Profile and Wildfire Vulnerability Assessment
Individual Community Wildfire Protection Plans (16 separate documents)	Incorporated data into Jurisdictional Annexes and Wildfire Vulnerability Assessment
Jefferson County Land Development Regulation	Informed Capabilities, Risk and Vulnerability Assessments and goals update in Section 5
Jefferson County Zoning Resolution	Incorporated into Capabilities Assessment
Addendum to 2018 Jefferson County Residential Code and Supplement – Appendix Z Special Building Construction Regulations in Wildfire Zone 1 (Effective January 1, 2020)	Incorporated into Capabilities Assessment
Jefferson County Floodplain Regulations	Incorporated into Capabilities Assessment
Grading, Erosion, and Sediment Control Regulation – Section 17 of the Jefferson County Land Development Regulation	Incorporated into Capabilities Assessment
Construction/Land Disturbance Activities Section 16	Incorporated into Capabilities Assessment
Jefferson County Roadway Design and Construction Manual	Incorporated into Capabilities Assessment
2018-2023 State of Colorado Hazard Mitigation Plan	Informed data sources and information gathering and goals update
Colorado Drought Mitigation & Response Plan 2018	Informed data sources and information gathering
City of Arvada Comprehensive Plan	Used as baseline for Annex update and incorporated into Community Profile, Planning Process, Risk and Vulnerability Assessment, Mitigation Strategy, and Implementation
City of Arvada Sustainable Action Plan (ASAP)	Informed Annex update
City of Arvada Land Development Code	Informed Annex update
City of Arvada Parks and Open Space Master Plan	Informed Annex update
City of Lakewood Community Resources Master Plan	Informed Annex update
City of Lakewood Comprehensive Plan	Used as baseline for Annex update and incorporated into Community Profile, Planning Process, Risk and

Plan	How Incorporated
	Vulnerability Assessment, Mitigation Strategy, and Implementation
City of Lakewood Zoning Ordinance/Floodplain Management	Informed Annex update
City of Wheat Ridge Strategic Plan	Informed Annex update
City of Wheat Ridge Comprehensive Plan	Informed Annex update
City of Wheat Ridge Parks and Recreation Master Plan	Informed Annex update
City of Wheat Ridge Zoning and Development Code	Informed Annex update
City of Golden Comprehensive Plan	Used as baseline for Annex update and incorporated into Community Profile, Planning Process, Risk and Vulnerability Assessment, Mitigation Strategy, and Implementation
City of Golden Land Use Plan	Informed Annex update
City of Edgewater Master Plan	Informed Annex update
Town of Morrison Ordinances	Informed Annex update
Town of Mountain View Master Plan	Informed Annex update

Other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. See also Appendix F for other references.

2016 Mitigation Plan Inclusion in Other Planning Mechanisms

The 2016 HMP was integrated into other planning mechanisms in the County. The risk assessment portion of the 2016 plan was integrated into the other planning mechanisms listed in Table 3-6. The table lists the jurisdiction and what planning mechanism the 2016 Plan was integrated into. In some cases, communities have deferred this for future planning mechanisms, as discussed in the Section 6 Plan Implementation and Maintenance.

Table 3-6 2016 Mitigation Plan Inclusion in Other Planning Mechanisms

Jurisdiction	Planning Mechanism
Jefferson County	Goals and approaches from 2016 HMP were included in the Jefferson County Comprehensive Master Plan (CMP) and regulation updates.
	The 2016 Jefferson County HMP was made available on the Emergency Management and Preparedness page on the Sheriff's Office web portal
Wheat Ridge	City of Wheat Ridge Local Energy Assurance Plan 2012. Hazard Mitigation Plan is cross referenced in several sections. Provided the basis for hazard profiles in the vulnerability assessment
State of Colorado	The 2018-2023 Colorado Hazard Mitigation Plan provides a meta-level analysis of local and multi-jurisdictional hazards profiled (with rankings for each hazard in each jurisdiction) in respective plans. Jefferson County's 2016 plan is included in this analysis.
	The 2018 Colorado Drought Mitigation Response Plan references local hazard mitigation plans and efforts, including Jefferson County.
Lakewood	Adopted by referenced in City Emergency Operations Plan as an important planning element and background on the various natural hazards and risks in the City.

Jurisdiction	Planning Mechanism
Arvada	2016 HIRA was incorporated into the City's Emergency Operations Plan. Floodplain regulations were updated and adopted in 2020. Incorporation into the Comprehensive Plan was deferred for incorporation by reference in future planning mechanisms (2023 Update).
Edgewater	Information from 2016 HMP was incorporated into Comprehensive Plan and is considered when updating local codes and plans.
Golden	Information from the 2016 HMP was incorporated into the City's Emergency Operations Plan
Morrison	Deferred for incorporation by reference in future planning mechanisms
Fire Districts	Fairmount FPD incorporated 2016 HMP into Strategic Plan and Standards of Coverage, which describes the District's response plans within the community. West Metro FPD considers and references the 2016 HMP where applicable.
Jefferson Conservation District	Deferred for incorporation by reference in future planning mechanisms, where applicable

3.4.2 Phase 2: Assess Risks

Planning Step 4 Identify the Hazards

Wood led the HMPC in an effort to identify and document all the hazards that have, or could, impact the planning area, including documenting recent drought, flood, wildfire and winter storm events. Data collection worksheets were used in this effort to aid in determining hazards and vulnerabilities and where risk varies across the planning area. The profile of each of these hazards was then developed and updated for 2021 with information from the HMPC and additional sources. Web resources, existing reports and plans, and existing GIS layers were used to compile information about past hazard events and determine the location, previous occurrences, probability of future occurrences, and magnitude/severity of each hazard. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. A more detailed description of the hazard identification and risk assessment process and the results are included in Section 4 Risk Assessment.

Planning Step 5 Assess the Risks

After updating the profiles of the hazards that could affect the County, the HMPC collected information to describe the likely impacts of future hazard events on the participating jurisdictions. This step included two parts: a vulnerability assessment and a capability assessment.

Vulnerability Assessment—Participating jurisdictions updated their assets at risk to natural hazards—overall and in identified hazard areas. These assets included the total number and value of structures; critical facilities and infrastructure; natural, historic, and cultural assets; and economic assets. The HMPC also analyzed development trends in hazard areas. The DFIRM was used to refine the estimated flood losses during the update, where available for the NFIP participating communities. The results of the vulnerability assessment are included in Section 4 Risk Assessment.

Capability Assessment—The HMPC also conducted a capability assessment update to review and document the planning area's current capabilities to mitigate risk and vulnerability from natural hazards. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC can assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. This information for is included in Section 2.7 and in the respective jurisdictional annexes.

Wood provided the draft risk assessment to the HMPC in March 2021 for review and comment. Results of the risk assessment were presented and comments discussed at the second meeting of the HMPC.

3.4.3 Phase 3: Develop the Mitigation Plan

Planning Step 6: Set Goals

Wood facilitated a discussion session with the HMPC to review the 2016 plan's goals and objectives. The HMPC discussed definitions and examples of goals, objectives, and actions and considered the goals of

the state hazard mitigation plan and other relevant local plans when reviewing and revising the goals and objectives. The resulting updated goals and objectives are presented in Section 5 Mitigation Strategy.

Planning Step 7: Review Possible Activities

Wood facilitated a discussion at an HMPC meeting to review the alternatives for mitigating hazards. This included a brainstorming session with the HMPC to identify a comprehensive range of mitigation actions for each identified hazard, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. More specifics on the process and the results of this collaborative process are captured in Section 5 Mitigation Strategy.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, Wood produced a complete first draft of the plan. This complete draft was delivered electronically for HMPC review and comment. HMPC and agency comments were integrated into the second draft, which was advertised and distributed to collect public input and comments. Other agencies were invited to comment on this draft as well. Wood integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for the Colorado Division of Homeland Security and Emergency Management (DHSEM) and FEMA Region VIII to review and approve, contingent upon final adoption by the governing boards of each participating jurisdiction.

3.4.4 Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the plan, the plan was re-adopted by the governing boards of each participating jurisdiction on the dates included in the adoption resolutions in Appendix A Plan Adoption.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Section 6 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the Jefferson County planning area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is vital to the ongoing success of this plan and mitigation in Jefferson County and is addressed further in Section 6. A plan update and maintenance schedule and a strategy for continued public involvement are also included in Section 6.

Implementation and Maintenance Process: 2016 Plan

The 2016 Hazard Mitigation Plan included a process for implementation and maintenance which was generally followed, with some variation. Implementation of the plan including the status of mitigation actions is captured in Section 5 and the jurisdictional annexes. In general, the County and participating jurisdictions have made good progress in the implementation of the plan. Successes of note are detailed in Section 5. As a result of revisiting the implementation and maintenance section some modifications were made including:

- Changed annual review from October to January.

An updated implementation and maintenance section can be referenced in Section 6.

4 Risk Assessment

- DMA Requirement §201.6(c)(2):

[The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:

(i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

(ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of:

(A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;

(B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate;

(C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

(iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a jurisdiction's potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication: Local Mitigation Planning Handbook (March 2013), which breaks the risk assessment down to a four-step process:

1. Describe Hazards
2. Identify Community Assets
3. Analyze Risks
4. Summarize Vulnerability

A key step in preventing disaster losses in Jefferson County is developing a comprehensive understanding of the hazards that pose risks to its communities. The following terms facilitate comparisons between communities and can be found throughout the Plan.

- **Hazard:** Event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business, other types of harm or loss
- **Risk:** Product of a hazard's likelihood of occurrence and its consequences to society; the estimated impact that a hazard would have on people, services, facilities, and structures in a community
- **Vulnerability:** Degree of susceptibility to physical injury, harm, damage, or economic loss; depends on an asset's construction, contents, and economic value of its functions.

Data collected through this process has been incorporated into the following sections of this section:

- **Section 4.1 Hazard Identification** identifies the hazards that threaten the planning area and describes why some hazards have been omitted from further consideration.
- **Section 4.2 Asset Summary** describes the people, property, infrastructure, and resources potentially exposed to risk across Jefferson.
- **Section 4.3 Hazard Profiles** discusses the hazards that threaten the county, describes previous occurrences, their geographic extent, potential magnitude, and assesses their probability of future occurrence. It also includes a vulnerability assessment for each hazard, considering assets at risk, critical facilities, and future development trends.
- **The Jurisdictional Annexes** discuss each participating jurisdiction's individual exposure to natural hazards, including how the threat of hazards varies across the planning area along with each jurisdiction's specific vulnerabilities.

4.1 Hazard Identification

The Hazard Mitigation Planning Committee (HMPC) conducted a hazard identification study to determine the hazards that threaten the planning area.

4.1.1 Results and Methodology

Using existing hazards data, plans from participating jurisdictions, and input gained through planning and public meetings, the HMPC agreed upon a list of hazards that could affect Jefferson County. Hazards data was obtained from various federal, state, and local sources such as FEMA, the Colorado Geological Survey (CGS), the Colorado Dam Safety Branch (DSB), the National Oceanic and Atmospheric Administration's (NOAA) National Center for Environmental Information (NCEI), the United States Geological Survey (USGS), and the Colorado Division of Homeland Security and Emergency Management (including the 2018 Colorado State Hazard Mitigation Plan), among others. The hazards evaluated in this plan include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future.

Sixteen natural hazards were profiled in the 2016 Jefferson County Hazard Mitigation Plan. The HMPC reviewed all of these hazards and determined they were all still relevant and should be continued into the 2021 Plan update. Additionally, the HMPC reviewed a number of human-caused hazards and elected to include the two of greatest concern as hazards new to the plan: cyber attack and pandemic.

Each of the hazards were identified based on geographic extent, previous occurrences, potential for future occurrence, and a discussion on the potential severity and magnitude of the event. The potential impacts of climate change on each hazard were also considered. Once these elements were examined, each hazard was assigned an overall rating for the County.

The following hazards were determined to have a high significance:

- Dam Failure
- Flood
- Hailstorm
- Wildfire
- Severe Winter Storms

The following hazards were determined to have a medium significance:

- Cyber Attack (new)
- Drought
- Earthquake
- Erosion and Deposition
- Expansive Soils
- Landslides/Debris Flows/Rockfalls
- Lightning
- Pandemic (new)
- Subsidence
- Tornado
- Windstorm

The following hazards were determined to have a low significance:

- Avalanche
- Extreme Temperatures

For many hazards, the risk varies between jurisdictions; the jurisdictional annexes provide more explicit detail to explain the variance levels.

4.1.2 Hazard Identification Summary

Table 1-1 reflects the hazard identification summaries discussed in detail in the rest of this section. The table is based on the Jefferson County Hazards Identification Worksheet, but also reflects the input from the HMPC to address magnitude and severity, which in some cases altered the overall rating of the hazard compared to the other hazards profiled. When viewing these ratings, it is particularly important to remember that the hazards are all possible in the planning area, and therefore are potentially dangerous. The overall rating is a method of prioritizing hazards relative to one another for the development of mitigation actions and goals.

DRAFT

Table 4-1 Hazards Identification Summary

Hazard	Geographic Extent	Probability of Future Occurrence	Potential Severity/Magnitude	Overall Significance
Avalanche	Negligible	Unlikely	Negligible	Low
Cyber Attack	Significant	Likely	Limited	Medium
Dam Failure	Extensive	Occasional	Critical	High
Drought	Extensive	Likely	Critical	High
Earthquake	Significant	Unlikely	Catastrophic	Medium
Erosion and Deposition	Significant	Likely	Critical	Medium
Expansive Soils	Extensive	Likely	Limited	Medium
Extreme Temperatures	Extensive	Likely	Limited	Low
Flood	Limited	Likely	Critical	High
Hailstorm	Significant	Likely	Critical	High
Landslide/Debris/Rockfall	Limited	Likely	Limited-Negligible	Medium
Lightning	Limited	Highly Likely	Limited	Medium
Pandemic	Extensive	Occasional	Critical	High
Severe Winter Storms	Extensive	Likely	Critical	High
Subsidence	Limited	Occasional	Limited	Medium
Tornado	Limited	Likely	Limited	Medium
Wildfire	Significant	Highly Likely	Critical	High
Windstorm	Significant	Highly Likely	Limited	Medium

Geographic Extent

Negligible: Less than 10 percent of planning area or isolated single-point occurrences

Limited: 10 to 25 percent of the planning area or limited single-point occurrences

Significant: 25 to 75 percent of planning area or frequent single-point occurrences

Extensive: 75 to 100 percent of planning area or consistent single-point occurrences

Potential Severity/Magnitude

Negligible: Less than 10 percent of property is severely damaged, facilities and services are unavailable for less than 24 hours, injuries and illnesses are treatable with first aid or within the response capability of the jurisdiction.

Limited: 10 to 25 percent of property is severely damaged, facilities and services are unavailable for between 1 and 7 days, injuries and illnesses require sophisticated medical support that does not strain the response capability of the jurisdiction, or results in very few permanent disabilities.

Critical: 25 to 50 percent of property is severely damaged, facilities and services are unavailable or severely hindered for 1 to 2 weeks, injuries and illnesses overwhelm medical support for a brief period of time, or result in many permanent disabilities and a few deaths.

Catastrophic: More than 50 percent of property is severely damaged, facilities and services are unavailable or hindered for more than 2 weeks, the medical response system is overwhelmed for an extended period of time or many deaths occur.

Probability of Future Occurrences

Unlikely: Less than 1 percent probability of occurrence in the next year, or has a recurrence interval of greater than every 100 years.

Occasional: Between a 1 and 10 percent probability of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Likely: Between 10 and 90 percent probability of occurrence in the next year, or has a recurrence interval of 1 to 10 years

Highly Likely: Between 90 and 100 percent probability of occurrence in the next year, or has a recurrence interval of less than 1 year.

Overall Significance

Low: Two or more of the criteria fall in the lower classifications or the event has a minimal impact on the planning area. Also used for hazards with a minimal or unknown record of occurrences and impacts or for hazards with minimal mitigation potential.

Medium: The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. Also used for hazards with a high impact rating but an extremely low frequency.

High: The criteria consistently fall along the high ranges of the classification and the event exerts significant and frequent impacts on the planning area. Also used for hazards with a high psychological impact or for hazards that the jurisdiction identifies as particularly relevant.

4.1.3 Hazards Not Profiled

Other hazards were discussed by the HMPC but ultimately not included in this plan. Thunderstorm is not identified as an individual hazard, but is recognized for its role in the flood, lightning, and windstorm hazards, and addressed accordingly in those hazard profiles. Fog was also discussed and determined that it is not a true disaster-level hazard for the planning area. The volcano hazard was also removed due to the extraordinary circumstances required for such a disaster event to severely impact the planning area. The natural hazards of coastal erosion, coastal storm, hurricane, and tsunami were excluded from this plan because they are not applicable in Jefferson County.

Several other human-caused hazards were also considered, to include hazardous materials incidents, active threats, transportation accidents, and infrastructure failures. While all those hazards have the potential to impact Jefferson County, the HMPC elected to focus mitigation efforts on the two human-caused hazards that present the greatest risk: cyber attack and pandemic.

It is important to be aware that hazard events that happen outside of the County boundaries also can have direct and indirect impacts to Jefferson County. For instance, transportation routes or power supply could be interrupted by severe winter storms or wildfire hazards outside of the County.

4.1.4 Disaster Declaration History

One method the HMPC used to identify hazards was the researching of past events that triggered federal and/or state emergency or disaster declarations in the planning area. Federal and/or state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors. The Fire Management Assistance Grant Program provides funding "for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster." The quantity and types of damages, as well as the type of event, determine the source of federal aid.

Table 4-2 provides information on the 13 federal emergencies and disasters declared in Jefferson County between 1953 and January 2021.

Table 4-2 Federal Disaster Declarations in Jefferson County

Year	Declaration	Disaster Type
1969	Federal Disaster Declaration	Severe Storms and Flooding
1973	Federal Disaster Declaration	Heavy Rains, Snowmelt
2000	Fire Management Assistance Declaration	High Meadows Fire
2002	Fire Management Assistance Declaration	Schoonover Fire, Black Mountain Fire, Snaking Fire, and Hayman Fire
2003	Emergency Declaration	Snow
2005	Emergency Declaration	Hurricane Katrina Evacuation*
2007	Emergency Declaration	Snow
2011	Fire Management Assistance Declaration	Indian Gulch Fire
2012	Fire Management Assistance Declaration	Lower North Fork Fire
2012	USDA Drought Declaration (Primary S3260)	Drought, excessive heat, high winds
2013	Emergency Declaration Federal Disaster Declaration	Severe Storms, Flooding, Landslides and Mudslides
2020	Emergency Declaration and Federal Disaster Declaration	COVID-19 Pandemic

Source: State of Colorado Natural Hazards Mitigation Plan, 2013; Federal Emergency Management Agency, PERI Presidential Disaster Declaration Site. U.S. Department of Agriculture; (*) indicates that Jefferson County was included in the declaration but did not receive funding.

A USDA declaration will result in the implementation of the Emergency Loan Program through the Farm Services Agency. The SBA also offers low interest loans for eligible businesses that suffer economic losses in declared and contiguous counties that have been declared by the USDA. This program enables eligible farmers and ranchers in the affected county as well as contiguous counties to apply for low interest loans. In 2012 the USDA streamlined the declaration process which now provides for nearly an automatic designation for any county in which drought conditions, as reported in the U.S. Drought Monitor when any portion of a county meets the D2 (Severe Drought) drought intensity value for eight consecutive weeks. A county that has a portion of its area in a drought intensity value of D3 (Extreme Drought) or higher at any time during the growing season also would be designated as a disaster area. USDA Declarations since that covered Jefferson County are shown in **Table 4-3**.

Table 4-3 USDA Declarations Including Jefferson County

Year	Declaration	Disaster Type
2012	S3260	Drought, excessive heat, high winds
2013	S3456	Drought, excessive heat, high winds, wildfire, insects
2013	S3548	Drought, excessive heat, high winds, wildfire, insects
2018	S4365	Hail and high wind
2018	S4386	Drought
2018	S4408	Drought
2019	S4468	Drought
2019	S4481	Drought

Year	Declaration	Disaster Type
2020	S4798	Drought
2020	S4848	Drought

Source: U.S. Department of Agriculture <https://www.fsa.usda.gov/programs-and-services/disaster-assistance-program/disaster-designation-information>

4.2 Asset Summary

4.2.1 Population and Structures

Table 4-4 shows the estimated total population and number of housing units for each jurisdiction based on the most recent American Community Survey and Colorado State Demography Office data. Jurisdictions that straddle County boundaries are indicated by an asterisk, and the numbers listed for these jurisdictions only represent the Jefferson County portion.

Table 4-4 Population and Housing Unit Exposure by Jurisdiction

Jurisdiction	2019 Population Estimate	2019 Housing Units Estimate
Arvada*	117,859	42,558
Bow Mar*	300	95
Edgewater	5,352	1,697
Golden	20,828	6,134
Lakeside	8	1
Lakewood	158,410	51,150
Littleton*	2,683	800
Morrison	436	135
Mountain View	536	241
Westminster*	44,162	15,090
Wheat Ridge	31,273	12,141
Unincorporated	201,234	76,455
Grand Total	583,081	206,497

Source: Colorado Department of Local Affairs Demography Section. * Only includes the portion within Jefferson County.

Building value assessments in this plan are based on data from the Jefferson County's Assessor's Office. Table 4-5 shows the total property inventory from the Assessor's Office. (The Assessor's Office assigns values to buildings for the specific purpose of valuation for ad valorem tax purposes, and values represented may not reflect actual building replacement values.) An address points layer was used as the basis for estimating building counts. The Assessor does not maintain data about the contents of structures, therefore the contents values shown in the table are estimates based upon the structure value using FEMA recommended values (typically 50% for residential structures, 100% for commercial, 100% for agricultural, 150% for industrial, 100% for mixed use and 100% for exempt). **Table 4-6** summarizes the property inventory for the County and each participating jurisdiction with detail by property type, including jurisdictions which may not be participating in the plan.

Table 4-5 Jefferson County's Building Inventory and Value Summary by Jurisdiction

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value
Arvada*	42,022	43,997	\$14,257,089,578	\$7,838,936,533	\$22,096,026,111
Bow Mar*	95	95	\$54,914,896	\$27,457,448	\$82,372,344
Edgewater	1,480	1,807	\$442,322,263	\$256,618,931	\$698,941,194
Golden	5,866	6,955	\$3,581,405,037	\$2,429,883,569	\$6,011,288,606
Lakeside	14	27	\$28,589,790	\$28,589,790	\$57,179,580
Lakewood	49,390	54,129	\$18,577,041,933	\$10,715,684,254	\$29,292,726,187
Littleton*	803	803	\$352,400,836	\$352,400,836	\$704,801,672
Morrison	155	188	\$65,397,995	\$42,262,140	\$107,660,135
Mountain View	246	273	\$46,888,818	\$27,130,145	\$74,018,963
Westminster*	15,050	15,691	\$5,793,485,591	\$3,387,532,303	\$9,181,017,894
Wheat Ridge	11,165	13,505	\$3,635,566,208	\$2,219,156,222	\$5,854,722,430
Unincorporated	76,220	79,412	\$29,606,470,107	\$15,953,167,281	\$45,559,637,388
Grand Total	202,506	216,882	\$76,441,573,052	\$43,278,819,451	\$119,720,392,503

Source: Jefferson County Assessor October 2020, FEMA HAZUS

* Only includes the portion within Jefferson County.

Table 4-6 Jefferson County's Building Inventory and Value Detail by Jurisdiction

Jurisdiction	Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value
Arvada*	Agriculture	8	8	\$2,760,667	\$2,760,667	\$5,521,334
	Commercial	515	856	\$550,997,194	\$550,997,194	\$1,101,994,388
	Exempt	125	144	\$312,137,969	\$312,137,969	\$624,275,938
	Industrial	199	247	\$212,035,772	\$318,053,658	\$530,089,430
	Mixed Use	147	184	\$130,816,114	\$130,816,114	\$261,632,228
	Residential	41,028	42,558	\$13,048,341,862	\$6,524,170,931	\$19,572,512,793
	Total	42,022	43,997	\$14,257,089,578	\$7,838,936,533	\$22,096,026,111
Bow Mar*	Residential	95	95	\$54,914,896	\$27,457,448	\$82,372,344
	Total	95	95	\$54,914,896	\$27,457,448	\$82,372,344
Edgewater	Commercial	45	79	\$35,300,820	\$35,300,820	\$70,601,640
	Exempt	12	13	\$24,162,201	\$24,162,201	\$48,324,402
	Industrial	2	2	\$304,000	\$304,000	\$608,000
	Mixed Use	10	16	\$11,148,577	\$11,148,577	\$22,297,154
	Residential	1,411	1,697	\$371,406,665	\$185,703,333	\$557,109,998
	Total	1,480	1,807	\$442,322,263	\$256,618,931	\$698,941,194
Golden	Agriculture	1	1	\$35,437	\$35,437	\$70,874
	Commercial	277	377	\$530,314,287	\$530,314,287	\$1,060,628,574
	Exempt	61	126	\$331,145,437	\$331,145,437	\$662,290,874
	Industrial	171	189	\$288,997,711	\$288,997,711	\$577,995,422
	Mixed Use	111	128	\$127,869,228	\$127,869,228	\$255,738,456
	Residential	5,245	6,134	\$2,303,042,937	\$1,151,521,469	\$3,454,564,406

Jurisdiction	Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value
	Total	5,866	6,955	\$3,581,405,037	\$2,429,883,569	\$6,011,288,606
Lakeside	Commercial	13	26	\$22,234,756	\$22,234,756	\$44,469,512
	Mixed Use	1	1	\$6,355,034	\$6,355,034	\$12,710,068
	Total	14	27	\$28,589,790	\$28,589,790	\$57,179,580
Lakewood	Agriculture	1	1	\$46,378	\$46,378	\$92,756
	Commercial	1,235	2,115	\$2,012,874,841	\$2,012,874,841	\$4,025,749,682
	Exempt	159	229	\$412,727,409	\$412,727,409	\$825,454,818
	Industrial	165	269	\$179,504,955	\$179,504,955	\$359,009,910
	Mixed Use	301	365	\$249,172,992	\$249,172,992	\$498,345,984
	Residential	47,529	51,150	\$15,722,715,358	\$7,861,357,679	\$23,584,073,037
	Total	49,390	54,129	\$18,577,041,933	\$10,715,684,254	\$29,292,726,187
Littleton*	Commercial	2	2	\$3,201,717	\$3,201,717	\$6,403,434
	Exempt	1	1	\$1,565,994	\$1,565,994	\$3,131,988
	Residential	800	800	\$347,633,125	\$347,633,125	\$695,266,250
	Total	803	803	\$352,400,836	\$352,400,836	\$704,801,672
Morrison	Commercial	20	36	\$6,526,206	\$6,526,206	\$13,052,412
	Exempt	6	6	\$9,920,151	\$9,920,151	\$19,840,302
	Industrial	2	2	\$482,576	\$482,576	\$965,152
	Mixed Use	8	9	\$2,197,352	\$2,197,352	\$4,394,704
	Residential	119	135	\$46,271,710	\$23,135,855	\$69,407,565
	Total	155	188	\$65,397,995	\$42,262,140	\$107,660,135
Mountain View	Commercial	16	28	\$6,507,708	\$6,507,708	\$13,015,416
	Exempt	2	2	\$359,593	\$359,593	\$719,186
	Mixed Use	2	2	\$504,171	\$504,171	\$1,008,342
	Residential	226	241	\$39,517,346	\$19,758,673	\$59,276,019
	Total	246	273	\$46,888,818	\$27,130,145	\$74,018,963
Westminster*	Commercial	195	402	\$381,774,297	\$381,774,297	\$763,548,594
	Exempt	24	26	\$104,426,475	\$104,426,475	\$208,852,950
	Industrial	77	127	\$124,568,101	\$124,568,101	\$249,136,202
	Mixed Use	45	46	\$370,810,142	\$370,810,142	\$741,620,284
	Residential	14,709	15,090	\$4,811,906,576	\$2,405,953,288	\$7,217,859,864
	Total	15,050	15,691	\$5,793,485,591	\$3,387,532,303	\$9,181,017,894
Wheat Ridge	Agriculture	2	2	\$22,618	\$22,618	\$45,236
	Commercial	414	723	\$416,007,224	\$416,007,224	\$832,014,448
	Exempt	59	76	\$114,136,176	\$114,136,176	\$228,272,352
	Industrial	279	391	\$214,853,118	\$214,853,118	\$429,706,236
	Mixed Use	134	172	\$57,727,100	\$57,727,100	\$115,454,200
	Residential	10,277	12,141	\$2,832,819,972	\$1,416,409,986	\$4,249,229,958
	Total	11,165	13,505	\$3,635,566,208	\$2,219,156,222	\$5,854,722,430
Unincorporated	Agriculture	67	70	\$7,972,025	\$7,972,025	\$15,944,050
	Commercial	907	1,480	\$1,311,289,870	\$1,311,289,870	\$2,622,579,740

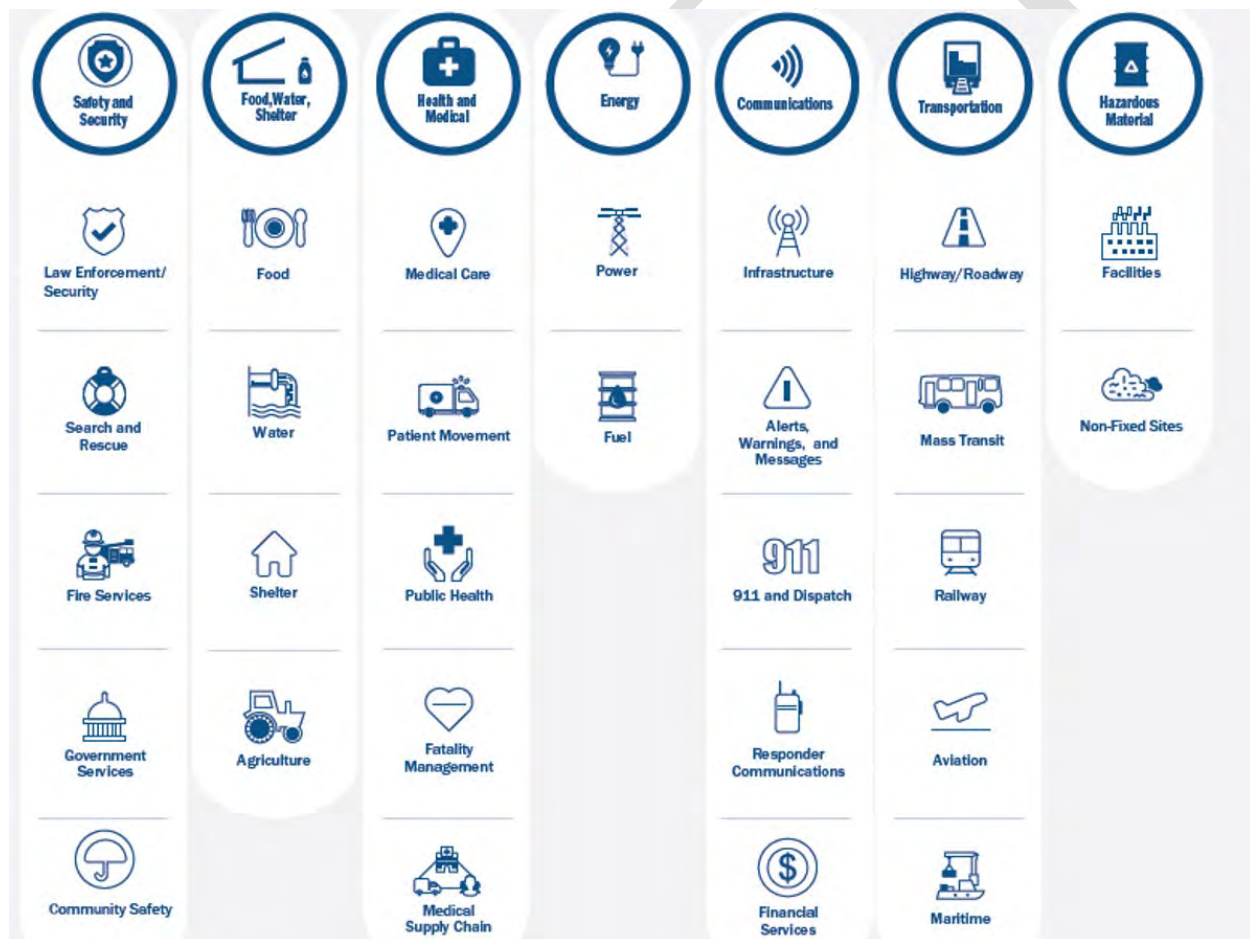
Jurisdiction	Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value
	Exempt	247	310	\$453,766,591	\$453,766,591	\$907,533,182
	Industrial	612	777	\$289,775,043	\$289,775,043	\$579,550,086
	Mixed Use	296	320	\$237,060,925	\$237,060,925	\$474,121,850
	Residential	74,091	76,455	\$27,306,605,653	\$13,653,302,827	\$40,959,908,480
	Total	76,220	79,412	\$29,606,470,107	\$15,953,167,281	\$45,559,637,388
Grand Total		202,506	216,882	\$76,441,573,052	\$43,278,819,451	\$119,720,392,503

Source: Jefferson County Assessor 2020, FEMA HAZUS * Only includes the portion within Jefferson County.

4.2.2 Critical Facilities, Infrastructure, and Other Important Community Assets

For the purposes of this plan, a critical facility is defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA sorts critical facilities into seven lifeline categories as shown in **Figure 4-1**.

Figure 4-1 Lifeline Categories



These lifeline categories standardize the classification of critical facilities and infrastructure that provide indispensable service, operation, or function to a community. A lifeline is defined as providing indispensable service that enables the continuous operation of critical business and government functions, and is critical to human health and safety, or economic security. These categorizations are particularly useful as they:

- Enable effort consolidations between government and other organizations (e.g. infrastructure owners and operators).
- Enable integration of preparedness efforts among plans; easier identification of unmet critical facility needs.
- Refine sources and products to enhance awareness, capability gaps, and progress towards stabilization.
- Enhance communication amongst critical entities, while enabling complex interdependencies between government assets.

Highlight lifeline related priority areas regarding general operations as well as response efforts.

To develop a comprehensive list of critical facilities in Jefferson County (Table 4-7), two data sources were compiled and broken down along the aforementioned critical asset categories: Jefferson County's GIS databases of critical facilities and infrastructure and the 2020 Homeland Infrastructure Foundation-Level Data (HIFLD) data.

The best available data was used, but some limitations include lack of complete or comprehensive data and values such as replacement costs. These databases were used in vulnerability assessments for hazards such as wildfire and flood, and are represented in maps and tables in the vulnerability by hazard section that follows.

Table 4-7 Summary of Critical Facilities by Jurisdiction and Lifeline

Jurisdiction	Communications	Energy	Food, Water, Shelter	Hazardous Material	Health and Medical	Safety and Security	Transportation	Total
Arvada	93	8	-	15	42	51	80	289
Edgewater	4	-	1	-	1	7	1	14
Golden	76	2	2	24	4	26	19	153
Lakewood	216	10	8	24	66	85	47	456
Morrison	8	-	-	3	1	2	8	22
Wheat Ridge	68	1	-	11	24	22	35	161
Unincorporated	705	23	24	51	48	135	267	1253
Total	1,170	44	35	128	186	328	457	2,348

Source: HIFLD and CERC

A 2020 Federal Highway Administration report found 22 bridges in Jefferson County in poor condition and in need of repairs. An additional 259 were found to be in fair condition, with only 166 being in good condition.

Maps of critical facilities in Jefferson County can be found in Appendix H (not for public release).

4.2.3 Natural, Historic, and Cultural Resources

Assessing the vulnerability of Jefferson County to different disasters also involves inventorying the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.

- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

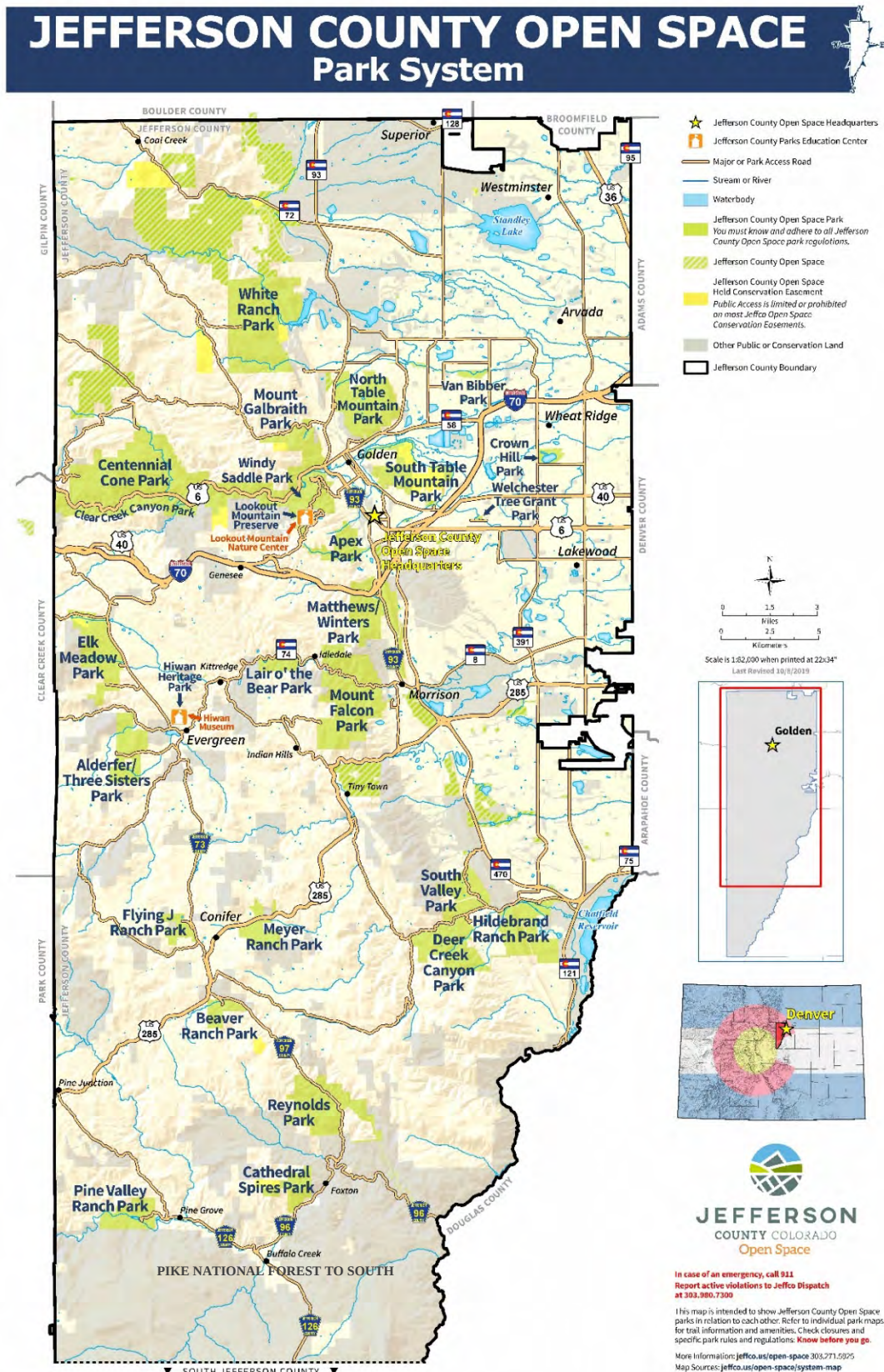
Natural Resources

Natural resources are important to include in benefit-cost analyses for future projects, and may be used to leverage additional funding for projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

Jefferson County contains a unique combination of prairie, forest, and tundra environments. The HMPC recognizes three types of valuable natural resources worthy of protection: environmental conservation areas, natural landmarks, and natural areas. These areas are described below and mapped in Figure 4-2.

- **Environmental conservation areas** are so designated because of the value they provide in the perpetuation of those species, biological communities, and ecological processes that function over large geographic areas and require a high degree of naturalness.
- **Natural landmarks** are defined as prominent landscape features that distinguish a specific locality in Jefferson County and are important because of the views they afford, their value as scenic vistas and backdrops, and the intrinsic value they hold as wildlife or plant habitats, natural areas, park and open space preserves, and open land areas.
- **Natural areas** are physical or biological areas that either retain or have reestablished their natural characters, although they need not be completely undisturbed, and that typify native vegetation and associated biological and geological features or provide habitat for rare or endangered animal or plant species or include geologic or other natural features of scientific or educational value.

Figure 4-2 Jefferson County Public Lands



Wetlands

Wetlands are a valuable natural resource for communities, due to their benefits to water quality, wildlife protection, recreation, and education. Wetlands also play an important role in hazard mitigation by reducing flood peaks and slowly releasing floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water. They also provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation are vital.

Jefferson County has numerous freshwater lakes and freshwater emergent wetlands in the various creeks and ditches scattered throughout the northeast (mostly urbanized) part of the County. These areas provide critical habitat as well as help mitigate flooding.

Endangered Species and Imperiled Natural Plant Communities

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed. Species listed as resolved taxon have received a finding of Not Warranted or Not Substantial or have been removed from the candidate list.

According to the U.S. Fish and Wildlife Service (FWS), as of February 2021, there were 27 federal endangered, threatened, or candidate species that may be present Jefferson County. These species are listed in Table 4-8. Note that the FWS is based on the existence of potential habitat for the species, and not all listed species may actually be present in the County.

Table 4-8 Threatened, Endangered, or other Listed Species Potentially Found in Jefferson County

Type of Species	Common Name	Scientific Name	Status
Amphibians	Northern leopard frog	<i>Rana pipiens</i>	Resolved Taxon
Birds	Whooping crane	<i>Grus americana</i>)	Experimental Population, Non-Essential
Birds	Bald eagle	<i>Haliaeetus leucocephalus</i>	Recovery
Birds	American peregrine falcon	<i>Falco peregrinus anatum</i>	Recovery
Birds	Southern white-tailed ptarmigan	<i>Lagopus leucura altipetens</i>	Resolved Taxon
Birds	Swainson's hawk	<i>Buteo swainsoni</i>	Resolved Taxon
Birds	Ferruginous hawk	<i>Buteo regalis</i>	Resolved Taxon
Birds	White-faced ibis	<i>Plegadis chihi</i>	Species of Concern
Birds	Western burrowing owl	<i>Athene cunicularia ssp. hypugaea</i>	Species of Concern
Birds	Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened
Flowering Plants	Colorado Butterfly plant	<i>Gaura neomexicana var. coloradensis</i>	Recovery
Flowering Plants	Bell's Twinpod	<i>Physaria bellii</i>	Species of Concern
Flowering Plants	Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	Threatened
Flowering Plants	Western prairie fringed Orchid	<i>Platanthera praeclara</i>	Threatened

Type of Species	Common Name	Scientific Name	Status
Insects	Pawnee montane skipper	Hesperia leonardus montana	Threatened
Mammals	Swift fox	Vulpes velox	Resolved Taxon
Mammals	Black-tailed prairie dog	Cynomys ludovicianus	Resolved Taxon
Mammals	Gunnison's prairie dog	Cynomys gunnisoni	Resolved Taxon
Mammals	North American wolverine	Gulo gulo luscus	Resolved Taxon
Mammals	American pika	Ochotona princeps	Resolved Taxon
Mammals	Fringed myotis	Myotis thysanodes	Species of Concern
Mammals	Long-legged myotis	Myotis volans	Species of Concern
Mammals	Long-eared myotis	Myotis evotis	Species of Concern
Mammals	Preble's meadow jumping mouse	Zapus hudsonius preblei	Threatened
Mammals	Canada Lynx	Lynx canadensis	Threatened
Mammals	Little brown bat	Myotis lucifugus	Under Review
Reptiles	Eastern short-horned lizard	Phrynosoma douglassii brevirostra	Species of Concern

Source: U.S. Fish & Wildlife Service <https://ecos.fws.gov/ecp/>

Historic and Cultural Resources

Information about historic assets in Jefferson County came from local sources, as well as two historic inventories:

The National Register of Historic Places is the Nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

The Colorado State Register of Historic Properties is a listing of the state's significant cultural resources worthy of preservation for the future education and enjoyment of Colorado's residents and visitors. Properties listed in the Colorado State Register include individual buildings, structures, objects, districts, and historic and archaeological sites. The Colorado State Register program is administered by the Office of Archaeology and Historic Preservation within the Colorado Historical Society. Properties listed in the National Register of Historic Places are automatically placed in the Colorado State Register.

Table 4-9 lists the 113 properties and districts in Jefferson County that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties.

Table 4-9 Jefferson County Historic Properties in National & State Registers

Property Name	City	Register	Listed Date
Arvada Downtown	Arvada	National	7/15/1998
Arvada Flour Mill	Arvada	National	4/24/1975
Churches Ranch	Arvada	National	7/23/1998
Enterprise Grange No. 15	Arvada	State	8/11/1999
Ralston Cemetery	Arvada	State	6/30/2011
Ralston Gold Discovery Site (Gold Strike Park)	Arvada	State	12/13/1995
Reno Park Addition Historic District	Arvada	National	9/29/1999
Russell-Graves House	Arvada	National	5/9/1983

Property Name	City	Register	Listed Date
Seventh Day Adventist Church – Arvada Jaycee Hall	Arvada	State	2/24/2011
Stocke--Walter Addition Historic District	Arvada	National	9/24/1999
Silver Spruce Ranch	Bailey	State	6/12/1996
Blue Jay Inn	Buffalo Creek	National	10/1/1974
Green Mercantile Store	Buffalo Creek	National	10/1/1974
Green Mountain Ranch	Buffalo Creek	National	10/1/1974
La Hacienda	Buffalo Creek	National	7/20/1973
Bradford Junction	Conifer	State	1/23/2014
Conifer Junction Schoolhouse	Conifer	National	2/10/2014
Midway House	Conifer	National	9/18/1990
Pleasant Park School	Conifer	State	6/12/1996
Tower of Memories	Denver	National	9/25/1987
Bergen Park	Evergreen	National	11/15/1990
Bergen Park Church	Evergreen	State	6/1/2018
Brook Forest Inn	Evergreen	National	7/29/2009
Corwina Park, O'Fallon Park, Pence Park	Evergreen	National	12/28/1990
Dedisse Park	Evergreen	National	11/15/1990
Evergreen Conference District	Evergreen	National	5/1/1979
Everhardt Ranch	Evergreen	National	5/7/1980
Fillius Park	Evergreen	National	2/24/1995
Hiwan Homestead	Evergreen	National	4/9/1974
Humphrey House	Evergreen	National	12/31/1974
Ammunition Igloo	Golden	National	5/20/1993
Astor House Hotel	Golden	National	3/1/1973
Barnes--Peery House	Golden	National	10/12/2001
Calvary Episcopal Church	Golden	National	3/3/1995
Camp George West Historic District	Golden	National	2/11/1993
Colorado Amphitheater	Golden	National	5/20/1993
Colorado Midland Railway Observation Car No. 111	Golden	State	12/11/1996
Colorado National Guard Armory	Golden	National	12/18/1978
Colorow Point Park	Golden	National	11/15/1990
Coors, Herman, House	Golden	National	10/17/1997
Deaton Sculptured House	Golden	National	2/24/2004
Denver & Rio Grande Railroad Cars (13 entries)	Golden	State	various
Denver and Rio Grande Western Railroad Caboose No. 0578	Golden	National	11/4/2003
First Presbyterian Church of Golden--Unger House	Golden	National	3/14/1991
Genesee Park	Golden	National	11/15/1990
Golden Cemetery	Golden	National	4/18/2012
Golden High School	Golden	National	3/14/1997
Golden Welcome Arch	Golden	State	6/14/2000
Great Western Railway Combine No. 100	Golden	State	9/11/1996

Property Name	City	Register	Listed Date
Lariat Trail Scenic Mountain Drive	Golden	National	11/15/1990
Lookout Mountain Park	Golden	National	11/15/1990
Lorraine Lodge	Golden	National	1/18/1984
Loveland Building and Coors Building	Golden	National	5/16/1996
Magic Mountain Site	Golden	National	8/21/1980
Mount Vernon House	Golden	National	11/20/1970
Oscar Barber House	Golden	State	6/13/1994
Quaintance Block	Golden	National	3/25/1994
Queen of Heaven Orphanage Summer Camp	Golden	National	1/14/2000
Rio Grande Southern Railroad Cars (4 entries)	Golden	State	various
Rio Grande Southern Railroad Engine No. 20	Golden	National	12/14/2000
Rio Grande Southern Railroad, Motor No. 2	Golden	National	2/14/1997
Rio Grande Southern Railroad, Motor No. 6	Golden	National	2/19/1997
Rio Grande Southern Railroad, Motor No. 7	Golden	National	2/28/1997
Rockland Community Church and Cemetery	Golden	National	8/5/2009
Rocky Flats Plant	Golden	National	5/19/1997
Romano, Samuel and Albina, House	Golden	National	9/26/2016
Rooney Ranch	Golden	National	2/13/1975
Tallman Ranch	Golden	State	6/14/1995
Thiede Ranch	Golden	National	1/11/1996
Twelfth Street Historic Residential District	Golden	National	9/22/1983
Little Park	Idledale	National	2/24/1995
Starbuck Park	Idledale	National	6/30/1995
Indian Hills Community Hall & Firehouse	Indian Hills	State	5/14/1997
Bonfils-Stanton Belmar Estate Outbuildings	Lakewood	State	5/23/2013
Building 710, Defense Civil Preparedness Agency, Region 6 Operations Center	Lakewood	National	3/2/2000
Country Club Garden Apartments	Lakewood	State	8/27/2009
Davies' Chuck Wagon Diner	Lakewood	National	7/2/1997
Denver and Intermountain Railroad Interurban No. 25	Lakewood	National	1/12/2012
Hill Section, Golden Hill Cemetery	Lakewood	National	7/31/1995
Howell House	Lakewood	State	9/11/1996
Jewish Consumptives" Relief Society	Lakewood	National	6/26/1980
Office of Civil Defense Emergency Operations Center	Lakewood	National	12/16/1999
Peterson House	Lakewood	National	9/10/1981
Schnell Farm	Lakewood	National	2/14/1997
South Ranch	Lakewood	National	4/18/2003
Stone House	Lakewood	National	5/1/1975
Washington Heights School	Lakewood	State	6/13/1994
Bradford House II	Littleton	National	2/2/2001
Bradford-Perley House	Littleton	State	2/2/2015
Hildebrande Ranch	Littleton	National	3/13/1975

Property Name	City	Register	Listed Date
Shaffer, John C., Barn	Littleton	National	7/12/2019
Bear Creek Canyon Scenic Mountain Drive	Morrison	National	11/15/1990
Bradford House III Archeological Site	Morrison	National	4/8/1980
Bradford, Robert Boyles, Property	Morrison	National	2/2/2015
Craig, Katherine, Park	Morrison	National	6/30/1995
Dinosaur Ridge	Morrison	State	3/10/1993
District No. 17 – Medlen School	Morrison	State	4/14/2015
District No. 17 School--Medlen School	Morrison	National	4/14/2015
Fort, The	Morrison	National	7/14/2006
LoDaisKa Site	Morrison	National	9/25/2003
Morrison Historic District	Morrison	National	9/28/1976
Morrison Schoolhouse	Morrison	National	9/4/1974
Red Rocks Park District	Morrison	National	5/18/1990
Baehr Lodge / Baehr Den of the Rockies (Pine Valley Lodge)	Pine	State	6/10/1998
Staunton Ranch Rural Historic Landscape	Pine	National	12/4/2012
North Fork Historic District	Pine and South Platte	National	10/9/1974
North Fork Historic District (Boundary Increase)	Pine and South Platte	National	10/8/2008
Baugh, James H., House	Wheat Ridge	National	8/14/2012
Crown Hill Burial Park	Wheat Ridge	National	7/24/2008
Fruitdale Grade School	Wheat Ridge	National	3/20/2013
Pioneer Sod House	Wheat Ridge	National	3/14/1973
Richards Mansion	Wheat Ridge	National	9/15/1977
Wheat Ridge Post Office	Wheat Ridge	State	8/12/1992

Sources: National Register of Historic Places, <https://www.nps.gov/subjects/nationalregister/> and Colorado State Register of Historic Properties: <https://www.historycolorado.org/colorado-state-register-historic-properties>

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets

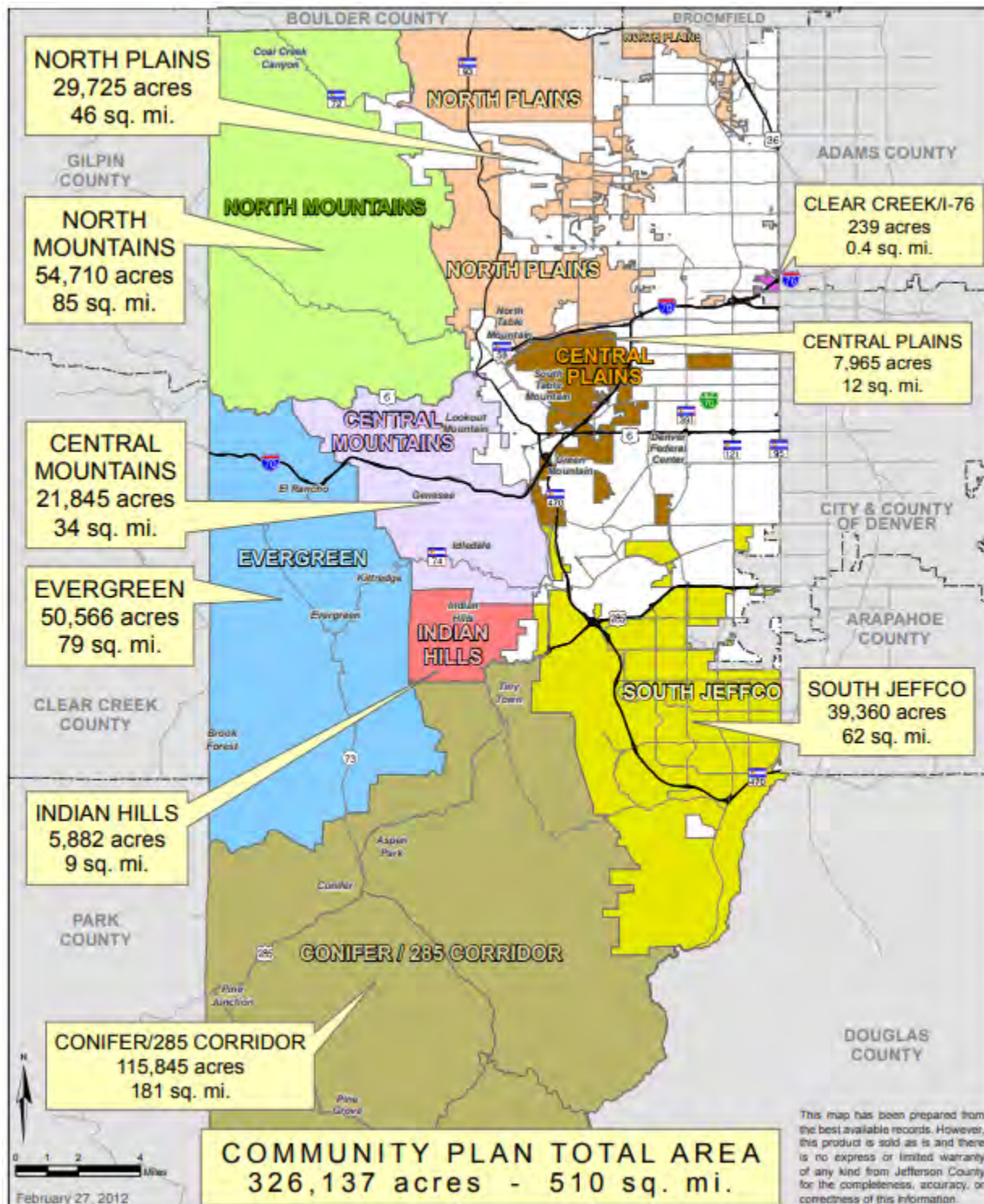
Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster. After a disaster, economic vitality is the engine that drives recovery. Every community has a specific set of economic drivers, which are important to understand when planning ahead to reduce disaster impacts to the economy. When major employers are unable to return to normal operations, impacts ripple throughout the community. A list of the top employers in Jefferson County by number of employees can be found in Section 2.

4.2.4 Growth and Development Trends

A key strategy for reducing future losses in a community is to avoid development in known hazard areas while enforcing the development of safe structures in other areas. The purpose of this strategy is to keep people, businesses, and buildings out of harm's way before a hazard event occurs. The 2021 Jefferson County Hazard Mitigation Plan highlights areas where future development can be expected and areas

where mitigation options can be considered in future land use decisions to ensure safe, smart growth in the county.

Figure 4-3 Jefferson County Community Plan Areas



Source: Jefferson County, JEFFCO demographics, <https://www.jeffco.us/2394/Demographics>

Jefferson County has grown significantly in the past decade and is one of the fastest growing counties in the State. Between 2000 and 2019 Jefferson County's total population increased by 10.7% (DOLA 2021). The amount of growth that County has seen over the past twenty years has been dictated by the availability of undeveloped land. Based on observed population growth trends, housing demand within Jefferson County is expected to remain steady over the next decade.

Land use patterns and cover varies across the County. Approximately 40% of the land in unincorporated Jefferson County is protected by the Jefferson County Open Space Division (Jefferson County 2018). In addition to the Jefferson County Comprehensive Master Plan, which helps guide development in the County, there are also eight Area Plans (North Plains, Central Plains, South Plains, North Mountains, Central Mountains, Indian Hills, Evergreen Area and Conifer/285 Corridor Area) that provide land use recommendations for each of these unique areas in Jefferson County. While most of the total land area (72%) in County is located in the Mountains Areas, most development in the County between 2010 and 2018 has taken place in the South Plains Areas (Jefferson County 2019). **Figure 4-3** shows the location and general size of each Area Plan in the county.

4.3 Hazard Profiles

The hazards identified in **Section 4.1: Hazard Identification** are profiled individually in this section. Much of the profile information came from the same sources used to initially identify the hazards.

4.3.1 Profile Methodology

Each hazard is profiled in a similar format that is described below. It is important to note that the profiles are data driven, and that potential errors or omissions may exist in the data. In particular, there is a time variance between the different data sets. For example, winter storms have been tracked in the planning area for a longer period of time than swelling soils hazards have been documented, so the comparison of severity, previous occurrences, and rates of future occurrences between the two hazards is somewhat skewed. This variance exists between all known hazards in this plan. The information presented is for planning level assessments only.

Description

This subsection gives a generic description of the hazard and associated problems, followed by details on the hazard specific to Jefferson County.

Geographic Extent

This subsection discusses how extensive the hazard is expected to be relative to Jefferson County. It may also include specific discussions regarding which areas of the County are most likely to be affected by the profiled hazard. An extent rating is assigned based on the following methodology:

- **Negligible:** Less than 10 percent of planning area or isolated single-point occurrences
- **Limited:** 10 to 25 percent of the planning area or limited single-point occurrences
- **Significant:** 25 to 75 percent of planning area or frequent single-point occurrences
- **Extensive:** 75 to 100 percent of planning area or consistent single-point occurrences

Percent of planning area is calculated by comparing the amount of area affected to the total county area: $(\text{affected acres} / \text{total county acres}) * 100 = \text{percent of affected planning area}$. Single point events, such as lightning, are evaluated for geographic extent by examining the density of the events collectively.

Previous Occurrences

This subsection contains an overview history of the hazard's occurrences, compiled from multiple data sources. This includes information provided by the HMPC. Significant or historic incidents are profiled in greater detail and include scope, severity, and magnitude, and known impacts.

Probability of Future Occurrences

This subsection utilizes the frequency of past (known) events to calculate a probability of future occurrences. The likelihood is categorized into four different classifications:

- **Unlikely:** Less than 1 percent probability of occurrence in the next year, or has a recurrence interval of greater than every 100 years.
- **Occasional:** Between a 1 and 10 percent probability of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Likely:** Between 10 and 90 percent probability of occurrence in the next year, or has a recurrence interval of 1 to 10 years
- **Highly Likely:** Between 90 and 100 percent probability of occurrence in the next year, or has a recurrence interval of less than 1 year.

Each hazard is calculated for a probability of future occurrence by comparing the known number of events to the available historic record: $(\# \text{ of known events} / \text{years on historic record}) * 100 = \text{Probability of Future Occurrence}$. Stated mathematically, the methodology for calculating the probability of future occurrences is:

$$\frac{\# \text{ of known events}}{\text{years of historic record}} \times 100$$

This formula evaluates that the probability of a given hazard occurring in any given year in Jefferson County. The period of record will vary for each hazard and is based upon available data. In some instances, additional prediction methods are also measured by recurrence intervals, such as floods or hazards where the events occur more than once a year.

Magnitude and Severity

This subsection summarizes the anticipated magnitude and severity of a hazard event based largely on previous occurrences and specific aspects of risk as it relates to the planning area. Magnitude and Severity are classified in the following manner:

- **Negligible:** Less than 10 percent of property is severely damaged, facilities and services are unavailable for less than 24 hours, injuries and illnesses are treatable with first aid or within the response capability of the jurisdiction.
- **Limited:** 10 to 25 percent of property is severely damaged, facilities and services are unavailable for between 1 and 7 days, injuries and illnesses require sophisticated medical support that does not strain the response capability of the jurisdiction, or results in very few permanent disabilities.
- **Critical:** 25 to 50 percent of property is severely damaged, facilities and services are unavailable or severely hindered for 1 to 2 weeks, injuries and illnesses overwhelm medical support for a brief period of time, or result in many permanent disabilities and a few deaths.
- **Catastrophic:** More than 50 percent of property is severely damaged, facilities and services are unavailable or hindered for more than 2 weeks, the medical response system is overwhelmed for an extended period of time or many deaths occur.

The rating is calculated by evaluating the event of record against these criteria. Since most events incur different levels of severity for each element, the rating is assigned to the classification with the most documented occurrences. The purpose of a magnitude and severity rating is to establish the highest known potential threshold of an event to help guide the mitigation goals and actions development. If there are significant events with much lower magnitude and severity ratings than the event of record, this discrepancy will be noted.

Climate Change Considerations

Climate includes patterns of temperature, precipitation, humidity, wind and seasons. Climate plays a fundamental role in shaping natural ecosystems, and the human economies and cultures that depend on them. "Climate change" refers to changes over a long period of time. It is generally perceived that climate change has had and will continue to have measurable impacts on the occurrence and severity of natural hazards around the world. Impacts include the following:

- Snow cover losses will continue, and declining snowpack will continue to affect snow-dependent water supplies and stream flow levels around the world.
- The risk of drought and the frequency, intensity, and duration of heat waves are expected to continue to increase.
- More extreme precipitation events will continue to be likely, increasing the risk of flooding.
- The Earth's average temperature is expected to continue to increase.

In 2018, the U.S. Global Change Research Program released the Fourth National Climate Assessment (NCA4), the authoritative and comprehensive report on climate change and its impacts in the United States. Not only did the report confirm that climate induced hazards continues to affect Americans in every region of the U.S., the report identifies increased heat, drought, insect outbreaks, wildfire, and flooding as key climate-related concerns for the Southwest region of the U.S., which includes Colorado. The following is a summary of climate change impacts from the Fourth National Climate Assessment.

Recent warming in the southwest region is among the most rapid in the nation and is significantly greater than the global average, and the period since 1950 has been hotter than any comparable long period in at least 600 years. Summer temperatures across the state are expected to warm more than winter temperatures and projections suggest that typical summer months will be as warm as (or warmer than) the hottest 10% of summers that occurred between 1950 and 1999. Under the higher emissions scenario (RCP8.5) climate models predict an increase of 8.6°F in the southwest regional annual average temperature by 2100.

Projected increases in temperatures in the southwest region are also projected to increase probabilities of natural events such as wildfires, drought, and extreme precipitation. These temperature changes have great potential to directly affect public health through increased risk of heat stress and infrastructure through increased risk of disruptions of electric power generation. Water supplies are also vulnerable to impacts of higher temperatures. While water supplies generally change year-to-year due to variabilities in water use and precipitation, higher temperatures are projected to increase evapotranspiration, reducing the effectiveness of precipitation in replenishing surface water and soil moisture. This will have direct impacts on crop yields and productivity of key regional crops and livestock a major risk for the agricultural industry and food security nationwide.

The impacts of climate induced hazards already pose a threat to people and property in the southwest region of the United States, including Jefferson County. Vulnerable populations, in particular those who are low-income, children, elderly, disabled and minorities will likely be impacted by the effects of climate induced hazards disproportionately than other populations (Refer to Section 2 for more information on social vulnerability in the county). Together, these impacts represent a slow-onset disaster that is likely to manifest and change over time. Current projections predict even more rapid changes in the near future, which are likely to affect many of the natural hazards that Jefferson County has historically dealt with. According to HMPC the County is already experiencing some hazards with more frequency and intensity than in years past, such as drought, flooding, wildfire and extreme heat.

Jefferson County's two most frequent and devastating hazards are wildfire and flood, both of which are expected to be impacted by our changing climate. The nature of erosion and public health hazards are also likely to evolve in intensity and character due to a changing regional climate. For these reasons, the hazard identification and risk assessment for the 2021 Jefferson County Hazard Mitigation Plan update includes climate change considerations discussion on how climate change may impact the frequency, intensity, and distribution of specific hazards within the county. Because many impacts of climate induced hazards cross county boundaries, some of the discussion looks at impacts on a regional scale. As climate science evolves, future mitigation plan updates may consider including climate change projections in the risk rankings and vulnerability assessments of the hazards included in the Plan.

Vulnerability Assessment

With Jefferson County's hazards identified and profiled, the HMPC conducted a vulnerability assessment to describe the impact that the significant hazards would have on the County. The vulnerability assessment quantifies, to the extent feasible, assets at risk to natural hazards and estimates potential losses. This vulnerability assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses, as well as Tasks 5 and 6 of the 2013 FEMA Local Mitigation Planning Handbook. The vulnerability assessment first describes the total vulnerability and values at risk and then discusses vulnerability by hazard.

The vulnerability assessment was conducted based on the significance of the hazard utilizing best available data. This assessment is an attempt to quantify assets at risk, by jurisdiction where possible, to further define populations, buildings, and infrastructure at risk to natural hazards. The methods of analysis vary by hazard type and data available and are discussed further in 4.3.4 with each hazard analyzed. The information presented is for planning level assessments only. Avalanche is omitted from this vulnerability assessment due to the relatively low significance, lack of previous damages based on research, and a lack of data to support quantifying future losses. Data to support the vulnerability assessment was collected and compiled from the following sources:

- Current County and municipal GIS data (hazards, base layers, critical facilities and assessor's data)
- 2010 US Census, 2019 American Community Survey, and 2019 CO Department of Local Affairs (DOLA) data
- 2020 Homeland Infrastructure Foundation-Level Data (HIFLD) data
- Written descriptions of inventory and risks provided by participating jurisdictions;
- A refined flood loss estimation by jurisdiction with the use of geospatial analysis for both 1% and 0.2% annual chance flooding
- Updated modeling of earthquake loss potential with HAZUS-MH 2.2, including a 2,500 year probabilistic scenario and a hypothetical M 6.5 event on the Golden Fault

- Existing plans and studies, and applicable regulations
- Personal interviews with planning team members, hazard experts, and County and municipal staff.

The scope of the vulnerability assessment is to describe the risks to the County as a whole. The vulnerability assessment first describes the assets in Jefferson County, including the total exposure of people and property; critical facilities and infrastructure; natural, historic, and cultural resources; and economic assets. Development trends, including population growth and land status, are analyzed in relation to hazard-prone areas. Next, where data was available, hazards are evaluated in more detail and potential losses are estimated. Data from each jurisdiction was also evaluated and is integrated here but specific variations of risk are noted in the appropriate annex. The methods to assess vulnerability presented here include an updated analysis from the 2016 Jefferson County Multi-Hazard Mitigation Plan. This includes a detailed risk assessment for all hazards based on advanced methods and updated hazard and inventory data. Thus this 2021 plan should be considered the baseline for measuring changes in vulnerability during future updates, recognizing that vulnerability information should become more refined as data sources and methodologies improve over time. Examples of refinements and changes made in this plan include:

- Updated population and building inventory information, including most recent values and 2020 assessor data;
- An updated and more comprehensive inventory of critical facilities;
- An updated inventory of natural, historic, and cultural resources;
- A refined flood loss estimation by jurisdiction with the use of geospatial data provided by the Assessor's office and FEMA NFHL to perform GIS analysis for both 1% and 0.2% annual chance flooding, supplemented by local flood payers;
- Updated modeling of earthquake loss potential with HAZUS-MH 2.2, including a 2,500 year probabilistic scenario M7.25 and a hypothetical M 6.5 event on the Golden Fault;
- Detailed inventory by jurisdiction of potential structures and critical facilities at risk to hazards

Overall Hazard Significance

Overall potential impact of each hazard is summarized in this subsection, based on geographic extent, probability of future occurrences, and the magnitude and severity of the event of record. These ratings are averaged to provide an overall hazard significance rating, which is useful for comparing the hazards to one another and for guiding the development of actions and priorities. The overall hazard significance ratings are classified as follows:

- **Low:** Two or more of the criteria fall in the lower classifications, or the event has a minimal impact on the planning area. This rating is also sometimes used for hazards with a minimal or unknown record of occurrences and impacts or for hazards with minimal mitigation potential.
- **Medium:** The criteria fall mostly in the middle ranges of classifications, and the event's impacts on the planning area are noticeable but not devastating. This rating is also sometimes utilized for hazards with a high impact rating but an extremely low occurrence rating.
- **High:** The criteria consistently fall along the high ranges of the classification and the event exerts significant and frequent impacts on the planning area. This rating is also sometimes utilized for hazards with a high psychological impact or for hazards that the jurisdiction identifies as particularly relevant.

4.3.2 Avalanche

Description

Avalanche hazards occur predominantly in the mountainous regions of Colorado above 8,000 feet. The vast majority of avalanches occur during and shortly after winter storms. Avalanches typically occur when loading of new snow increases stress to a snow covered slope at a rate faster than strength in the snowpack develops. Critical stresses develop more quickly on steeper slopes, and where deposition of wind-transported snow is common. While most avalanches are caused simply by the weight of accumulated snow, other triggers can be a human (e.g., skier, snowshoer, snowmobiler), or animals.

According to the Colorado Avalanche Information Center (CAIC), about 98 percent of all avalanches start on slopes of 25-50 degrees. Avalanches release most often on slopes above timberline that face away from prevailing winds (leeward slopes collect snow blowing from the windward sides of ridges).

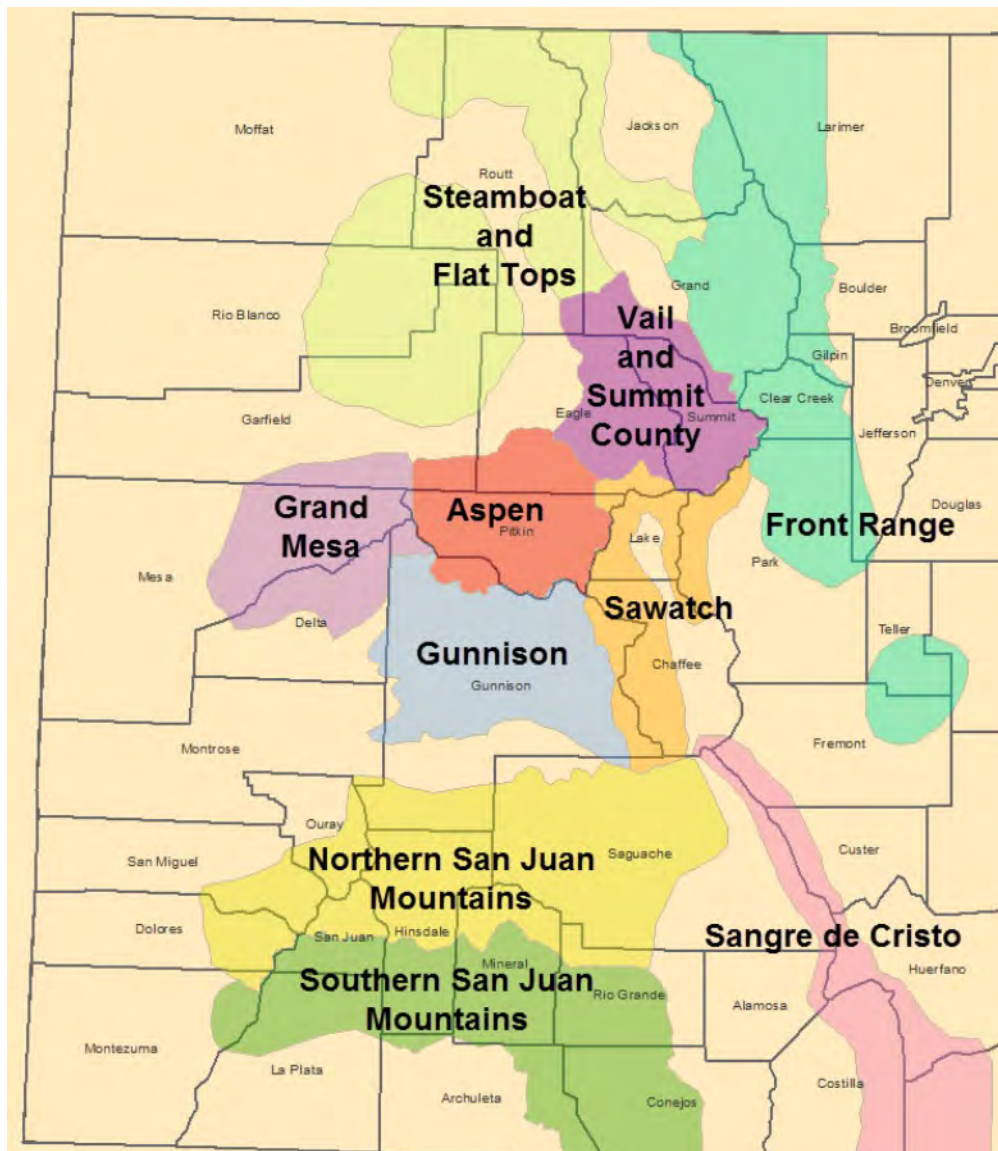
Avalanches can also run on small slopes well below timberline, such as gullies, road cuts, and small openings in the trees. Very dense trees can anchor the snow to steep slopes and prevent avalanches from starting; however, avalanches can release and travel through a moderately dense forest. An average-sized avalanche travels around 80 mph; the typical range of impact pressure from an avalanche is from 0.5 to 5.0 tons per square foot.

Avalanches in Colorado occur during the winter and spring, mainly between November and April. The most avalanche-prone months are February, March, and January. Avalanches caused by thaw occur most often in April. The avalanche danger increases with major snowstorms and periods of thaw followed by heavy snows. About 2,300 avalanches are reported to the CAIC during an average winter. More than 80 percent of these fall during or just after large snowstorms.

Statistics and reporting from the CAIC indicate that between the winter of 1950/1951 and 2019/2020, Colorado suffered the highest number of avalanche fatalities (293) in the United States. On average over the past 10 winters, 27 people have died in avalanches in the United States each winter (CAIC 2020). This hazard generally affects climbers, backcountry skiers, snowmobilers, and skiers and snowboarders. A smaller number of motorists along highways are also at risk of injury and death due to avalanches, as are residents who live in avalanche-prone areas and other individuals working in those areas. Road and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. Some residents may live in areas prone to avalanches and may be impacted directly if an avalanche occurs on their property, or indirectly if an avalanche limits or removes accessibility to the property, both for the resident(s) and for emergency response personnel. Recognizing areas prone to avalanches is critical in determining the nature and type of development allowed in a given area.

Geographic Extent

Avalanches typically occur above 8,000 feet and on slopes ranging between 25 and 50 degrees incline. The CAIC website provides backcountry forecasts for avalanche conditions for various forecast zones within the state, as depicted in Figure 4-4. The Front Range zone extends from the Wyoming border south, west to Loveland Pass, and includes the Pikes Peak Area. Almost all of Jefferson County falls outside of the zone boundaries. Only a small portion located just south of I-70, along the southeastern border of Clear Creek County, falls into the Front Range forecast zone. The Front Range zone extends from the Wyoming border south, west to Loveland Pass, and includes the Pikes Peak Area. Overall, this equates to far less than 10% of the planning area.

Figure 4-4 Colorado Avalanche Information Center Forecasts Zones

Source: Colorado Avalanche Information Center

There are few areas of the County where slopes are 30% higher. The majority of vulnerable area in the County lies west of the C-470 corridor, with isolated areas along North and South Table Mountains, the hogback formations and Green Mountain. Most of the areas east of the foothills have strict development restrictions, which minimizes the exposure of the population. In the mountainous areas, the greatest areas of potential occurrence which may impact developments lie along Highway 6, Bear Creek Canyon, Coal Creek Canyon, Ralston Creek Road, and Clear Creek Canyon. Not unexpectedly, these areas are also the areas with greatest potential for rock falls, landslides, or unstable slope events. However, while these areas demonstrate a slope with a known vulnerability to avalanches, the occurrence and tracking records indicate that the areas lack some other element that contributes to avalanche events, such as consistent snowpack.

Based on this information, the geographic extent rating for avalanches in Jefferson County is **negligible** or, at most, **limited**.

Previous Occurrences

The Colorado Avalanche Information Center (CAIC) database recorded 298 occurrences in the State of Colorado between late 1996 and January 2021. However, the database only captures accidents with unusual circumstances, fatalities, and injuries, and therefore represents only a fraction of occurrences.

According to the 2018 State Hazard Mitigation Plan, Jefferson County has had 4 avalanches that caused damage between 1960 and 2008, causing \$8,333 in damage. The HMPC could not find any additional details on these, likely due to the small amount of damage. There have been many more occurrences in neighboring Clear Creek County, which have indirect impacts on Jefferson County. Clear Creek County falls almost entirely in the Front Range forecast zone, with the western-most area falling into the Vail-Summit forecast zone. These zones are explained in the Geographic Extent section below. Impacts from avalanches as far away as Summit County can also impact Jefferson County. Avalanches along the I-70 corridor and US Highway 6 threaten transportation routes into Jefferson County from the Western Slope, and may threaten water supplies for downstream residents by jamming creeks, damaging dams, or destroying infrastructure. Several previous occurrences which indirectly impacted the planning area are recounted below, but none of them were within Jefferson County. These occurrences help establish the threat of secondary impacts of avalanches on Front Range counties.

March 23, 2003. The CAIC database recounts a very large avalanche just west of Silver Plume. The avalanche extended all the way down the mountain into Clear Creek and across I-70, spilling into the eastern lanes of the highway and damming the creek, which in turn threatened down-stream water supplies. The event was considered unusual because of its long run out in an area that normally is not avalanche prone.

December 30, 2007. The Channel 7 website reported that avalanche dangers and high winds closed all six lanes of I-70 stranding almost 2,000 travelers along the highway from Floyd Hill to Vail. Interviews with stranded travelers indicate a range of destinations, including the Denver International Airport, sporting events, and New Year's Eve celebration destinations, which underscores the economic impact of the danger on the entire state.

January 7, 2008. The Channel 7 website records avalanche mitigation efforts along I-70 halfway between the Eisenhower Tunnel and Silverthorne covered all six lanes of the highway and ranged from 6 to 10 feet deep. Other efforts closed down I-70 over Vail Pass and various other Colorado and U.S. highways across the western slope, heightening the dangers that avalanche conditions pose to travelers.

March 3 and 7, 2019. Media broadcasts reported avalanches on March 3rd and March 7th which swept across Interstate-70 in the Ten Mile Canyon between Frisco and Copper Mountain and trapped vehicles in several inches of avalanche debris. Fortunately, no injuries or property damages were reported but a large stretch of I-70 required closing down for several hours due to avalanche remediation work.

Probability of Future Occurrences

Jefferson County has only experienced four recorded avalanches in the past 60 years. This corresponds to a probability of future occurrences rating of **unlikely**.

Magnitude and Severity

According to the CAIC, there have been no reported deaths in Jefferson County due to avalanches between 1950 and 2014. Indirect impacts of avalanches on the planning area, such as economic losses due to road closures, are a matter of speculation rather than quantifiable data. With no reported damage amounts and no impact to the operation and delivery of critical services and functions it is difficult to consider the hazard very severe.

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. There is no record of damages for Jefferson County; therefore the magnitude and severity ratings for avalanches must remain **negligible** until additional information becomes available.

Climate Change Considerations

Climate change is likely to continue to alter the frequency and severity of avalanches in the future. In the last decade many experts in western states have pointed out increased avalanche risk associated with a changing snow, precipitation, accumulation, and overall warmer winter patterns. Snow may fall early in the winter and is then followed by a long period without snow. This creates a thin snowpack that becomes structurally weaker as winter goes on. New layers of snow may not bond well to the weak base layer, creating prime conditions for avalanches. Periods of sporadic snowfall in early and mid-spring in Colorado also contribute to this process of creating structurally weaker snowpack, which can lead to avalanche activity as snow accumulation has already begun to thaw with the warmer season. As Colorado experiences winters with higher average temperatures and lower average precipitation, these conditions that increase avalanche risk become more common. More intense and continuous storms over multiple days can also increase the potential for major avalanche cycles, as was experienced in March 2019.

Vulnerability Assessment

Due to limited available data, few recorded impacts, and the low significance rating, a detailed vulnerability assessment was not conducted for avalanche.

Overall Hazard Significance

Avalanches in Jefferson County do not have a significant impact on the planning area. In general, the impacts of avalanches for Jefferson County will be secondary. Avalanches in counties with a higher risk or vulnerability, such as Clear Creek County, may close roads and access points into Jefferson County or those counties may request mutual aid assistance to deal with the event occurrence. The geographic extent of the hazard is considered **negligible**. The probability of future occurrences is considered **unlikely** and the magnitude/severity for the event of record is **negligible**. In addition, the HMPC considers the hazard to have a **low** impact on the County. This equates to an overall impact rating of **low**.

4.3.3 Dam Failure/Incidents

Description

Dams are human-built structures built for a variety of uses, including flood protection, power, agriculture, water supply, and recreation. Dams typically are constructed of earth, rock, concrete, or mine tailings. Two factors that influence the potential severity of a full or partial dam failure are the amount of water impounded and the density, type, and value of development and infrastructure located downstream.

Dam failures can result from any one or a combination of the following causes:

- Prolonged periods of rainfall and flooding, which result in overtopping
- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

Dam failure occurs when the retention function of the dam is compromised, in part or in its entirety. Damage to a dam structure that may result in a failure may be caused by many sources. Possible damages include poor maintenance, age, animal incursion (particularly in earthen dams), erosion, and damages sustained as a result of seismological activity. A dam failure is not the only type of emergency associated with dams. Spillway discharges that are large enough to cause flooding in downstream areas or flooding upstream of dams due to backwater effects or high pool levels are both considered dam emergencies and may cause significant property damage and loss of life (USACE 1980).

Dam failures result in a unique source of flash flooding, when a large amount of previously detained water is suddenly released into a previously dry area due to a failure in some way of the dam. Dams are classified into four classes. The U.S. Army Corps of Engineers and the Colorado State Engineer classify dams into four categories based on the potential consequences should the dam fail:

- **High Hazard:** A dam for which life loss is expected to result from failure of the dam.
- **Significant Hazard:** A dam for which significant damage, but no life loss is expected to result from failure of the dam. Significant damage is defined as damage to structures where people generally live, work, or recreate, including public and private facilities. Significant damage is determined to be damage sufficient to render structures or facilities uninhabitable or inoperable.
- **Low Hazard:** A dam for which neither life loss nor significant damage as defined for a Significant Hazard dam are expected to result from failure of the dam.
- **No Public Hazard (NPH):** A dam for which neither life loss nor significant damage as defined for a Significant Hazard dam are expected to result from failure of the dam.

It is important to keep in mind that the hazard classification of a dam is a measure of the consequences if the dam were to fail, not a measure of how likely the dam is to fail.

Privately owned High and Significant hazard potential dams are required by Colorado regulations to have Emergency Action Plans (EAPs) in place. Class I dams are required to have inundation maps as well. Federally owned High hazard dams are also required to have EAPs by Federal Regulations (USACE). According to the 2018 State Hazard Mitigation Plan, all high-hazard dams in Colorado have EAPs in place, which provide for the emergency response procedures in the event of a dam emergency event.

Dam inundation can also occur from non-failure events or incidents such as when outlet releases increase during periods of heavy rains or high inflows. Controlled releases to allow water to escape when a reservoir is overfilling can help prevent future overtopping or failure. When outlet releases are not enough, spillways are designed to allow excess water to exit the reservoir and prevent overtopping. This can protect the dam but result in flooding downstream.

A low head dam is an engineered structure built into and across stream and river channels. Low head dams were historically built for a variety of purposes to support industrial, municipal, and agricultural

water usage through the diversion of water from streams. Low head dams have also been built to provide recreational amenities for boating, rafting and tubing as well as improve aquatic habitats (Colorado DNR). Water flows over the dams creating a recirculating current that can trap unknowing river users. Due to the low height of this type of dam, low head dams can be difficult to see by river users that are not aware of them and because of the tranquil pool that gives the appearance there is no danger. There are 49 identified low head dams located on the South Platte River, Clear Creek and Ralston Creek in Jefferson County. These low head dams in the County are used as diversion, grade control structures and for recreation purposes. The low head dams along each stream in the County are summarized in Table 4-10 and mapped in Figure 4-8.

Table 4-10 Low Head Dams in Jefferson County

Stream Name	Low Head Dam Category	Count
South Platte River	Grade Control Structure	3
	Diversion Dam	1
Clear Creek	Grade Control Structure	15
	Diversion Dam	16
	Recreation	1
Ralston Creek	Grade Control Structure	9
	Diversion Dam	4

Source: Colorado Department of Natural Resources, Dam Safety Branch

Levees are defined by the Army Corps of Engineers as “earthen embankments whose primary purpose is to furnish flood protection from seasonal high water for a few days or weeks a year. Levees are broadly classified as either urban or agricultural because of different requirements from each” (USACE 2007). Riverine levees are those built to protect from flooding of river ways, whereas coastal levees are those built to protect from coastal water flooding. Levee failures can occur when a flood occurs that exceeds the designed level of protection. In this case the levee may fail or be overtopped. Levees that are not maintained are at risk from failure due to erosion, rodent activity, or piping along roots from vegetation growing on the levee. According to the U.S. Army Corp of Engineers (USACE) and FEMA National Levee Database there are no levees in Jefferson County.

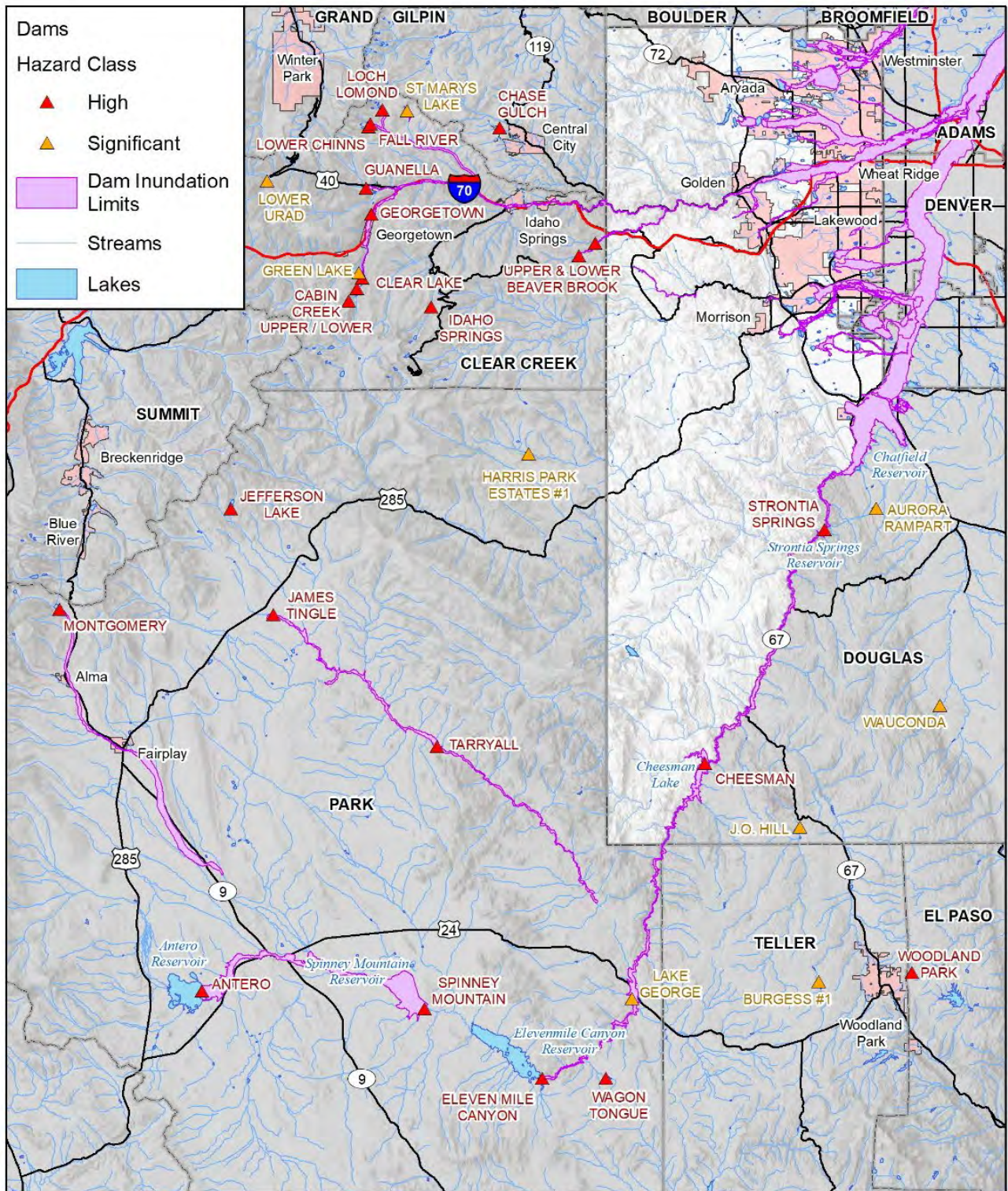
Geographic Extent

Jefferson County contains 30 high hazard, 11 significant hazard and 70 low hazard dams. In addition, one high hazard dam and two low hazard dams have been identified as potentially impacting areas of Jefferson County if breached. Dams outside the county along the in the South Platte River watershed to the south would impact the southern, unincorporated areas of Jefferson County; dams located to the north would affect the more-populated jurisdictions along Clear Creek.

This data indicates that a large portion of the County and County population centers, certainly more than 25%, are exposed to potential dam failures. For example, in a failure of both the Ralston Reservoir Dam and Blunn Dam at Arvada Reservoir, almost 5% of the County would be impacted. Based on this information, the geographic extent rating for dam failure is **significant**.

Table 4-11 lists the high and significant hazard dams within Jefferson County. Dam Names with an asterisk (*) next to them have been given a conditionally satisfactory or unsatisfactory rating by the State Engineer, meaning they have storage restrictions due to structural concerns. As of February 2021, 33 dams in Jefferson County were given the conditionally satisfactory or unsatisfactory ratings. While 23 of these are low hazard dams, 2 are rated significant hazard and 8 are rated high hazard.

Figure 4-5 High and Significant Hazard Dams with Potential to Impact Jefferson County



wood. Map compiled 3/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado DWR Dam Safety

0 5 10 Miles



Figure 4-6 shows where the high and significant hazard dams are located. Table 4-12 lists the high and significant hazard dams that are located outside the County, but whose failure could have impacts inside the County. These regional dams are presented in Figure 4-5.

Table 4-11 High and Significant Hazard Dams in Jefferson County

Dam Name	Stream	Downstream Community	Storage Capacity (Acre-Feet)	Emergency Action Plan?	Hazard Rating
Bear Creek	Bear Creek	Lakewood	2,000	Yes	High
Bergen East	Weaver Gulch	Morrison	706	Yes	High
Blunn	Ralston Creek	Arvada	6,361	Yes	High
Chatfield	South Platte River	Littleton	26,600	Yes	High
Cheesman	South Platte River	Deckers	79,064	Yes	High
East	Weir Gulch	Lakewood	102	Yes	High
Evergreen*	Bear Creek	Evergreen	669	Yes	High
Fairmount Reservoir	Clear Creek	Wheat Ridge	981	Yes	High
Fortune	Big Dry Creek	Westminster	9,800	Yes	High
Genesee No. 2			101	Yes	High
Harriman	Weaver Creek	Lakewood	762	Yes	High
Hyatt*	Van Bibber Creek	Arvada	760	Yes	High
Ketner	Walnut Creek	Westminster	166	Yes	High
Leyden	Leyden Creek	Arvada	90	Yes	High
Lookout Mountain	Clear Creek	Golden	101	Yes	High
Lower Long Lake*	Ralston Creek	Arvada	292	Yes	High
Magic Mountain #1	Jackson Gulch	Pleasant View	145	Yes	High
Main	Weir Gulch	Lakewood	583	Yes	High
Maple Grove	Lena Gulch	Lakewood	1,123	Yes	High
Morrison Raw Water	Bear Creek	Morrison	29	Yes	High
Polly A. Deane*	Dutch Creek	Littleton	512	Yes	High
Ralston	Ralston Creek	Arvada	10,749	Yes	High
Smith*	Bear Creek	Lakewood	638	Yes	High
Standley Lake	Big Dry Creek	Westminster	43,344	Yes	High
Strontia Springs	South Platte River	Kassler	7,700	Yes	High
Tucker Lake - North Dam	Ralston Creek	Arvada	586	Yes	High
Tucker Lake - South Dam	Ralston Creek	Arvada	882	Yes	High
Upper Long Lake*	Ralston Creek	Arvada	1,500	Yes	High
Wellington*	S. Fork Buffalo Creek	Buffalo Creek	4,399	Yes	High
Willow Springs #1*	Turkey Creek	Lakewood	108	Yes	High
Woman Creek	Woman Creek	Westminster	836	Yes	High
Beers Sisters Lake	S. Platte River	Littleton	39	Yes	Significant
Bergen West*	Weaver Gulch	Lakewood	370	Yes	Significant
Bowles #1	South Platte River	Bowmar	2,475	Yes	Significant
Carmody	Sanderson Gulch	Lakewood	22	Yes	Significant

Dam Name	Stream	Downstream Community	Storage Capacity (Acre-Feet)	Emergency Action Plan?	Hazard Rating
Devinney	S. Lakewood Gulch	Lakewood	10	Yes	Significant
Harwood S Storage Reservoir	Weaver Gulch	Lakewood	143	Yes	Significant
Johnston	Lilley Gulch	Littleton	547	Yes	Significant
Kendrick	Sanderson Gulch	Lakewood	242	Yes	Significant
Lockport	Troublesome Creek	Kittredge	36	Yes	Significant
Meadow View	North Turkey Creek		51	No	Significant
Pomona No. 2 And No. 3*	Little Dry Creek	Arvada	114	Yes	Significant

Source: National Inventory of Dams, NHD

Note: * represents dams that have been rated as unsatisfactory or conditionally satisfactory by the State Engineer

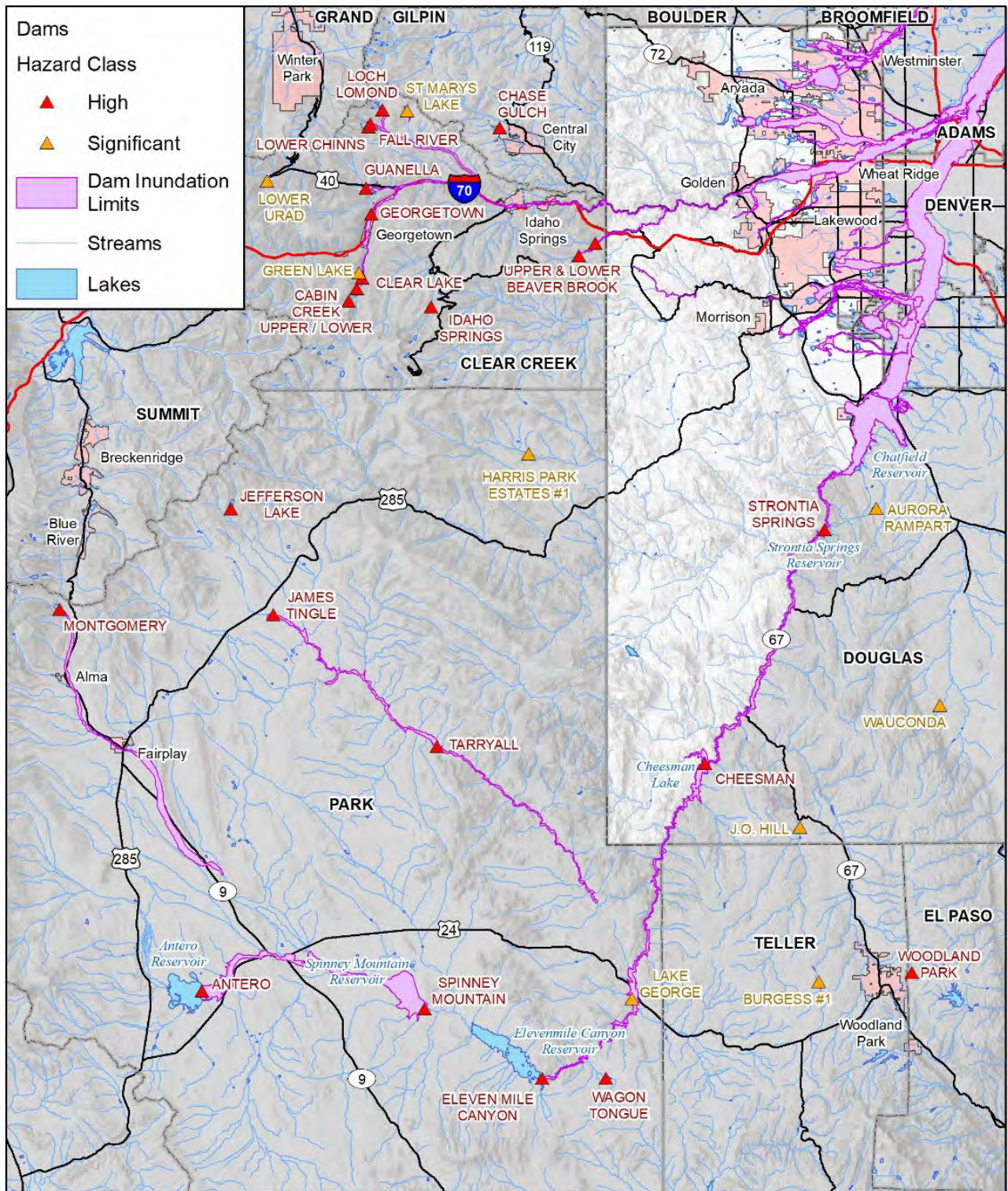
Table 4-12 Other High and Significant Hazard Dams That May Impact Jefferson County

Dam Name	Stream	Downstream City	Storage Capacity (Acre-Feet)	Emergency Action Plan?	Hazard Rating
Lower Beaver Brook	Beaver Brook	Golden	30	Yes	High
Upper Beaver Brook	Beaver Brook	Golden	397	Yes	High
Upper Cabin Creek	South Clear Creek	Georgetown	1,602	Yes	High
Lower Cabin Creek	South Clear Creek	Georgetown	1,988	Yes	High
Idaho Springs	Chicago Creek	Idaho Springs	230	Yes	High
Lower Chinns	Fall River	Idaho Springs	108	Yes	High
Clear Lake	South Clear Creek	Georgetown	703	Yes	High
Fall River	Fall River	Idaho Springs	890	Yes	High
Georgetown	South Clear Creek	Lawson	386	Yes	High
Loch Lomond	Fall River	Idaho Springs	875	Yes	High
Chase Gulch	Chase Gulch	Black Hawk	602	Yes	High
Guanella	West Fork Of Clear Creek	Empire	1,340	Yes	High
Woodland Park	Loy Gulch	Woodland Park	60	Yes	High
Antero	S. Fork S. Platte River	Hartsel	44,733	Yes	High
Eleven Mile Canyon	South Platte River	Lake George	97,800	Yes	High
Jefferson Lake	Jefferson Creek	Jefferson	2,560	Yes	High
Montgomery	Middle Fork S. Platte	Alma	5,088	Yes	High
Tarryall	Tarryall Creek	Deckers	1,963	Yes	High
Wagon Tongue	Wagon Tongue Gulch	Lake George	130	Yes	High
Spinney Mountain	South Platte River	Lake George	53,873	Yes	High
James Tingle	Michigan Creek	Jefferson	400	Yes	High
Green Lake	South Clear Creek	Georgetown	96	Yes	Significant
St. Marys Lake	Silver Creek	Idaho Springs	38	Yes	Significant
Lower Urad	Woods Creek	Empire	252	Yes	Significant
Aurora-Rampart	Willow Creek	Kassler	1,200	Yes	Significant

Dam Name	Stream	Downstream City	Storage Capacity (Acre-Feet)	Emergency Action Plan?	Hazard Rating
J. O. Hill	West Creek	Deckers	154	Yes	Significant
Wauconda	Bear Creek	Sedalia	336	Yes	Significant
Burgess #1	Rule Creek	Deckers	210	Yes	Significant
Lake George	S. Platte River	Lake George	270	Yes	Significant
Harris Park Estates #1	Elk Creek	Shaffers Crossing	101	Yes	Significant

Source: National Inventory of Dams, NHD

Figure 4-5 High and Significant Hazard Dams with Potential to Impact Jefferson County



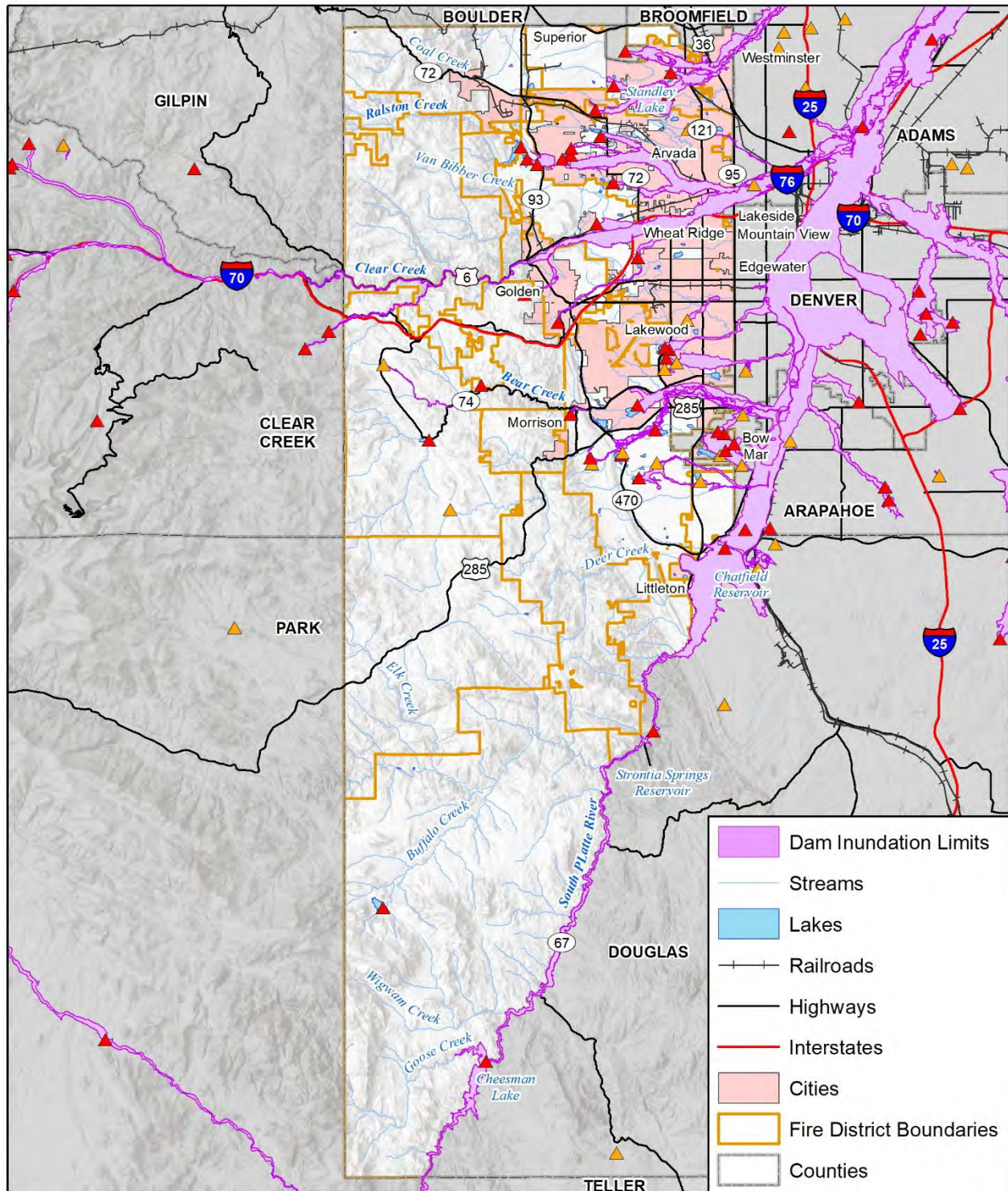
wood.

Map compiled 3/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado DWR Dam Safety

0 5 10 Miles

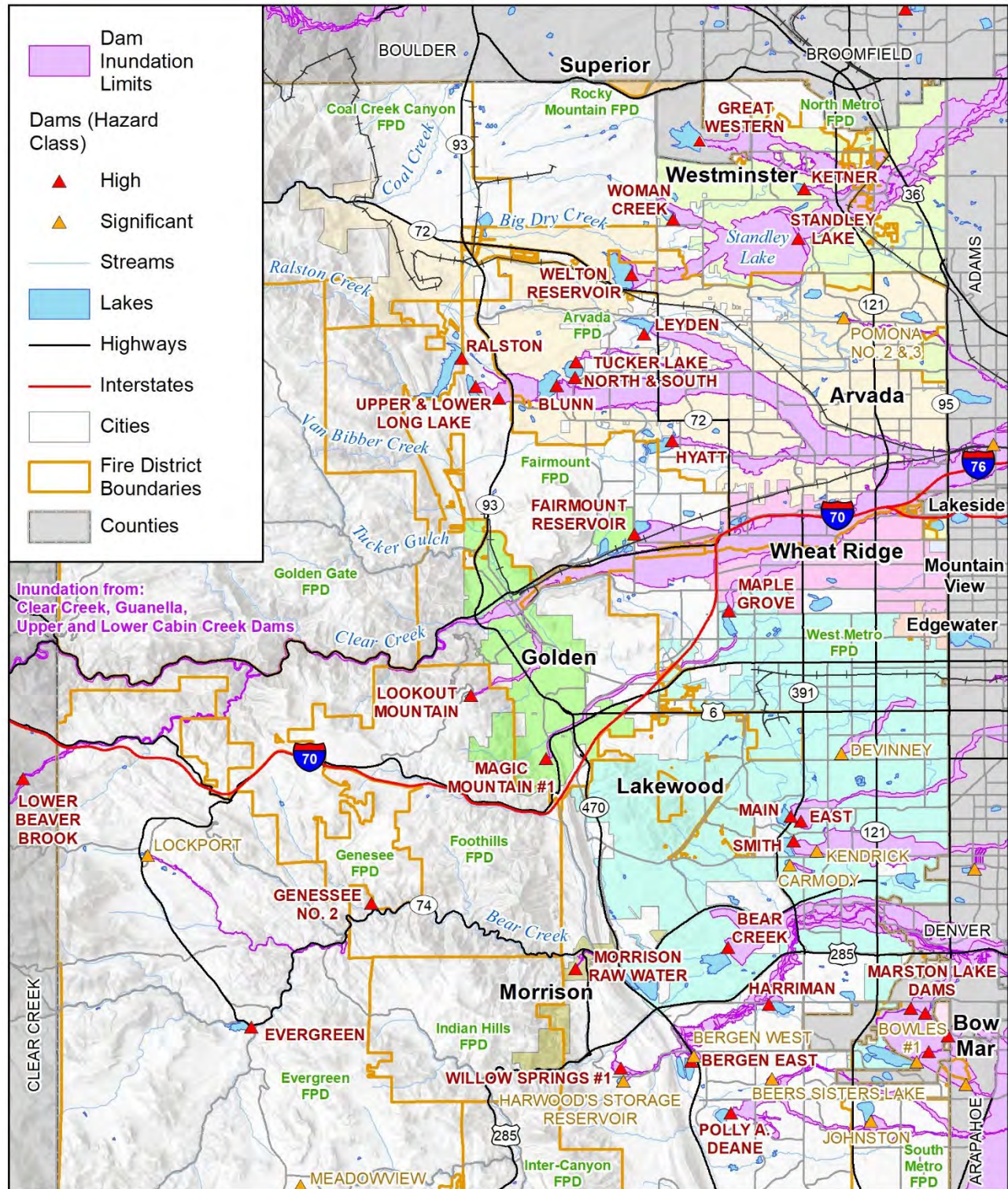


Figure 4-6 Potential Dam Inundation Areas



wood
Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado DWR Dam Safety, EAP

Figure 4-7 Potential Dam Inundation Areas (Northern Half)

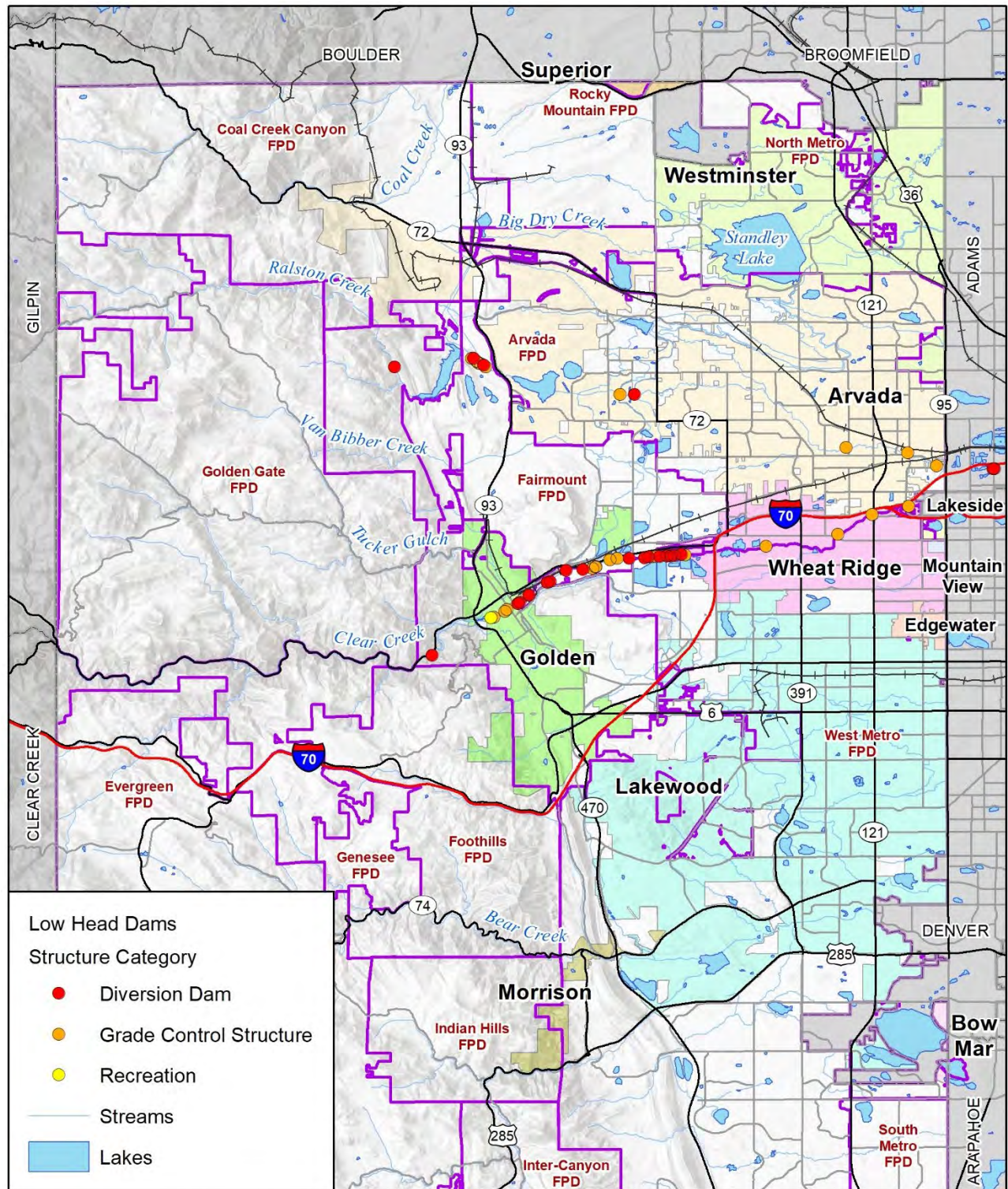


Map compiled 5/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado DWR Dam Safety, EAP

0 5 10 Miles



Figure 4-8 Low Head Dams in Jefferson County



Non-Failure Dam Incidents:

The Colorado DNR has a statewide database that identifies the potential for non-failure dam inundation to show potential areas of flooding where outlet capacity exceeds the downstream channel capacity. The dams at the highest risk of non-failure inundation are shown in Table 4-13. The ranking shown in the table represents the likelihood of hazardous conditions existing below the dams during a worst case, maximum outlet release scenario. Dams are ranked as high, moderate, or low likelihood for outlet releases to cause conditions that could require an emergency response to reduce potential downstream consequences. The ranking is based on a statewide database of high hazard dams that includes 441 high hazard dams that have been analyzed by the Colorado DNR for this aspect of dam incident flooding. The high, moderate, or low designations were assigned by DNR by dividing the total number of ranked dams across the state into thirds. Should there be a need to relieve pressure on the dam (e.g. if there was excess inflow from high rains or snowmelt) releases from the dams ranked as high or moderate may result in downstream flooding.

Table 4-13 Dam with Risk of Non-Failure Inundation

Dam ID	Dam Name	Outlet Description	Max Outlet Release Capacity (cfs)	Ranking	Outlet Release Hazard Rating
090112	Bear Creek	7 FT X 10.5 FT*	2,000	3	High
070302	Blunn	48" RCP	420	6	High
080324	Chatfield	2-10' X 15.5' *	8,300	4	High
800102	Cheesman	78" steel + upper level tunnel	2,382	137	High
090111	Evergreen	12" steel pipe	425	30	High
090240	Genesee No. 2	DIP with multi-level intake	22	119	High
070209	Leyden	36" CIP	193	23	High
070214	Magic Mountain #1	30" CMP w/ 24-INCH HDPE LINING	67	123	High
070219	Maple Grove	30" STEEL	102	2	High
070224	Ralston	60" STEEL	650	8	High
020326	Standley Lake	new outlet constructed 2004, 2 - 72" dia steel intake pipes, 102" tunnel along toe	700	7	High
080401	Strontia Springs	2-48", 2-18", 2-*	4,000	59	High
020633	Woman Creek	30" STEEL & RCP	75	62	High
090104	Bergen East	12" CIP	45	157	Moderate
020635	Fortune	30 inch steel pipe encased in concrete	107	189	Moderate
020226	Ketner	12" CMP w/ insituform liner	6	210	Moderate
090208	Morrison Raw Water	8" D.I.P.	4	207	Moderate
090131	Polly A. Deane	18" RCP	25	216	Moderate
075311	Smith	12" CIP; installed in 1940	12	228	Moderate
070232	Tucker Lake - South Dam	2- 15" RCP	34	246	Moderate
800116	Wellington	6'W X 8'H rock tunnel	162	161	Moderate
075309	East	18" RCP	22	280	Low
070312	Fairmount Reservoir	24" DIP	30	309	Low
090115	Harriman	37" Steel	63	323	Low

Dam ID	Dam Name	Outlet Description	Max Outlet Release Capacity (cfs)	Ranking	Outlet Release Hazard Rating
070136	Hyatt	8"&10" PVC, sliplined old pipes	18	296	Low
070104	Lookout Mountain	2-8" DIP	5	343	Low
070115	Lower Long Lake	12" CIP	18	341	Low
075310	Main	20" CIP	32	284	Low
070320	Tucker Lake - North Dam	12" RCP	0	348	Low
070114	Upper Long Lake	18" CIP	61	367	Low
090204	Willow Springs #1	6" steel	2	358	Low

Source: State of Colorado Department of Natural Resources, Dam Safety

Previous Occurrences

While there are numerous dams in and around Jefferson County, there have only been thirteen incidents reported to the National Performance of Dams database, three of which were failures. Those incidents are recorded in Table 4-14. Specifics related to these dam failures are not available, but a brief profile of the anticipated impacts for dam failures for the high hazard dams, based on the contents of the dam emergency action plans (EAP) is discussed.

Table 4-14 Jefferson County Dam Failures and Incidents

Date	Dam Name	Waterway	Nearest Town	Dam Hazard Potential	Event	Failure?
1952	Clear Lake ¹	Clear Creek	Georgetown	Significant	Inflow flood-hydrologic event	Yes
1974	Oberon Lake No. 1	Ralston Creek	Arvada	Significant	Inflow flood-hydrologic event	Yes
February 1979	Maple Grove	Lena Gulch	Lakewood, Wheat Ridge	High	Vandalism	Yes
January 1993	Standley Lake	Big Dry Creek	Westminster	High	Reservoir-Wind Waves	No
April 1998	Fairmount	Clear Creek	Wheat Ridge	High	Reservoir Incident	No
June 5, 2013	Montgomery ²	Middle Fork S. Platte	Unincorporated County	High	Seepage/Internal Erosion	No
Sept. 12, 2013	Chase Gulch ²	S. Platte	Golden	High	Seepage/Internal Erosion	No
Sept. 12, 2013	Leyden	Chase Gulch	Arvada	High	Hydrologic/flooding	No
Sept. 13, 2013	Tucker Lake – South Dam	S. Platte River	Arvada	High	Hydrologic/flooding – High Reservoir Level	No
May 22, 2015	Strontia Springs	S. Platte River	Littleton	High	High Reservoir Level	No
June 16, 2015	Eleven Mile Canyon ²	S. Platte	Unincorporated County	High	Hydrologic/flooding – High Reservoir Level	No
June 17, 2015	Cheesman	S. Platte River	Unincorporated County	High	Hydrologic/flooding – High Reservoir Level	No

Date	Dam Name	Waterway	Nearest Town	Dam Hazard Potential	Event	Failure?
June 22, 2017	Jefferson Lake ²	Jefferson Creek	Unincorporated County	High	Seepage/Internal Erosion – Excessive/increased Seepage	No

Source: National Performance of Dams database, Stanford University and Association of State Dam Safety Officials Dam Incident Database ¹This dam is located in Clear Creek County, but the dam failure affected the City of Golden in Jefferson County

² These dams are located outside of Jefferson County but have the potential to impact the County.

2013 Flooding Event: In September 2013, Jefferson County and the entire Front Range experienced heavy rainfall over an eight-day period from the 11th to the 18th. The rainfall caused many dam spillways to flow in Jefferson County and the surrounding area. The dam spillway overflows mitigated structural damage to the dam but was cause for concern for some downstream communities not used to seeing spillways full of water. There was also concern that spillway flows and outlet discharges could cause flooding downstream. Per a CBS Denver report, residents living near Leyden Dam in Arvada were voluntarily evacuated on September 12th, 2013. While there was no fear of the dam failure, concern was centered around excess runoff from the spillway creating dangerous flooding on roadways. The event caused damage to Indiana Street that caused the road to be closed for several weeks for repairs. According to the Urban Drainage and Flood Control District “*A September to Remember*” document the flooding exposed an 18-inch water main encased in a 36-inch concrete pipe, overtopped the upstream embankment of the Croke Canal, and resulted in shallow flooding of several homes and businesses along Leyden Creek. The document also suggests that dam improvements in 2001 likely averted a catastrophic dam failure, which would have caused severe property damage and likely cost lives.

Ralston Reservoir is owned by Denver Water and is a water supply reservoir on Ralston Creek west of Arvada. Because it has no flood storage it released water over its emergency spillway on September 12, 2013, causing significant erosion on a steep hillside near Highway 93. The spillway discharge added to the downstream watershed contribution, causing substantial channel and erosion damage before reaching Arvada/Blunn Reservoir.

For the most part, communities in Jefferson County had seen substantial investment in dam improvements prior to the 2013 floods, which paid off when the storm and its impacts arrived. Pat Dougherty, Arvada City Engineer was quoted in “*A September to Remember*” as saying “the story is that there is no story, because the story is what we did over the years to prevent flood damages.” Bear Creek Reservoir was constructed to protect Lakewood and Denver from flooding. A significant amount of water was impounded during 2013 and 2015 flood events. While this caused some damage to the City of Lakewood’s park facilities it likely prevented flood damage to residents and businesses downstream.

Non-jurisdictional dams or impoundments did not fare so well. These are low hazard dams that are not inspected by the State Engineer. At least two of these structures breached, both located west of Highway 93 near Leyden. One of these created severe erosion that was visible from the highway.

Probability of Future Occurrences

There have been 13 dam incidents in Jefferson County since 1890. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a dam failure occurring in any given year is 6%. This corresponds to a probability of future occurrences rating of **occasional**.

Magnitude and Severity

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. There is no event of record for Jefferson County with a sufficiently detailed profile that allows for a specific discussion on the severity and magnitude of such an event. However, the rating systems utilized in dam classification is a useful measurement for assessing the

potential magnitude and severity of a dam failure. In addition, all high-hazard dams in Colorado are required to have Emergency Action Plans (EAPs) that include predicted inundation maps for dam failure scenarios. These tools allow planners to measure the estimated worst-case or event-of-record occurrences for a dam failure.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property located in the inundation area (downstream). The largest four dams in terms of maximum storage are the Cheesman (79,064), Standley Lake (43,344), Chatfield (26,600), and the Ralston Dams (10,749). Chatfield and Cheesman Dams both are located on the South Platte River and a failure to either could be catastrophic for Jefferson County. A failure of the Chatfield Dam would impact the City of Littleton but would also affect unincorporated areas of the County. Unincorporated areas of the County, specifically Deckers, would also be impacted if Cheesman Dam were to fail. Failure of the Standley Lake Dam would affect Westminster and the Ralston Dam would have the greatest impact on the City of Arvada if it were to fail.

Police stations, fire stations, or health care facilities are located directly in the inundation areas, they would be indirectly impacted by the event, which would not only overwhelm local emergency response capabilities (who would be entirely consumed in the evacuation process and require additional assistance from neighboring counties to assist in both the evacuation and routine calls), but hinder response activities through the direct impacts on roads, bridges and railways.

Potential injuries caused by a failure are considered numerous and severe, and the high-hazard rating placed on the dam indicates that human fatalities are anticipated during a failure. The medical response of the County would be severely impacted or overwhelmed, though nearby jurisdictions are anticipated to help. However, the dam break would also impact Denver, Adams, and Weld Counties directly, which would stretch support resources even thinner. Based on these factors, the magnitude severity ratings for dam failure are considered **critical** and perhaps even **catastrophic**.

Climate Change Considerations

The potential for climate change to affect the likelihood of dam failure has been incorporated into the 2020 Rules and Regulations for Dam Safety and Dam Construction. The climate-change related Rule is based on a state-of-the-practice regional extreme precipitation study completed in 2018 (DWR, 2018). This study determined a very high likelihood of temperature increases, resulting in increased moisture availability to extreme storms. As such, an atmospheric moisture factor of 7% is required to be added to estimates of extreme rainfall for spillway design.

Vulnerability Analysis

The impacts of a dam failure to existing development in Jefferson County could be catastrophic. Specific inundation maps and risk information are included in the dam-specific emergency action plans housed the Jefferson County Office of Emergency Management. The estimated impacts to property within the County and its municipalities from a dam failure are discussed in this vulnerability analysis. However, dam failures would potentially result in a much greater loss of life and more extensive destruction to property and infrastructure due to the potential speed of onset; greater depth, extent, and velocity of flooding; and the wider damage areas caused by the ability of dam failures to flood areas outside of mapped floodplains. For reference, high hazard dams threaten lives and property, significant hazard dams threaten property only.

In general, communities located below a dam and along a waterway are likely to be exposed to the impacts of a dam failure. The reservoirs located in the foothills and Rocky Mountains have the greatest potential impacts; this includes reservoirs located in the planning area, and reservoirs that may be located outside and upstream of the planning area but could still have impacts in Jefferson County. The dams within the planning area include the large reservoirs of Arvada, Ralston, and Standley Lake. Bear Creek Dam is primarily a flood control dam. Antero, Chatfield, Cheesman, Eleven Mile, Strontia Springs, Marston Lake, and Spinney Lake are mostly outside of the planning area on the South Platte River. The South Platte River is also the southeast border of Jefferson County. Impacts in the South Platte River Canyon could be severe if any of these dams failed, but fortunately most of this area is sparsely developed. The impacts of any of these dam failures would be great in the Denver Metropolitan Area, but

this would mostly be outside of Jefferson County. Jefferson County's first responders would likely be heavily involved in mutual aid assistance should an event occur.

The portions of the planning area exposed to significant impacts by a dam failure are numerous. Within the planning area (the County limits) there are 30 high hazard and 11 significant hazard dams. The jurisdictions and the number of dams upstream of them are listed in Table 4-15 and Figure 4-8; dam locations are shown in the maps in the hazard profile earlier in this section. The table notes the first jurisdiction to be impacted by dams. Note that the dams that threaten communities such as Golden in the Clear Creek watershed may also impact Wheat Ridge or other parts of the unincorporated areas.

There are numerous dams outside the county limits whose failure could have impacts inside the county. An analysis of all the watersheds that drain into Jefferson County revealed that there is one high hazard dam and one significant hazard dam whose failure could have impacts in unincorporated Jefferson County.

Table 4-15 Summary of High and Significant Hazard Dams Inside Jefferson County

First Downstream Area At-Risk	# of High Hazard Dams Upstream	# of Significant Hazard Dams Upstream
Arvada	8	1
Bow Mar	0	1
Golden	1	0
Lakewood	7	5
Littleton	2	2
Morrison	2	0
Pleasant View	1	0
Unincorporated Jefferson County	4	2
Westminster	4	0
Wheat Ridge	1	0
Total	30	11

Source: Jefferson County, National Inventory of Dams, NHD

General Property

Losses from a dam failure vary based on the dam, cause of failure, warning time for impacted communities, and time of day. Potential property loss estimates are in the billions, along with multiple anticipated deaths and injuries. Inundation maps that identify anticipated flooded areas (which may not coincide with known floodplains) are produced for all high hazard dams and are contained in the Emergency Action Plan (EAP) required for each dam. However, the information contained in those plans is considered sensitive and is not widely distributed. Therefore, structures and potential loss estimates in the county are based on approximate estimates for some of the dams present countywide and are provided in Table 4-16 and Table 4-17.

The total properties at risk and their improvements were found by counting the number of parcels intersecting with the dam inundation extents available and summing those improvement values.

Table 4-16 Dam Inundation Risk to Properties and Population by Jurisdiction

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Arvada	6,921	7,427	\$2,576,108,097	\$1,563,274,479	\$4,139,382,576	16,194

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Golden	522	572	\$338,765,969	\$237,380,701	\$576,146,670	883
Lakewood	5,120	5,473	\$1,595,152,222	\$834,074,380	\$2,429,226,602	11,461
Morrison	6	6	\$1,851,531	\$1,031,533	\$2,883,064	10
Wheat Ridge	2,373	3,072	\$786,308,504	\$523,827,235	\$1,310,135,739	4,418
Unincorporated	3,083	3,283	\$1,246,893,571	\$779,693,472	\$2,026,587,043	7,387
Total	18,025	19,833	\$6,545,079,894	\$3,939,281,799	\$10,484,361,693	40,354

Source: Jefferson County Assessor, National Inventory of Dams, NHD

Based on the above results, Arvada has over 6,000 parcels potentially exposed to dam inundation hazards, followed by Lakewood (5,120 parcels exposed), Wheat Ridge (2,373 parcels exposed) and the unincorporated areas of the county (3,083 parcels). Further analysis shows Wheat Ridge has the greatest total percentage (21%) of parcels at risk to inundation, followed by Arvada (16%) and Lakewood (10%), refer to Table 4-17.

Table 4-17 summarizes parcels at risk by property type and jurisdiction. The table below indicates that Residential properties are at highest risk based on their total counts and total values, followed by Commercial, Exempt, Industrial and Mixed Use parcels. The estimated total value exposed to the available dam inundation layers amount to over \$10 billion based on the available data, which again may be limited in detail and extent.

Table 4-17 Dam Inundation Effects on Parcels – Estimates by Parcel Type

Jurisdiction	Property Type	Improved Parcels	Building Parcels	Improved Value	Content Value	Total Value	% of Parcels at Risk
Arvada	Agriculture	3	3	\$265,224	\$265,224	\$530,448	
	Commercial	174	238	\$191,228,879	\$191,228,879	\$382,457,758	
	Exempt	23	26	\$35,076,293	\$35,076,293	\$70,152,586	
	Industrial	135	174	\$140,155,569	\$210,233,354	\$350,388,923	
	Mixed Use	56	75	\$43,559,327	\$43,559,327	\$87,118,654	
	Residential	6,530	6,911	\$2,165,822,805	\$1,082,911,403	\$3,248,734,208	
	Total	6,921	7,427	\$2,576,108,097	\$1,563,274,479	\$4,139,382,576	16%
Golden	Commercial	65	92	\$68,831,101	\$68,831,101	\$137,662,202	
	Exempt	12	13	\$42,696,376	\$42,696,376	\$85,392,752	
	Industrial	3	3	\$3,441,445	\$5,162,168	\$8,603,613	
	Mixed Use	48	54	\$17,585,066	\$17,585,066	\$35,170,132	
	Residential	394	410	\$206,211,981	\$103,105,991	\$309,317,972	
	Total	522	572	\$338,765,969	\$237,380,701	\$576,146,670	9%
Lakewood	Agriculture	1	1	\$46,378	\$46,378	\$92,756	
	Commercial	56	149	\$32,534,002	\$32,534,002	\$65,068,004	
	Exempt	8	13	\$32,249,867	\$32,249,867	\$64,499,734	
	Industrial	1	3	\$1,087,099	\$1,630,649	\$2,717,748	
	Mixed Use	5	6	\$5,992,092	\$5,992,092	\$11,984,184	
	Residential	5,049	5,301	\$1,523,242,784	\$761,621,392	\$2,284,864,176	
	Total	5,120	5,473	\$1,595,152,222	\$834,074,380	\$2,429,226,602	10%
Morrison	Commercial	1	1	\$211,534	\$211,534	\$423,068	
	Residential	5	5	\$1,639,997	\$819,999	\$2,459,996	

Jurisdiction	Property Type	Improved Parcels	Building Parcels	Improved Value	Content Value	Total Value	% of Parcels at Risk
	Total	6	6	\$1,851,531	\$1,031,533	\$2,883,064	4%
Wheat Ridge	Agriculture	1	1	\$11,380	\$11,380	\$22,760	
	Commercial	107	159	\$90,654,979	\$90,654,979	\$181,309,958	
	Exempt	18	22	\$8,220,916	\$8,220,916	\$16,441,832	
	Industrial	150	197	\$78,103,977	\$117,155,966	\$195,259,943	
	Mixed Use	13	14	\$6,250,736	\$6,250,736	\$12,501,472	
	Residential	2,084	2,679	\$603,066,516	\$301,533,258	\$904,599,774	
	Total	2,373	3,072	\$786,308,504	\$523,827,235	\$1,310,135,739	21%
Unincorporated	Agriculture	2	2	\$249,352	\$249,352	\$498,704	
	Commercial	54	79	\$162,511,303	\$162,511,303	\$325,022,606	
	Exempt	14	17	\$19,518,307	\$19,518,307	\$39,036,614	
	Industrial	88	171	\$61,105,441	\$91,658,162	\$152,763,603	
	Mixed Use	28	30	\$8,003,529	\$8,003,529	\$16,007,058	
	Residential	2,897	2,984	\$995,505,639	\$497,752,820	\$1,493,258,459	
	Total	3,083	3,283	\$1,246,893,571	\$779,693,472	\$2,026,587,043	4%
Grand Total		18,025	19,833	\$6,545,079,894	\$3,939,281,799	\$10,484,361,693	9%

Source: Jefferson County Assessor, National Inventory of Dams, NHD

Each dam owner is responsible for having an EAP and inundation map for their facility. These documents are regularly updated and shared with Jefferson County Emergency Management and other governmental entities that have a direct role in emergency response. Emergency Management and response entities use the EAPs and inundation maps when developing response plans. Questions should be directed to the Emergency Management Department or the facility owner.

People

Persons located downstream of a dam are at risk of a dam failure, though the level of risk can be tempered by topography, amount of water or material in the reservoir/dam/structure, and time of day of the breach. Injuries and fatalities can occur from debris, drowning, or release of sludge or other hazardous material. People in the inundation area may need to be evacuated, cared for, and possibly permanently relocated. Impacts could include hundreds of evacuations and possibly casualties, depending on the dam involved. Specific population impacts are noted in Table 4-16; total people at risk were calculated by multiplying the average number of persons per household in Jefferson County based on Census estimates times the number of properties where the dam inundation extents were available. An estimated total of 40,354 people could be at risk countywide based on the rough estimation used, though again it is unlikely that all the parcels or properties found to overlap with dam inundation extents will be populated by the total persons estimated or actually affected by a dam failure event simultaneously. This estimate does not account for non-resident or visitor population.

Low head dams pose a risk to even the most experienced recreational users of rivers due to the difficulty to detect the dams when approaching from upstream and risk of becoming trapped in the low head dams recirculating currents. According to the Colorado Department of Natural Resources, Dam Safety Division, in recent years Colorado has experienced 1 fatality annually and there have been a total of 13 fatal incidents recorded since 1986 (Zimmer 2019). The Dam Safety Division, Low Head Dam Inventory Final Report (October 2019), notes an increase of low head dam incidents in the state directly correlated to increased recreational water usage by out-of-state tourists, new residents, and long-term residents (Zimmer 2019). As the population increases in Colorado and in Jefferson County there is the potential for increased fatalities from low head dams.

Critical Facilities and Infrastructure

A total dam failure can cause catastrophic impacts to areas downstream of the water body, including critical infrastructure. Any critical asset located under the dam in an inundation area would be susceptible to the impacts of a dam failure. Of particular risk would be roads and bridges that could be vulnerable to washouts, further complicating response and recovery by cutting off impacted areas. Based on the critical facility inventory considered in the updating of this plan and intersected with the dam inundation extents available, 316 critical facilities were found to be at risk. These at-risk facilities are listed in the tables below by jurisdiction and critical facility classification as based on the FEMA Lifeline categories (FEMA Community Lifelines, 2019).

Table 4-18 Dam Inundation Effects on Critical Facilities – Estimates by FEMA Lifeline

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	62
	Microwave Service Towers	21
	Paging Transmission	1
	Total	84
Energy	Electric Substation	3
	Power Plant	3
	Total	6
Food, Water, Shelter	Wastewater Plant	2
	Water Facility	2
	Total	4
Hazardous Material	RMP Facility	1
	Tier II	30
	Total	31
Health and Medical	Nursing Home	15
	Total	15
Safety and Security	EOC	2
	Fire Station	5
	Government Facility	4
	Law Enforcement	3
	School	16
	Total	30
Transportation	Bridge	146
	Total	146
Grand Total		316

Source: National Inventory of Dams, HIFLD, CERC

Economy

Extensive and long-lasting economic impacts could result from a major dam failure or inundation event, including the long-term loss of water in a reservoir, which may be critical for potable water needs, agriculture, or local wildlife. A major dam failure and loss of water from a key structure could bring about direct business and industry damages and potential indirect disruption of the local economy, and potentially affect important transportation routes enabling business and tourism into the county.

Historical, Cultural, and Natural Resources

Dam or reservoir failure effects on the environment would be similar to those caused by flooding from other causes. Water could erode stream channels and topsoil and cover the environment with debris. For the most part the environment is resilient and would be able to rebound from whatever damages occurred, though this process could take years. However, historic and cultural resources could be affected just as housing or critical infrastructures would, were a dam to fail and cause downstream inundation that could further erode surfaces or cause scouring of structural foundations.

Future Development

An analysis of the Year Built field in County Assessor's Office data shows that from 2015 through 2020, 784 new structures have been built in dam inundation areas. While not a large number compared to the total structures at risk described above, it does show that new development is continuing in areas potentially at risk of dam related flooding.

It is important that the County and municipalities keep the dam failure hazard in mind when permitting new development, particularly downstream of the high and significant hazard dams present in the County. New residential development is occurring in western Arvada in the vicinity of Indiana and County Road 19, west of Standley Lake and below Welton reservoir. This development increases the number of properties, population, and infrastructure vulnerable to a dam failure, and may even change the ratings of upstream dams.

There are currently 72 low hazard dams within the County boundaries. These could become significant or high hazard dams if development occurs below them and the consequences of failure increase. Regular inspection and monitoring of dams, exercising and updating of EAPs, and rapid response to problems when detected at dams are ways to mitigate the potential impacts of these rare but potentially catastrophic events.

Overall Hazard Significance

Dam failures in Jefferson County have a large potential impact on the planning area. The geographic extent of the hazard is considered **significant**. The probability of future occurrences is considered **occasional** and the magnitude/severity for the event of record is **critical** or even **catastrophic**. The HMPC considers the hazard to have a **medium** overall impact rating on the County. This corresponds to the available data drawn from known occurrences; however, the potential record of event equates to an overall impact rating of **high**.

An event that would cause all dams in the planning area to fail is extremely unlikely. However, events which may impact the structural integrity of dams, such as earthquakes, may also be region-wide and therefore it is important to assess the planning-area wide impact of all dams, not just incident-specific occurrences. Furthermore, the failure of any high-hazard dam in the planning area is considered an event of critical magnitude and severity, and therefore, despite having a more limited geographic extent, is still a significant planning consideration.

4.3.4 Drought

Description

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving many factors, but in general terms it occurs when a normal amount of moisture is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological** drought is usually defined by a period of below average water supply.
- **Agricultural** drought occurs when there is an inadequate water supply to meet the needs of the area's crops and other agricultural operations such as livestock.
- **Hydrological** drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as stream flow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic** drought occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

With its semiarid conditions, drought is a natural part of the Colorado climate cycle. Due to natural variations in climate and precipitation sources, it is rare for all of Colorado to be deficient in moisture at the same time. However, single season droughts over some portion of the state are quite common. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users that have a different water supply. Individual water suppliers may use criteria, such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler, to define their water supply conditions. Drought is further compounded by the complexity of water rights throughout the Western U.S.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in Colorado are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and wildlife preservation. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flash flooding and erosion. A drought may also increase the speed at which dead and fallen trees dry out and become particularly dangerous as fuel sources in wildfires. Drought may also weaken trees in areas already affected by mountain pine beetle infestations, causing more extensive damage to trees and increasing wildfire risks. An ongoing drought which severely inhibits natural plant growth cycles may increase the susceptibility of the area to wildfire for a period of time. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

Geographic Extent

Droughts are regional events, sometimes impacting multiple states simultaneously. Therefore, as the climate of the planning region is fairly continuous, it is reasonable to assume that a drought will impact the entire planning region simultaneously. Based on this information, the geographic extent rating for drought is **extensive**.

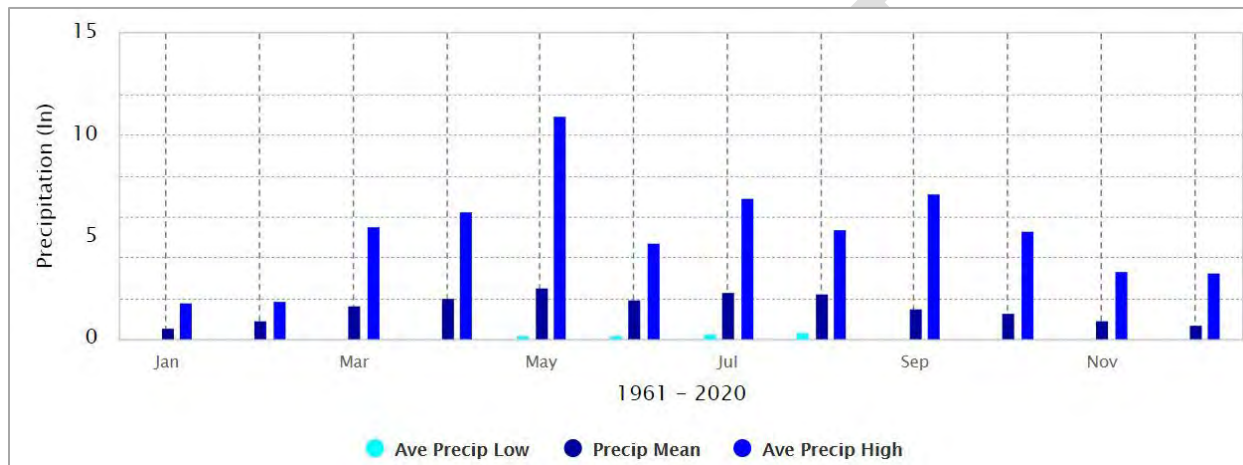
The Southwest Climate and Environmental Information Collaborative (SCENIC) reports precipitation data from weather stations in and around Jefferson County. The data reported here are from two of the stations: Lakewood and Evergreen. Table 4-19 contains precipitation summaries for the two stations, and Figure 4-9 through Figure 4-10 show monthly average total precipitation. These summaries include rainfall only. Drought in Colorado and Jefferson County is largely contingent upon winter snowpack, which is discussed in Section 4.2.13 Severe Winter Storms.

Table 4-19 Jefferson County Precipitation Summaries

Station	Average Annual Precipitation	Month with Most Precipitation/Average Precipitation	Highest Monthly Precipitation	Highest Annual Precipitation	Lowest Annual Precipitation
Evergreen (052790) ²	18.88	May/2.55	10.94/May 1969	17.87/1992	12.55/1968
Lakewood (054762) ³	16.67	May/2.55	6.87/Sept. 1976	19.66/1984	9.71/1968

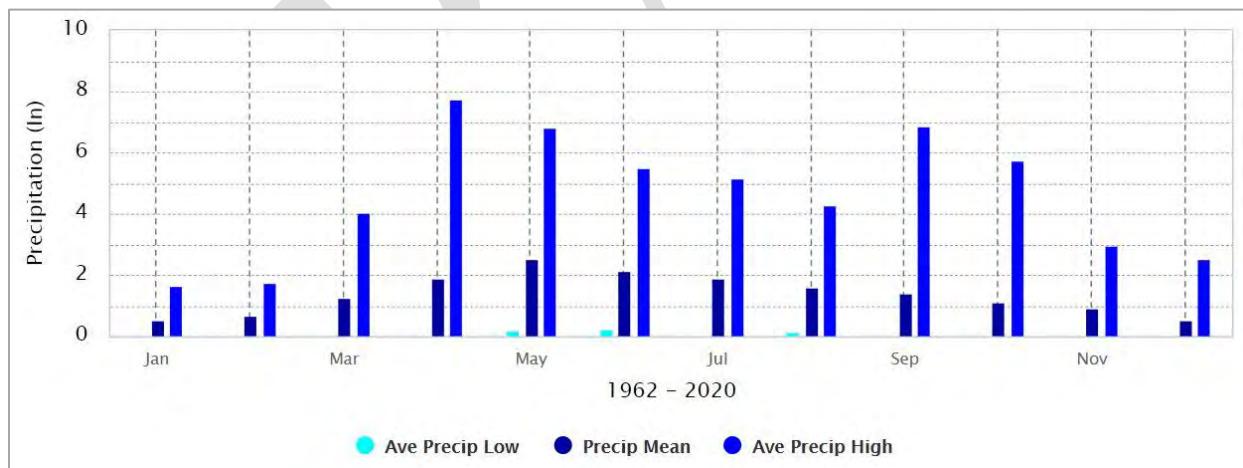
Source: SCENIC ¹All totals are reported inches; ²Period of Record: 1961-2020 ³Period of Record: 1962-2020

Figure 4-9 Evergreen Station (052790) Average Monthly Precipitation (In)



Source: SCENIC

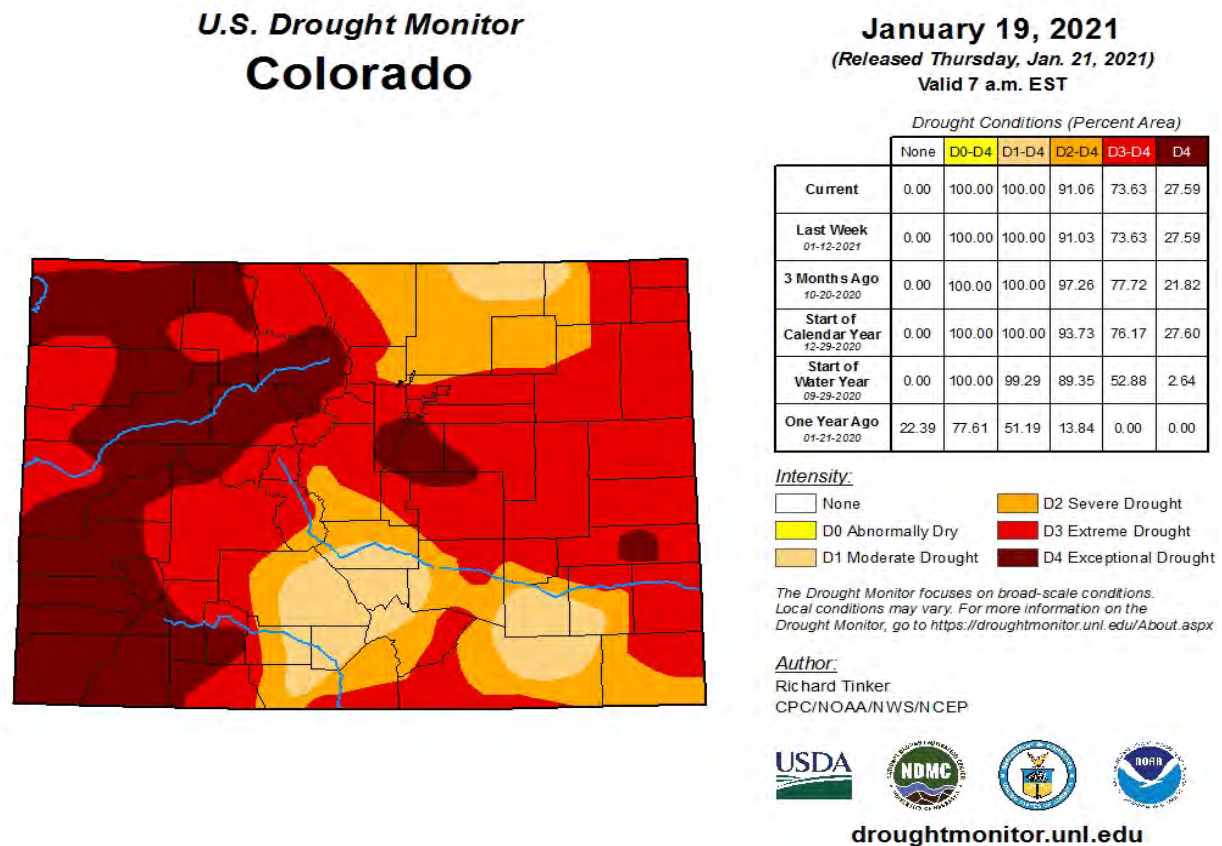
Figure 4-10 Lakewood Station (05472) Average Monthly Precipitation (In)



Source: SCENIC

Figure 4-11 shows the U.S. Drought Monitor for Colorado as of January 21, 2021, illustrating the regional nature of drought.

Figure 4-11 U.S. Drought Monitor, As of January 21, 2021



Previous Occurrences

Colorado has experienced multiple severe droughts over the years. The most significant of the instrumented period (which began in the late 1800s) are listed in Table 4-20. Although drought conditions can vary across the state, it is likely that Jefferson County was affected by most of these dry periods.

Table 4-20 Historical Dry and Wet Periods in Colorado

Date	Dry	Wet	Duration (years)
1893-1905	X		12
1905-1931		X	26
1931-1941	X		10
1941-1951		X	10
1951-1957	X		6
1957-1959		X	2
1963-1965	X		2
1965-1975		X	10
1975-1978	X		3
1979-1999*		X	20
2000-2006*	X		6
2007-2010		X	3

Date	Dry	Wet	Duration (years)
2011-2013	X		2
2018	X		1

Source: Source: McKee, et al. *Modified for the Colorado State Drought Plan in 2010 and Jefferson County Mitigation Plan 2021 based on input from the Colorado Climate Center and US Drought Monitor.

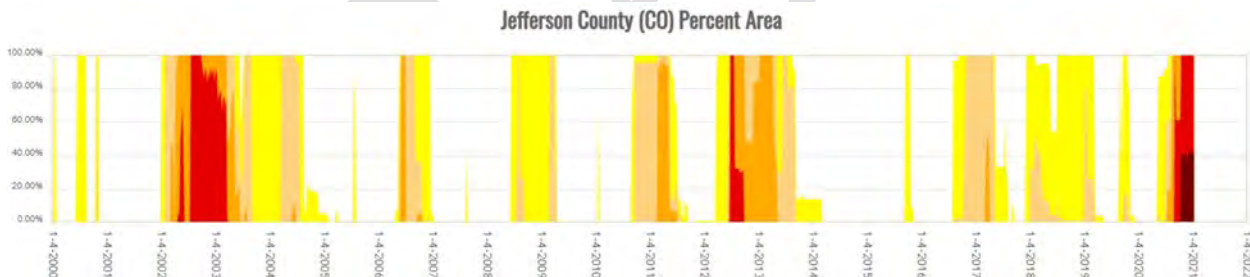
Drought is a regular and widespread occurrence in the State of Colorado. According to the U.S. Drought Monitor records for Jefferson County, in the 1,096-week period from 2000 through January 4, 2021, the county spent 645 weeks (60% of the time) in some level of drought, defined as Abnormally Dry (D0) or worse conditions. Approximately 36% of the time, or 393 weeks, was spent in Moderate Drought (D1) or worse conditions. Weeks in drought are summarized in Table 4-21 and shown in time series in Figure 4-12.

Table 4-21 Jefferson County Weeks in Drought by Intensity, 2000-Jan. 4, 2021

Category	Description	Palmer Drought Severity Index (PDSI)	Standardized Precipitation Index (SPI)	Jefferson County Weeks in Drought, 2000-Jan. 4, 2021
D0	Abnormally Dry	-1.0 to -1.9	-0.5 to -0.7	645
D1	Moderate Drought	-2.0 to -2.9	-0.8 to -1.2	393
D2	Severe Drought	-3.0 to -3.9	-1.3 to -1.5	194
D3	Extreme Drought	-4.0 to -4.9	-1.6 to -1.9	74
D4	Exceptional Drought	-5.0 or less	-2.0 or less	11

Source: U.S. Drought Monitor

Figure 4-12 Jefferson County Drought Intensity, 2000-Jan. 4, 2021



Source: U.S. Drought Monitor

Since 2012 there have been 8 drought declarations issued by the USDA's Secretary of Agriculture in Jefferson County, 7 of which were Fast Track Secretarial disaster designations (see Table 4-2 in Section 4.1.4). According to the Secretary of Agriculture, a Fast Track designation is for a severe drought and provides an automatic designation when, during the growing season, any portion of the county meets the severe drought intensity value for eight consecutive weeks or more.

April 2002: Statewide drought event. April, normally the third snowiest month of the year, ended up being the third driest April on record for Denver. Only a trace of snow was recorded for the month with .23 inches liquid precipitation. The snowpack in the North Platte River Basin was only 44 percent of normal by the end of the month. The snowpack was much lower across some of the other Colorado river basins. The very dry conditions prompted the Governor to request a statewide emergency drought declaration from the U.S. Agricultural Secretary, making farmers and ranchers eligible for federal assistance.

June 2002: Ongoing drought conditions, hot temperature, low relative humidity and strong winds caused the Hayman Fire to grow into, at the time, the largest wildfire in state's history. Located in the foothills

southwest of Denver the wildfire consumed a total of 137,760 acres of forest land, approximately 95,000 acres was burned in Park, Jefferson and Douglas Counties.

March 2011: The month of March 2011 was the eighth least snowiest March on record with 2.9 inches of snowfall at Denver International Airport. The seasonal snowfall of 20.6 inches, measured between July 1, 2010 and March 31, 2011 made it the third least snowiest season to date. The combination of above normal temperatures, windy conditions and sparse precipitation resulted in very dry conditions along the Front Range Foothills, Urban Corridor and Northeast Plains. Over two dozen wildfires occurred throughout the region in March alone. The Indian Gulch Wildfire occurred just west of Golden, between Clear Creek and Golden Gate Canyons from March 20-25th. Strong winds coupled with very rugged terrain hampered firefighting efforts and allowed the wildfire to consume another 1570 acres.

2012 Drought: Even though 2011 was very wet across northern Colorado, the extreme drought during this time in Texas, New Mexico, and Oklahoma was also felt in the Rio Grande and Arkansas Basins in Colorado. This trend continued in those basins as 2012 began, but also increased in breadth across the rest of Colorado. Based on the U.S. Drought Monitor, approximately 50% of Colorado was already under drought conditions at the beginning of 2012. Drought conditions and a period of extremely hot temperatures in June 2012 contributed to very dry forests, contributing to the conditions that led to the High Park fire in northern Colorado and the Waldo Canyon fire near Colorado Springs, two of Colorado's most destructive wildfires. Drought conditions also exacerbated the Lower North Fork fire in Jefferson County in March of 2012. Reservoir levels in many portions of the State helped abate some of the drought impacts seen in 2011-2013. Had the reservoir levels not been at levels sufficient for carryover storage into 2012 (due to record breaking high snowpack in 2011) in many river basins, many of the impacts discussed above may have been worse.

2018-2021 Drought: According to the HMPC, drought that began in May 2018 and continuing into 2021 has caused inability to store snowmelt runoff on Beaver Brook due to junior water rights on Clear Creek. This has impacted the entire Lookout Mountain Water District although minimal revenue has been lost. The Water District considers a similar event is highly likely to occur in the future.

NOAA's National Centers for Environmental Information (NCEI) records 3 drought events between 1950 and 2020. Brief descriptions of each event are shown below, no damages or casualties were recorded for any of the events. Note, the June 9, 2002 and March 1, 2011 events were related to wildfire events which were both fueled by ongoing drought conditions.

Probability of Future Occurrences

According to information from the Colorado Drought Mitigation and Response Plan (2018), including recent drought conditions Colorado was in drought for 50 of the past 126 years (1893-2018). Thus, there is a 39.7% chance that a drought will happen in Colorado in any given year, and a drought can be expected somewhere in the state every 2.5 years. Similarly looking at the weekly U.S. Drought Monitor data cited above, Jefferson County was in moderate or worse drought conditions 36% of the time. Thus, the probability of drought conditions is **likely**.

Magnitude and Severity

The impacts drought can have on modern society are often underrated. Droughts cause obvious and severe impacts on agricultural areas by destroying existing crops and prolonging unsuitable growing conditions which hinders efforts to recover agricultural losses. This causes secondary financial impacts first on the farmers, who have no crops to sell, and then on the consumers, who must pay higher prices for scarce produce. Increased demand for a decreased water supply raises water costs, which also drives up the overall costs to both farm producers and consumers.

Urban areas are also impacted by rising water costs, which may impact personal property and personal water usage bills. Recreational uses which are water-dependent may increase significantly in price or decrease in availability, particularly those which are based in reservoirs or lakes, as the water levels may be too low to sustain safe recreation. Finally, the increased risk of wildfires impacts the planning region. While the hazard of fire itself is profiled separately, drought conditions increase the likelihood that wildfires will occur, either naturally or due to human causes.

To calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area, information from the event of record is used. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it reflects common occurrence. The event of record for Jefferson County occurred between 1999 and 2003. The event impacted the entire planning area, although the exact percent of directly-impacted property in the County is not available. Any damages inflicted on critical facilities and services (critical infrastructure) resulted in no loss or disruption of services. There were no directly attributable documented illnesses or injuries and the medical response capability of the County was not impacted. However, the drought seriously impacted water supply levels and water quality, and several severe wildfires, augmented by drought conditions, occurred in the planning area during this time. The impact on the costs of water resulted in significantly higher water billing rates, and some jurisdictions implemented water regulation measures which also extended beyond the drought period.

The U.S. Drought Monitor classifies droughts into different categories, from D0 (Abnormally Dry) to D4 (Exceptional Drought), as shown in Figure 4-13. Periods of dryness are classified in one of these categories as the drought's life cycle is tracked. The following table explains each of these categories.

Figure 4-13 U.S. Drought Monitor Drought Severity Classifications

Category	Description	Possible Impacts	Ranges				
			Palmer Drought Severity Index (PDSI)	CPC Soil Moisture Model (Percentiles)	USGS Weekly Streamflow (Percentiles)	Standardized Precipitation Index (SPI)	Objective Drought Indicator Blends (Percentiles)
D0	Abnormally Dry	- Going into drought: - short-term dryness slowing planting, growth of crops or pastures - Coming out of drought: - some lingering water deficits - pastures or crops not fully recovered	-1.0 to -1.9	21 to 30	21 to 30	-0.5 to -0.7	21 to 30
D1	Moderate Drought	- Some damage to crops, pastures - Streams, reservoirs, or wells low, some water shortages developing or imminent - Voluntary water-use restrictions requested	-2.0 to -2.9	11 to 20	11 to 20	-0.8 to -1.2	11 to 20
D2	Severe Drought	- Crop or pasture losses likely - Water shortages common - Water restrictions imposed	-3.0 to -3.9	6 to 10	6 to 10	-1.3 to -1.5	6 to 10
D3	Extreme Drought	- Major crop/pasture losses - Widespread water shortages or restrictions	-4.0 to -4.9	3 to 5	3 to 5	-1.6 to -1.9	3 to 5
D4	Exceptional Drought	- Exceptional and widespread crop/pasture losses - Shortages of water in reservoirs, streams, and wells creating water emergencies	-5.0 or less	0 to 2	0 to 2	-2.0 or less	0 to 2

Source: U.S. Drought Monitor

Drought impacts in Jefferson County can be wide-reaching: economic, environmental, and societal. The most significant impacts associated with drought are those related to water intensive activities such as wildfire protection, commerce, tourism/recreation, municipal usage, and wildlife preservation. Although the agricultural industry in the County is limited, it is expected to experience crop losses and livestock feeding expenses and deaths. Jefferson County will see an increase in dry fuels, beetle kill, associated wildfires, and some loss of tourism/recreation revenue. Water supply issues for municipal, industrial, and domestic needs will be a concern for the entire County. Lawn and tree impacts in suburban areas could result from water restrictions. Vulnerability increases with consecutive winters of below-average snowpack. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It also increases the wildfire hazard and even landslide hazard.

Based on these factors, the magnitude severity ratings for droughts are considered **critical**.

Climate Change Considerations

Climate change can have impacts both in terms of inter-annual droughts and intra-annual runoff patterns (State of Colorado Drought Mitigation and Response Plan Update, 2018). Temperatures increased and resulting changes in evaporation and soil moistures will also add to the trend of decreasing runoff in a majority of Colorado Basins. The following table shows the challenges water managers may face with the projected changes in climate.

Table 4-22 Future Drought Vulnerability Due to Climate Change and Challenges Faced by Colorado Water Managers

Challenge	Observed and/or Projected Change
Water demands for agriculture and outdoor watering	Increasing temperatures raise evapotranspiration by plants, lower soil moisture, alter growing seasons, and thus increase water demand.
Water supply infrastructure	Changes in snowpack, streamflow timing, and hydrograph evolution may affect reservoir operations including flood control and storage. Changes in the timing and magnitude of runoff may affect functioning of diversion, storage, and conveyance structures.
Legal water systems	Earlier runoff may complicate prior appropriation systems and interstate water compacts, affecting which rights holders receive water and operations plans for reservoirs
Water quality	Although other factors have a large impact, "water quality is sensitive both to increased water temperatures and changes in patterns of precipitation" (CCSP SAP 4.3, p. 149). For example, changes in the timing and hydrograph may affect sediment load and pollution, impacting human health.
Energy demand and operating costs	Warmer air temperatures may place higher demands on hydropower reservoirs for peaking power. Warmer lake and stream temperatures may affect water use by cooling power plants and other industries.
Mountain habitats	Increasing temperature and soil moisture changes may shift mountain habitats toward higher elevation.
Interplay among forests, hydrology, wildfires, and pests	Changes in air, water, and soil temperatures may affect the relationships between forests, surface and groundwater, wildfire, and insect pests. Water-stressed trees, for example, may be more vulnerable to pests.
Riparian habitats and fisheries	Stream temperatures are expected to increase as the climate warms, which could have direct and indirect effects on aquatic ecosystems (CCSP SAP 43.), including the spread of instream non-native species and diseases to higher elevation and the potential for nonnative plant species to invade riparian areas. Changes in streamflow intensity and timing may also affect riparian ecosystems.
Water – and snow – based recreation	Changes in reservoir storage affect lake and river recreation activities; changes in streamflow intensity and timing will continue to affect rafting directly and trout fishing indirectly. Changes in the character and timing of snowpack and the ratio of snowfall to rainfall will continue to influence winter recreational activities and tourism.
Groundwater resources	Changes in long-term precipitation and soil moisture can affect groundwater recharge rates; coupled with demand issues, this may mean greater pressure on groundwater resources.

Source: State of Colorado Drought Mitigation and Response Plan 2018, Reproduced from CWCB

Vulnerability Assessment

Based on Jefferson County's recent multi-year droughts and Colorado's drought history, it is evident that all of Jefferson County is vulnerable to drought. However, the impacts of future droughts will vary by region. The agricultural industry of the County, though limited, could experience hardships, including agricultural losses, and livestock feeding expenses and deaths. The County will see an increase in dry fuels, beetle kill, and associated wildfires and some loss of tourism/recreation revenue. Examples of

potential impacts to recreation include low water flows in the Golden Whitewater Park, fire bans and closures of campgrounds in the Pike National Forest, and water restrictions on golf courses.

The Colorado State Drought Mitigation Plan includes vulnerability to state owned buildings and critical infrastructure, state land board lands, state operated recreational activity, aquatic habitat and species, agriculture activities, protected environments, recreation, socioeconomics, and the municipal and industrial (M&I) sectors. Jefferson County generally ranked moderate in vulnerability across the sectors. The sector vulnerability scores for Jefferson County are shown in Table 4-23. A score of 3.0 or above means that sector is highly vulnerable to drought; Jefferson County doesn't reach the 3.0 score for any of the sectors.

Table 4-23 Jefferson County Drought Vulnerability Score by Sector

Sector	Score
Recreation	2.48
Energy	1.00
Agriculture	2.42
State Assets	2.59
Socioeconomic	2.0
Environment	2.27
Average Overall Vulnerability	2.13

Source: 2018 State of Colorado Drought Mitigation and Response Plan

The National Drought Mitigation Center (NDMC), located at the University of Nebraska in Lincoln, provides a clearinghouse for information on the effects of drought based on reports from media, observers, impact records, and other sources.

According to the NDMC's Drought Impact Reporter, during the 20-year period from 2000 through 2020, 924 drought impacts were recorded for the State of Colorado, of which 53 were reported to affect Jefferson County. Table 4-24 summarizes the number of impacts reported by category and the years impacts were reported for each category, where available. Note that the Drought Impact Reporter assigns multiple categories to each impact, so there is some duplication between categories.

Table 4-24 NDMC Drought Impact Reporter, 2000-2020

Impact Category	# of Impacts
Agriculture	8
Business & Industry	2
Fire	13
Plants & Wildlife	14
Relief, Response & Restrictions	20
Society & Public Health	6
Tourism & Recreation	4
Water Supply & Quality	16

Source: National Drought Mitigation Center Drought Impact Reporter (<https://droughtreporter.unl.edu/map/>)

General Property

Drought does not typically have a direct impact on buildings, although an increase in expanding or collapsing soils could affect building foundations. Developed areas may experience damages to landscaping if water use restrictions are put in place, however these losses are not considered significant.

People

The historical and potential impacts of drought on populations include agricultural and recreation/tourism sector job loss, secondary economic losses to local businesses and public recreational resources, increased cost to local and state government for large-scale water acquisition and delivery, and water rationing and water wells running dry for individuals and families. Other public health issues can include impaired drinking water quality, increased incidence of mosquito-borne illness, an increase in wildlife-human confrontations and respiratory complications as a result of declined air quality in times of drought.

Critical Facilities and Infrastructure

Water supply issues for municipal, industrial, and domestic needs will be a concern for the entire County during droughts. Water restrictions could lead to lawn and tree impacts in suburban areas. Much of Jefferson County's water comes from snow melt runoff in the high country of the western County that is captured in reservoir storage. Vulnerability increases with consecutive winters of below-average snowpack.

According to the State Drought Plan drought vulnerability within the Denver Metropolitan Area is relatively low when compared to other regions within the State. This is primarily attributed to the fact that Denver Water owns one of the most senior urban water rights portfolios along the Front Range. Denver Water has also taken additional drought mitigation actions since 2002 to further improve water supply reliability. Additional vulnerability and capability information on drought can be referenced in the Denver Water Annex.

Economy

Jefferson County's reliance on tourism and the recreation sector as the main economic base make it particularly vulnerable to the effects of drought. Wildlife viewing, hunting and fishing activities have been impacted in past drought events by lower production and requirement numbers and by animals moving away from traditional viewing and hunting areas due to lack of water, loss of vegetative cover, decreased streamflows, sedimentation and fish decline. Drought also has an impact on camping due to forced closures of campsites and surrounding forest due to wildfires and risk of wildfire and hazardous trees are all exacerbated by drought. Drought impacts on the County's natural environment and the cascading impacts to the recreation sector could lead to less people visiting and spending money in County which could have a negative impact on the entire local economy.

The Colorado Water Conservation Board (CWCB) maintains a Future Avoided Cost Explorer (FACE) tool, which estimates annual damages from drought. According to FACE analysis, Jefferson County could potentially experience an average annual loss of \$210,000 due to drought conditions under current population and climate scenarios.

Historic, Cultural, and Natural Resources

Severe, prolonged drought can have a negative impact on the natural environment. Wildlife and natural habitats can be affected, including the shrinkage of habitat, dwindling food supplies and the migration of wildlife to more palatable areas. Prolonged drought can cause poor soil quality and increased soil erosion. One of the prevailing impacts of drought to the natural environment is the increased risk of pest infestations and wildfires that burn larger and more intensely during dry conditions. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Future Development

Drought vulnerability will increase with future development as there will be increased demands for limited water resources. Future growth in the unincorporated areas will mean more wells and more demands on groundwater and surface water resources. Increased development also lends itself to the increased potential for impervious surface development, which reduces the amount of water absorbed into the ground from precipitation. State law (CRS 30-28-133(3)) requires that local governments "shall not approve an application for a development permit unless...the applicant has satisfactorily demonstrated that the proposed water supply will be adequate." The County implements this by requiring the Planning and Zoning Department to complete a Water Availability Analysis and Aquifer Test for all new

development. Section 21 Water Supply of the County's Land Development Regulations as well as policies in the Comprehensive Master Plan require new development to consider future water usage and water conservation. Refer to Section 2 Capabilities Assessment for further details on these water conservation and usage policies.

Lookout Mountain Water District noted that continuing residential development on Lookout Mountain has increased the need for more fire hydrants and better lateral pipelines to supply them water. Warming trends have increased the likelihood of early snowmelt runoff occurring before free river on Clear Creek, increasing the need for the District to acquire senior water rights on Clear Creek to enable Upper Beaver Brook reservoir to fill every year.

The Future Avoided Cost Explorer (FACE) developed by the Colorado Water Conservation Board (CWCB) provides an in-depth look at the potential economic impacts and expected annual damages from future flood, drought and wildfire events. The tool looks at three different climate scenarios (current climate conditions, 2050 future – moderately warmer climate and 2050 – severely warmer climate) as well as compares current population to low, medium and high growth population scenarios. The following table compares the estimated annual damages for Jefferson County due to drought events for each of the climate and population scenarios.

Table 4-25 Potential Future Economic Losses from Drought in Jefferson County

Climate Scenarios	Population Scenarios		
	Low Growth (~653,000)	Medium Growth (~695,000)	High Growth (~740,000)
Current Conditions	Total damages: \$950,000	Total damages: \$950,000	Total damages: \$1M
	Total damages per person: less than \$10	Total damages per person: less than \$10	Total damages per person: less than \$10
Moderately Warmer Climate by 2050	Total damages: \$1.4M	Total damages: \$1.5M	Total damages: \$1.5M
	Total damages per person: less than \$10	Total damages per person: less than \$10	Total damages per person: less than \$10
Severely Warmer Climate by 2050	Total damages: \$1.7M	Total damages: \$1.7M	Total damages: \$1.8M
	Total damages per person: less than \$10	Total damages per person: less than \$10	Total damages per person: less than \$10

Source: Colorado Water Conservation Board (CWCB) Future Avoided Cost Explorer: Hazards <https://cwcb.colorado.gov/FACE>

Overall Hazard Significance

Droughts in Jefferson County do have an impact on the planning area. While the impacts of the drought may be less severe than those inflicted on primarily agricultural counties, it is nevertheless a significant hazard to examine. As discussed earlier, the most profound impacts of drought on urbanized planning areas such as this are in the increased costs of water for general and recreational use and the heightened wildfire conditions. In fact, all of the drought periods recorded here culminated in a wildfire event, which is of particular concern for Jefferson County. The geographic extent of the hazard is considered **extensive**. The probability of future occurrences is considered **likely** and the magnitude/severity for the event of record is **critical**. This equates to an overall impact rating of **high**.

4.3.5 Earthquake

Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a Richter magnitude and is measured directly from the earthquake as recorded on seismographs. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface as felt by humans or resulting damage to structures and defined in the Modified Mercalli scale (see Table 4-26). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-26 Modified Mercalli Intensity (MMI) Scale

Magnitude	Mercalli Intensity	Effects	Frequency
Less than 2.0	I	Micro-earthquakes, not felt or rarely felt; recorded by seismographs.	Continual
2.0-2.9	I to II	Felt slightly by some people; damages to buildings.	Over 1M per year
3.0-3.9	II to IV	Often felt by people; rarely causes damage; shaking of indoor objects noticeable.	Over 100,000 per year
4.0-4.9	IV to VI	Noticeable shaking of indoor objects and rattling noises; felt by most people in the affected area; slightly felt outside; generally, no to minimal damage.	10K to 15K per year
5.0-5.9	VI to VIII	Can cause damage of varying severity to poorly constructed buildings; at most, none to slight damage to all other buildings. Felt by everyone.	1K to 1,500 per year
6.0-6.9	VII to X	Damage to a moderate number of well-built structures in populated areas; earthquake-resistant structures survive with slight to moderate damage; poorly designed structures receive moderate to severe damage; felt in wider areas; up to hundreds of miles/kilometers from the epicenter; strong to violent shaking in epicentral area.	100 to 150 per year
7.0-7.9	VIII<	Causes damage to most buildings, some to partially or completely collapse or receive severe damage; well-designed structures are likely to receive damage; felt across great distances with major damage mostly limited to 250 km from epicenter.	10 to 20 per year
8.0-8.9	VIII<	Major damage to buildings, structures likely to be destroyed; will cause moderate to heavy damage to sturdy or earthquake-resistant buildings; damaging in large areas; felt in extremely large regions.	One per year
9.0 and Greater	VIII<	At or near total destruction - severe damage or collapse to all buildings; heavy damage and shaking extends to distant locations; permanent changes in ground topography.	One per 10-50 years

Source: USGS. <http://earthquake.usgs.gov/learn/topics/mercalli.php>

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, communication, and transportation lines. Other damaging effects of earthquakes include surface rupture, fissuring, ground settlement, and permanent horizontal and vertical shifting of the ground. Secondary impacts can include landslides, seiches, liquefaction, fires, and dam failure. The combination of widespread primary and secondary affects from large earthquakes make this hazard potentially devastating.

Colorado's earthquake hazard is similar to other states in the intermountain west region. It is less than in states like California, Nevada, Washington, or Oregon, but greater than many states in the central and

eastern United States. There are many unknowns about the earthquake hazard in Colorado, but the potential for damaging earthquakes does exist.

Previous Occurrences

According to the U.S. Geological Survey (USGS), eastern Colorado is nearly aseismic, with just a few epicenters in the Arkansas and Platte river valleys. Most shocks in the history of Colorado have been centered west of the Rocky Mountain Front Range. The first seismographs in Colorado of sufficient quality to monitor earthquake activity were installed in 1962. Newspaper accounts are the primary source of published data for earthquake events before that time. Figure 4-14 illustrates historic earthquakes and Quaternary faults in Colorado.

More than 400 earthquake tremors of magnitude 2.5 or higher have been recorded in Colorado since 1867. More earthquakes of magnitude 2.5 to 3 probably occurred during that time, but were not recorded because of the sparse distribution of population and limited instrumental coverage in much of the state. For comparison, more than 20,500 similar-sized events have been recorded in California during the same period. Although many of Colorado's earthquakes occurred in mountainous regions of the state, some have been located east of the mountains. The best-known Colorado earthquakes were a series of events in the 1960s that were later shown to have been triggered by the injection of liquid waste into a deep borehole at the Rocky Mountain Arsenal northeast of Denver. These and other notable earthquakes affecting Jefferson County include:

November 7, 1882 - The first ever to cause damage at Denver, probably centered in the northern Front Range near Rocky Mountain National Park and is the largest historical earthquake in the state. The magnitude is estimated to be about 6.6 on the Richter scale. The quake was felt as far away as Salina, Kansas and Salt Lake City, Utah.

September 29, 1965 – A magnitude 4.7 earthquake epicentered near Arvada shook the northern metro area and cracked plaster and windows.

February 16, 1965 – A magnitude 4.6 located in northeastern Jefferson County – no further information.

November 14, 1966 – A strong shock rumbled through the Denver area, causing some damage at Commerce City and Eastlake. The magnitude of this event was between 4.1 and 4.4.

April 10, 1967 – This was one of the largest in a series of earthquakes that began in 1962; 118 windowpanes were broken in buildings at the Rocky Mountain Arsenal, a crack in an asphalt parking lot was noted in the Derby area, and schools were dismissed in Boulder, where walls sustained cracks. Legislators quickly moved from beneath chandeliers in the Denver Capitol Building, fearing they might fall. The Colorado School of Mines rated this shock a magnitude 5.0.

August 9, 1967 - The strongest and most widely felt shock in Denver's history struck at 6:25 in the morning. The magnitude 5.3 tremor caused the most serious damage at Northglenn, where a church's concrete pillar roof supports were weakened, and 20 windows were broken. An acoustical ceiling and light fixtures fell at one school. Many homeowners reported wall, ceiling, floor, patio, sidewalk, and foundation cracks. Several reported basement floors separated from walls. Extremely loud, explosive-like earth noises were heard. Damage on a lesser scale occurred throughout the area.

November 1967 - The Denver region was shaken by five moderate earthquakes. Two early morning shocks occurred November 14th. They awakened many residents but were not widely felt. A similar shock, magnitude 4.1, centered in the Denver area November 15th. Residents were generally shaken, but no damage was sustained. A local shock awakened a few persons in Commerce City November 25th. Houses creaked and objects rattled during this magnitude 2.1 earthquake.

November 26, 1967 - The magnitude 5.2 event caused widespread minor damage in the suburban areas of northeast Denver. Many residents reported it was the strongest earthquake they had ever experienced. It was felt at Laramie, Wyoming, to the northwest, east to Goodland, Kansas, and south to Pueblo, Colorado. At Commerce City merchandise fell in several supermarkets and walls cracked in larger buildings. Several persons scurried into the streets when buildings started shaking back and forth.

May 23, 1970 – A magnitude 4.1 earthquake struck northeastern Jefferson County on County line – no further information.

January 5, 1979 at 6:59 p.m. MST - A small but rare earthquake occurred in the central part of the State. The magnitude 2.9 tremor was centered about 30 miles northwest of Colorado Springs near Florissant and Lake George. Some minor damage (MM VI) was reported at Cripple Creek and Royal Gorge.

March, April, and November 1981 – On April 2nd a sharp earthquake, magnitude 4.1, occurred that was centered approximately 12 miles north of downtown Denver in the Thornton area. Some slight damage (MM VI) was observed at Commerce City and Thornton. The quake was felt in other parts of Adams County and in parts of Arapahoe, Boulder, Clear Creek, Denver, Douglas, Jefferson, Gilpin, and Weld Counties. This earthquake was preceded by a small tremor located in the same area on March 24 at 6:04 a.m. MST with magnitude 2.8. It was felt in the Commerce City and Northglenn-Thornton area. The north-central part of Colorado experienced a small earthquake on September 16, 1981 at 1:59 p.m. MDT. The magnitude 2.1 tremor was located in the Commerce City-Thornton area and was felt by a few people in that area.

November 1, 1981 - A minor but alarming earthquake occurred in Jefferson County on November 1, 1981, at 8:03 p.m. MST. The magnitude 3.1 tremor was centered in the Evergreen area about 22 miles southwest of Denver. The effects registered MM V, and were experienced in the Conifer, Evergreen, and Pine Junction areas. It was also felt in other parts of Jefferson County and in parts of Clear Creek and Park Counties.

March and September 1982 – On March 11, 1982 at 4:55 p.m. MST a very minor 2.8 magnitude earthquake occurred. It was located about 12 miles north of downtown Denver in the Thornton area. It was felt in the Commerce City, Northglenn, and Thornton areas. MM III effects were experienced in the Thornton area. On September 18 at 10:12 a.m. MDT, a small part of the north-central part of Colorado was shaken by a very minor earthquake. The magnitude 2.8 tremor was located about 12 miles north of downtown Denver in the Thornton area. MM III effects were noted at Thornton; it was also felt at Commerce City and Northglenn.

February 25, 1984 at 2:18 a.m. MDT - A very minor earthquake occurred in the Denver metropolitan area. This magnitude 2.5 tremor was located about 13 miles north of downtown Denver in the Thornton area where it was felt lightly.

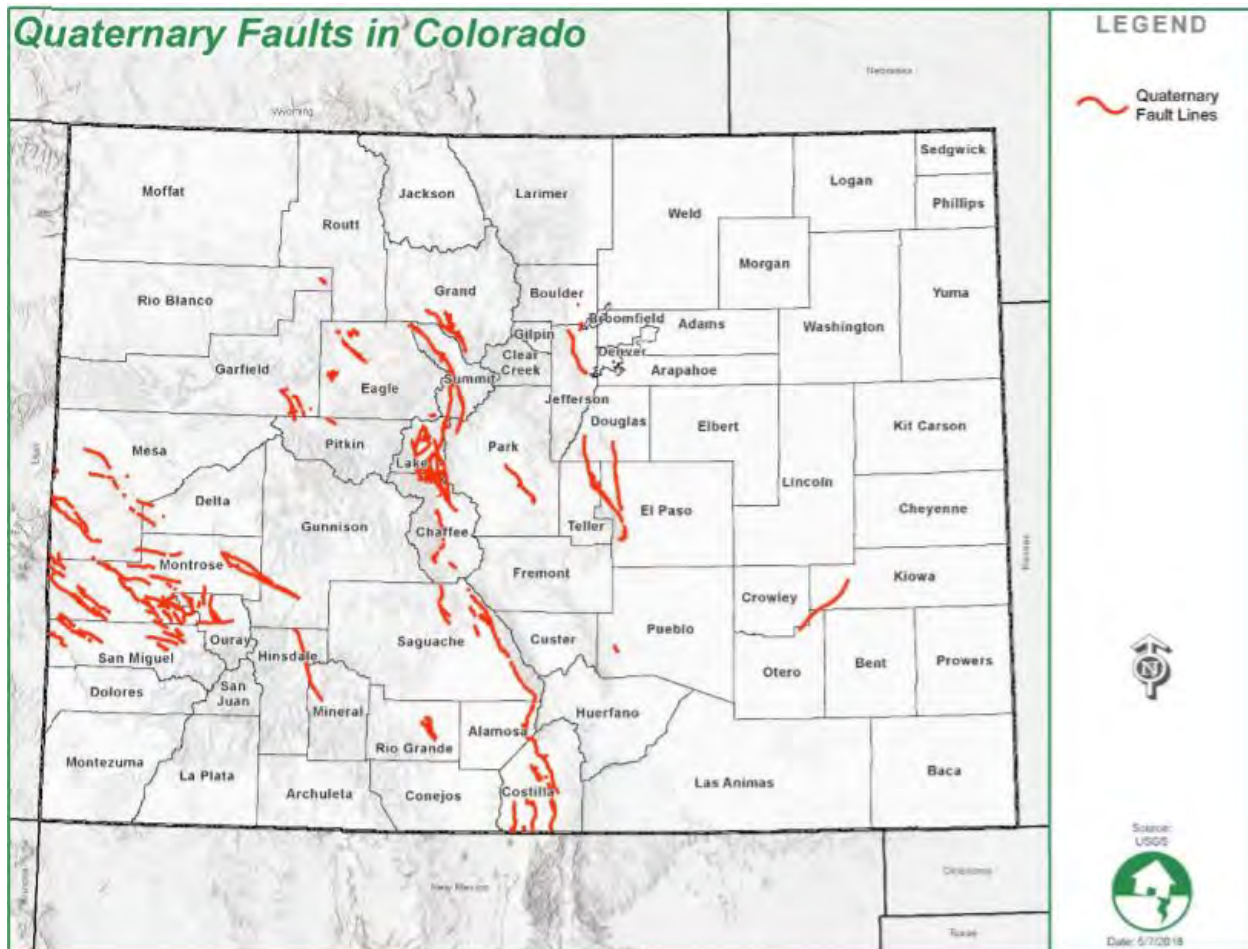
November 8, 1989 at 7:24 a.m. MDT - A minor earthquake with a magnitude of 2.5 was felt in the northern Denver metropolitan area. The shock was felt at different intensities in several location, MM IV at Thornton and MM III at Eastlake, Montbello, Northglenn and in parts of Denver. A small aftershock, ML 1.8, occurred about 90 seconds later.

December 25, 1994 12:06 p.m. MDT - A moderate earthquake with an epicenter approximately 6 miles southeast of Castle Rock struck the central front range. With a magnitude of 4.0 and a maximum Modified Mercalli intensity of V, the shock was felt from Colorado Springs to Denver. No further information available.

Geographic Extent

Geological research indicates there are about 100 potentially active faults in Colorado with documented movement within the last 2.6 million years (Quaternary). Figure 4-14 indicates that potentially active faults exist in the vicinity of Jefferson County that are capable of producing damaging earthquakes. There could be other faults in the state that may have potential for producing future earthquakes that are not known to be hazardous or do not rupture the ground surface.

Figure 4-14 Colorado Quaternary Fault Map



Source: State of Colorado Natural Hazard Mitigation Plan, 2018

Faults have been classified based on the geologic time frame of their latest suspected movement (in order of activity occurrence, most recent is listed first):

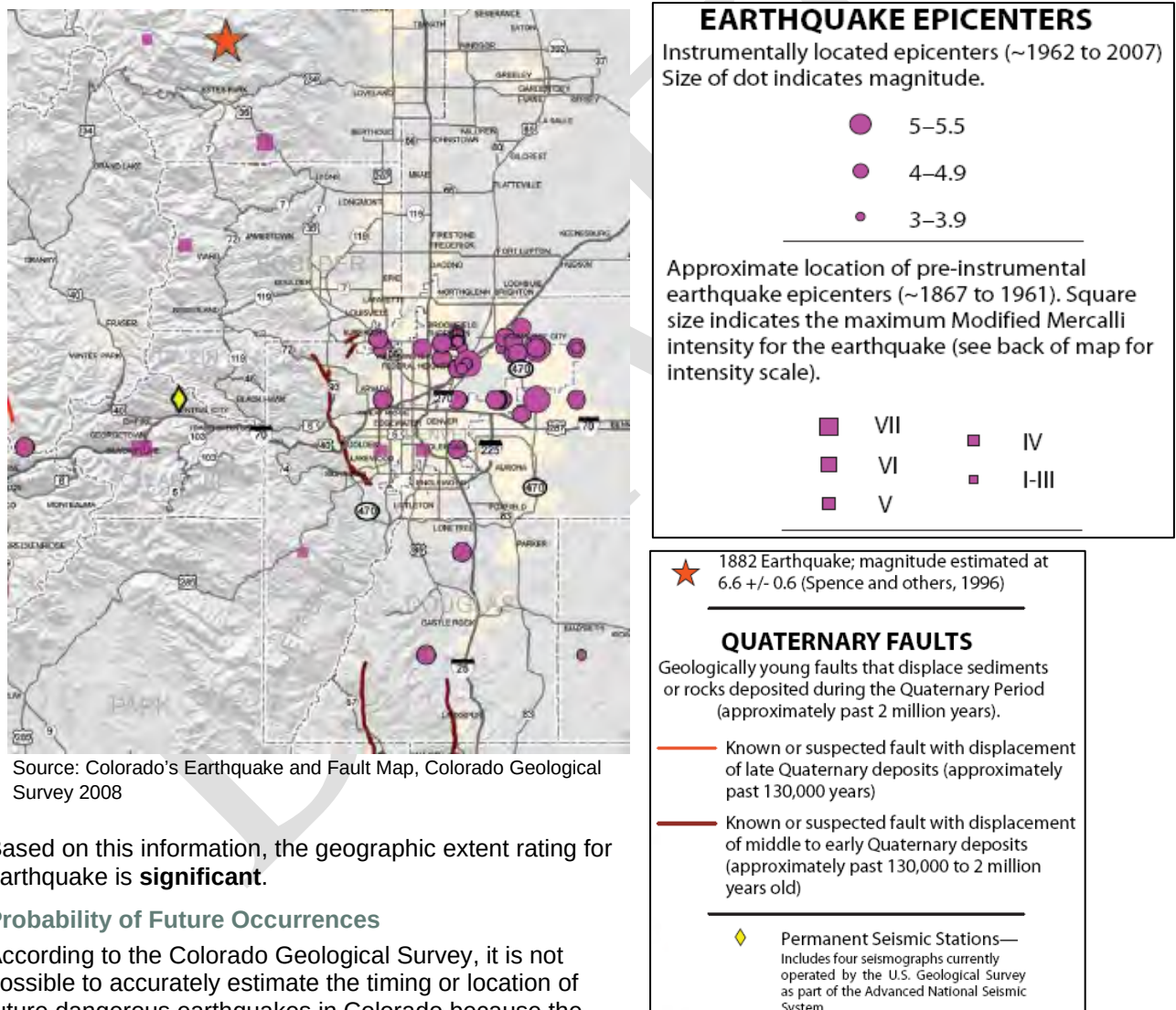
- H—Holocene (within past 15,000 years)
- LQ—Late Quaternary (15,000-130,000 years)
- MLQ—Middle to Late Quaternary (130,000 - 750,000 years)
- Q—Quaternary (approximately past 2.6 million years)

Faults with evidence of movement in the past 130,000 years (Late Quaternary) are considered active faults. Faults that last moved between 130,000 and 1.8 million years ago may be considered potentially active. These active and potentially active faults are thought to be the most likely source for future earthquakes (Source: 2018 Colorado State Hazard Mitigation Plan). The only known potentially active fault in Jefferson County is the Golden Fault, which is a Quaternary fault. This fault runs along the base of the foothills west of Golden, roughly paralleling Highway 93 from Highway 72 to the north down to Highway 285 near Morrison, and is shown on the map in Figure 4-14, which is taken from a statewide map of Colorado earthquake hazards developed by the Colorado Geological Survey. The fault runs through sparsely developed sections of western Arvada, Golden, western Lakewood, and just east of Morrison. According to the Colorado Earthquake Evaluation Report associated with the Colorado Hazard Mitigation Plan the fault is thought to be capable of producing a M6.5 earthquake. The Colorado Late Cenozoic Fault, Fold, and Earthquake Database considers this a “suspect feature” that has not shown evidence of movement in the past 500,000 years, and that definitive evidence of Quaternary movement is

lacking. Many of these faults and historic epicenters are also shown in Figure 4-15 below, which provides a focused view of Jefferson County.

In addition to the Golden Fault there are potentially active faults to the north (Walnut Creek (Q) and Valmont (MLQ), Rock Creek (Q) in Boulder County), east (Rocky Mountain Arsenal Fault (H) in Adams County), and south (Ute Pass (MLQ) in Douglas County) of the County. The Golden, Ute Pass, and Walnut Creek faults, all which could affect Jefferson County, are three of the state's five potentially most damaging faults, according to the Earthquake Evaluation Report. The Walnut Creek Fault is in unincorporated Jefferson and Boulder Counties near Rocky Flats. In addition to these faults there is a fault suspected to be located beneath the Rocky Mountain Arsenal, which has been the source of damaging earthquakes in the Denver metro area and is considered by the Colorado Geological Survey to have the potential of producing a magnitude 6.25 earthquake. This fault is not shown on the map because it is not evident on the earth's surface.

Figure 4-15 Colorado Earthquake Fault Map- Jefferson County Excerpt



Based on this information, the geographic extent rating for earthquake is **significant**.

Probability of Future Occurrences

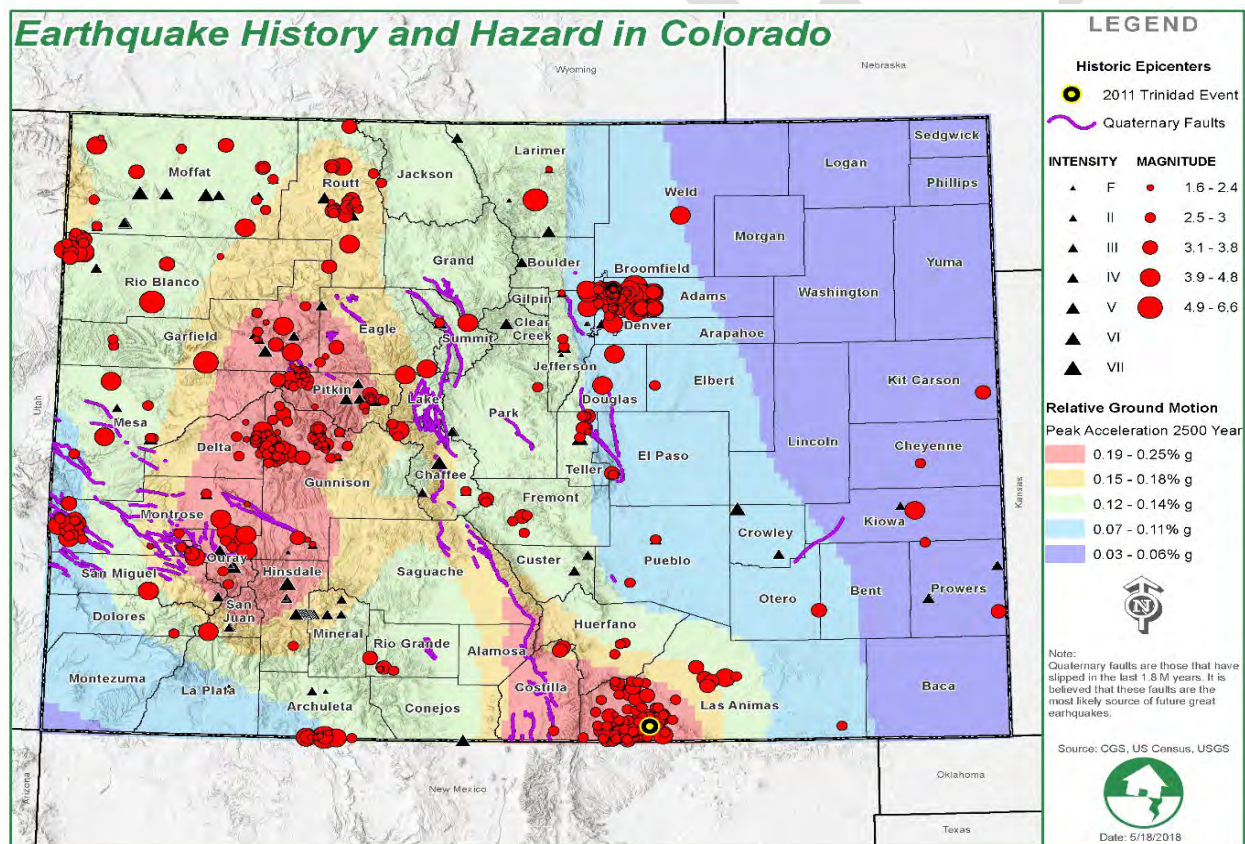
According to the Colorado Geological Survey, it is not possible to accurately estimate the timing or location of future dangerous earthquakes in Colorado because the occurrence of earthquakes is relatively infrequent in the state, and the historical earthquake record is relatively short (only about 145 years). It is prudent to expect future earthquakes as large as magnitude 6.6, the largest historical event in Colorado. Studies indicate earthquakes as large as 7.25 could occur

within the state, but scientists are unable to accurately predict when and where it will occur (Source: Colorado Earthquake Hazards – Colorado Earthquake Mitigation Council 2008.)

National seismic hazard zone maps indicate the probability of earthquakes in the United States, based on analyses of faults, soils, topography, and past events. Figure 4-16 is a probabilistic seismic hazard map of Colorado from the USGS that depicts the probability that ground motion will reach a certain level during an earthquake. The data show peak horizontal ground acceleration (the fastest measured change in speed for a particle at ground level that is moving horizontally because of an earthquake). Figure 4-16 represents the 2,500-year probability ground motion, which is more of a worst-case scenario, and depicts the shaking level that has a 2 percent chance of being exceeded over a period of 50 years. In this scenario, Jefferson County lies in the range of 10-14 and 14-20 percent peak acceleration. Ground motions become structurally damaging when average peak accelerations reach 10 to 15 percent of gravity, average peak velocities reach 8 to 12 centimeters per second, and when the Modified Mercalli Intensity Scale is about VII (18-34 percent peak ground acceleration), which is considered to be very strong (general alarm; walls crack; plaster falls).

Thus, probability for an earthquake producing minor shaking is considered **occasional**, and an earthquake causing significant damage is **unlikely**, with less than a 1 percent chance of occurrence over the next 100-year period.

Figure 4-16 Colorado Seismic Hazard Map—2% Probability of Exceedance in 50 Years



Source: Colorado State Hazard Mitigation Plan 2018

Magnitude and Severity

Earthquakes in or near Jefferson County are low probability but potentially high consequence events. The primary earthquake hazard in Jefferson County includes strong ground shaking, which could affect the entire County. It is prudent to expect future earthquakes as large as magnitude 6.6, the largest historical event in Colorado. Studies indicate earthquakes as large as 7.25 could occur within the state, but

scientists are unable to accurately predict when and where it will occur (Source: Colorado Earthquake Hazards – Colorado Earthquake Mitigation Council 2008.) While structural damage could result to buildings, damage to non-structural building elements and contents will account for the majority of damages. A 6.5 earthquake has the potential to cause multiple fatalities and injuries. The general perception is that earthquakes don't happen in Colorado, thus the populace is ill-prepared for what to do when one occurs. There is also potential for rupture of the ground surface, which could happen along a fault trace. Though a remote possibility, the potential for fault rupture would be most likely along the Golden Fault, in the vicinity of Golden along the base of the foothills. Fault rupture could impact homes and highways in west Golden. Secondary earthquake hazards that could occur in western Jefferson County and near Golden include landslides and rockfall, which could potentially damage transportation infrastructure, property, and cause death or injury. There is also the potential for damaging large waves called seiches that can form in lakes during earthquakes. This could impact reservoirs such as Chatfield, Strontia Springs, and Cheeseman, potentially causing damage to the marina and property at Chatfield.

During the development of this mitigation plan, HAZUS-MH was used to model the consequences of a large earthquake in Jefferson County. The results of this analysis are presented in the Vulnerability Assessment subsection below. This analysis complements HAZUS-MH studies performed by the Colorado Geological Survey on various faults statewide. According to those studies Jefferson County ranks 2nd in the state, behind El Paso County, as having the highest earthquake risk while comparing potential for economic loss and casualties. Considering a worst case scenario, the potential magnitude/severity rating of earthquakes is **catastrophic**, with widespread property damage, shutdown of facilities for more than two weeks and/or multiple fatalities.

Climate Change Considerations

According to the Colorado State Hazard Mitigation Plan, the best available data does not indicate that climate change is expected to influence future earthquake events in the planning area.

Vulnerability Assessment

As noted above, earthquakes strike with little to no warning and can have multiple impacts on an area. After-effects from an earthquake can include impacted roadways, downed power and communication lines, fires, and damages to structures (especially poorly built, or those already in disrepair).

The most appropriate risk assessment methodology for seismic hazards involves scenario modeling using FEMA's HAZUS loss estimation software. HAZUS is a regional earthquake loss estimation model developed by FEMA and the National Institute of Building Science. The primary purpose of HAZUS is to provide a methodology and software application to develop earthquake loss at a regional scale. HAZUS is a very useful planning tool because it provides a standard method for estimating earthquake damage, loss of function of infrastructure, and casualties, among many other factors. There are three levels of HAZUS analysis, from Level 1, which uses the default FEMA-derived datasets and damage functions, to Level 3, which uses independently compiled and accurately verified structure and infrastructure inventories and damage functions. A summary of the total loss estimations as a result of the HAZUS-MH analysis can be found below in Table 4-28.

Traditionally, earthquakes have not been considered a very likely hazard for Front Range communities and, as such, it is unlikely that many structures are built to be earthquake-resistant. All structures in the planning area are potentially exposed to damage from an event, with older or historic structures more at risk. Damage potential will vary by the size, extent, and severity of the earthquake and the location of the event's epicenter. The entire population of the planning area may also be considered at risk, and likely unprepared for earthquakes. The population at risk will vary based on the timing of a large earthquake.

Table 4-27 illustrates the potential earthquake losses in and around Jefferson County as compiled by the Colorado Geological Survey (CGS) Earthquake Reports, issued in 2013. The fatalities totals assume the quake occurs at 5:00pm. Economic impacts include both direct and indirect losses.

Table 4-27 Potential Earthquake Losses in Front Range by Fault

Fault/Magnitude	Casualties	Total Economic Loss
Inside Jefferson County		
Golden M6.5 Arbitrary	1,606	\$45 Billion
Walnut Creek M6.5 CEUS	2,303	\$60.5 Billion
Near Jefferson County/Front Range		
Chase Gulch M6.75	38	\$4.4 Billion
Mosquito M7.0 Arbitrary	125	\$8.04 Billion
Rampart M7.0 Arbitrary	743	\$28 Billion
Rocky Mountain Arsenal M6.25	1,263	\$39.9 Billion
Ute Pass M7.0 Arbitrary	594	\$22.3 Billion
Valmont M5.0 Arbitrary	22	\$2.9 Billion

Source: Earthquake Evaluation Reports, <http://coloradogeologicalsurvey.org>

According to the CGS reports, the Rocky Mountain Arsenal, Golden, Rampart Range, Ute Pass, and Walnut Creek faults are considered the top five potentially most damaging faults in the state (which includes damage to Jefferson as well as other counties in the Denver Metropolitan Area). Figure 4-14 shows the relative location of these faults.

A Level 1 HAZUS-MH earthquake loss analysis was conducted for this plan update, based on an inventory database compiled at a national level aggregated to Census Tracts. As with any model there are uncertainties, and the results should be considered approximate for planning purposes.

To evaluate potential losses associated with earthquake activity in the planning area, a HAZUS 2,500-year probabilistic scenario was run for the entire County. The methodology utilizes probabilistic seismic hazard contour maps developed by the U.S. Geological Survey (USGS).

During the update of this plan in 2021, a HAZUS-MH probabilistic earthquake scenario was run with the latest version of HAZUS-MH (Version 2.2). A driving Magnitude of 7.25 was input into the HAZUS scenario, but the results are primarily based on the USGS 2,500 year probabilistic ground shaking maps. The USGS maps provide estimates of potential ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively.

The 2,500-year return period analyzes ground shaking estimates with a 2 percent probability of being exceeded in 50 years, from the various seismic sources in the area. The International Building Code uses this level of ground shaking for building design in seismic areas. The CGS believes that the USGS probabilistic shaking maps likely underestimate the hazard, as there are limited studies of the earthquake hazard in the state to base the shaking maps on. Table 4-28 summarizes the results of the 2,500-year HAZUS-MH scenario. A 100-year return period scenario was also analyzed. This scenario did not produce any damage.

Table 4-28 HAZUS-MH Earthquake Loss Estimation 2,500-Year Scenario Results

Type of Impact	Impacts to County
Total Buildings Damaged	Slight: 25,355 Moderate: 10,355 Extensive: 2,004 Complete: 118

Type of Impact	Impacts to County
Building and Income Related Losses	\$1.7 Billion 65% of damage related to residential structures 17% of loss due to business interruption
Total Economic Losses (includes building, income and lifeline losses)	\$2.2 Billion Building: \$1.41 Billion Income: \$295.4 Million Transportation/Utility: \$4.6 Million
Casualties (based on 2 a.m. time of occurrence)	Without requiring hospitalization: 177 Requiring hospitalization: 22 Life threatening: 2 Fatalities: 3
Casualties (based on 2 p.m. time of occurrence)	Without requiring hospitalization: 307 Requiring hospitalization: 46 Life threatening: 4 Fatalities: 8
Casualties (based on 5 p.m. time of occurrence)	Without requiring hospitalization: 223 Requiring hospitalization: 33 Life threatening: 3 Fatalities: 5
Damage to Transportation and Utility Systems and essential facilities	No transportation or pipeline damage, 0 essential facilities damaged
Fire Following Earthquake	0 Ignitions 0.00 sq. miles burnt
Debris Generation	416,000 million tons of debris generated 16,640 truckloads
Displaced Households	826
Shelter Requirements	437

Source: HAZUS-MH 2.2

Another HAZUS-MH earthquake scenario is included in this analysis. The Colorado Geologic Survey produced a report for a M6.5 event on the Golden Fault as it is presumed to be the most damaging to Jefferson County based on its proximity to the City of Golden and the Jefferson County governmental offices, including the Emergency Operations Center (EOC). The epicenter, or point on the ground surface where the earthquake originates, was chosen at an arbitrary location on the fault at -105.22 longitude and 39.75 latitude, just south of the community of Beverly Heights in Golden, along US Highway 6.

The model assumed the following fault rupture parameters: depth of 10km, rupture orientation of 157 degrees and a West US Extensional 2008 attenuation function. Table 4-29 summarizes the output from this 'worst case' scenario for Jefferson County.

Table 4-29 HAZUS-MH Earthquake Loss Estimation Golden Fault M 6.5 Scenario Results

Type of Impact	Impacts to County
Total Buildings Damaged	Slight: 48,908 Moderate: 35,760 Extensive: 17,176 Complete: 6,629

Type of Impact	Impacts to County
Building and Income Related Losses	Total: \$11.5 Billion 60% of damage related to residential structures 20% of loss due to business interruption
Total Economic Losses (includes building, income and lifeline losses)	Total: \$11.5 Billion Building: \$8.3 Billion Income: \$2.1Billion Lifeline: \$1.2 Billion
Casualties (based on 2 a.m. time of occurrence)	Without requiring hospitalization: 2,218 Requiring hospitalization: 578 Life threatening: 88 Fatalities: 172
Casualties (based on 2 p.m. time of occurrence)	Without requiring hospitalization: 4,516 Requiring hospitalization: 1,297 Life threatening: 213 Fatalities: 415
Casualties (based on 5 p.m. time of occurrence)	Without requiring hospitalization: 3,191 Requiring hospitalization: 908 Life threatening: 169 Fatalities: 284
Damage to Transportation Facilities and essential facilities	Total Transportation Replacement Value: \$3.5 Billion 34 essential facilities damaged with functionality > 50% on Day 1
Fire Following Earthquake (Monte Carlo Simulation)	0 ignitions 0.0 sq. miles burned
Debris Generation	3.73 million tons of debris generated 149,080 truckloads
Displaced Households	11,616
Shelter Requirements	6,086

Source: HAZUS-MH 2.2

General Property

There are an estimated 197,000 buildings in Jefferson County with a total building replacement value (excluding contents) of \$66.7 Billion. Approximately 92% of these buildings (and 82% of the building value) are associated with residential housing. In terms of building construction types found in the region, wood frame construction makes up 70% of the building inventory. The remaining percentage is distributed between the other general building types.

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents.

The categories of damages defined by HAZUS are:

- **Slight** damage includes diagonal hairline fractures on most shear wall surfaces and hairline cracks on most infill walls.
- **Moderate** damage includes cracks on most walls and failure of some shear walls.
- **Extensive** damage means that most shear wall surfaces in the structure have reached or exceeded their capacity exhibited by large, through-the-wall diagonal cracks.
- **Complete** damage means that the structure has collapsed or is in danger of collapse.

In the probabilistic scenario, HAZUS estimates that about 12,477 buildings will be at least moderately damaged, of these an estimated 118 buildings will be damaged beyond repair. This leads to over 6% of the total number of buildings in the County being at least moderately damaged. Most of the damage modeled as extensive and complete is associated with unreinforced masonry buildings. Losses by type for this scenario, both in the type of loss (i.e. structural, wages, income, etc.) and occupancy type, are detailed further in Figure 4-17.

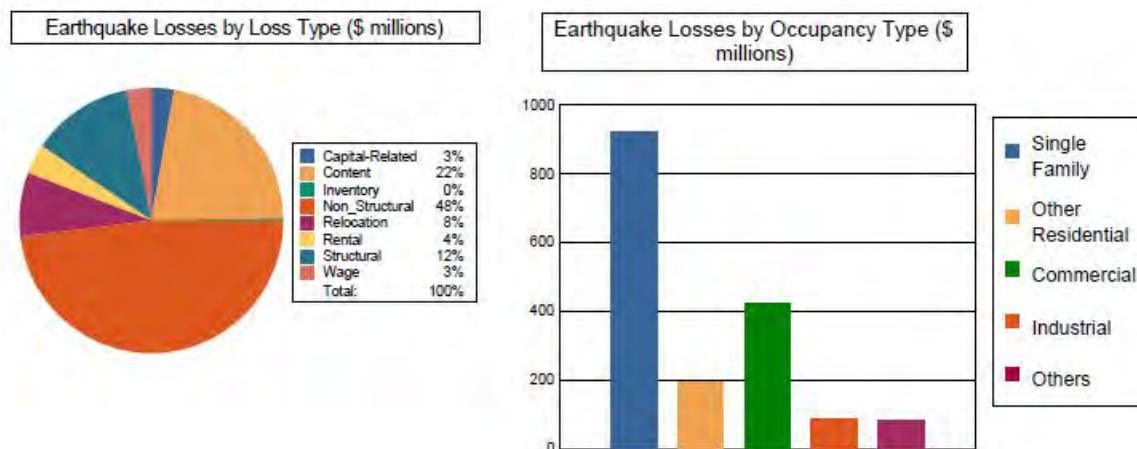
The total building-related losses in this scenario were \$1.7 billion, with detail shown in Table 4-30. By far, the largest loss was sustained by the residential occupancies which made up over 65% of the total loss.

Table 4-30 Building-Related Economic Loss Estimates in Millions of Dollars – 2,500 Year Probabilistic Scenario

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	2.1614	45.5558	1.8342	3.5963	53.1477
	Capital-Related	0.0000	0.9199	43.5063	1.1226	0.6431	46.1919
	Rental	19.9095	10.9176	27.8553	0.7209	1.6131	61.0164
	Relocation	70.7959	8.5331	40.1474	4.5635	10.9656	135.0055
	Subtotal	90.7054	22.5320	157.0648	8.2412	16.8181	295.3615
Capital Stock Losses							
	Structural	122.0547	19.1404	47.5426	10.9099	11.3541	211.0017
	Non_Structural	495.4731	117.3821	135.3296	36.9199	31.3129	816.4176
	Content	212.2252	36.0274	81.5750	25.1596	20.1904	375.1776
	Inventory	0.0000	0.0000	1.7881	4.6542	0.3039	6.7462
	Subtotal	829.7530	172.5499	266.2353	77.6436	63.1613	1409.3431
	Total	920.46	195.08	423.30	85.88	79.98	1704.70

Source: HAZUS-MH Global Summary Report, Wood analysis

Figure 4-17 Earthquake Losses by Type – 2,500 Year Probabilistic Scenario



The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake. 17% of the estimated losses were related to business interruption.

For the Golden Fault deterministic scenario, HAZUS estimates much more extensive damage with about 59,565 buildings at least moderately damaged and 6,629 of these buildings damaged beyond repair. This is over 30% of the total number of buildings in the County at least moderately damaged. Most of the

damage modeled as extensive and complete is associated with masonry buildings, both reinforced and unreinforced.

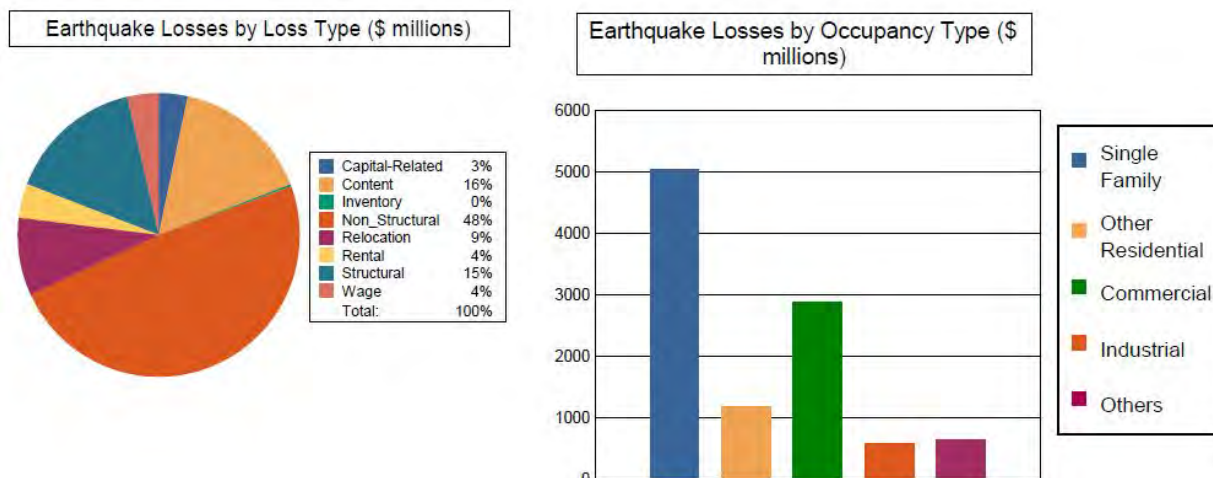
The total building-related losses in this scenario were \$10.3 billion, with detail shown in Table 4-30. By far, the largest loss was sustained by the residential occupancies which made up over 65% of the total loss. Earthquake losses for the Golden Fault scenario by type, both in the type of loss (i.e. structural, wages, income, etc.) and occupancy type, are detailed further in Figure 4-18.

Table 4-31 Economic Loss Estimates in Millions of Dollars – M6.5 Golden Fault Scenario

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	18.8614	321.8556	13.1289	28.9066	382.7525
	Capital-Related	0.0000	8.0303	318.0109	8.1135	5.2837	339.4384
	Rental	143.7674	79.0565	170.5806	4.3559	14.1979	411.9583
	Relocation	500.7302	53.1115	252.0721	23.3202	90.8138	920.0478
	Subtotal	644.4976	159.0597	1062.5192	48.9185	139.2020	2054.1970
Capital Stock Losses							
	Structural	896.2019	144.3440	373.7022	84.0864	95.8819	1,594.2164
	Non_Structural	2758.7286	710.8701	1005.2295	260.7901	266.4793	5,002.0976
	Content	756.6651	161.3783	433.2579	159.2894	122.4645	1,633.0552
	Inventory	0.0000	0.0000	9.4733	28.8443	1.3308	39.6484
	Subtotal	4411.5956	1016.5924	1821.6629	533.0102	486.1565	8269.0176
	Total	5056.09	1175.65	2884.18	581.93	625.36	10323.21

Source: HAZUS-MH Global Summary Report, Wood analysis

Figure 4-18 Earthquake Losses by Type – M6.5 Golden Fault Scenario



People

Potential fatalities and injuries are described above in the HAZUS results. Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking. HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four severity levels that describe the extent of the injuries. The levels are described as follows:

- **Severity Level 1:** Injuries will require medical attention, but hospitalization is not needed.

- **Severity Level 2:** Injuries will require hospitalization but are not considered life-threatening.
- **Severity Level 3:** Injuries will require hospitalization and can become life threatening if not promptly treated.
- **Severity Level 4:** Victims are killed by the earthquake.

The casualty estimates are provided for three times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is at its maximum. The 2:00 PM estimate considers that the educational, commercial, and industrial sector loads are at their maximum. The 5:00 PM represents peak commute time. The models show that for both scenarios the 2:00 PM event time would result in the most casualties. In the probabilistic scenario, most of these would be minor injuries (307 Level 1 and 46 Level 2), and 4 hospitalizations (Level 3) and 8 fatalities (Level 4) are estimated. In the M 6.5 Golden Fault event, the casualty numbers are estimated to be significantly higher, with 4,516 Level 1 and 1,297 Level 2 casualties, 213 hospitalizations, and 415 fatalities.

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates that approximately 826 households will be displaced due to the earthquake, and 437 people will seek temporary shelter in public shelters. The Golden Fault scenario would result in an estimated 11,616 displaced households and 6,086 individuals seeking temporary shelter.

Critical Facilities and Infrastructure

HAZUS breaks critical facilities into two groups: essential facilities and high potential loss (HPL) facilities. Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

The model estimates the region has 6 hospitals with 780 hospital beds total. The probabilistic scenario estimates that on the day of the earthquake only 566 (73%) would be available for use. After one week 88% of the beds will be back in service. The model did not predict there would be any damage to schools, police, fire stations, or EOCs.

Within HAZUS, the lifeline inventory is divided between transportation and utility lifeline systems. There are 7 transportation systems that include highways, railways, light rail, bus, ports, ferry, and airports. The transportation systems inventory includes over 280.24 miles of highways and 447 bridges. The probabilistic scenario estimated approximately \$4.6 million in damage to transportation systems, mostly to highways, bridges, and bus facilities.

There are 6 utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power, and communications. The inventory value of the utility lifeline systems combined is estimated to be \$6.1 billion including 13,106 miles of pipes, and related economic losses to these systems in the probabilistic scenario would be around \$486.6 million, with the largest losses to wastewater and electrical power systems.

The expected utility system facility damages in terms of Economic losses in millions of dollars are found in Table 4-32.

Table 4-32 Utility System Economic Losses in Millions of Dollars

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	161.5050	12.7520	7.90
	Distribution Lines	210.9119	0.8434	0.40
	Subtotal	372.4169	13.5954	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	3783.9140	332.7814	8.79
	Distribution Lines	126.5471	0.4237	0.33
	Subtotal	3910.4611	333.2051	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	84.3648	0.1452	0.17
	Subtotal	84.3648	0.1452	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0970	0.0084	8.66
	Subtotal	0.0970	0.0084	
Electrical Power	Facilities	1697.0281	139.4595	8.22
	Subtotal	1697.0281	139.4595	
Communication	Facilities	2.4250	0.2037	8.40
	Subtotal	2.4250	0.2037	
	Total	6,066.79	486.62	

The Golden Fault scenario estimates that on the day of the earthquake only 240 hospital beds (31%) would be available for use. After one week 52% of the beds will be back in service. The model predicted that 3 hospitals, 126 schools, 5 EOCs, 14 police stations, and 20 fire stations would be at least moderately damaged but with > 50% functionality from the event. These figures make up 49% of the county's essential facilities. The model further estimates that 10 essential facilities would be completely damaged.

The model estimates the Golden Fault scenario would result in \$50.55 million in economic losses to the transportation lifelines and \$1.1 billion in losses to utility lifelines.

Economy

The 2,500 year probabilistic scenario estimates a total economic loss for the earthquake at \$2.2 billion, which includes building and lifeline related losses based on the County's available inventory. \$295.4 million is estimated to result from business interruption.

The M 6.5 Golden Fault scenario results in \$11.5 billion in total economic losses for the county, including building and lifeline losses.

Historical, Cultural, and Natural Resources

Earthquake effects on the environment, natural resources, and historic and cultural assets would likely be minor. The biggest impact would likely be on the older historic properties constructed with unreinforced masonry.

Future Development

Without earthquake-resistant building considerations, future development will exhibit similar exposure and vulnerability to earthquakes as existing structures. As the region continues to expand, the overall estimated costs of a significant earthquake, both fiscally and in terms of casualty rates, may be expected to rise.

Overall Hazard Significance

Earthquakes in Jefferson County can impact the entire planning area. Within Colorado's relatively short historic record, earthquakes have been limited mainly and generally low in magnitude and/or intensity. The geographic extent of the hazard is considered **significant**. The probability of future large magnitude occurrences is considered **unlikely** (less than 1 percent probability of occurrence), though the magnitude/severity for a worst-case scenario is **catastrophic**. In addition, the HMPC considers the hazard to have a **high** overall impact on the County. While this lends itself to an overall ranking of high, the likelihood of an earthquake event that causes damages and significant impacts on the planning area is extremely low. Furthermore, mitigation activities for the planning area are very expensive and, according to stakeholder input, prohibitive in both timeframe for implementation and overall expense. As such the hazard is rated as **medium**.

4.3.6 Erosion and Deposition

Description

Erosion is the removal of solids (sediment, soil, rock and other particles) in the natural environment. It usually occurs due to transport by wind, water, or ice; by down-slope creep of soil and other material under the force of gravity; or in the case of bioerosion by living organisms such as burrowing animals. Erosion is distinct from weathering, which is the process of chemical or physical breakdown of the minerals in the rocks, although the two processes may occur concurrently.

The rate of erosion depends on many factors. Climatic factors include the amount and intensity of precipitation, freeze-thaw cycles, seasonality, the wind speed, and storm frequency. The geologic factors include the sediment or rock type, its porosity and permeability, the slope of the land, and whether the rocks are tilted, faulted, folded, or weathered. The biological factors include ground cover from vegetation or lack thereof, the type of organisms inhabiting the area, and the land use. Areas with high-intensity precipitation, more frequent rainfall, more wind, freeze-thaw cycles, or more storms are expected to have more erosion. Sediment with high sand or silt contents and areas with steep slopes erode more easily, as do areas with highly fractured or weathered rock. The porosity and permeability of the sediment or rock also affect how fast water can percolate into the ground. If the water moves underground, less runoff is generated, reducing the amount of surface erosion. Sediments containing more clay tend to erode less than those with sand or silt.

Grus soils form as a result of weathering of granites with abundant feldspar, such as the Pikes Peak Granite present in southwestern foothills of Jefferson County. The result is similar to 'kitty litter', which can easily be eroded and transported by wind and rain. Problems result from both erosion and deposition of these soils, particularly in areas burned by recent wildfires. Generally, land underlain by grus is gently rolling.

Changes in the kind of vegetation in an area can also affect erosion rates. Different kinds of vegetation lead to different infiltration rates of rain into the soil, and different surface runoff flow speeds. For example, forested areas have higher infiltration rates, so precipitation will result in less surface runoff, thus less erosion. If the trees are removed, for example by fire or logging, infiltration rates become high, but erosion can remain low to the degree that the forest floor remains intact. It is the removal of, or compromise to, the forest floor, not the removal of the canopy, which leads to increased erosion.

Poor land use practices can also lead to increased erosion. Some of those practices include deforestation, overgrazing, unmanaged construction activity and road-building. Land that is used for the production of agricultural crops generally experiences a significantly greater rate of erosion than that of land under natural vegetation. In the case of construction or road building, when the litter layer is removed or compacted, the susceptibility of the soil to erosion is greatly increased and the process, without proper engineering, can significantly change drainage patterns. There has been a marked increase in recreational land use that has left erosive remnants. The County Land Development Regulations, Section 17 addresses requirements for erosion and sediment control for new developments, refer to Section 2 Capabilities Assessment for further details. Large numbers of hikers use trails leaving furrowed foot traffic, or extensive use of off-road vehicles leave paths of beaten down vegetation and gouged terrain. There is a potential for the impacts of "beetle kill" to negatively affect soil stability and lead to erosion and watershed degradation as well. As discussed in Section 4.3.16 Wildfire, these predictions are difficult to quantify the impacts have not yet occurred, though the precedence is set. Future evaluation on the impacts of beetle kill on erosion may be merited in future planning efforts. While a certain amount of erosion is natural and, in fact, healthy for the ecosystem, wise land use practices are also necessary to keep it balanced.

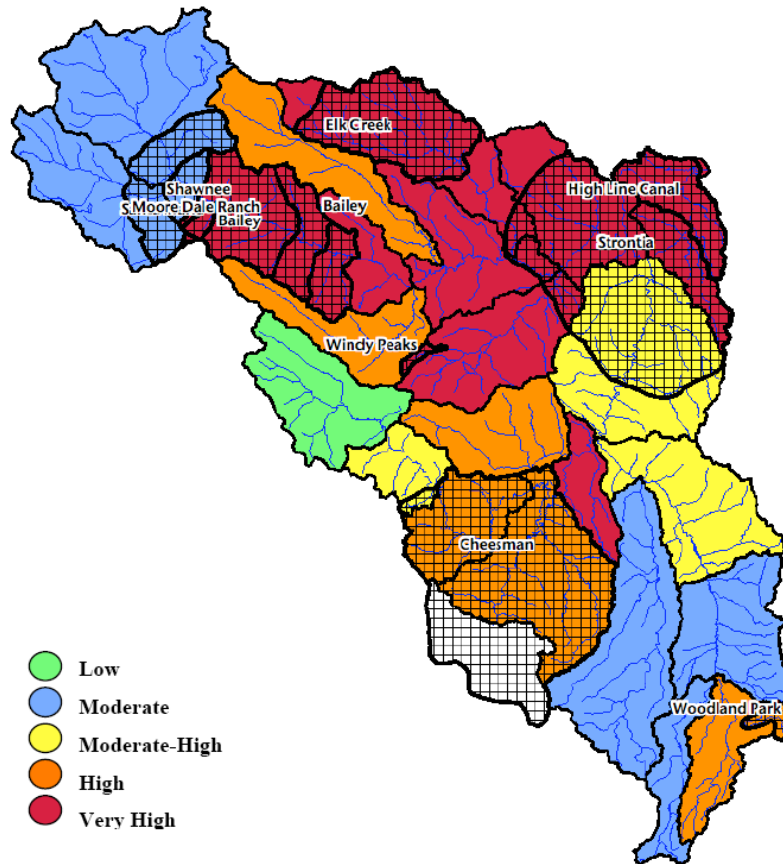
Geographic Extent

Determining erosion vulnerability for the planning area is difficult at best. Theoretically, areas of potential erosion due to human-exacerbated conditions, such as construction sites, are temporary and move around frequently as the County undergoes normal ebbs and flows in development.

Forested areas in the foothills of Jefferson County, which account for over 50% of the planning area, are potentially vulnerable to erosion problems after severe wildfires.

The Front Range Watershed Protection Data Refinement Work Group has developed a technical approach to protecting watersheds from post wildfire erosion. The purpose of this group is to identify and prioritize those watersheds that provided or convey water used by communities and municipalities. The data analysis is designed to identify and prioritize watersheds for hazard reduction treatments or other watershed protection measures. Through GIS analysis of soil erodibility, water uses, wildfire hazard, and flood or debris flow risk hazardous watersheds have been identified. Many of these are within Jefferson County are displayed on the following map. The source water area upstream from important surface water intakes, upstream diversion points, and classified drinking water supply reservoirs that have a higher potential for contributing significant sediment or debris is referred to as the Zone of Concern, and is mapped in Figure 4-19.

Figure 4-19 Upper South Platte Zones of Concern and Watershed Prioritization Map



Source: Front Range Watershed Protection Data Refinement Workgroup Executive Summary

Finally, the natural geologic formations found in the planning area, and specifically the sides of North and South Table Mountain, Green Mountain, and the hogback formations, may be vulnerable to erosion from natural causes. In general, however, the overall extent of erosion susceptibility is fairly small.

Based on this information, the geographic extent rating for erosion is **significant**.

Previous Occurrences

Erosion occurs frequently in Jefferson County and is, in fact, a natural part of the ecosystem. Concerns about erosion arise when large amounts of sedimentation are deposited into the water supply because of erosion (generally driven by human factors) or when significant erosion occurs in wildfire burn areas, which impacts both watershed quality and recovery efforts in the burn area.

Specific incidents of development-driven erosion, or the erosion that occurs when sites undergoing development and construction are not adequately protected against erosion, are too numerous to specifically quantify. Under state, local and federal regulation, however, construction sites are required to mitigate or minimize erosion and sedimentation as far as possible, which would reduce future occurrences.

The Buffalo Creek Fire in Jefferson County in May of 1996 was followed by substantial flooding and erosion two months later. The burned area is within the Pike National Forest, in the South Platte Watershed and foothills of Jefferson County. The flooding transported approximately 331,000 m³ of coarse sediment into Strontia Springs Reservoir in three months after the fire. This reservoir supplies over 75% of the drinking water to the City of Denver. Studies indicate the sedimentation rate was nearly 30 times the annual rate of sediment input used in designing the reservoir. The reservoir also experienced a significant degradation in water quality as a result of the input of burned material and sediment. Denver Water, the agency responsible for distributing drinking water from the reservoir, estimates that it spent over \$1 million in immediate clean-up efforts after the fire. Denver Water is in the process of dredging excess sediment from the reservoir, at an estimated cost of \$23 million.

The 2002 wildfire season, detailed in the wildfire hazard profile, was unusually severe in terms of both the number and extent of wildfires the state experienced, and the severity of the lasting impacts of those fires. Unlike the 1996 Buffalo Creek post-fire recovery time, localized extreme flooding and substantial erosion and deposition that pose significant hazards to the public have continued to 2009; the potential for more flooding and erosion and will likely continue for several more years, particularly in and near the community of West Creek and on Six Mile Creek near Deckers. In 2009, seven years after the fire, Vail Resorts, the U.S. Forest Service, and the National Forest Foundation announced plans to raise \$4 million to undo damages caused by the Hayman fire, including watershed cleanup, restoration of burned lands, and rebuilding of recreational trails. This project was successfully completed over three years between 2011 and 2013. Based on the lessons learned from the Buffalo Creek Fire, Denver Water installed sediment traps on Turkey Creek to protect Cheesman reservoir from siltation, at a cost of \$2 million. These sediment traps require periodic mucking out, which costs about \$350,000 each time, but should mitigate more expensive dredging operations at the reservoir in addition to water quality impacts.

The Coal Creek Watershed suffered a heavy rainfall event on September 12, 2013 that caused large amounts of channel migration that resulted in erosion and deposition. Per the Upper Coal Creek Watershed Restoration Master Plan: The rainfall event on September 12, 2013, was unprecedented in the Coal Creek watershed. Damage throughout the corridor was widespread. In particular, downstream of Twin Spruce Gap Road, nearly every access culvert failed, was washed out, or was significantly damaged. The channel eroded significantly, leading to visible scour through the La Duwaik Estates and other central residential corridors. Highway culverts also plugged with debris, further exasperating flooding effects on the highway and downstream infrastructure. The culvert crossing at the Union Pacific Railroad (UPRR) did manage to pass the peak flows; however, a sedimentation zone was formed in the valley upstream of the culvert, where much of the eroded material was deposited. With the exception of the old Real Estate building at Twin Spruce Gap Road, no homes or buildings were destroyed in this area, although some were badly damaged. This building has since been demolished, and the land acquired by the Colorado Department of Transportation (CDOT).

The Coal Creek Canyon community center is located upstream of Twin Spruce Gap Road. Significant damage was also evident in this area, including structure inundation and culvert failures. Runoff from the Crescent Park Tributary eroded drainages and moved sediment through this corridor. Flood damage was widespread at both commercial and residential locations. A new channel was excavated at the intersection of Crescent Park Drive and Highway 72 to help direct discharges from the Crescent Park Tributary to Coal Creek.

Similar observations were made in the upper portions of Coal Creek and its tributaries, with damages along Twin Spruce Gap Road (Beaver Creek), Crescent Park Drive, and Ranch Elsie Road. Again, failure was noted at many driveway and access culverts, as well as damage to homes and other structures.

As with other historic flood events, highway and roadway access was limited during and after the flood event. Highway 72 reopened permanently approximately two months following the flood event. Access for

residents to and from the Front Range was very limited over this time period and required extensive detouring to otherwise nearby areas.

Following the flood event significant efforts were made (and are still ongoing) to repair the destruction. Much of the repair work, such as private culvert replacement, has been completed by individual landowners. The National Resources Conservation Services (NRCS) has also provided assistance to qualified landowners in need of immediate assistance through their Emergency Watershed Protection (EWP) program. Repair work to public infrastructure has been led by groups including Jefferson and Boulder Counties.

Along Highway 72, CDOT has been active in repairing and reopening the highway. This work has included debris removal, roadway reconstruction/resurfacing, and bank reinforcement in areas adjacent to the highway with high erosive susceptibility. Much of this initial work was an immediate response to the flood event and CDOT began flood repair and roadway improvement project along Coal Creek Canyon in April 2019 and completed in 2020. The repairs include road reconstruction of 12 miles of Highway 72, replacing culverts, stabilizing slopes and restoring channels, and adding a four-foot shoulder (CDOT 2020).

Probability of Future Occurrences

Erosion occurs daily as a natural process in both developed and undeveloped lands, and natural erosion is not considered a hazard.

Future incidents of erosion associated with wildfires are likely particularly in a mountainous area where the ground is sloping. As such, for this erosion and deposition, the probability of future occurrence mimics that of the wildfire hazard. Since 1980, there have been 23 fire incidents in Jefferson County that have burned 10 or more acres. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of erosion occurring as a result of severe wildfire in any given year is 57.5%. This corresponds to a probability of future occurrences rating of **likely**.

Magnitude and Severity

According to the *Small Site Erosion and Sediment Control Manual* published by the Jefferson County Planning and Zoning Division, stormwater runoff polluted with sediment is the main cause of surface water pollution in the United States. Furthermore, construction activities may generate 400 times the amount of erosion compared to undisturbed land, or 400 years' worth of erosion over a period of one year of construction. Erosion issues with new development should be minimal if erosion control practices are utilized.

Post-fire erosion in the foothills of Jefferson County has and will continue to cause watershed health problems. Erosion rates due to wildfires varies based on the terrain, slope, severity of the burn, subsequent rainfall until groundcover can be re-established, and the overall erodibility of the soil in question. While a methodology is still under development, the impacts of erosion into watersheds is well documented. Erosion carries sediment, organic debris, and chemicals into the water supplies, which may damage aquatic habitats and impact the water quality utilized by populations. As water is a critical resource to Jefferson County's large population, the impacts may be widespread. Erosion, therefore, could pose significant indirect impacts on the planning area, even if it does not directly impact life quality and other critical services.

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. The event of record for this hazard is the resulting erosion caused by the Buffalo Creek Fire in 1996, but the impacts have been long-range. Response and recovery costs to address erosion problems have cost Denver Water alone over \$27.7 million. Erosion may occur and damage the entire burn area, with damages inflicted on critical facilities from the loss or disruption of services, particularly if reservoirs, water treatment plants, roads, or communication lines are impacted or damaged. Erosion may cause illnesses to the watershed populations who are exposed to diminished water quality but the burden on the medical community is anticipated to be minimal. Knowledge of these

impacts is well addressed in local planning and mitigation efforts, however, which decreases the likely occurrence of these impacts.

Based on these factors, the magnitude severity rating for erosion is considered **critical**, mainly for watershed health and critical facility impacts.

Climate Change Considerations

Climate change projections show an increase of climate induced events related to in the intensity of heavy rain events which can result in increased erosion and sediment transport in local water bodies threatening to both water quality as well as the fish and aquatic vegetation the live in the streams and rivers. Higher river levels and faster stream velocity as a result of stronger, more intense storms can also increase erosion. According to the 2018 State of Colorado Hazard Mitigation Plan, the extent of erosion and deposition are expected to increase as the frequency of wildfires increase across the state. Overall, wildfire erosion is expected to increase across Colorado.

Dust-on-snow causes increased snowmelt because dust is darker than snow it absorbs more sunlight causing the snow underneath to heat up more rapidly. This is an emerging factor that could lead to substantial long-term reductions in Colorado's seasonal snow cover. The Center for Snow and Avalanche Studies (CSAS), located in Silverton, Colorado, operates the Colorado Dust-on-Snow (CODOS) program to study the effects of dust on Colorado's snowpack. The program has CSAS sensors at 11 mountain pass locations throughout the state to monitor the presence or absence of dust layers, including Grizzly Peak adjacent to Loveland Pass. As of April 30, 2019, the CODOS reported dust to be more evident and severe compared to the 10 other sites. The Rocky Mountains have been receiving dust since the ice age but the CODOS has seen evidence that the size and frequency of dust storms in the Colorado Mountains have been increasing since the 1990s.

Vulnerability Assessment

Two different areas of existing development are vulnerable to erosion. Erosion of soils due to slope grade, soil content and cover, and exposure to weather conditions is fairly limited and generally falls within underdeveloped areas. This is also due to the concurrence of erosion potential with other geologic hazard areas, such as dipping bedrock or subsidence regions, which are regulated for development by the County.

General Property

Buildings and infrastructure across the county may be vulnerable to the impacts of erosion and deposition. Although damage or losses to structures are typically minimal, there can be impacts with mitigation and maintenance costs, lost time, and minor structural damage. Areas susceptible to wildfire-driven erosion, which often result in debris flow (see below) or the erosion and deposition of soil into watersheds, also does not usually directly impact developed areas. There are some areas of variance, particularly in the wildland-urban interface, where debris flows may impact housing and commercial districts.

People

There are no reported injuries or deaths to these soil hazards in Jefferson County, and direct impacts on people are likely to be very minimal.

Critical Facilities and Infrastructure

In addition to the general areas of existing vulnerability, scour critical bridges are also vulnerable to the effects of erosion and deposition. These bridges are listed in Table 4-45. Erosion around bridges may compromise the construction of the structure, making them unsafe. Deposition may also press up against the structures, causing structural strain or sweeping out the structure by debris. In this instance, the vulnerability overlaps those identified in the debris flow section that follows.

Economy

Response and recovery costs to address erosion problems have cost Denver Water alone over \$27.7 million. This can be used as an estimate of future losses but will vary depending on if fire and resulting erosion problems affect critical watersheds.

Historical, Cultural, and Natural Resources

The largest concern surrounding erosion centers on the pollution of the watersheds by soils, which impacts wildlife balances and degrades water quality for downstream habitats. Continued erosion and movement of soils in wildfire areas usually degrade watershed quality and thus exert a larger or disproportionate impact on the larger planning area. In addition, recovery for the washed-out areas may be prolonged or difficult, as demonstrated in the burn areas of the Hayman fire, due to the loss of nutrient-rich soil.

Future Development

Future development on steep slopes is not likely, and the areas at the base of the hogbacks are regulated by the County, therefore future development exposed to slope-driven erosion is unlikely. Unsuitable slopes are mapped in area plans (such as the Evergreen Area Community Plan) and are part of the County Comprehensive Plan. Future developments subjected to erosion and deposition as a result of wildfire, forest thinning, and clearcutting are vulnerable to the same extent as discussed in the landslide, debris flow, and rockslide hazard.

Overall Hazard Significance

Erosion events in Jefferson County have a potentially significant impact on the planning area, but the County has recognized and addressed these threats. As such, the geographic extent of the hazard is considered **significant**, the probability of future occurrences is considered **likely** and the magnitude/severity for the event of record is **critical**. In addition, the HMPC considers the hazard to have a low overall impact on the planning area. This equates to an overall impact rating of **medium**.

4.3.7 Expansive Soils

Description

Swelling soils and swelling bedrock contain clay which causes the material to increase in volume when exposed to moisture and shrink as it dries. They are also commonly known as expansive, shrinking and swelling, bentonitic, heaving, or unstable soils and bedrock. In general, the term refers to both soil and bedrock contents although the occurrence of the two materials may occur concurrently or separately. The difference between the materials is that swelling soil contains clay, while swelling bedrock contains claystone. In this profile, the term is used to refer to both materials, as they are both relevant to the planning area.

The clay materials in swelling soils are capable of absorbing large quantities of water and expanding 10 percent or more as the clay becomes wet. The force of expansion is capable of exerting pressures of 15,000 pounds per square foot or greater on foundations, slabs, and other confining structures. The amount of swelling (or potential volume of expansion) is linked to five main factors: the type of mineral content, the concentration of swelling clay, the density of the materials, moisture changes in the environment, and the restraining pressure exerted by materials on top of the swelling soil. Each of these factors impact how much swelling a particular area will experience, but may be modified, for better or worse, by development actions in the area.

In Colorado, swelling soils expand and contract naturally during seasonal wetting (winter and spring) and drying (summer and fall) conditions and in their natural, undeveloped state they cause little damage. However, exposure to additional water sources, such as lawn and garden irrigation or precipitation drainage from houses, and reduced evaporation properties caused by the development of roads, sidewalks, buildings and parking lots, may cause the swelling soils to expand more than they would if they remained undeveloped. In addition, the re-grading of development areas may expose more swelling soil to moisture than the natural state, causing a more widespread swelling event.

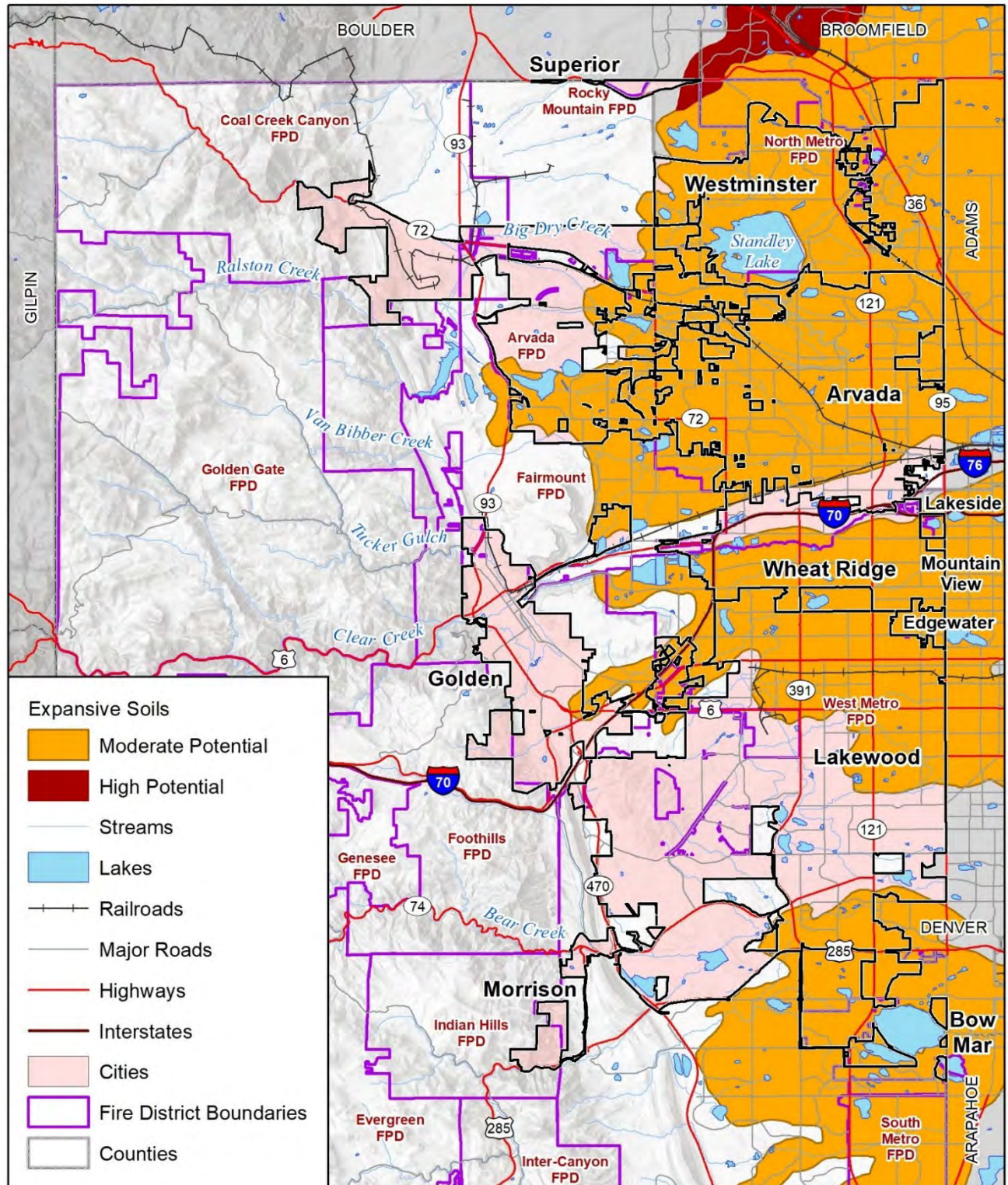
In Jefferson County, there are also areas of steeply dipping bedrock or heaving bedrock along the foothills. In these areas, sedimentary bedrock layers are steeply upturned and tilted to form the distinctive hogback features. This causes bedrock to swell unevenly in a linear pattern, instead of the uniform pattern more common to flatter areas of swelling soils, and subjects structures to extreme amounts of both vertical and lateral stress. In Jefferson County, areas of potential dipping and heaving bedrock are identified as a geologic hazard and construction in those areas is heavily restricted.

Swelling soils are one of the nation's most prevalent causes of damage to buildings. According to the 2018 State Hazard Mitigation Plan, annual losses nationwide are estimated in the range of \$2 billion. In Colorado, the cost is estimated at \$16 million annually. Potential damages include severe structural damage; cracked driveways, sidewalks, and basement floors; heaving of roads and highway structures; condemnation of buildings; and disruption of pipelines and other utilities. Destructive forces may be upward, horizontal, or both. Buildings designed with lightly loaded foundations and floor systems often incur the greatest damage and costly repairs from expansive soils. Building in and on swelling soils can be done successfully, although more expensively, as long as appropriate construction design and mitigation measures are followed. In some cases, avoidance may be the best mitigation policy.

Geographic Extent

The extent of swelling soils across Jefferson County is primarily contained in the developed portion of the County at the base of the foothills in the northeast portion of the planning area. In fact, the swelling soils neatly follow the rise of the Rocky Mountains along the western and southern portions of the County. The extent of dipping bedrock in the planning area neatly abuts the extent of the mostly horizontal plains of swelling soil on the east, and the fall of the hogback formations on the west. The figures below demonstrate the mapped geologic hazard layers utilized by the planning area for development.

Figure 4-20 Jefferson County Expansive Soils

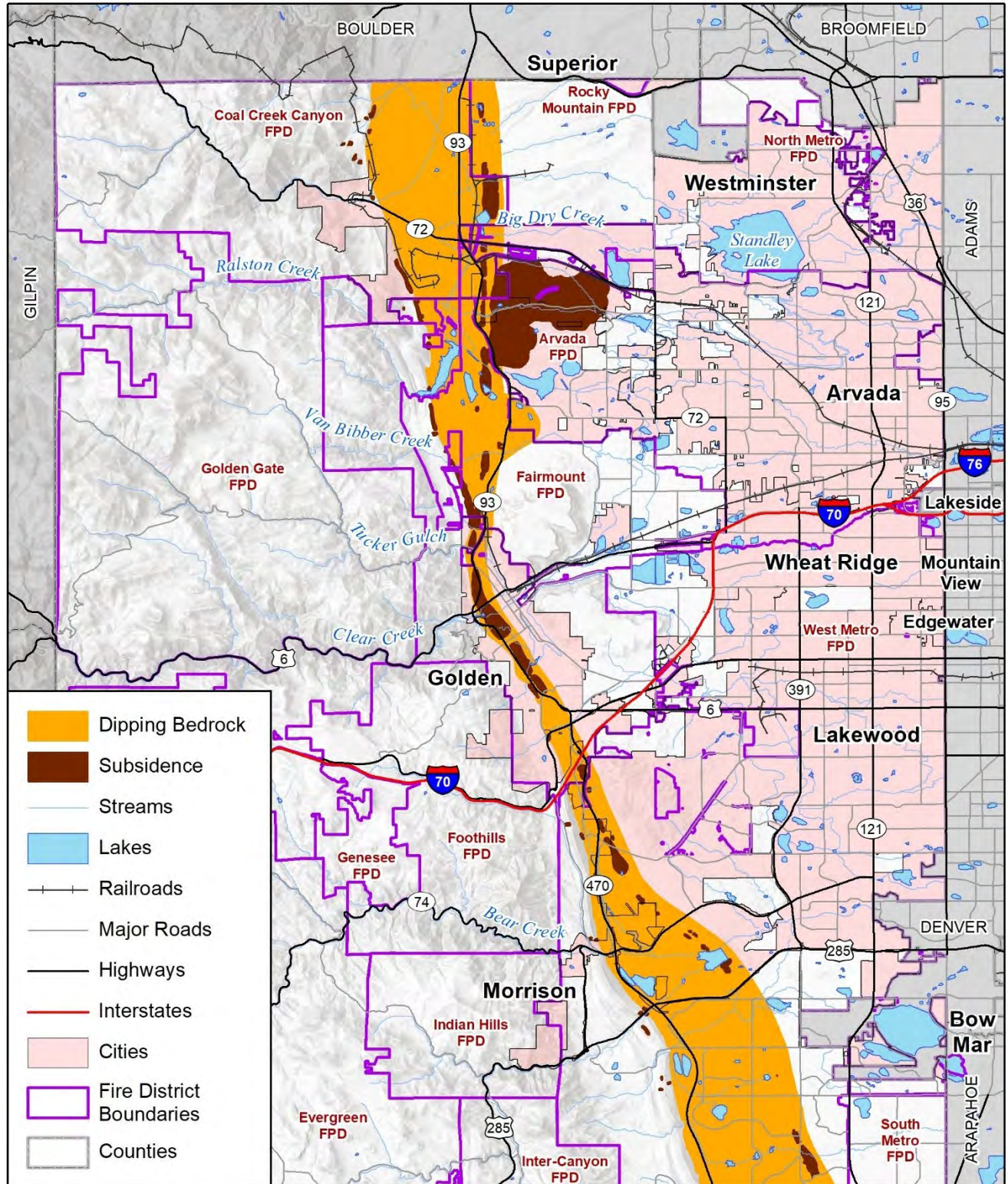


Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado Geological Survey

0 5 10 Miles



Figure 4-21 Jefferson County Dipping Bedrock and Subsidence



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT

0 5 10 Miles



Previous Occurrences

Damage of varying degrees of severity occurs on an ongoing and seasonal basis. The frequency of damage from expansive soils is associated with the cycles of drought and heavy rainfall and also reflects changes in moisture content based on typical seasonal patterns. Building codes and structure ages also contribute to overall damages, as newer structures are usually built with more resistant techniques or as development restrictions in vulnerable areas minimize expansion and exposure. Published data summarizing damages specific to Jefferson County is not available, but it is acknowledged that a certain degree of damage to property and infrastructure occurs annually, as noted above.

Since the last plan update, the most significant areas that intersect Golden and Morrison remain largely undeveloped; however, growth in western Arvada, western Lakewood, and unincorporated areas along Highway 93 and CO-470 since the last update exposes new development to this hazard. It is important to note that recent development east of Highway 93 in West Arvada and north of Golden was not reflected in the 2015 plan. It is reflected in this plan and shows increased exposure for these areas.

The mapped extent of the hazards clearly impacts approximately 50% of the planning area. However, when considering the geographic impact on the planning area, it is important to note that the entire southern portion of the County is occupied by Pike National Forest, and therefore has a minimal impact on this hazard mitigation plan as development in the area is highly regulated outside of County authority. Of the actively developed and monitored lands in the County, more than 75% is subject to swelling soils or dipping bedrock hazards.

Based on this information, the geographic extent rating for swelling soils is **extensive**.

Probability of Future Occurrences

The planning area has extensive development regulations to minimize the damages incurred by dipping bedrock and other geologic hazards in the County. As such, while previous occurrences are certainly commonly known, it is reasonable to assume that damages and future occurrences should be decreasing.

Since records of specific occurrences are not available to the planning process, it is difficult to estimate the probability of future occurrences. The hazards occur seasonally and annually, which should theoretically equate to a highly likely rating. However, mitigation efforts in place in the County since 1995 should prevent the likelihood of the hazard having damaging impacts. Due to the extensiveness of swelling soils in the County the probability rating for this hazard is considered as **likely**.

Magnitude and Severity

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. For this hazard, there is no specific event of record, and the extensive mitigation efforts taken since the initial identification of the hazard nearly thirty years ago are taken into account with the magnitude and severity ratings. Therefore, this hazard will be evaluated for potential worst-case scenarios possible under current regulatory standards. Such an event could potentially damage entire neighborhoods, including roads, sidewalks, properties, and utility pipes. Even minor damages on such a scale would quickly incur enormous costs. While critical infrastructure services are not directly vulnerable to the hazard, structures experience the same risks identified for private and commercial properties: if they are built on swelling soil without adequate or appropriate building mitigation, they are vulnerable to damage. In worst case scenarios, this could include loss of communication lines or severe damages to structures rendering them uninhabitable. If this occurred to a hospital or jail, for instance, it could have significant social repercussions, in addition to the incurred costs. Injuries, illnesses and deaths associated with the hazard would be unique and minimal, and probably incurred as secondary hazards resulting from damages to infrastructure. Overall, though the fiscal damage may be extensive, the overall severity and impacts of the hazard are readily mitigated, reducing the overall impacts.

Based on these factors, the magnitude and severity rating for swelling soils is considered **limited**.

Climate Change Considerations

Changing climate conditions are expected to affect soil resources in many ways. During hot, dry years annual grasses that stabilize and protect topsoil often fail to germinate or do not grow well. This leaves soil surfaces highly vulnerable to erosion from wind and precipitation runoff. Without the availability of nutrient-rich topsoil, crops struggle to survive and flourish. As discussed previously, higher rates of erosion can have a profound effect on agricultural production and on the economies of rural areas of the county.

Many soils and rocks have the potential to swell or expand based on a combination of its mineralogy and water content. The actual swelling of expansive soils will be caused by a change in the environment (e.g. water content, stress, chemistry, or temperature) in which the material exists. Since the 1950s, snow precipitation and duration of snowpack have both decreased while rising temperatures have increase rate of water evaporating into the air and earlier runoff, creating drier soil conditions in Colorado (EPA 2016). More extremes in climate conditions (e.g. wet-dry conditions), could potentially exacerbate the swelling of expansive soil issues in the future.

Vulnerability Assessment

General Property

Similar to the subsidence hazard, the majority of the hazard's significance is drawn from the exposure of existing development to this hazard. As identified in the hazard profile and noted above, extensive areas of the planning region east of the foothills are characterized to some extent by swelling soils. Older construction may not be resistant to the swelling soil conditions and, therefore, may experience expensive and potentially extensive damages. This includes heaving sidewalks, structural damage to walls and basements, the need to replace windows and doors, or dangers and damages caused by ruptured pipelines. Newer construction may have included mitigation techniques to avoid most damage from the hazard, but the dangers continue if mitigation actions are not supported by homeowners. For example, the maintenance of grading away from foundations and the use of appropriate landscaping near structures must be continued to prevent an overabundance of water in vulnerable soils near structures. While continued public education efforts may help increase compliance for landscaping and interior finishing mitigation actions, physical reconstruction of foundations is probably not feasible in all but the most heavily impacted of existing development. Therefore, damages may be expected into the future for existing structures.

GIS was used to create a risk assessment for geological hazards in Jefferson County. Dipping bedrock (i.e. heaving bedrock) hazard data was overlaid on Jefferson County parcel and assessor's data. For the purposes of the analysis, if the hazard zone intersects an improved parcel center, its improved value is included and parcel is counted in Table 4-33. Results are sorted by occupancy type and by jurisdiction to demonstrate how the hazard's risk varies across the planning area.

This analysis outlines the potential exposure of improvements built on dipping bedrock for existing development in the planning area. This represents only a tiny portion of the swelling-soil related building exposure, as a swelling soils GIS layer was not available. However, the exposure to the dipping bedrock alone identifies that there could be potential for damage from this hazard. The table indicates that Golden, Lakewood, Morrison, Arvada and the unincorporated areas east of the foothills have the greatest exposure to this hazard. In this analysis, improved values (typically structures and buildings) are assumed to be potentially exposed, but not necessarily 'at risk.' This analysis does not take into account site-specific mitigation measures that may be in place, thus estimating losses for dipping bedrock is difficult.

Compared to 2016, in general exposure of buildings to dipping bedrock increased for all jurisdictions, likely due to development outward for all jurisdictions. Residential property exposure to dipping bedrock increased for parcels for Arvada, Golden, Lakewood, and Unincorporated. For example, residential property improved parcels exposed to dipping bedrock increased from 22 to 203, nearly a 10-fold increase.

Table 4-33 Exposure of Buildings to Dipping Bedrock

Jurisdiction	Property Type	Improved Parcels	Building Parcels	Total Value	Population
Arvada	Commercial	2	2	\$3,589,478	
	Industrial	2	2	\$8,225,885	
	Residential	203	205	\$128,134,394	508
	Total	207	209	\$139,949,757	508
Golden	Agriculture	1	1	\$70,874	
	Commercial	78	99	\$231,482,526	
	Exempt	15	31	\$208,931,936	
	Industrial	86	89	\$131,473,603	
	Mixed Use	9	17	\$125,961,762	
	Residential	1,786	2,562	\$1,247,910,033	5,739
	Total	1,975	2,799	\$1,945,830,734	5,739
Lakewood	Commercial	2	15	\$8,684,812	
	Exempt	2	3	\$106,386	
	Industrial	1	4	\$176,850	
	Residential	1,391	1,391	\$975,570,386	3,158
	Total	1,396	1,413	\$984,538,434	3,158
Morrison	Commercial	1	1	\$1,681,678	
	Exempt	3	3	\$17,958,698	
	Industrial	1	1	\$181,443	
	Total	5	5	\$19,821,819	0
Unincorporated	Agriculture	9	9	\$1,131,166	
	Commercial	203	242	\$584,914,140	
	Exempt	45	48	\$358,498,400	
	Industrial	183	190	\$286,860,023	
	Mixed Use	65	74	\$118,221,706	
	Residential	20,393	20,696	\$9,911,186,736	52,775
	Total	20,898	21,259	\$11,260,812,171	52,775
Grand Total		24,481	25,685	\$14,350,952,913	62,180

Source: Jefferson County GIS and Assessor's Data

People

There are no reported injuries or deaths to these soil hazards in Jefferson County, and direct impacts on people are likely to be very minimal.

Critical Facilities and Infrastructure

Existing critical facilities impacted by dipping bedrock and other swelling soil hazards are of particular concern, as the damages caused to these structures may impact the ability of the planning area to provide critical services to the population. Schools built on the area may pose a danger to occupants if the buildings are severely damaged in an event. If building integrity is compromised, it may also reduce the sheltering capacity or public health distribution capacity of the County, as schools are often used for these functions.

Table 4-34 includes the results of a GIS overlay of critical facilities on the dipping bedrock areas. Critical facilities exposed to dipping bedrock increased in number for all jurisdictions compared to the 2016 plan. The unincorporated jurisdiction has the most critical facilities at risk and a majority of those are communication and transportation FEMA lifelines. A number of schools and fire stations in the planning area are potentially exposed. This analysis does not take into account site-specific mitigation measures that may be in place.

Table 4-34 Critical Facilities in Dipping Bedrock Zones in Jefferson County

Jurisdiction	FEMA Lifeline	Critical Facility Type	Count
Arvada	Communications	Land Mobile Private Towers	1
	Communications	Microwave Service Towers	2
	Energy	Electric Substation	2
	Energy	Power Plant	2
	Hazardous Material	Tier II	1
	Transportation	Bridge	2
		Total	10
Golden	Communications	Land Mobile Private Towers	9
	Communications	Microwave Service Towers	9
	Food, Water, Shelter	Water Facility	1
	Hazardous Material	Household Hazardous Waste	1
	Hazardous Material	Tier II	1
	Health and Medical	Nursing Home	2
	Safety and Security	EOC	1
	Safety and Security	Government Facility	6
	Safety and Security	Law Enforcement	1
	Safety and Security	School	2
	Transportation	Bridge	6
		Total	39
Lakewood	Communications	Land Mobile Private Towers	1
	Energy	Electric Substation	2
	Food, Water, Shelter	Wastewater Plant	1
	Transportation	Bridge	7
		Total	11
Morrison	Communications	Land Mobile Private Towers	1
	Safety and Security	Fire Station	1
	Transportation	Bridge	2
		Total	4
Unincorporated	Communications	Land Mobile Private Towers	31
	Communications	Microwave Service Towers	29
	Energy	Electric Substation	6
	Energy	Power Plant	1
	Hazardous Material	Tier II	13
	Health and Medical	Nursing Home	9
	Safety and Security	Fire Station	2

Jurisdiction	FEMA Lifeline	Critical Facility Type	Count
	Safety and Security	Government Facility	1
	Safety and Security	Law Enforcement	1
	Safety and Security	School	17
	Transportation	Bridge	45
	Transportation	Government Facility	4
Total			159

Source: HIFLD and CERC

Economy

The economic cost of this hazard is typically minor in the short term, although over time they can add up to significant impacts.

Historical, Cultural, and Natural Resources

Collapsible and expansive soils are a natural environmental process. Nonetheless they have the potential to alter the landscape and can cause damages to historic and cultural resources.

Future Development

The most effective mitigation actions for expansive soil are complete avoidance or non-conflicting use, or correct engineering design (which includes foundation design, adequate drainage, landscaping, and appropriate interior finishing.) While some areas are devoted to non-conflicting use permits, in particular the areas which are included in the dipping bedrock zones, so much of the Colorado basin is covered in swelling soils that complete avoidance is not possible.

Land use planning regulations in place should temper the risk of swelling soil impacts on future development. Continued efforts to regulate building in areas of high or moderate swelling potential increase the number of structures and infrastructure built with swelling-adaptive methods, which in turn reduces the amount of damage incurred each year on the property. Continued education on the hazard, particularly with landscaping and maintenance concerns, will be needed to reduce the impacts of the hazard on development. As existing development deteriorates and requires either renovation or reconstruction, mitigation methods should be implemented to bring the developments up to contemporary mitigation standards.

Since the last plan update, the most significant areas that intersect Golden and Morrison remain largely undeveloped; however, growth in western Arvada, unincorporated areas along Highway 93, and in Lakewood exposes new development to this hazard. It is important to note that recent development east of Highway 93 in West Arvada and north of Golden was not reflected in the 2015 parcel and associated databases. It is reflected in this plan and shows increased exposure for these areas.

Overall Hazard Significance

Swelling soil in Jefferson County has, historically, exerted significant impacts on the County, particularly during the large growth expansion experienced between 1970 and 1995. In response to the growing hazard, Jefferson County formed and convened an Expansive Soils Task Force in the spring of 1994 and implemented development regulations by 1995. As a result, the impacts of the hazards in the planning area have been extensively mitigated, either by restricting where development is permitted or by heavily regulating the type of construction permitted in certain areas to adequately address the hazard. The geographic extent of the hazard is considered **extensive**. The probability of future occurrences is considered **likely** and the magnitude/severity for the event of record is **limited**. In addition, the HMPC considers the hazard to have a low overall impact on the jurisdiction. This equates to an overall impact rating of **medium**. In many ways, the swelling soils hazard is an excellent example for demonstrating the effectiveness of how mitigation efforts may reduce the vulnerabilities and risks of a previously high-concern hazard. Sound planning and engineering practices should keep the impact to future development low, however the potential for damages exist in older residential areas.

4.3.8 Extreme Temperatures

Description

Extreme Heat

The Colorado State Hazard Mitigation Plan defines extreme heat as “temperatures over 90 degrees for an extended period of time, or that hover 10 degrees or more above the average high temperature for the region and last for multiple consecutive days.” In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornadoes, floods, or earthquakes—takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died.

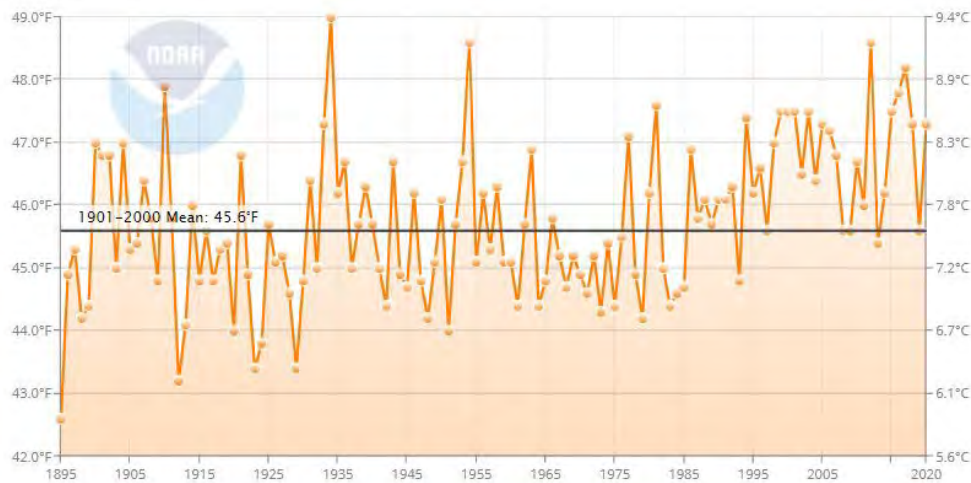
Heat disorders generally have to do with a reduction or collapse of the body’s ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body’s inner core begins to rise, and heat-related illness may develop. Elderly persons, small children, those with chronic illnesses, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where moderate climate usually prevails.

Extreme Cold

Extreme cold often accompanies a winter storm or is left in its wake. It is most likely to occur in the winter months of December, January, and February. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Extreme cold can disrupt or impair communications facilities.

Previous Occurrences

According to the National Weather Service Forecast Office for Denver/Boulder, there have been 82 streaks with temperatures of 90 degrees or greater since 1895, which accounts for more than 150 days of extremely hot temperatures in the metro area (NWS). During 2008, Denver’s 87-year-old record for the number of consecutive days above 90 degrees Fahrenheit was broken. The new record of 24 consecutive days surpassed the previous record by almost a week. On August 1st, it reached 104 degrees, breaking a record set in 1938 and on August 2nd, it reached 103 degrees, breaking a record set in 1878. In addition, as of August 2008, the area documented 68 days with temperatures above 100°F and 29 days with temperatures below -20°F between February 2008 and 1872 (NWS), as shown in Figure 4-22.

Figure 4-22 Jefferson County Average Annual Temperature, 1895 – 2020Jefferson County, Colorado Average Temperature
January–December

Source: NOAA

By contrast, the Denver Metro area averages 156 days a year with a minimum temperature of 32°F or less. The highest recorded temperature for Jefferson County is 104°F, and the lowest is -41°F. The Southwest Climate and Environmental Information Collaborative (SCENIC) reports data summaries from a station in the City of Lakewood and a station in the Town of Evergreen. Table 4-35 contains temperature summaries related to extreme heat for the station.

Table 4-35 Temperature Data from Lakewood and Evergreen Stations

Station	Average Annual Maximum Temperature	Average Annual Minimum Temperature	Extreme Maximum Temperature	Extreme Minimum Temperature	Avg Annual Days Max. >90	Avg Annual Days Max. <32	Avg Annual Days Min. <32	Avg Annual Days Min. <0
Lakewood1 (054762)	64	37	104 6/27/1994	-26 1/12/1963	8.7	6.5	49.2	2
Evergreen2 (052790)	61	27	97 6/23/2012	-38 1/12/1963	1.5	6.7	74.3	6

Source: SCENIC ¹Period of Record: 1962-2020 ²Period of Record: 1961-2020

Since temperature variations are a regional hazard, many of the previous occurrences are documented at a regional level as well. For example, between 1996 and 2020 the NCEI database reflects one incident of extreme temperatures for Jefferson County (extreme cold/wind chill in 2011), but documents eight incidents in neighboring Denver County. Therefore, the incidents below impact more than just the planning region.

1983 – A cold spell impacted the entire Metro area with readings dipping to -21°F, marking the coldest recorded temperature in 20 years.

1989 – Periods of extreme cold and high winds combined with snow created a severe storm scenario. Stapleton Airport was closed, and a 46-car pileup occurred on Interstate 25. More details on this storm are captured in Section 4.3.13.

April 11, 1995 – Extreme cold was reported across the region with temperatures recorded at 13°F. Damages to wheat crops in Arapahoe County were estimated at \$1 million (\$1.4 million in 2008 dollars).

December 16-18, 1996 – Extreme wind chills impacted the entire Front Range and plains regions. Lows in the Denver area were reported at -9°F. A homeless man found in his car, with a body temperature of only 85°F at the time, died a few hours later.

October 24-25, 1997 – A blizzard left snow up to 4' deep in the foothills and wind gusts were documented at 70 mph. With wind chill, temperatures dropped to between -25°F and -40°F. A State of Emergency was declared, with five recorded deaths and 15 injuries.

December 18-24, 1998 – An arctic air mass settled in over northeastern Colorado dropping overnight temperatures well below zero for 6 consecutive days. Overnight temperatures bottomed out at -19°F on the morning of the 22nd. At least 15 people, mostly homeless, were treated for hypothermia at area hospitals. The bitter cold weather was responsible, either directly or indirectly, for at least 5 fatalities. Three of the victims died directly from exposure. The cold weather also caused intermittent power outages. Following the cold snap, thawing water pipes cracked and burst in several homes and businesses causing extensive damage. Damage estimates were unavailable.

June and July 2000 – June 29th marked the beginning of a near record hot streak for the Denver area. The maximum high temperature at Denver International Airport equaled or exceeded the 90°F mark for 17 consecutive days, from June 29th-July 15th; one day short of tying the all-time record. The record of 18 consecutive days was set in two different years, July 1st-18th, 1874 and July 6th-23rd, 1901.

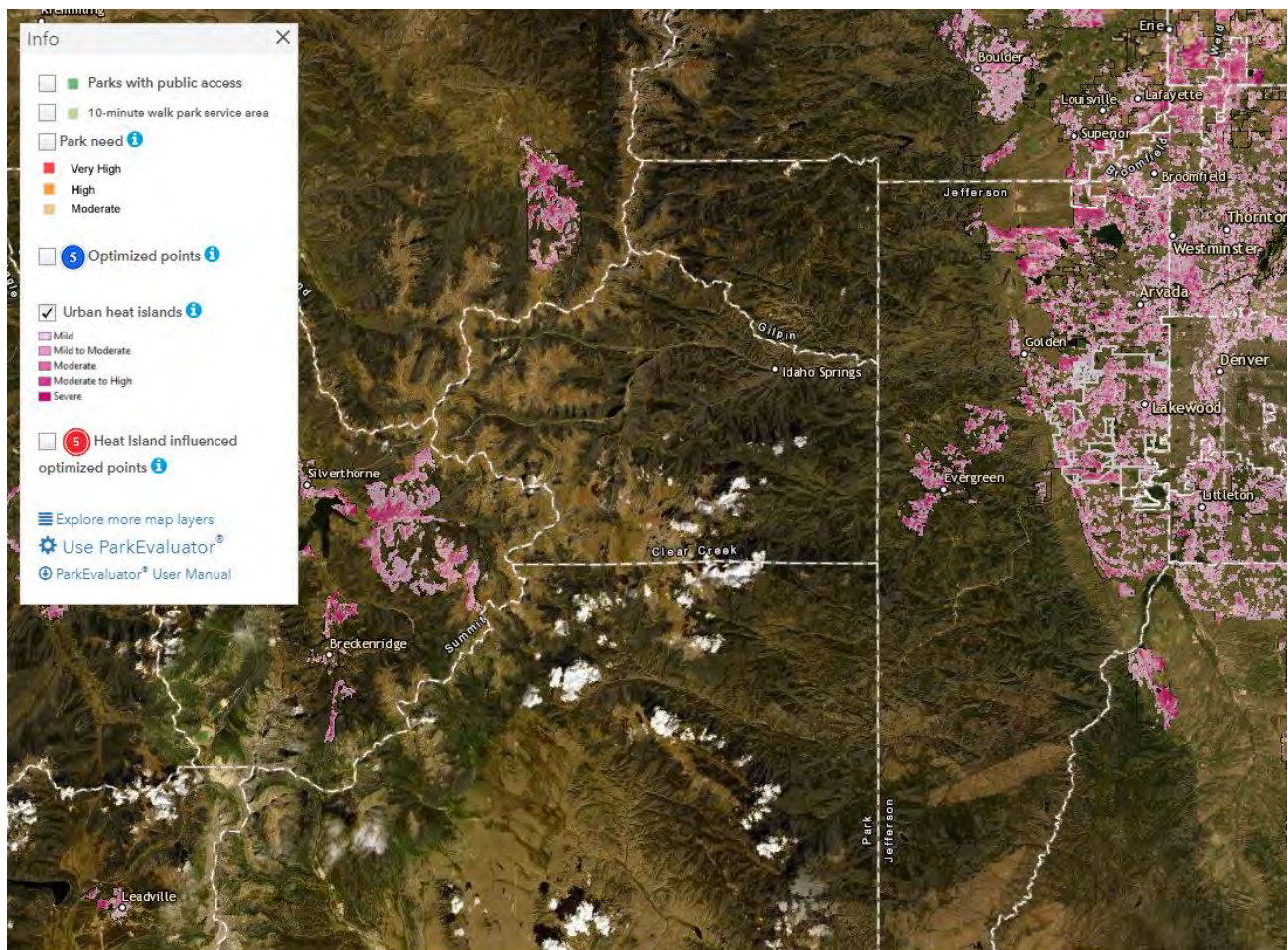
February 1-4, 2011 – A frigid Arctic air mass settled into the Front Range Urban Corridor to start out the month. At Denver International Airport, overnight low temperatures on the 1st through the 3rd were 13 and 17 below zero and zero respectively. The icy temperatures caused pipes to crack and burst following the freeze. At the Jefferson County Courts administration building, a steady stream of water from a crack on the 5th floor went unnoticed and flooded all floors of the administration wing overnight, damaging much of the office equipment, furniture and carpet. The icy temperatures also forced the closure of several school districts.

Geographic Extent

The inherent nature of temperature hazards makes them a regional threat, impacting most or all of the planning area simultaneously although the impacts will vary by location. The County being located along the foothills of the Rocky Mountains and encompasses the West Denver Metro area municipalities of Arvada, Golden, Lakewood, Lakeside, Morrison, Mountain View, Westminster and Wheat Ridge. These areas experience similar temperate climate to the remaining Denver Metropolitan Area and are more susceptible to extreme heat events compared to the higher elevations of the County due to the more urbanized areas. The areas of higher elevations like Kittredge, Evergreen, Idledale, and the unincorporated rural mountain areas are more susceptible to extreme variations in general, which can pose a danger to those citizens that may be more vulnerable and certainly so if those extremes temperatures are extended. This is reflected in the previous occurrence record, which consistently discusses the Denver Metro Area, rather than singling out particular counties or communities.

Urbanized areas, in the Denver Metro Area can experience pockets of heightened temperatures where surfaces such as pavement and roofs become hotter than the air temperatures, a phenomenon known as the urban heat island effect. These hot surfaces also retain heat, causing high temperatures to persist even when air temperature drops. Per the EPA, "the annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F (1–3°C) warmer than its surroundings. On a clear, calm night, however, the temperature difference can be as much as 22°F" (US EPA). Colorado's climate tends to experience large day and night temperature changes. This nighttime cooling will help alleviate heat conditions and is thought to benefit and reduce risk of extreme heat.

The Trust for Public Land, ParkServe online mapping tool allows users to find areas that are impacted by urban heat islands as well as the availability of parks with public access. Figure 4-23 shows the urban heat island areas within Jefferson County and the level of severity, from mild to severe impact.

Figure 4-23 Urban Heat Island Areas within Jefferson County

Source: The Trust for Public Lands, ParkServe <https://parkserve.tpl.org/mapping/> The geographic extent rating for extreme temperatures is extensive.

Probability of Future Occurrences

Temperature extremes occur on a regular basis, with an annual average of 4.6 days in the mountain areas and 25.7 in the metro area where the maximum temperatures exceed 90°F. The temperatures dip below freezing (32°F) an annual average of 19 days. Severe incidents or prolonged exposures to a temperature extreme are a higher threat to the community than isolated, seasonal occurrences.

There have been 23 incidents of extreme temperatures in Jefferson County since 1961. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a severe temperature extreme occurring in any given year is 39%. This corresponds to a probability of future occurrences rating of **likely**.

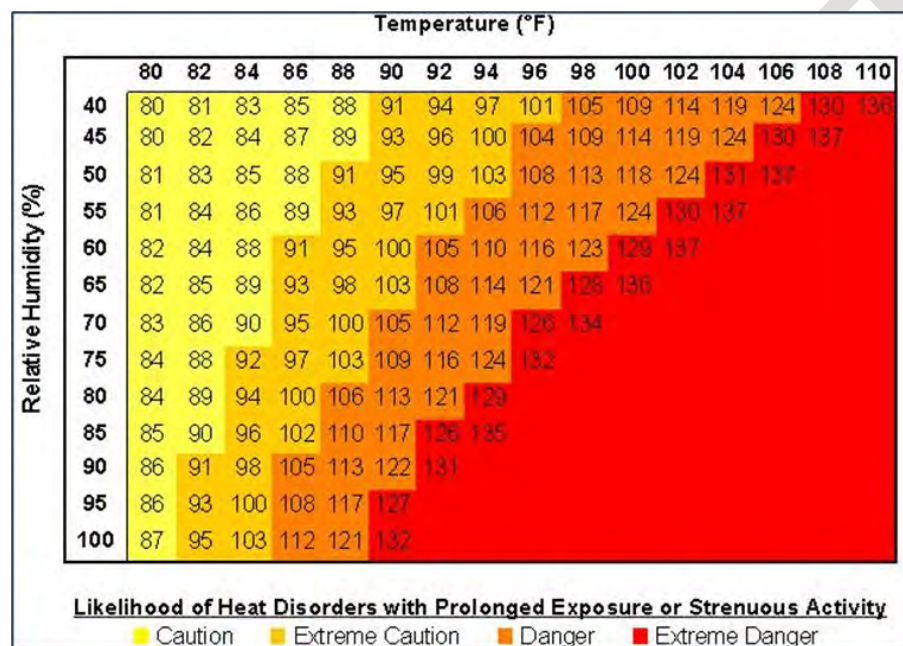
Magnitude and Severity

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. Since temperature extremes refer to both extreme heat and extreme cold, there is not a single event of record. The event of record for extreme heat in Jefferson County occurred in the summer of 2000. While specific property damages are not available, the event coincided with a severe drought period, which caused extensive damages to crops and personal property, impacted overall water supplies, and caused economic damages due to both conditions. The event of record for

extended periods of severe cold in Jefferson County occurred during December 18-24 in 1998. Damages caused by ruptured water pipes were considered extensive in both the private and public sectors. Power outages increased damages to property and impacted human lives. Hospitals documented a small surge in casualties either directly or indirectly attributed to the cold, and at least 15 injuries were reported. Five deaths were attributed to the cold weather as well, with three of them due directly to exposure. Nationwide, extreme temperatures remain the leading cause of weather-related deaths.

The National Weather Service Heat Index Program provides a measure of the extent of typical health impacts of exposure to heat, as shown in Figure 4-24 and Table 4-36. During these conditions, the human body has difficulties cooling through the normal method of the evaporation of perspiration, and health risks rise. The chart below illustrates the relationship of temperature and humidity to heat disorders.

Figure 4-24 Heat Index Chart



Source: National Weather Service

Note that Heat Index (HI) values were devised for shady, light wind conditions. Exposure to full sunshine can increase HI values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

Table 4-36 Typical Health Impacts of Extreme Heat by Heat Index

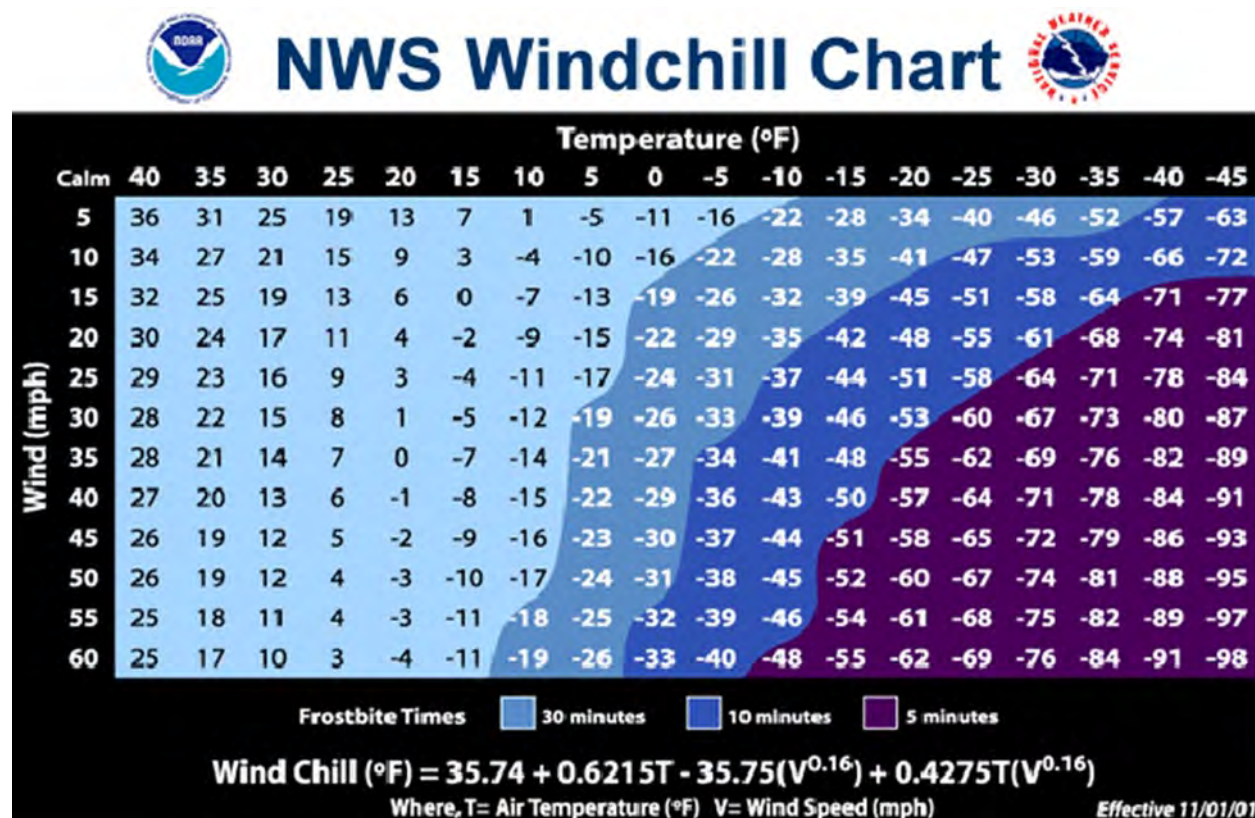
Heat Index	Disorder
80-90° F	Fatigue possible with prolonged exposure and/or physical activity
90-105° F	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

The NWS has in place a system to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for the issuance of excessive heat alerts is when the maximum daytime high is expected to equal or exceed 105°F and a nighttime minimum high of 80°F or above is expected for two or more consecutive days.

In 2001, the NWS implemented an updated Wind Chill Temperature index (see Figure 4-25). This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 4-25 National Weather Service Wind Chill Chart



Source: National Weather Service

The National Weather Service Denver/Boulder Forecast Office issues warnings and advisories for cold temperatures. The following is a breakdown on the various NWS defined watches, warnings and advisories that could be issued:

- Wind Chill Watch is issued when wind chill warning criteria are possible in the next 12 to 35 hours.
- Wind Chill Warning is issued for wind chills of at least -25°F on the plains and -35°F in the mountains and foothills.
- Wind Chill advisory is issued on the plains when wind and temperature combine to produce wind chill values of -18°F to -25°F and -25°F for the mountains and foothills.
- Freeze Watch is issued when freeze conditions are possible in the next 12 to 36 hours.
- Freeze Warning is issued during the growing season when widespread temperatures are expected to drop to below 32°F.
- A frost advisory is issued during the growing season when temperatures are expected to drop to between 32°F and 35°F on clear calm nights.

The Jefferson County Emergency Preparedness Guide addresses both of these temperature extremes, and notes that people living in urban areas may experience a greater risk from the effects of a prolonged heat wave than those living in rural areas, due to the impacts of heat on the atmosphere, air quality and temperature. In some cases, extreme heat incidents may lead to emergency water shortages, which are shorter in duration than a drought, but exhibit similar impacts and secondary hazardous situations.

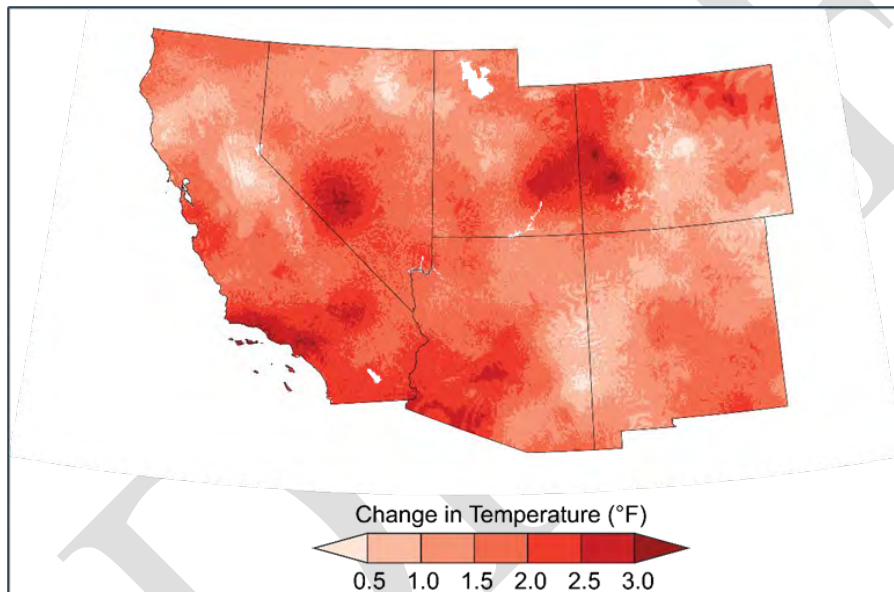
Based on these factors, the magnitude and severity rating for temperature extremes is considered **limited**.

Climate Change Considerations

Climate change is projected to increase the uncertainty of weather patterns and produce more extreme climate induced events. Scientists have suggested that warming in the Arctic has been linked changes in the jet stream which may lead to increased polar vortex events in Colorado. The polar vortex is well documented and is described as large areas of low pressure and cold air surrounding the North and South poles. Increased temperatures in the polar regions has weakened and destabilized the jet stream leading to polar air to dip into lower latitudes, bringing it farther south than typical (UC Davis).

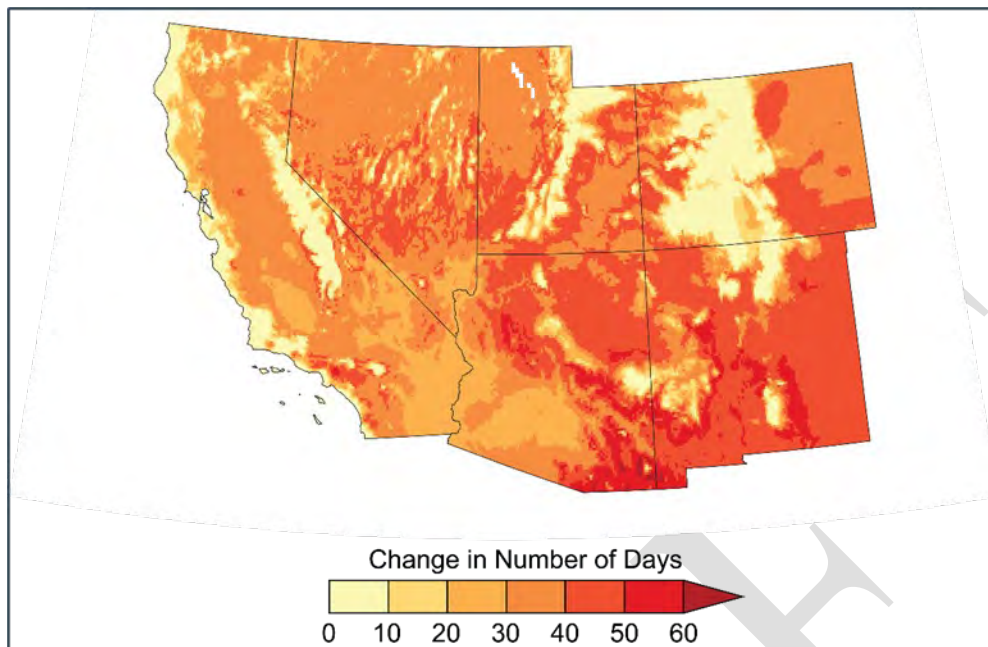
Research cited in the Fourth National Climate Assessment indicates that average temperatures have already increased across the Southwest and will likely continue to rise. Figure 4-26 shows the difference between the 1986-2016 average temperature and the 1901-1960 average temperature. This trend toward higher temperatures is expected to continue and would cause more frequent and severe droughts in the Southwest as well as drier future conditions and an increased risk of megadroughts—dry periods lasting 10 years or more). Additionally, current models project decreases in snowpack, less snow and more rain, shorter snowfall seasons, and earlier runoff, all of which may increase the probability of future water shortages (Gonzalez et al., 2018).

Figure 4-26 Change in Average Temperature Across the Southwest, 1901-1960 to 1986-2016



Source: Fourth National Climate Assessment

Extreme heat is also expected to increase in frequency. Figure 4-27 shows projected increases in extreme heat as an increase in the number of days per year when the temperature exceeds 90°F by the period 2036-2065 compared to the period 1976-2005. Under the higher emissions scenario (RCP8.5), the number of days of extreme heat would increase in Jefferson County by 30 to 50 days based on the figure below.

Figure 4-27 Projected Increases in Extreme Heat

Source: Fourth National Climate Assessment *Based on higher emission scenario RCP8.5

Vulnerability Assessment

General Property

Recent research indicates that the impact of extreme temperatures, particularly on populations, has been historically under-represented. The risks of extreme temperatures are often profiled as part of larger hazards, such as severe winter storms or drought. However, as temperature variances may occur outside of larger hazards or outside of the expected seasons but still incur large costs, it is important to examine them as stand-alone hazards. Extreme heat may overload demands for electricity to run air conditioners in homes and businesses during prolonged periods of exposure and presents health concerns to individuals outside in the temperatures. Extreme heat may also be a secondary effect of droughts or may cause temporary drought-like conditions. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist.

Extreme cold impacts structures when pipes or water mains freeze and burst, causing damage. Cold can also, in the most extreme of circumstances, make materials more fragile and breakable, although the Front Range rarely gets this cold. Extreme cold may also lead to higher electricity and natural gas demands to maintain appropriate indoor heating levels combined with damages caused to the delivery infrastructure such as frozen lines and pipes. Cold may impact transportation as well. Exposed populations may be at risk while waiting for public transportation, particularly when combined with wind-chill, and some vehicles may not start which impacts the commute of the workforce and, in worst case scenarios, the movement of emergency services personnel.

People

The impacts of cold and extreme heat on health are also a consideration. Traditionally, the very young and very old are considered at higher risk to the effects of extreme temperatures, but any populations outdoors in the weather are exposed, including otherwise young and healthy adults and homeless populations. Arguably, the young-and-otherwise-healthy demographic may be more exposed and experience a higher vulnerability because of the increased likelihood that they will be out in the extreme temperature deviation, whether due to commuting for work or school, conducting property maintenance such as snow removal or lawn care, or for recreational reasons.

Critical Facilities and Infrastructure

Prolonged heat exposure can have significant impacts on infrastructure. Prolonged high heat exposure increases the potential of pavement deterioration, as well as railroad warping or buckling. High heat also puts a strain on energy systems and consumption, as air conditioners are run at a higher rate and for longer. Extreme heat can also reduce transmission capacity over electric systems.

Secondary impacts of extreme cold can affect the supporting mechanisms or systems of a community's infrastructure. For example, when extreme cold is coupled with high winds or ice storms, power lines may be downed, resulting in an interruption in the transmission of that power shutting down electric furnaces, which may lead to frozen pipes in homes and businesses.

The impact of severe temperature deviation on power delivery is a significant factor when assessing current development exposure. Xcel Energy, the utility provider for Jefferson County, estimates that service outages due to extreme temperatures cost the utility an average of \$50,000 to fix for every 20,000 people affected. This includes repair and replacements costs, equipment usage and crew overtime.

Economy

Extreme temperatures can lead to potential loss of facilities or infrastructure function or accessibility and uninsured damages. Impact to transportation sector and movement of goods. Historic events in Colorado have impacted community business districts where a majority of businesses are lost (CO SHMP 2018).

Historical, Cultural, and Natural Resources

Jefferson County has hundreds of square miles of parks and open space which provide habitat for various species that are valuable to residents and visitors to the County, and which are vulnerable to extreme temperatures. (Jefferson County 2018). Extreme temperatures can have significant impacts to these natural ecosystems. Increasing temperatures may cause species to shift habitats in elevation and latitude and extended periods of extreme heat can stress both flora and fauna species. According to Colorado Parks and Wildlife, warmer temperatures can also lead to earlier snowmelt affecting insect and wildlife life cycles as well as seed production and germination.

Future Development

Since structures are not usually directly impacted by severe temperature fluctuations, continued development is less impacted by this hazard than others in the plan. However, new development can add stress to the electric grid, potentially increasing the possibility of brownouts or blackouts.

Pre-emptive cautions such as construction of green buildings that require less energy to heat and cool, use of good insulation on pipes and electric wirings, and smart construction of walkways, parking structures, and pedestrian zones that minimize exposures to severe temperatures may help increase the overall durability of the buildings and the community to the variations. Continued development also implies continued population growth, which raises the number of individuals potentially exposed to variations. Public education efforts should continue to help the population understand the risks and vulnerabilities of outdoor activities, property maintenance, and regular exposures during periods of extreme heat and cold.

Overall Hazard Significance

Extreme temperatures in Jefferson County have a particular impact on the planning area. The risk to the population is the greatest, with exposure posing a significant threat to life and safety of residents. In addition, potential damages to property as an indirect impact of the temperature, particularly during cold weather, are costly. Temperature extremes often accompany other, more obvious hazards such as droughts and blizzards or other winter storms and may have undocumented impacts in the community as well. The geographic extent of the hazard is considered **extensive**. The probability of future occurrences is considered **likely** and the magnitude/severity for the events of record is **limited**. The HMPC considers the hazard to have an overall impact rating of **low** on the County. Collectively, the data indicates that the overall impact rating for extreme temperatures is **low**.

4.3.9 Flood

Description

A flood is an overflow or accumulation of an expanse of water that submerges land. Flooding may result from the volume of water within a river or lake which escapes its normal boundaries. While the size of a lake or river will vary with seasonal changes in precipitation and snow melt, it is not a significant flood unless such escapes of water endanger lives and property of inhabited areas along the waterway, which is referred to as the floodplain.

River (or stream) flooding is normally due to excessive high flows and the strength of the water-force that pushes it out of the river channel, particularly at bends or meanders. Businesses and homes along such rivers usually sustain significant damages. While flood damage can be virtually eliminated by moving away from rivers and other bodies of water, people continue to inhabit areas that are threatened by the flood hazard. Communities are strengthening their floodplain building regulations, acquiring property along floodplains to turn into open space recreational areas, and designing flood control projects that better protect large populations.

Floods can be among the most frequent and costly natural disaster in terms of human hardship and economic loss. They are caused by a number of different weather events. Floods can cause injuries and deaths and substantial damage to structures, landscapes, and critical infrastructure and services. Certain health hazards are also common to flood events. Standing water and wet materials in structures can become a breeding ground for microorganisms such as bacteria, mold, and viruses. This can cause disease, trigger allergic reactions, and damage materials long after the flooding event is over.

Direct impacts such as drowning can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be critical to reduce life and safety impacts.

Although heavy rainfall, especially in the form of cloudbursts, is alone capable of causing flash flooding, snowmelt combined with heavy rainfall can certainly increase the chance of flash flooding. Floods caused by rainstorms can peak within a few hours of the onset, and in less than an hour on smaller streams, leaving little time for evacuation.

Communities in Jefferson County are susceptible to various types of flood events as described below.

Riverine or Overbank Flooding

Riverine or overbank flooding is defined as a *watercourse that exceeds its "bank-full" capacity* and is usually the most common type of flood event. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that occurs when soils are already saturated, or drainage systems overloaded from previous rain events. The duration of riverine floods may vary from a few hours to several days and may exhibit a seasonal pattern over a course of years.

Factors that directly affect the amount of flood runoff include: 1) precipitation amount, precipitation intensity, frequency of precipitation, and its spatial and temporal distribution; 2) the saturation levels of the soils, variation in vegetation, erosion and/or bank stability, and the amount of impervious surfaces due to urbanization; and 3) snow-pack depth at higher elevations, rate of snow melt versus snow evaporation and transpiration, and the ratio or pattern of sunny hot days to cooler cloudy days. The weather pattern during peak runoff can be a major factor in whether a watercourse exceeds its capacity or not. Another critical consideration, though secondary to the flood event, is the presence of debris blocking a waterway, channel, bridge, or culverts. The debris can be recent build-up from current runoff or an accumulation long overdue for removal. In any case, debris can further aggravate a flood event.

Development can alter the natural environment, changing and interrupting natural drainage-ways. As a result, drainage systems can become overloaded more frequently intensifying the effects of flooding.

Figure 4-28 and Figure 4-29 show examples of recent riverine flooding in the County. In Figure 4-28, the Cottonwood trees in Bear Lake Park dramatically show the high water line from the September 2013 flooding. The leaves below the high-water line were destroyed, leaving the tops of the trees untouched and still able to display their fall colors. During the height of the fall floods, the park's water level rose

roughly 55 feet above normal. The park, more than 2,500 acres in size, suffered substantial damage due to the high water level, but functioned as it was designed and protected many people and properties downstream.

Figure 4-28 High Water Mark from September 2013 Flooding in Bear Lake Park



Source: CASFM and Lakewood resident Carole Kaune

Figure 4-29 South Platte River at Trumbull Bridge Hwy 67 June 17, 2015

Source: Jefferson County Emergency Management

The most serious overbank flooding occurs during flash floods. They result from intense rainstorms or following a dam or levee failure. The term flash flood describes localized flooding as an incident of sizable peak flow and magnitude, in conjunction with quick onset and short duration. Flash floods usually result from a heavy rainfall on a relatively small drainage area; locally, these are known as cloudburst storms. In contrast, frontal-type rainstorms or snowmelt runoff are more regional in nature, result from moderate rainfall or snowmelt over large areas. Though rain-on-snow flooding can occur, it is fairly infrequent in the Colorado Front Range (and Colorado in general) and does not produce maximum flooding. Flash flooding usually results from a heavy rainfall on a relatively small drainage area occurring very quickly with little or no warning. With residential and businesses development along these small drainages combined with the quickness of an overbank-type flash flooding, evacuation can be difficult. Early warning systems that include automated detection of heavy rainfall and stream level changes are imperative for the public's safety in these types of developed drainage-ways.

Gulches/Irrigation Ditch/Canal Flooding

Jefferson County has numerous valleys, gulches and creeks, canyons and draws, irrigation ditches, and canals used to convey water collected in the mountain reservoirs to downstream users. Ditches convey irrigation water along hillsides, following contours and, as a result, cut across the natural drainage pattern of stormwater runoff flowing down hillsides. Although efforts are made to separate stormwater runoff and irrigation water, excessive runoff can flow into an irrigation ditch causing overbank flooding or a collapse of the ditch itself. Similar to flash floods, there is often little warning for these types of events.

Urban or Street Flood Events

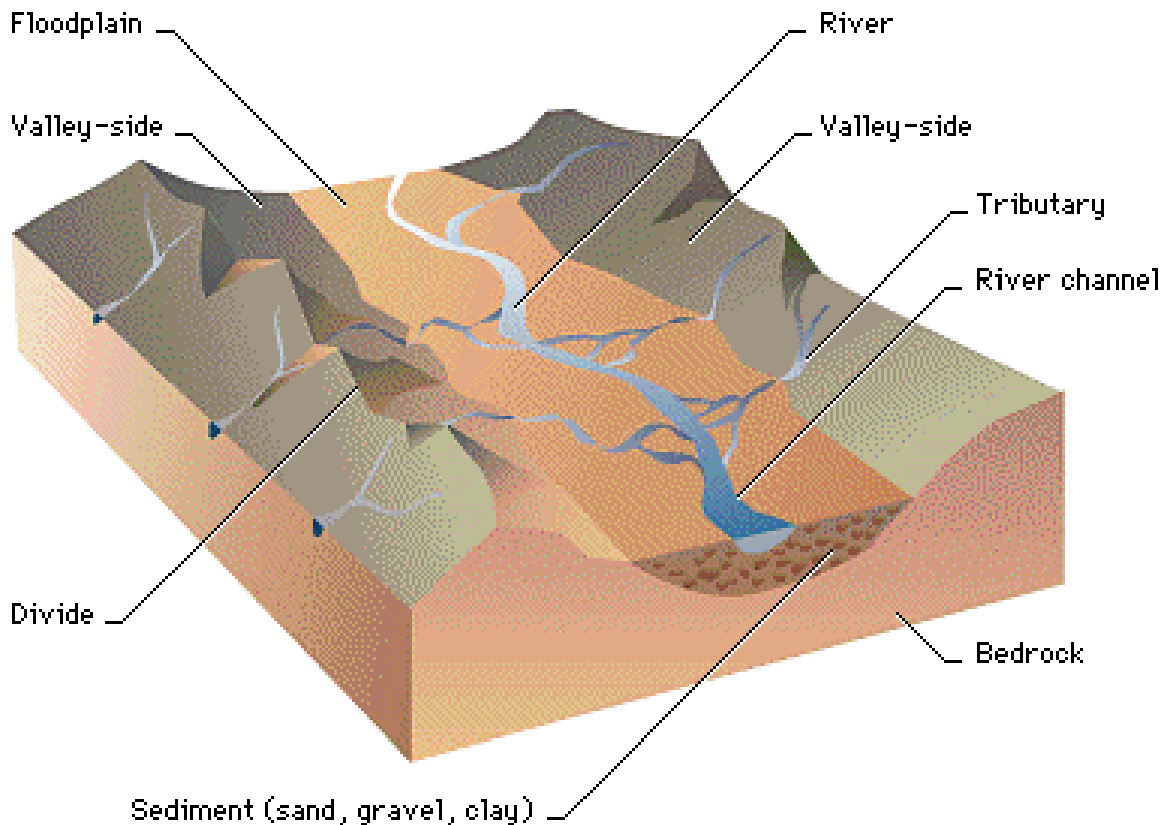
Urban or street flood events occur due to the conversion of land from undeveloped areas to surfaces appropriate for roads, parking lots, and other types of site development needs. This is called urbanization, which is the reason that a soil's ability to absorb water is reduced. When soil is subjected to an excessive

amount of water in an accelerated timeframe, it cannot balance the rate of absorption. Urbanization increases runoff two to six times over what would occur on natural terrain. Underpasses, street flooding and yard ponding usually do not exceed more than a foot or two and are often viewed more as a nuisance than a major hazard. However, in some localized urban areas, larger flood velocities and depths, which can develop as rapidly as flash floods, can produce extremely hazardous conditions to the public and block vehicular traffic. Stormwater drainage systems may or may not be adequate enough to handle the incoming flow. Impervious surface studies can be conducted to assess runoff levels, which can identify areas of increased risk or threat as well as the need for improved capture of stormwater runoff.

Floodplain

As shown in Figure 4-30, a floodplain is flat or nearly flat land adjacent to a stream or river that experiences occasional or periodic flooding. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which are areas covered by the flood, but which do not experience a strong current.

Figure 4-30 Floodplain Topography



Floodplains are made when floodwaters exceed the capacity of the main channel or escape the channel by eroding its banks. When this occurs sediments (including rocks and debris) are deposited that gradually build up over time to create the floor of the floodplain. Floodplains generally contain unconsolidated sediments, often extending below the bed of the stream.

Regulated floodplains are illustrated on inundation maps called Flood Insurance Rate Maps (FIRM). FIRM maps are currently being replaced with Digital Flood Insurance Rate Maps (DFIRM) as part of FEMA's map modernization project. The Jefferson County DFIRM is current as February 5, 2014. It is the official

map of a community on which the Federal Emergency Management Agency (FEMA) has delineated both the special flood hazard areas and the risk premium zones applicable to the community. Private citizens and insurance agents use FIRM's to determine whether or not specific properties are located within the FEMA defined flood hazard zones.

Each of the flood zones that begins with the letter 'A' depict the Special Flood Hazard Area, or the 1% annual chance flood event (commonly referred to as the 100-year flood). Table 4-37 explains the difference between mapped flood zones.

Table 4-37 Flood Hazard Zones

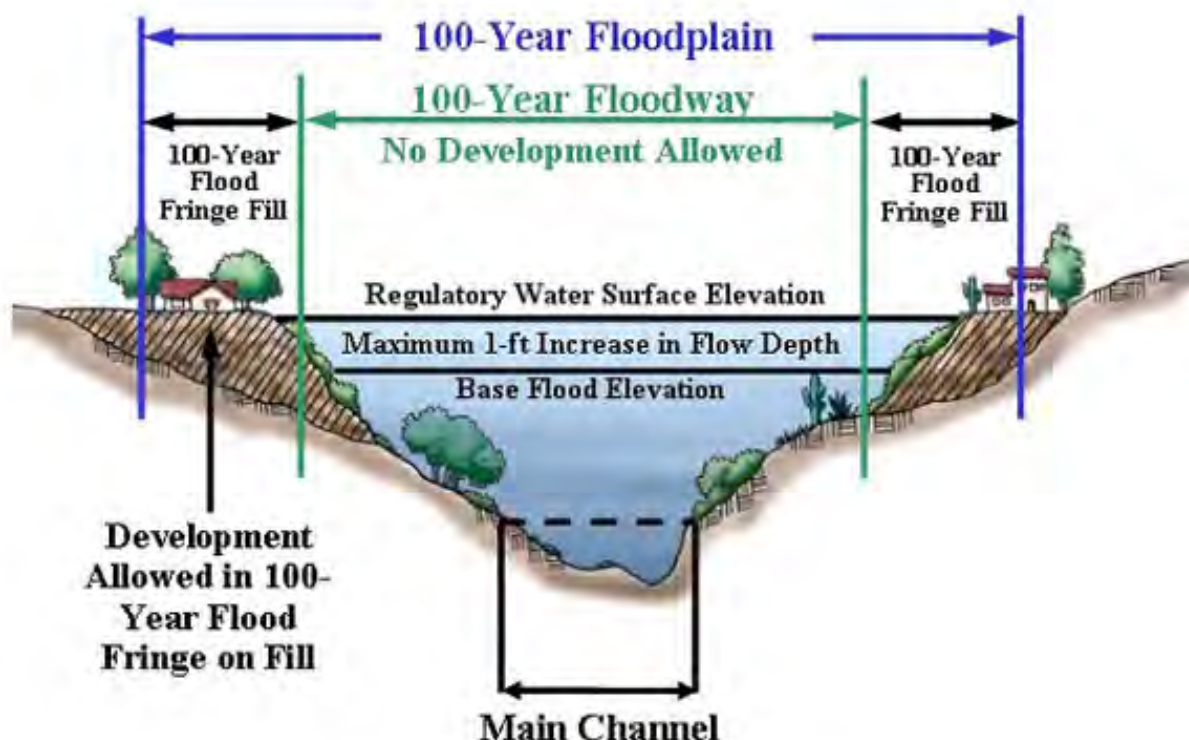
Flood Zone	Description
1% Annual Chance	100-year Flood: Also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year.
Zone A	100-year Flood: No base flood elevations provided
Zone AE	100-year Flood: Base flood elevations provided
Zone AO	100-year Flood: Sheet flow areas, base flood depths provided
0.2% Annual Chance or Shaded Zone X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depth of less than 1 foot or with drainage areas less than 1 square mile; and areas protect by levees from 1% annual chance flood
Zone D	Areas in which flood hazards are undetermined, but possible
Zone X	Areas determined to be outside the 0.2% annual chance floodplain

Source: FEMA

Community officials use DFIRM's to administer floodplain management regulations and to mitigate flood damage. Lending institutions and federal agencies use FIRM's to locate properties and buildings in relation to mapped flood hazards, and to determine whether flood insurance is required when making loans or providing grants following a disaster for the purchase or construction of a building.

The floodplain most often refers to that area that is inundated by the 100-year flood. The term 100-year flood is misleading. It is not the flood that will occur once every 100 years. Rather, it is the flood elevation (or depth) that has a 1- percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the minimum standard used by most Federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. Over a 30-year period (the term of a typical home mortgage), a structure located within a special flood hazard area has a one-in-four chance of experiencing the flood depicted on the NFIP map. The chance is even more likely that a damaging flood of lesser magnitude will occur, while the possibility of a much larger flood is also quite real. Extreme events have been measured at many locations that exceed the magnitude of the 100-year flood by three times or more. Figure 4-31 illustrates a 100-year floodplain. Figure 4-32 shows the 100-year floodplains in Jefferson County. Only major streams are highlighted; however, flooding can occur in any channel or drainage in the County.

Figure 4-31 100-year Floodplain



Geographic Extent

Jefferson County has multiple creeks, tributaries, and associated floodplains that comprise the geographic extent of flooding throughout the planning area. It is a region heavily influenced by snow and rain patterns in the mountains that flow downstream to a heavily urbanized area in the foothills and plains. Abbreviated snow melts can cause flooding along these creeks and tributaries and they can swell to many times their size after large amounts of rainfall in a short period of time. This overwhelms the smaller channels quickly, which in turn impacts downstream populated areas with little or no warning. As mentioned above, the Buffalo Creek and Hayman burn areas were stripped of vital vegetation ground cover, which is imperative for natural flood mitigation. With soils scorched and stripped of their nutrients and cohesiveness, the areas became more susceptible to flash flooding immediately after the wildfire devastation. It has continued to be a secondary impact issue ten years after the initial incident. In fact, two deaths occurred in the North Fork fire district (Pine Junction area) from secondary flash flooding within weeks after the fire, which caused massive debris flows where innocent people were caught in their paths. Debris flows of this magnitude are attributed to the inability of depleted soils and lack of ground vegetation to hold back the runoff, and thereby normal rainfall precipitation can become a wall of moving earthen debris. See more description of debris flows in the landslide, debris flow and rockfall hazard profile.

The geographic extent rating for flooding is limited as it is within 10% to 25% of the County's area. Refer to Figure 4-32 through Figure 4-34 for the location of the FEMA and local floodplains. Figure 4-34 depicts areas Jefferson County regulates that are within Zone D, and are within 50 feet of the thalweg of a major drainage tributary area of 130 acres or greater. The section following these figures details the extent and history of flood hazards by the major watersheds in the County including Bear Creek, Clear Creek, South Platte River, Turkey Creek, and Ralston Creek.

Figure 4-32 Jefferson County Flood Hazard Map

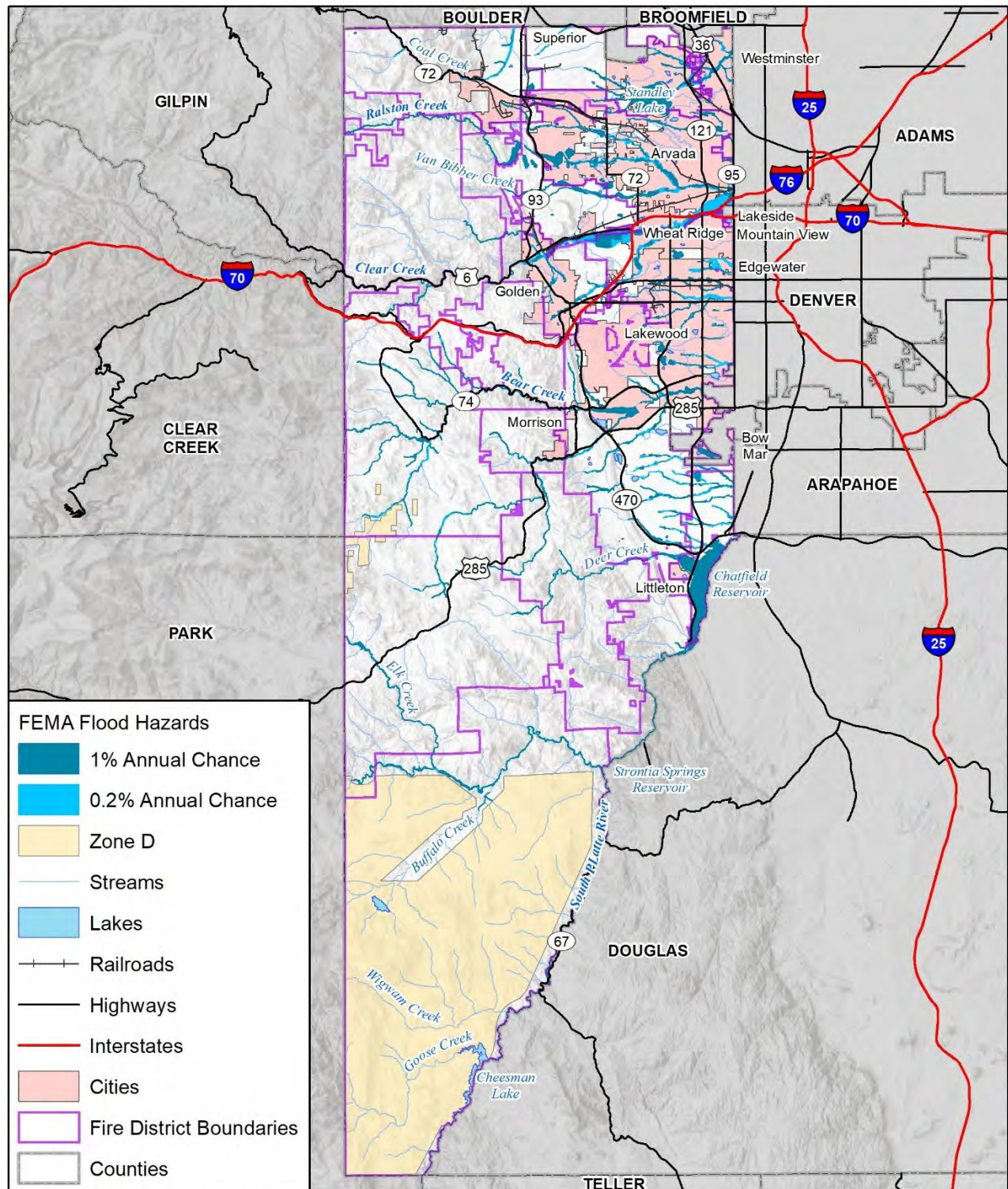


Figure 4-33 Jefferson County Flood Hazard Map (North Half)

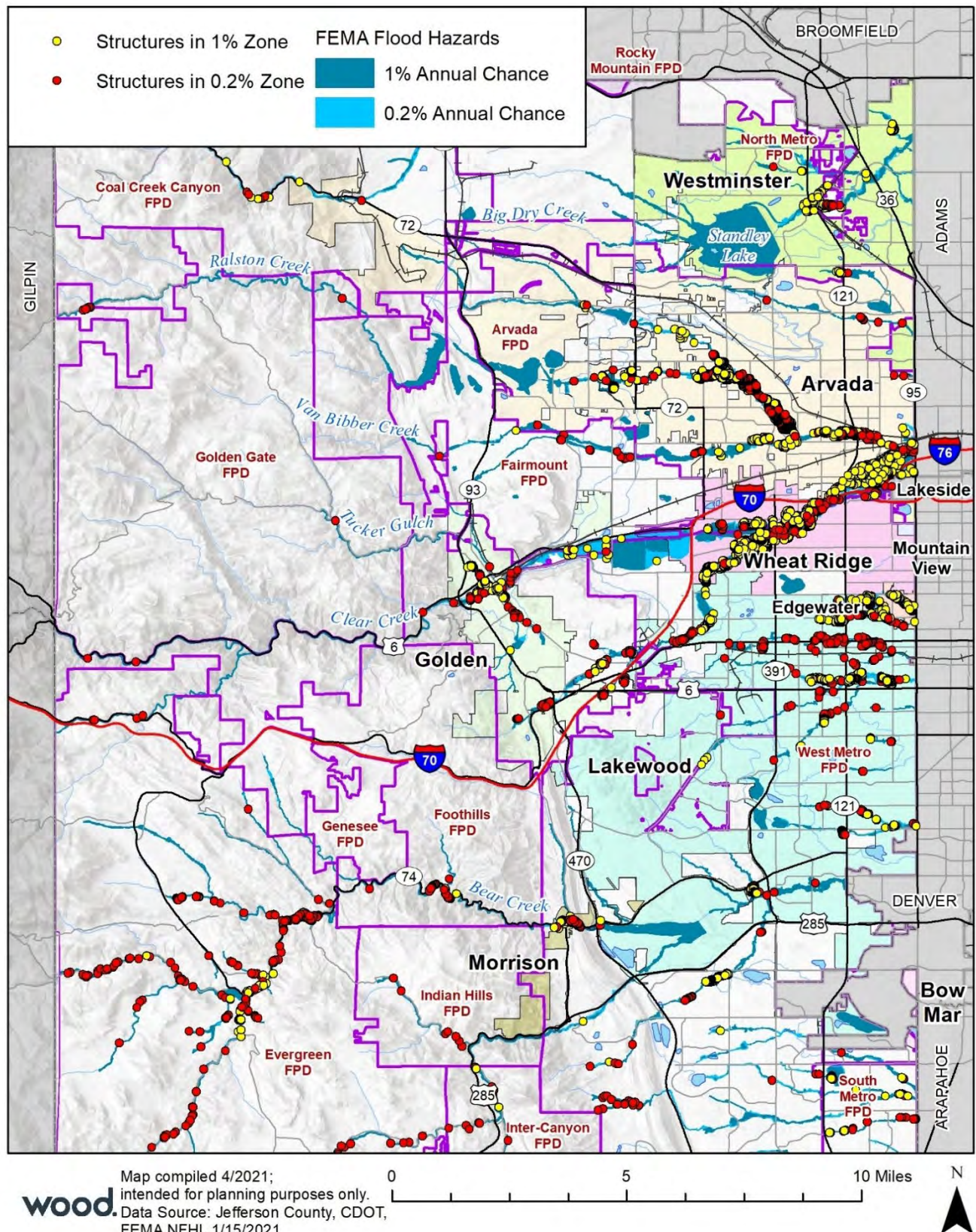
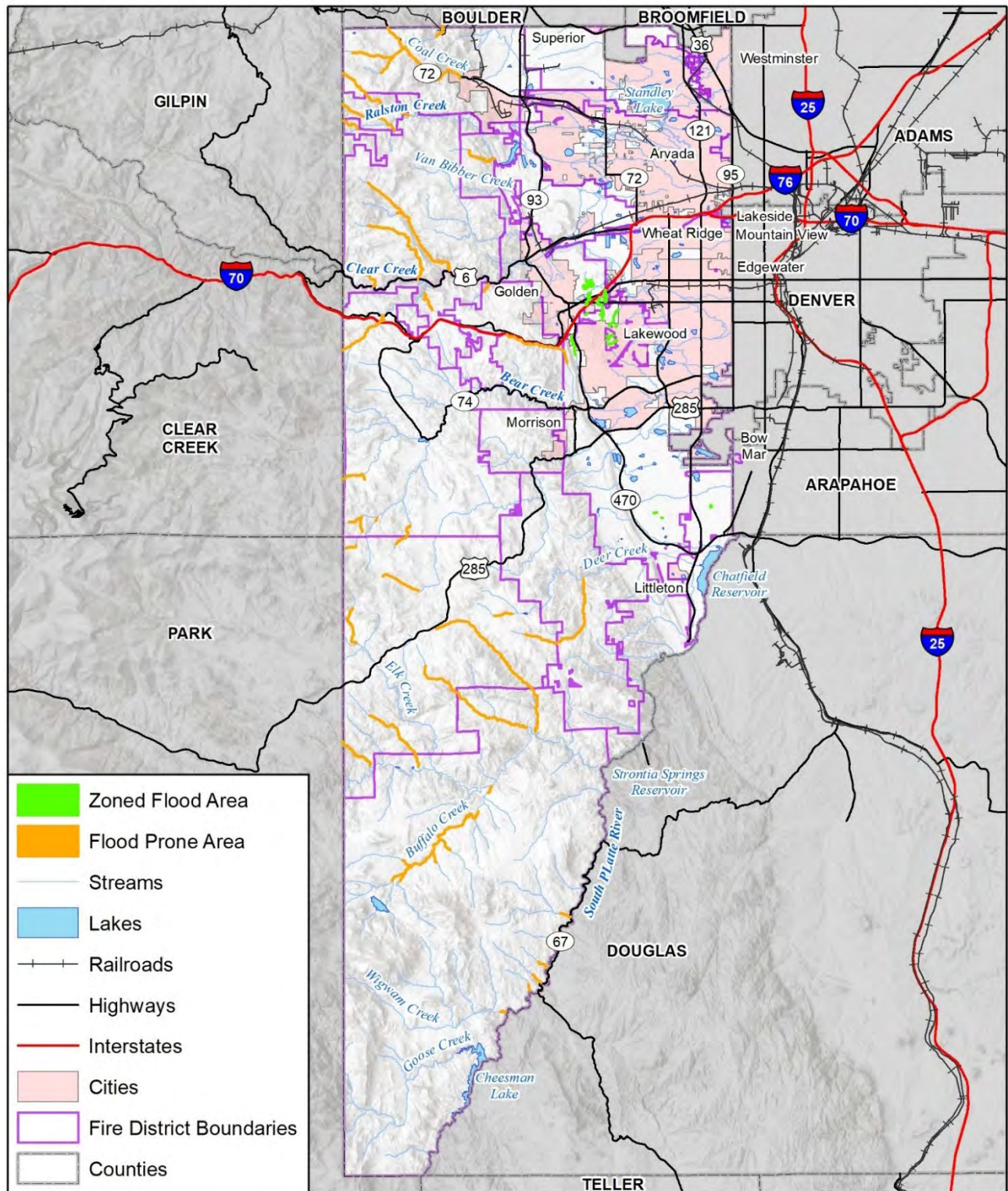


Figure 4-34 Jefferson County Local Flood Hazards



Map compiled 4/2021;
intended for planning purposes only.
wood. Data Source: Jefferson County, CDOT

0 5 10 Miles



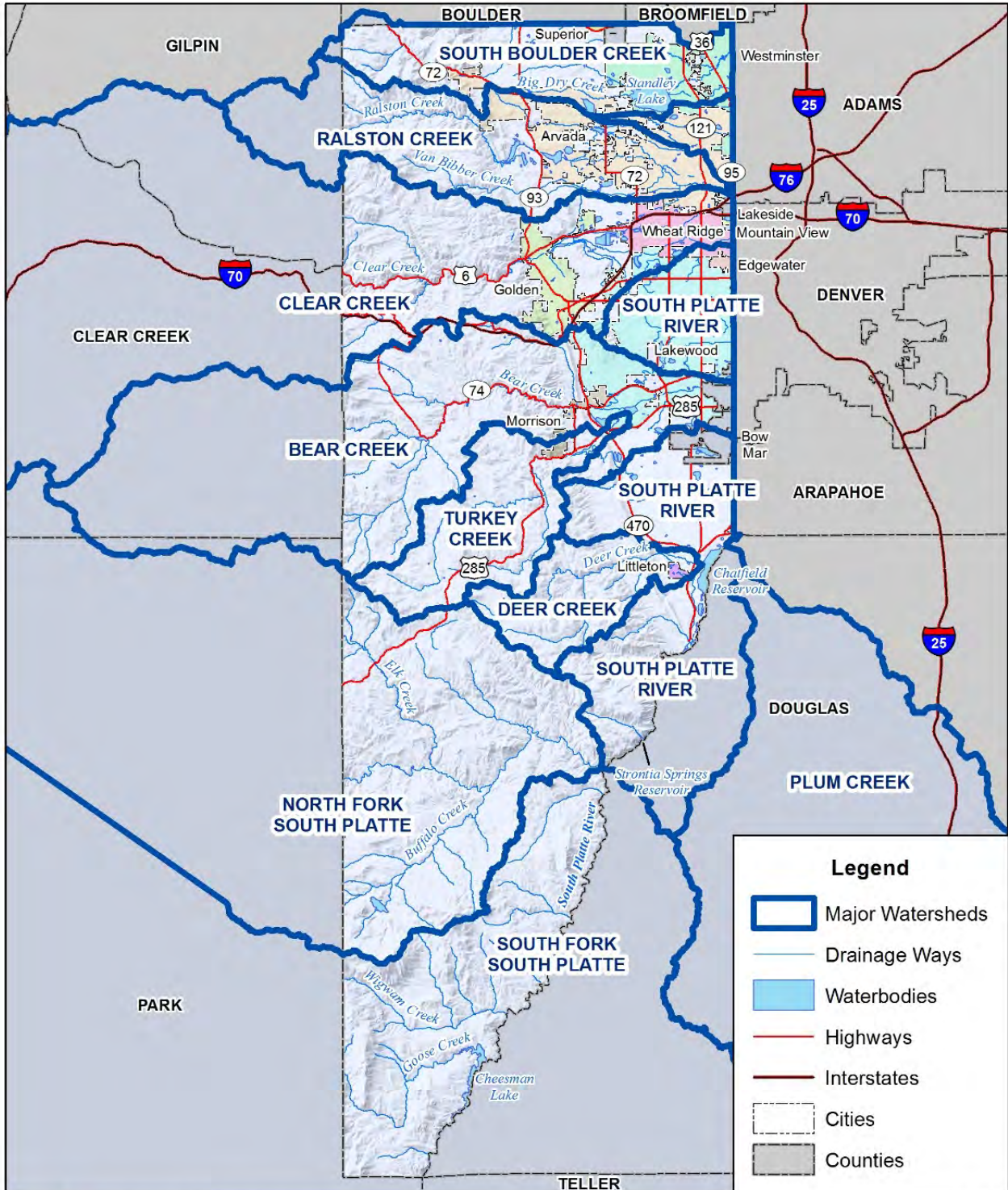
Watershed Drainage Systems

A watershed is an area of land that gets drained by a river and its tributaries. While there are many definitions, scientist and geographer John Wesley Powell put it succinctly when he said that a watershed is: *"...that area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community."*

A watershed's boundaries are defined by areas of higher elevation, such as a ridge or mountain range, from which rain and snow melt runoff flows toward a common low point. In this hazard profile, since the planning area includes unincorporated Jefferson County and its municipalities, the flood history or occurrences are identified by watershed or areas impacted to indicate locations with a higher flood hazard risk. The association between wildfire impacted areas and floods as secondary impacts are also discussed.

Figure 4-35 illustrates the watersheds in Jefferson County.

Figure 4-35 Watershed Map



Map compiled 11/2015;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
NHD

0 5 10 Miles



South Platte River Watershed

The South Platte River Watershed begins high up in the Rocky Mountains at the origin of the South Platte River, and encompasses 28,068 square miles in Colorado, of which the Denver metro area sits squarely in the middle. Jefferson County is located west of Denver and makes up the west metro area Denver suburbs of Lakewood, Golden, Wheat Ridge, Edgewater, Mountain View, Lakeside, Arvada, Westminster, parts of Littleton, and Bow Mar. The foothills communities include the town of Morrison, unincorporated Evergreen, and various urban interface communities along I-70.

The Denver region covers about 535 square miles, all of which are in the South Platte River Watershed. The South Platte River is the main artery of the watershed, and is fed by the many creeks, lakes and minor tributaries that come down from the mountains and hills that surround Denver. Some of these tributaries include South Fork, Middle Fork, North Fork, Clear Creek, Bear Creek, Cherry Creek, and Sand Creek. Clear Creek and Bear Creek run through Jefferson County as they descend from the mountains to the plains. The water that fills Denver's lakes also eventually makes its way into the streams. In addition, drainage ditches, intermittent streams and, most critically, storm sewers, empty into the watershed. Figure 4-36 illustrates the South Platte River Basin Watershed.

Figure 4-36 South Platte River Basin Watersheds



Source: United States Geological Survey

South Platte River

Description

The South Platte River is one of the two principal tributaries of the Platte River and itself a major river of the American West located in Colorado and Nebraska. It drains much of the eastern flank of the Rocky Mountains in Colorado, as well as much of the populated region known as the Colorado Front Range and Eastern Plains. The South Platte forms the Platte at its confluence with the North Platte River in western Nebraska. The river serves as the principal source of water for eastern Colorado. Its valley along the foothills in Colorado has provided for agriculture in an area of the Colorado Piedmont and Great Plains that is otherwise arid. Its drainage basin also includes a portion of southeastern Wyoming in the vicinity of the city of Cheyenne.

The river is formed in Park County, Colorado southwest of Denver in the South Park grassland basin by the confluence of the South Fork and Middle Fork, approximately 15 miles southeast of Fairplay. Both forks rise along the eastern flank of the Mosquito Range, on the western side of South Park, which is drained by the tributaries at the headwaters of the river. From South Park, it passes through Platte Canyon, which is a deep narrow scenic gorge. The canyon is southwest of Denver on the border between Jefferson and Douglas counties. The canyon, approximately 50 miles in length, also receives the North Fork through the Rampart Range before it emerges on the Eastern Plains where it is impounded to form Chatfield Reservoir, a source of drinking water for the Denver Metropolitan Area.

The river flows north through central Denver, which was founded along its banks at its confluence with Cherry Creek. The valley through Denver is highly industrialized, serving generally as the route for both the railroad lines, as well as Interstate 25. On the north side of Denver, it is joined somewhat inconspicuously by Clear Creek, which descends from the Continental Divide through Clear Creek Canyon following Interstate 70 and Hwy 6 through Clear Creek Canyon entering Jefferson County west of the City of Golden flowing past the Coors Brewing Company. North of Denver the South Platte River flows through the agricultural heartland of the Eastern Plains or Piedmont region (rock formations of sandstone, shale, and limestone that was formed by ocean deposited sediments through erosion of the ancestral Rockies). It flows directly past the communities of Brighton and Fort Lupton, and is joined in succession by Saint Vrain Creek, the Little Thompson River, the Big Thompson River, and the Cache la Poudre River, which it receives just east of Greeley.

East of Greeley it turns eastward, flowing across the Colorado Eastern Plains, past the towns of Fort Morgan and Brush, where it turns northeastward, flowing past the town of Sterling and into Nebraska near the town of Julesburg. In Nebraska, it passes south of the town of Ogallala and joins the North Platte near the town of North Platte, Nebraska.

In an urban area where millions of people live and work, the cumulative actions of a watershed's residents can have a powerful impact on the health of the watershed. On the other hand, in sparsely populated areas of wildland urban interface, careless human-caused wildfires can devastate a watershed leaving it vulnerable to the ravaging effects of post-wildfire flooding. The following flood history is a more recent schedule of events that have occurred post Buffalo Creek, Hi Meadow, and Hayman wildfire burns.

South Platte Watershed Flood History

June 16, 1965 – In mid-June of 1965, heavy spring storms stalled over the Front Range, overwhelming the basins of the Arkansas and South Platte rivers. The magnitude of the rain, floodwaters and subsequent damage defied belief to those who did not witness the storms firsthand. Over three hours, 14 inches of rain fell at Castle Rock. The water was too much for the creeks and arroyos, picking up debris and scraping gouges in the western flank of Dawson Butte that are still visible today. At the juncture of Plum Creek and the South Platte, it was estimated that the river was 200 feet wide and 20 feet deep, moving at ten miles per hour and carrying 40 times its normal flow. In the *Report to the Colorado General Assembly*, total damages from the 1965 floods were estimated at \$397 million with 11 lives lost. Jefferson County emerged relatively unscathed with no officially reported monetary damage or lives lost. This was due to the limited length of the flooded river along the southern county border. Only about one mile of the South Platte River between Plum Creek and Wolhurst was flooded. At the time, this area was rural and sparsely populated (Jefferson County 2014).

July 12, 1996 – On May 18, 1996, a human induced wildfire burned nearly 12,000 acres of the Pike National Forest and surrounding private lands, destroying 10 dwellings and costing millions in suppression costs and property damage. Less than two months later, on July 12, 1996, a high intensity thunderstorm dumped approximately 2.5 inches of rain on the fire ravaged terrain causing severe flooding, which resulted in the washout of Jefferson County Highway 126 and the destruction of the Buffalo Creek community's potable water system and telephone facilities. Major flood flows occurred along Sand Draw, Buffalo Creek, the North Fork of the South Platte River (North Fork) below its confluence with Buffalo Creek, Spring Creek (a tributary to the South Platte River just upstream from the North Fork South Platte River), and several other tributary streams in the area. The storm also resulted in the deposition of hundreds of thousands of tons of sediment into Strontia Springs Reservoir (15-year sediment load), the loss of miles of pristine riparian habitat along Buffalo Creek and Spring Creek drainages. Two lives were lost as a direct result of the flooding. Although the geographic area affected was smaller than in some other floods, the Buffalo Creek flash flood event was truly a disaster. Given the magnitude and quick onslaught of the flood flows, it is nothing short of a miracle that more people weren't killed or injured. The flooding hazards and increased sediment loading potential associated with barren watersheds was dramatically evident at Buffalo Creek after July 12, 1996. Total damages were more than \$4.6 million.

September 14, 1996 – Thunderstorms over southern Jefferson County brought more heavy rain to the Buffalo Creek area. Some minor roads were washed out by flash flooding but no other damage was reported.

July 28, 1997 – Some culverts in the Pine and Conifer areas were washed out due to heavy rainfall.

July 31, 1998 – Heavy rain, up to 3 inches in an hour, caused a flash flood along Buffalo Creek. Portions of County Road 126, just south of the town of Buffalo Creek, were washed out. The floodwaters nearly washed away the bridge as mud and debris slammed into the structure. It was 2 years earlier that a deadly flash flood rushed through the small town killing 2 residents. There was no loss of life or structures, however, large debris accumulations, and disrupting electric, phone and water service for the night. Debris flows were a problem for a number of other mountain towns that evening.

August 4, 1999 - Flooding and flash flooding problems developed over portions of the Urban Corridor as slow moving thunderstorms dumped anywhere from 2 to 3.5 inches of rainfall in approximately 3 hours. Numerous outages were reported with widespread blackouts in Thornton and Littleton. Along Massey Draw in Jefferson County, near Carr Street and Chatfield Reservoir, four homes were flood damaged and portions of their backyards washed out.

July 12, 2000 – Heavy rain fell across a portion of the Hi Meadow burn area near Buffalo Creek, causing localized flash flooding. Approximately three quarters of an inch (0.75) of rain fell in 30 minutes across Miller Gulch. Some culverts became plugged by debris from the fire. As a result, small sections of a forest service road along Miller Gulch were washed out.

July 17, 2000 – An estimated 2 inches of rain reportedly fell in less than an hour in Pine. As a result, two secondary roads in Buck and Miller gulches, in the Hi Meadows burn area, washed out. Water also covered County Road 68 which connects to Bailey. Homeowners in Pine Valley Estates attempted to divert some of the runoff by piling stacks of hay above their homes.

June 19, 2002 - July 21, 2002 – Six flash floods were reported over this 33 day period in the southern portion of the County. Locally heavy rainfall in the Hayman burn area washed out a secondary road. Debris associated with the runoff, blocked a culvert, forcing the water to wash out the road. Gulch Road, which connects to Forest Service Road 211 was washed out. Runoff from heavy rainfall in the Hayman burn area flooded Lost Creek Ranch with up to 18 inches of water, just off of State Highway 126. Floodwaters ruined a very expensive rug in the lodge. Also, a driveway to another local residence was washed out.

May 30, 2003 – Flash flooding was reported in the Hayman burn area in Jefferson County and in southwestern sections of Douglas County, as up to 1 inch of rain reportedly fell in 30 minutes. In Jefferson County, several access roads were washed out.

June 8, 2004 – Locally heavy rain caused flash flooding in the Hayman burn area. Up to a foot of water damaged sections of Trumbull Road and a maintenance road near Lazy Gulch.

August 29, 2007 – Heavy rain caused localized flash flooding in the Hayman burn area, in Southern Jefferson County. The flash flooding forced the closure of County Road 126 and Wigwam Road. Brush and Wigwam Creeks jumped their banks, leaving debris atop the roadway.

July 21, 2009 – Heavy rain produced mudslides in the Hayman burn area. Trees, stumps, sticks, debris, and decomposed granite came down with the mudslides. Most of the damage occurred from Six Mile Creek to Forest Service Road 211 above the Wigwam Fishing Club. Road crews had to totally restore shoulders and slopes and cleaned out ditches downstream of draws and ravines. The mudslides washed out a 250-ft stretch of one shoulder of State Highway 126, near the turnoff to Cheesman Reservoir, and a large section of guard rail was washed out.

September 2013 – Between September 11th and 14th, Colorado's Front Range experienced major flooding and flash flooding. Storms began on September 9, when power was knocked out at the Jefferson County Administration and Courts Facility and in southern Golden, and west Colfax Avenue had to be closed due to torrential rain. Two days later, Highway 72 in Coal Creek Canyon was closed, as was Highway 93 a few days later. Many major roadways were closed by Friday, September 13th; voluntary and involuntary evacuations were in effect in Upper Bear Creek, below Leyden Dam, and from Morrison to Evergreen. Jefferson County's Fairgrounds accepted more than 100 horses, five goats, and two llamas. Rockslides were a major concern in canyons, and prevention efforts occupied emergency crews throughout the foothills.

Bear Creek stood at 8.8 feet above normal flows by Friday night. All the water pouring down from its 164 sq. mile upper watershed was captured in Bear Creek Lake until Monday, September 16, when the Army Corps of Engineers finally began releasing some of the water into the lower drainage systems. By then, floodwaters had raised water elevations in the lake 53 feet, to a new record high of more than 5,600 feet. The previous record, set in 1995, was six feet lower. On September 17th, the Jefferson County Sheriff's Office estimated damage to infrastructure countywide at a "preliminary" \$6,000,000, with 14 residences destroyed, 215 damaged, and 5,805 threatened. Two dozen commercial properties were damaged and another 24 threatened; 200 more "minor" structures were also affected or threatened.

Jefferson County, however, escaped the worst effects, which struck with full force in the northern Front Range. Across the 17 counties affected, eight people died, an estimated 1,500 homes were destroyed, thousands more damaged, and more than \$2 billion in costs incurred, largely by homeowners. Within the county, Coal Creek Canyon, Clear Creek, and Bear Creek were the hardest hit, as the effects of the storms dwindled southward. Clear Creek and Bear Creek remained torrential well into October, but service gradually began to be restored across the county. Most roads and parks hit by flooding reopened within weeks, although repair efforts continued in some places for months after (Jefferson County 2014).

July 7, 2014 – Severe thunderstorms large hail and damaging winds across Arapahoe, Boulder, Elbert and Jefferson County. Heavy rainfall, nearly two inches in one hour, flooded several residences in Evergreen. In addition, several bridges along Forest Estate Road were washed out.

May 9, 2015 – Heavy rain and rising levels of South Turkey Creek washed out many driveways in Indian Hills.

June 14, 2015 – The combination of heavy rain and snowmelt caused minor flooding in southern Jefferson County. Road closures included West Platte River Rd from Buffalo Creek, and sections of South West River Rd and West Pine Creek Rd.

Watershed Health

Watershed health is of utmost importance after a devastating wildfire. There is evidence that a scorched area from wildfire can even attract atmospheric systems, which then dump its moisture on the same soils stripped of its natural defenses. The chances increase for secondary impacts of flooding, erosion, and sedimentation when an area has been burnt from wildfire. There are Federal and State program dollars used to focus on expediting the re-vegetation of wildfire impacted areas to help reduce the devastation of the secondary impacts of flooding.

Bear Creek Drainage Basin

Bear Creek, which rises in the mountains southwest of Denver, is a left bank tributary of the South Platte River. The total drainage area at the mouth is 261 square miles of which 164 square miles are upstream of Morrison. The basin, shown in Figure 4-35 includes parts of Jefferson, Clear Creek and Park Counties, and ranges in elevation from 5,780 feet at Morrison to 14,264 feet at Mt. Evans. Idledale, Kittredge, and Evergreen are towns located in Jefferson County along Bear Creek upstream of Morrison. Major tributaries entering Bear Creek below Evergreen Lake to Morrison include: Cub Creek, Troublesome Creek, Swede Gulch, Cold Spring Gulch, Sawmill Gulch at Idledale and Mount Vernon Creek at Morrison. Bear Creek flows into Bear Creek Lake just east (downstream) of the Dakota Hogback geologic formation at Morrison. This facility is a major flood control reservoir constructed and operated by the U. S. Army Corps of Engineers. East of the hogback, Rooney Gulch enters Bear Creek Lake from the north and Turkey Creek enters the lake from the south. The City of Lakewood Parks Department is responsible for public safety in the park area surrounding Bear Creek Lake. Upstream, the Evergreen Dam is a 380' long, 34' high structure located on the main stem of Bear Creek above Cub Creek at the town of Evergreen, forming a 40-acre lake known as Evergreen Lake. This reservoir is not a flood control facility, but it does impound 670 acre-feet of water.

Turkey Creek Watershed (Part of the Bear Creek Drainage Basin)

The Turkey Creek Watershed is a main drainage basin located along the southeast border of the Bear Creek Drainage Basin.

Turkey Creek Watershed Study

The USGS Mountain Ground Water Resources Study (MGWRS) on the Turkey Creek Watershed was conducted in 1999-2000. The purpose of the study was to better understand water resources, including surface and ground water quantity and quality, in the 47 square mile Turkey Creek Watershed. This study was considered a first step in developing scientifically sound management strategies and for the development of methods to assess ground water availability within different hydrologic settings, evapotranspiration (a term used to describe the sum of evaporation and plant transpiration from the land surface to the atmosphere) and ground water vulnerability to various land uses. Today there is an aggressive Turkey Creek Watershed monitoring program in force. The Precipitation Runoff Modeling System (PMRS) is used to evaluate the amount of precipitation received that is potentially available for ground water storage. The three most important components of runoff are surface runoff, sub-surface flow, and ground water flow. The PMRS results include the percent of precipitation that is returned to the atmosphere by evapotranspiration, the percent that leaves the watershed through surface runoff and subsurface flow, or becomes part of the long-term ground water storage system.

Bear Creek Drainage Basin Flood History

From 1866 to 1973 there have been 24 known floods in the Bear Creek basin; and from 1974 to 2007 there have been 23, which will be discussed later. Most of the floods from 1866 to 1973 were caused by runoff from intense rainstorms during the summer months. However, early season floods were caused from rainfall runoff in conjunction with snowmelt flows. The UDFCD monitors rainfall and streamflow from the Bear Creek basin as part of their early flood warning program, which runs from mid-April through mid-September. The peak discharge measurement at the stream gage on Bear Creek at Morrison in 1896 was 8,600 cubic feet per second (cfs) and the peak discharge on Bear Creek downstream of the gage below the confluence of Mount Vernon Creek during the 1938 flood was estimated to be considerably more than 10,000 cfs. The peak flow rate for Mount Vernon Creek alone was estimated at 9,230 cfs, which is more than twice the magnitude of the 100-year flood.

Mount Vernon Creek enters Bear Creek downstream of the Morrison Stream gage and has a drainage area of only 9.4 square miles. The headwaters of Mount Vernon Creek are at Genesee where I-70 begins its climb into the mountains along Mount Vernon Canyon. The south side of Lookout Mountain also drains into Mount Vernon Creek. At the Dakota Hogback the creek turns south, passing through Red Rocks Park and continuing to its mouth at Morrison, where a very narrow, confined stream channel exists.

A stream gage located east of Bear Creek Lake at Lowell Blvd and Sheridan has continuously measured Bear Creek flows since 1927. The Morrison gage has partial records dating back to 1888 and continuous records since 1922. When comparing the gage records it can reveal variances in peak discharges for

each flood event. This indicates the majority of flood drainage came from two different locations. For example, in the 1933, 1934 and 1938 floods, the storms were concentrated in the foothills and mountains of Bear Creek, and the resulting flood peaks attenuated between Morrison and Sheridan. For the 1957, 1965, 1969, and 1973 floods, the majority of runoff occurred from watershed areas downstream of Morrison or from Turkey Creek.

Bear Creek floods are characterized as rapid concentrations of runoff, sharp peak discharges, and rapid flood recession. Peaking time for floods on Bear Creek at Morrison is about 3 to 5 hours after the causing rainfall, while floods on Mount Vernon Creek peak between 1 and 3 hours.

Turkey Creek was the known principal contributor for the 1957, 1965, 1969 and 1973 flood events.

May 21-23, 1876 – Reported by the Denver Tribune on June 5 of that year; "... informs us that one resident had never seen such destruction in the region... He spent some days in the valleys of Soda and Bear Creeks and their tributaries and found new gullies worn to the depth of 20 feet in the action of the raging torrents."

May 29-June 1, 1894 – In the vicinity of Morrison, a flood that caused the loss of bridges, railroad tracks, houses, and destroyed the highway in the canyon.

July 24, 1896 – Intense rainfall centered on Cub Creek, a tributary of Bear Creek near Evergreen. "Without a moment's warning the largest flood that ever came down Bear Creek struck Morrison about 8 o'clock tonight (July 24), sweeping everything in its path ... although the water came down through the town nearly 3 feet deep in the main street, the buildings in the business section all withstood it." Twenty-seven lives were lost in the flood (available records do not indicate where the deaths occurred) and severe damages were reported from Evergreen to the mouth of Bear Creek. No rainfall records of this flood are available. The peak flow on Bear Creek at the Morrison gauging station was estimated at 8,600 cfs, which is the flood of record for the gage. The most recent hydrologic studies indicate that this flood would have a one in 40 chance of occurring in any year. It is not known to what extent Mount Vernon Creek contributed to the Morrison flooding. The Flood of 1896 was the most catastrophic flash flood to hit Bear Creek Canyon. Farms along Cub Creek were obliterated. "The water descended about Evergreen like a huge, moving wall carrying houses, sheds, barns and livestock with it", according to the news. It was determined after the news account that 29 lives were actually lost.

July 7-8, 1933 – "Five persons known dead ... property damage of un-estimated degree and nearly all the highways between Mt. Morrison and Idledale ruined, is the toll up to date of one of the most devastating floods last Friday afternoon (July 7) ever to visit the Bear Creek Watershed. A cloudburst at about 1 o'clock in the neighborhood of Idledale sent a wall of water down Saw Mill Gulch leading to Bear Creek, and another raging torrent down Vernon Creek. ... The Vernon Creek waters reached a height of 15 feet ... in the narrow passage between the business houses. The highway up beautiful Bear Creek Canyon between Mt. Morrison and Idledale is practically ruined." The peak discharge at Morrison was 8,000 cfs on Bear Creek and estimated as 1,500 cfs on Mount Vernon Creek.

August 9, 1934 – The flood of August 9, 1934 in the Bear Creek basin was caused by cloudburst-type rainfall near Kittredge and at the head of Mount Vernon Creek. Six lives were lost and much property damage resulted. It was reported that Mount Vernon Creek ran higher than the previous year and much of the canyon roadway was destroyed. Damage to Morrison was reduced because the Bear Creek peak flow passed through the town before the Mount Vernon Creek high water arrived.

September 2-3, 1938 – A widespread thunderstorm that began over the eastern slope of the Front Range on 30 August became most intense in the Morrison area on 2 September. An unofficial report stated that 7.9 inches fell just north of Morrison in six hours. The heaviest rainfall centered on the divide between Bear Creek and Mount Vernon Creek. The peak discharge on Bear Creek at Morrison above Mount Vernon Creek was 6,200 cfs. From post flood measurements the Mount Vernon Creek peak discharge was estimated at 9,230 cfs at a point 1/2 mile upstream from Morrison. From statements by local residents, it appears that the peak discharge on Mount Vernon Creek reached Morrison at about 7 p.m., preceding that on Bear Creek by 1/2 hour. Six persons drowned when trapped in their automobile between Morrison and Kittredge. Damages in the basin were estimated at \$450,000. If Morrison had not

been warned, or if the flood had occurred late at night, the number of deaths would likely have been considerably higher.

August 24, 1946 – A heavy rain near Idledale caused Bear Creek to overflow. A Morrison woman was swept from her stranded car and drowned.

August 21, 1957 – Thunderstorms occurred over the Bear Creek basin with heavy rain and hail beginning about 1 p.m. east of Squaw Pass and northwest of Evergreen. At most locations the rain stopped within an hour. The Mount Vernon Creek peak discharge at Morrison was estimated at 1,000 cfs at 2:30 p.m., and 1,640 cfs on Bear Creek at about 3 p.m. While most damages from Bear Creek occurred downstream of Morrison, which is a drainage from Turkey Creek. Mount Vernon Creek left debris on the grounds of six or seven residences in Morrison, flooded a garage and a used car lot, and broke a water main. State Highway 8 at Morrison was closed upon warning of the flood. Later, portions of the highway were flooded by both streams.

July 25, 1965 – On 23-24 July 1965, heavy rains over the headwaters of Bear Creek caused minor flooding throughout its length. Most damages occurred downstream of Morrison. A peak discharge of 1,030 cfs was measured for Bear Creek at Morrison on July 25, 1965.

May 7, 1969 – Heavy rains from May 4-8, 1969 resulted in flooding in the Bear Creek basin with most damages occurring downstream from Morrison. A weather station at Morrison reported a total storm rainfall of 11.27 inches, with a maximum daily amount of 5.77 inches. Unofficial rainfall amounts in the basin varied from 6.7 inches to 11.8 inches during the five-day storm period. The peak flow for Bear Creek at Morrison was 2,340 cfs on May 7, 1969.

May 6, 1973 – The last significant flood to cause damages in the Bear Creek Basin. According to the National Weather Service, damages from the flood were estimated at around \$120 million. The following damage estimates were printed in the Denver Post on May 13, 1973. Damages estimates in Weld County, hardest hit by the flood, were \$20 million. In Adams County, the estimate was \$8 million. In Denver, the estimate had climbed to well over \$6 million and in Jefferson County, officials reported over \$500,000 damage to roads, culverts, and other County property. Two deaths were attributed to this event.

“The 1973 flood was the last big flood in Denver” (Brian Schat, Denver Public Works, personal communication 8/22/03). Rainfall was widespread along the Front Range with totals ranging from one to five inches. A sustained downpour dropped more than three inches in the Denver metropolitan area on Sunday, May 6. In the foothills, heavy snow fell.

Most of the damage was a result of river flooding. The South Platte was four feet above flood level at its crest when it measured 10.85 feet at the 19th Street Bridge early on the morning of May 7. The flood stage of the South Platte at W. Evans Ave. equaled that during the 1965 disaster. However, this flood was more of “a steady overflowing of water” as opposed to the “one surge” Denver experienced during the flood of 1965.

The South Platte flooding was compounded when normally dry gulches and tributaries from the mountains west of Denver became turbulent flows that emptied into the river. When Bear Creek reached southwest Denver, it had grown to be 150 yards wide in spots. Plum Creek and Indian Creek, other South Platte tributaries, also poured out of their banks, virtually isolating the town of Louviers. In Englewood, the Highline Canal and the normally dry Little Dry Creek both overflowed.

Before evacuations were ordered in Denver, water began rising in Turkey, Bear, and Clear Creek Canyons because of the heavy snow runoff on May 5. By May 6, several Jefferson County roads in those areas had been washed out and residents had to be evacuated. In addition, several rockfalls and debris flows forced road closures.

Flooding in the Bear Creek watershed has killed 45 people and caused extensive property damage since the area was settled. It is idyllic for tourists and recreation seekers, unfortunately, under the right conditions Bear Creek Canyon and its tributaries can become death traps in a short amount of time. It doesn't take much rain to create a devastating flash flood. Retired Captain from the Jefferson County Sheriff's Office and historian, Dennis Potter, has documented 15 major floods that have taken place

between 1864 and 1938. Of the 15, two occurred in May, one in June, eight in July, two in August, and two in September.

September 2013 – The damage associated with the widespread Front Range flood event was largely north of the Bear Creek Watershed, but damage

Clear Creek Watershed Drainage Basin

Located west of Denver, the Clear Creek Watershed spans 575-square miles from the 14,000-ft. mountain peaks along its southwestern edge on the basing and part of the Continental Divide, to the urbanized plains at its confluence to the South Platte River just north of Denver. The Clear Creek Watershed is the source of drinking water for more than 300,000 people. Clear Creek also provides water for irrigation, recreation and industry. Four hundred square miles of the watershed are located in the mountains west of Golden, and fully one-third of the Clear Creek Watershed lies within the Arapahoe & Roosevelt National Forests.

Clear Creek's headwaters begin in an area rimmed by four 14-ers (mountains that are 14,000 feet in elevation or higher) – Grays and Torreys Peaks, Mt. Evans, and Mt. Bierstadt. Major tributaries that feed into Clear Creek include the North, South and West Forks; Leavenworth, Lion, Trail, Chicago, Soda and Ralston Creeks; Fall River; Tucker Gulch; Kenneys Run; Lena Gulch; Little Dry Creek (confluence in Adams County); and Beaver Brook. The main-stem flows eastward along the Interstate 70 (I-70) corridor, through several communities, along approximately 12 miles of Highway 6 corridor through the Clear Creek Canyon and then back along the I-70 corridor through several Denver Front Range Communities.

Clear Creek

Clear Creek is a tributary of the South Platte River, approximately 40 miles long, in north central Colorado in the United States. The creek drains a canyon, called Clear Creek Canyon in the Rocky Mountains directly west of Denver, descending through a long gorge to emerge on the Colorado Eastern Plains where it joins the South Platte. The creek is famous as the location of the most intense early mining activity during the Colorado Gold Rush of 1859. The creek provided the route of the Colorado Central Railroad and later for the United States Highway 6 and Interstate 70 as they ascend to the Continental Divide west of Denver.

The creek begins near the continental divide in the Front Range, northwest of Grays Peak in western Clear Creek County. It descends eastward through Clear Creek Canyon past the towns of Silver Plume, Georgetown, and Idaho Springs, all of which were founded as mining camps in the 1859 gold rush. Within the canyon it receives numerous smaller tributary creeks that descend from the rugged mountains on either side.

At the mouth of the canyon, in Jefferson County, the creek passes through the town of Golden, past the Coors brewery. East of the foothills, it flows through the northwest part of the Denver Metropolitan Area, passing through Wheat Ridge, southeastern Arvada, then roughly along the route of Interstate 76 (I-76). Along this section it is largely an undeveloped urban stream, with an undeveloped floodplain. Part of the creek path forms a wooded park with bicycle/foot path. It passes under Interstate 25 (I-25) between its junction with Interstate -70 (I-70) and U.S. Highway 36 (Hwy 36 - the Boulder-Denver Turnpike). It joins the South Platte from the west in southeast Thornton, near the junction of Interstate 76 (I-76) and State Highway 224 (Hwy 224).

Clear Creek Watershed Flood History

The Mile High Flood District (MHFD), formally known as the Urban Drainage and Flood Control District (UDFCD), under joint sponsorship with the City and County of Denver, City of Wheat Ridge, City of Golden, Adams County, Jefferson County and ICON Engineering, Inc. conducted a study, *Planning and Flood Hazard Delineation Area for Clear Creek Drainageway*, which extends from Sheridan Boulevard at the downstream study limit to the City of Golden in Jefferson County, at the upstream study limit. The drainage area at the location of the Golden gage near the bluff line is approximately 400 square miles. From Golden, Clear Creek flows in a northeasterly direction, through the Denver Metropolitan Area to its confluence with the South Platte River, near Derby. At the Derby gage, located approximately 0.6 miles upstream from the mouth, Clear Creek has a drainage area of approximately 575 square miles.

Elevations within the Clear Creek basin range from approximately 5,100 feet above mean sea level at the mouth to over 14,000 feet above mean sea level in the Rocky Mountains.

The intent of the report is to evaluate and document the existing floodplain along Clear Creek so that project stakeholders, and other users, can implement floodplain zoning ordinances, floodplain regulations, and other land-use controls, as needed, to reduce potential damages and adverse development in the floodplain. This report provides information on past flooding events and defines the nature and extent of probable future floods along an 11.6 mile reach of Clear Creek, from Sheridan Boulevard to approximately 2,200 feet upstream of Highway 6 in the City of Golden. Discharge information along Clear Creek was originally computed by the U.S. Army Corps of Engineers (COE) and incorporated into previous Flood Hazard Area Delineation (FHAD) and Master Planning documents. Historically, flooding in the Clear Creek basin has been relatively infrequent. Since 1864, twelve floods have been reported on Clear Creek and its tributaries. The following descriptions include the floods of August 1888, July 1890, June 1956, and July 1965 (Gingery 1979).

Flood of August 1888 – This flood resulted from cloudbursts on the eastern slope of the Front Range of the Rocky Mountains. A discharge of 8,700 cubic feet per second (cfs) was reported at the mouth of Clear Creek canyon. This is the largest estimated peak discharge in the history of this gauging station, which is located 1.5 miles upstream from Golden.

July 19, 1890 – A severe rainstorm began after a long dry spell, causing Clear Creek to flood. Flood waters reached Golden at 4:00 p.m. on the 20th. The deaths of two women and an 18-month-old baby were attributed to the flood.

July 26, 1923 – Cloudbursts in the foothills above Golden caused floods in all the gulches that enter Clear Creek from the north within 2 miles of Golden. At the mouth of Magpie Gulch the rainfall was moderate, but half a mile above it was a cloudburst. The rain began about 12:45 p.m. and the flood reached its crest by 1 p.m. and then fell so rapidly that by 1:40 p.m. the flow in the gulch was again normal. This flood deposited a gravel and boulder dam 10 feet high entirely across Clear Creek, a distance of about 70 feet. Some of the boulders moved by the flood weighed as much as 5 tons.

June 6, 1948 – there was a flash flood in Tucker Gulch, a left bank tributary to Clear Creek in Golden. The peak discharge in Golden was 11,600 cfs and there were substantial flood damages. This flood from the 11.2 mi² basin is nearly twice the largest flood in Clear Creek (~400 mi²). This is one of the largest, if not the largest, flood for this size watershed in Colorado.

Flood of June 1956 – Unusually heavy snowmelt runoff resulted in the failure of the Georgetown Dam located about 1 mile downstream from Georgetown. The peak discharge passing the gage above Golden was 5,250 cfs. By the time the crest reached the gauging station near the mouth of Clear Creek, it was reduced to 2,880 cfs.

Flood of July 23-26, 1965 - On July 23 and 24, during severe storms over the headwaters of Clear Creek and Tucker Gulch, 4.5 inches of rain was reported to have fallen in Tucker Gulch in an hour, which caused flash flooding in Golden, however, flooding extended only a short distance downstream. In Golden, flood waters from Tucker Gulch spread over about 17 blocks and caused an estimated \$112,000 damage to 69 residences, three commercial enterprises, three railroad bridges, four street bridges, and utility lines. At Georgetown, debris blocked the channel and diverted the waters down a street, thereby causing extensive washing of the surface and the flooding of several basements.

July 29, 2003 – Heavy rainfall caused flooding and flash flooding problems in north central Jefferson County. Officials were forced to briefly close State Highway 93, north of Golden, which was flooded by runoff and littered with debris. In Golden, flash floods left several backyards and basements full of standing water. At least one car was submerged in a garage. Radar estimated 1 to 1.5 inches of rain had fallen in the area in approximately 30 minutes.

June 8, 2004 – In Golden, heavy rains triggered a small debris flow on U.S. Highway 6, near the intersection of Colorado Highway 119. Automated gages in the area registered 2 to 3 inches of rain in one hour. Near the Colorado Mills Mall in the Lena Gulch drainage basin, numerous intersections were inundated from 1 to 3 feet of water and hail, stranding several vehicles, including a fire engine. Approximately 30 basements were flooded in Golden and Lakewood and many windows, to both cars and

homes, were broken by large hail. June 8th was the first of five days in which flash flood warnings were issued for the UDFCD area. Seven other days warranted flash flood watches, making 2004 one of the most active flood seasons in the 26-year history of the District's flash flood prediction program. Fortunately, no lives were lost and the flooding that did occur was localized with total damages not reaching disaster proportions. An early morning cold front set the stage for 2004's first outbreak of flood producing storms. Around 8 p.m. storms began developing along the urban foothills of Jefferson County. Over the next two hours, Golden, Lakewood, Wheat Ridge, and nearby areas were pounded by heavy rain and hail. The Colorado Mills shopping mall was hit especially hard with over 3 inches of rain in 90 minutes. Homes were flooded and streets were closed in the vicinity of W. 32nd Ave. and I-70 where an unconfirmed precipitation measurement of 5" was reported. A Golden firefighter stated that flood fighting at the intersection of 20th Street and Washington was like working a swift water rescue. Hail depths up to 18 inches were reported in some areas and motorists in Lakewood were rescued from cars.

June 27, 2004 – A deluge of very heavy rain from nearly stationary thunderstorms caused flooding and flash flooding problems over parts of Jefferson County. In Jefferson County, an automated rain gauge north of Golden measure 3.6 inches of rain in one hour. Numerous homes were flooded in Golden, including one that was 146 years old. The home was listed as a complete loss. In addition, State Highway 93 had to be closed from the Pine Ridge subdivision (near 6th Ave and Hwy 93) to Golden Gate Canyon Road. At the height of the storm, about 4 feet of water covered Colorado 93 through Golden, forcing its temporary closure. Rockfall and debris flows were also reported in Golden Gate Canyon. Several intersections were also flooded and impassable. The worst flooding in Golden occurred along a small drainage known as Arapahoe Gulch, which runs along the west side of Washington Street. Affected residents there may have a similar predicament with regard to flood insurance since the hazard area associated with Arapahoe Gulch is not shown on the Flood Insurance Rate Map. The storm that caused this flooding produced between 3.5 and 4 inches of rain over the watershed. Based on surveyed high water marks and debris lines, peak flow rates in Arapahoe Gulch during the June 27 event were approximately 400 cfs. The peak flow estimate was nearly a 200-year event and greatly exceeded the capacity of the Arapahoe Gulch drainage system downstream of 2nd Street.

August 3, 2006 – Heavy rain caused flash flooding along Leyden Creek in unincorporated Jefferson County, northwest of Arvada. An automated rain gauge in upper Leyden Creek, 6 miles northwest of Arvada, measured 2.68 inches of rain in less than two hours. Two to three feet of water covered the roadway at 82nd and Quaker. Leyden Creek is a tributary to Ralston Creek.

September 2013 – See the dam failure section for a description of flooding during 2013.

May 2015 – Sustained rainfall in the month of May caused many creeks and drainages to be bank full and causing minor overbank flooding including along Leyden Creek in Arvada.

Coal Creek Watershed

The Coal Creek Watershed drains almost 80 square miles in southern Boulder County and northern Jefferson County and is part of the South Boulder Creek Watershed. The watershed is approximately 28 miles long and an average of 3 miles wide, with an elevation drop of about 5,500 feet. The drainage begins in the foothills east of the Rocky Mountains, and flows through Superior, Louisville, Lafayette, Erie, and the City and County of Broomfield until it reaches Boulder Creek. The existing land use within the watershed is about 61 percent open space and parks. Rural residential development makes up approximately 16 percent of the existing land use, while residential, commercial, industrial and roadways comprise another 16 percent of the watershed. Public facilities, such as schools, comprise about 7 percent. Approximately 45 percent of the watershed is considered developed, with the lower end still developing.

The Coal Creek Watershed suffered a heavy rainfall event on September 12, 2013 that caused large amounts of channel migration that resulted in erosion and deposition. More information on this can be found in the Erosion and Deposition section of this document.

Ralston Creek Watershed

Ralston Creek is a tributary of Clear Creek, approximately 15 miles long. It drains a suburban and urban area of the northwestern Denver Metropolitan Area. It rises in the foothills in northeastern Gilpin County,

in southern Golden Gate Canyon State Park. It descends through a valley eastward into Jefferson County following Drew Hill Road (County Road 57), emerging from the mountains approximately 3 miles north of Golden, where it is impounded to form Ralston Reservoir west of State Highway 93 and the Arvada/Blunn Reservoir on both sides downstream of State Highway 93. It flows eastward through Arvada and joins Clear Creek from the north in southeast Arvada, near the intersection of Sheridan Avenue and Interstate 76. The U.S. Army Corps of Engineers funded a flood and erosion control stream improvement project to the 100-year floodplain along Ralston Creek at the location of the Garrison Street Bridge in 2005.

Deer Creek Watershed

Deer Creek created Deer Creek Canyon. It is an important riparian corridor between the hogback and Wetlands Conservation Areas. It is a rich butterfly habitat and a large portion of it is protected by the Deer Creek Canyon Park, which encompasses diverse, natural environments. Perhaps most striking is the scrub oak habitat, uncommon in Jefferson County. Although small in stature, the scrub oak provides important food and cover for wildlife including grouse, turkey, mule deer, elk, mountain lion, and black bear. Deer Creek discharges directly into Chatfield Reservoir.

Significant Jefferson County Gulches

As mentioned above there are over 90 gulches, canyons and draws in Jefferson County. Some gulches, where there is a high vulnerability to larger numbers of populations, are discussed in further detail below.

Lena Gulch

Lena Gulch is a tributary of Clear Creek with a confluence near 41st Avenue and Kipling Street. The total drainage area for the basin is 13.3 square miles. Lena Gulch is predominantly in the City of Wheat Ridge, but also through Golden, the Pleasant View area, Lakewood, Wheat Ridge and parts of unincorporated Jefferson County. The lower reach of Lena Gulch begins at Maple Grove Reservoir, which is a water storage reservoir operated by the Consolidated Mutual Water District Company. The drainage basin entering Maple Grove Reservoir is 10.5 square miles. Typically, low flows from the upper basin pass through the reservoir and are released downstream. The lower basin has a drainage area of 2.8 square miles. Lena Gulch is unusual for a small foothills stream in that it has a constant base flow. This makes for an attractive stream setting with riparian zones and aquatic flora and fauna along the corridor. There are several areas of concern along Lena Gulch. Discussions for flood control projects are currently under way across several jurisdictions. Lena Gulch will be further discussed in the jurisdictional annex for the City of Wheat Ridge. A complete study of the Flood Hazard Area Delineation for Lena Gulch has been created.

Lena Gulch Flood History

July 27, 1997 – Heavy rain caused Lena Gulch to surge 2 feet over its banks. The fire department had to rescue a man when his van stalled in the high water.

August 10, 1998 – Heavy rain caused flooding and flash flooding problems over southwest portions of Metropolitan Denver. An observer in Lakewood recorded 3.26 inches of rainfall in one hour. Several streets were flooded in central Lakewood. In addition, a trailer park along Lena Gulch in Wheat Ridge was evacuated due to the high waters.

June 8, 2004 – Heavy rain and large hail caused flooding and flash flooding across northeast Jefferson County. Automated gages in the area registered 2 to 3 inches of rain in one hour.

Lakewood Gulch

Lakewood Gulch is a well-defined drainageway. It originates on the northwest slopes of Green Mountain in Lakewood, flows east through Sixth Avenue West Park, and continues east through Lakewood into Denver, where it joins the South Platte River southwest of the intersection of I-25 and Colfax Avenue. A small portion of the studied length of Lakewood Gulch is in unincorporated Jefferson County, while the predominant length lies in Lakewood. Lakewood Gulch will be further discussed in the jurisdiction annex for the City of Lakewood. A complete study of the Flood Hazard Area Delineation for Lakewood Gulch has been created.

Lakewood Gulch Flood History

August 21, 1998 – While no flash flood warning was issued for the August 10th storm, extensive urban flooding did occur in Lakewood and Denver. Between 4:45 and 5:45 P.M., 3.26 inches of rain was measured in Lakewood near the intersection West 1st Ave. and Balsam Street. Rush-hour traffic was at a crawl while many homes had their basements flooded. Vehicles were floating in the Wal-Mart parking lot where the floodwater was 3 to 4 feet deep. This parking lot is located in the floodplain of South Lakewood Gulch near West 2nd Ave. and Wadsworth Blvd. East of Kipling Street, McIntyre Gulch was out of its banks at a number of locations. Lakewood Gulch in Denver overtopped Wolff Street by at least 3 feet. This event contributed directly to a Lakewood City County action exactly 2 weeks later endorsing a plan to form a stormwater utility and establish a fee of \$0.88 a month for each 1,000 square feet of impervious surface area, costing the average homeowner \$1.98 per month.

May 14, 2007 – a mother and her toddler got trapped in a flash flood on Lakewood Gulch in Denver. They were taking a walk along the gulch trail when it started to hail. They attempted to escape the hail from the storm by going further down into a small box culvert underneath Decatur Street adjoining the creek as it travels under Decatur Street in Denver. The mother lost the grip of her toddler's stroller and the child was swept downstream. He was found dead a few days later a few miles away on the banks of the South Platte River. After the incident, the bike path adjoining the creek was permanently closed.

July 20, 2019 – A thunderstorm produced a flash flood in southern Jefferson and southwest Denver counties. Rescue crews searched Lakewood Gulch, after the report of a person in the water near West 12th Avenue and Miller Street. Her body was found in 10 ft of water the following day along Lakewood Gulch near West 12th Avenue and Lee Street. There were reports of West Colfax Avenue in Lakewood being inundated with water. There was up to 3 feet of water on other streets in Lakewood. One woman was rescued by a passerby in Lakewood when floodwaters began pouring into her car near the iconic Casa Bonita restaurant.

Past Occurrences

A discussion on previous occurrences of flood events is organized under each major watershed above.

Probability of Future Occurrences

There have been 48 floods in Jefferson County recorded since 1876; however, 38 of them (35 recorded by the NCEI, 3 recorded by NWS and a number of others by MHFD) have occurred since 1950, or a span of 70 years. The methodology for calculating the probability of future occurrences using the number of incidents from 1950 is described in Section 4.3.1. This formula evaluates that the probability of a flood occurring in any given year is 69%. This corresponds to a probability of future occurrences rating of **likely**.

If the total number of flood incidents is used (48) over a period of 144 years, the probability of a flood occurring in any given year is 33%. This still corresponds to a probability of future occurrences rating of **likely**. A 100-year flood has an annual probability of 1%. A 500-year flood has a 0.2% chance of occurring in any given year.

Magnitude and Severity

Magnitude and severity can be described or evaluated in terms of a combination of the different levels of impact that a community sustains from a hazard event. Several factors contribute to the relative vulnerabilities of certain areas in the floodplain. Development, or the presence of people and property in the hazardous areas, is a critical factor in determining vulnerability to flooding. Additional factors that contribute to flood vulnerability range from specific characteristics of the floodplain to characteristics of the structures located within the floodplain. The following is a brief discussion of some of these flood factors which pose risk.

- **Elevation:** The lowest possible point where floodwaters may enter a structure is the most significant factor contributing to its vulnerability to damage, due to the higher likelihood that it will come into contact with water for a prolonged amount of time.
- **Flood depth:** The greater the depth of flooding, the higher the potential for significant damages due to larger availability of flooding waters.

- **Flood duration:** The longer duration of time that floodwaters are in contact with building components, such as structural members, interior finishes, and mechanical equipment, the greater the potential for damage.
- **Velocity:** Flowing water exerts forces on the structural members of a building, increasing the likelihood of significant damage (e.g. such as scouring).
- **Construction type:** Certain types of construction and materials are more resistant to the effects of floodwaters than others. Typically, masonry buildings, constructed of brick or concrete blocks, are the most resistant to damages simply because masonry materials can be in contact with limited depths of flooding without sustaining significant damage. Wood frame structures are more susceptible to damage because the construction materials used are easily damaged when inundated with water.

Specific examples of negative impacts from flooding on Jefferson County span a comprehensive range and are summarized as follows:

- Floods cause damage to private property that often creates financial hardship for individuals and families;
- Floods cause damage to public infrastructure resulting in increased public expenditures and demand for tax dollars;
- Floods cause loss of personal income for agricultural producers that experience flood damages;
- Floods cause loss of income to businesses relying on recreational uses of County waterways;
- Floods cause emotional distress on individuals and families; and
- Floods can cause injury and death.

Note that the terms 1% annual chance flood and 0.2% annual chance flood, described above as measures of frequency, are also used as a shorthand to describe magnitude, particularly in terms of flood depth.

Jefferson County is uniquely located covering very populated urban areas as well as wildland urban interface foothills. Areas burned by wildfire tend to have a high runoff, resulting in flash flooding in those areas. Hilly terrain, coupled with brief, heavy summer downpours can result in flash flooding in many areas in the County. Fast-moving water is extremely powerful. The result can be deadly to anyone in the water's path. The force of flash flood waters can be extremely dangerous to motorists who unwittingly or unknowingly drive over water-covered roads - only two feet of running water are needed to sweep away a car. Risks to life and property can be very high during periods of flash flooding.

The magnitude and severity of the flood hazard is usually determined by not only the extent of impact it has on the overall geographic area, but also by identifying the most catastrophic event in the previous flood history. Sometimes it is referred to as the "event of record." There are differences in how the various natural hazard events are recorded and therefore do not apply across the hazards equally. For this reason additional data was taken into consideration to define the term "flood of record." Normally a flood of record relates to official stream-flow information available from the USGS and other sources, which include the National Weather Service and Urban Drainage and Flood Control District. The "flood of record" is almost always correlated to a peak discharge at a gage, but that event may not have caused the worst historic flood impact in terms of property damage, deaths, etc.

The 1938 flood illustrates this point well. It was likely the most devastating flood that Morrison has ever experienced; however, the '38 flood was not the largest historic stream-flow measurement for the Bear Creek at Morrison gage. The 1896 Black Friday Flood peak discharge was 8,600 cfs versus 6,200 cfs for the 1938 flood. In 1933 the Bear Creek gage recorded a peak discharge of 8,110 cfs and deaths occurred, but the 1938 flood caused far more damage to the town.

With this said, it is important to evaluate all the variables when attempting to identify a "flood of record." The 1965 flood received much media attention along Plum Creek in Douglas County and along the South Platte River through Denver, but Jefferson County sustained its share of damages as well. When major floods happen, lesser impact areas from the same event are given less attention by the media. To get a handle on the flood year that caused the most damage, additional research was necessary. NFIP claims statistics for the past 30 years were considered, however, the two worst flood damage years predated the NFIP. Inflation adjustments were also calculated. The accumulated data pointed to the 1896 Black Friday

Flood to be the “flood of record.” There were 29 lives lost and devastation from Evergreen to the mouth of Bear Creek wiping out everything in its path. Farms were destroyed along with the livelihoods of most of those who lived in the area. The City of Golden was under siege by floodwaters coming in from two directions taking out all bridges and shutting down the electric plant. Miles of railroad tracks were twisted like pretzels up Clear Creek, and the town of Morrison was a mass of wreckage and ruin. Enormous amounts of debris were strewn from the mountains to the plains of Denver. It was considered an economic catastrophe of its time where reconstruction took years. A future event of this magnitude could have similar devastation to Morrison and Golden. Based on these factors, the magnitude severity ratings for flood are considered **critical**.

Climate Change Considerations

According to the National Oceanic and Atmospheric Administration, there is generally more rain and snow falling in the Northern Hemisphere and precipitation has increased by about 5% over the last century. An increase in precipitation alone is not immediately alarming, but “factors such as precipitation intensity, soil moisture and snow conditions, and basin topography are also important in determining the occurrence and severity of flooding.” As with temperature, it is the extremes that matter most with regard to rainfall. According to Robert Hanson, author of *The Thinking Person’s Guide to Climate Change*, “Data shows a clear ramp up in precipitation intensity for the United States, Europe, and several other areas over the last century, especially since the 1970s. When it rains or snows in these places, it now tends to rain or snow harder, over periods ranging from a few hours to several days.” Additionally, with wildfires already being a problem in many parts of Colorado, increasing periods of drought and lack of precipitation are expected to exacerbate conditions for fires to occur, and in turn worsen the potential for runoff and flooding associated with burned areas.

These events can lead to increased infrastructure damage, injury, illness, and death. Additionally, warmer temperatures in the winters may cause increased precipitation to fall as rain instead of snow in mountain regions of Colorado. This may lead to elevated stream flows and increased flood risk across the state. As climate science and data evolves it will be important for communities in and around Jefferson County to address how our changing climate will affect how water moves through local streams and regional landscapes.

Vulnerability Assessment

General Property

Floods pose a significant risk to existing development in the planning area. In addition to the enormous economic loss potential associated with flood hazards, floods have historically been a source of significant loss of life in the planning area.

A flood vulnerability assessment was performed for Jefferson County using GIS. The county’s address point layer and associated assessor’s building improvement valuation data were provided by the county and were used as the basis for the inventory. The latest FEMA NFHL data along with the Jefferson County parcel layer provided by the Assessor’s Office. FEMA’s NFHL data depicts the 1% annual chance (100-year) and the 0.2% annual chance (500-year) flood events. Flood zones A, AE, AH and AO are variations of the 1% annual chance event and were included in the analysis. The Shaded Zone X along with the subtype 0.2% annual chance hazard zone were used to represent the 500-year flood event.

GIS was used to create a centroid, or point, representing the center of each parcel polygon. Only parcels with improvement values greater than zero were used in the analysis (with the exception of Exempt parcels, which were included regardless of improvement values); this assumes that improved parcels have a structure of some type. The FEMA flood zones were overlaid in GIS on the parcel centroid data to identify structures that would likely be inundated during a 1% annual chance or 0.2% annual chance flood event. Property improvement values for the points were based on the assessor’s parcel data and summed by parcel type and jurisdiction across the county.

Results of the overlay analysis are summarized in Table 4-38 and Table 4-39; further details are shown in Table 4-40 and Table 4-41 by property type. Contents values were estimated as a percentage of property improvement values based on their occupancy type, using FEMA HAZUS guidance as follows: a) Commercial parcels received content values worth 100% of their improvements; b) Residential parcels

received content values worth 50% of their improvements; and c) Exempt and Vacant parcels received content values worth 0% of their improvements. Property improvements and content values were then totaled, and a 25% loss estimation factor was applied based on those totals, per the FEMA depth damage functions.

There are approximately 2,228 buildings in the 1% annual chance flood zone based on the analysis. The total property exposure (actual building value plus content value estimate) in that flood zone is \$1,417,453,541, with a loss estimate of \$354,363,385. In the 0.2% annual chance flood there are 3,003 buildings, with a total exposure value of \$1,952,814,238 and a loss estimate of \$488,203,559 million additional for that zone. Morrison and Edgewater have the greatest percentage of improved parcels (10% and 14%) at risk of the 0.2% annual flood.

Based on this analysis, the greatest potential losses from 500-year flooding, based on combining the 1% and 0.2% building counts, would occur in Arvada (with roughly total 1,353 buildings) and Wheat Ridge (with 1,441 buildings), unincorporated Jefferson County (with 1,052 buildings), and Lakewood (with 578 buildings). Overall, there are a total of 4,405 parcels at risk or 2% of total improved parcels, with a total value of \$3,370,267,779 million and a loss estimate of \$842,566,945 countywide.

Table 4-38 1% Annual Chance Flood Vulnerability by Jurisdiction

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Estimated Loss	Population
Arvada	631	692	\$206,855,552	\$114,802,322	\$320,406,861	\$80,101,715	1,622
Edgewater	23	33	\$11,012,162	\$5,506,081	\$16,518,243	\$4,129,561	76
Golden	78	124	\$55,642,393	\$38,348,992	\$93,991,385	\$23,497,846	188
Lakewood	212	269	\$183,062,710	\$114,867,152	\$297,929,862	\$74,482,466	338
Morrison	37	60	\$11,257,465	\$9,528,695	\$20,786,160	\$5,196,540	43
Wheat Ridge	333	414	\$107,158,293	\$61,743,602	\$168,901,895	\$42,225,474	772
Unincorporated	561	636	\$289,319,650	\$209,599,486	\$498,919,136	\$124,729,784	1,385
Total	1,875	2,228	\$864,338,225	\$554,396,329	\$1,417,453,541	\$354,363,385	4,424

Source: Wood analysis with Jefferson County Assessor's Data,

Table 4-39 0.2% Annual Chance Flood Vulnerability by Jurisdiction

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Estimated Loss	Population
Arvada	722	804	\$364,374,198	\$281,578,730	\$645,952,928	\$161,488,232	1,696
Edgewater	152	166	\$30,133,979	\$15,979,212	\$46,113,191	\$11,528,298	368
Golden	245	256	\$144,999,142	\$91,462,889	\$236,462,031	\$59,115,508	491
Lakewood	297	309	\$104,593,776	\$58,388,391	\$162,982,167	\$40,745,542	686
Morrison	21	25	\$5,413,965	\$3,025,722	\$8,439,687	\$2,109,922	39
Wheat Ridge	778	1,027	\$287,950,652	\$162,587,474	\$450,538,126	\$112,634,531	2,067
Unincorporated	315	416	\$212,552,121	\$189,773,989	\$402,326,110	\$100,581,527	1,061
Total							

Source: Wood analysis with Jefferson County Assessor's Data

Table 4-40 Improved Properties at Risk of 1% Annual Chance Flood Hazard by Jurisdiction

Jurisdiction	Property Type	Improved Parcels	Building Counts	Improved Value	Content Value	Total Value	Estimated Loss (25%)	% of Total Parcels
Arvada	Commercial	10	20	\$11,938,573	\$11,938,573	\$23,877,146	\$5,969,287	
	Exempt	3	4	\$479,778	\$479,778	\$959,556	\$239,889	
	Industrial	4	5	\$5,550,988	\$8,326,482	\$13,877,470	\$3,469,368	
	Mixed Use	1	9	\$1,760,791	\$479,778	\$959,556	\$239,889	
	Residential	613	654	\$187,155,422	\$93,577,711	\$280,733,133	\$70,183,283	
	Total	631	692	\$206,885,552	\$114,802,322	\$320,406,861	\$80,101,715	2%
Edgewater	Residential	23	33	\$11,012,162	\$5,506,081	\$16,518,243	\$4,129,561	
	Total	23	33	\$11,012,162	\$5,506,081	\$16,518,243	\$4,129,561	2%
Golden	Commercial	16	26	\$10,064,295	\$10,064,295	\$20,128,590	\$5,032,148	
	Exempt	3	3	\$5,775,725	\$5,775,725	\$11,551,450	\$2,887,863	
	Industrial	7	8	\$1,990,530	\$2,985,795	\$4,976,325	\$1,244,081	
	Mixed Use	3	3	\$1,234,510	\$1,234,510	\$2,469,020	\$617,255	
	Residential	49	84	\$36,577,333	\$18,288,667	\$54,866,000	\$13,716,500	
	Total	78	124	\$55,642,393	\$38,348,992	\$93,991,385	\$23,497,846	1%
Lakewood	Commercial	52	85	\$27,573,709	\$27,573,709	\$55,147,418	\$13,786,855	
	Exempt	4	4	\$2,942,409	\$2,942,409	\$5,884,818	\$1,471,205	
	Industrial	13	25	\$7,039,789	\$10,559,684	\$17,599,473	\$4,399,868	
	Mixed Use	5	6	\$2,075,898	\$2,075,898	\$4,151,796	\$1,037,949	
	Residential	138	149	\$143,430,905	\$71,715,453	\$215,146,358	\$53,786,589	
	Total	212	269	\$183,062,710	\$114,867,152	\$297,929,862	\$74,482,466	0.4%
Morrison	Commercial	18	31	\$5,632,583	\$5,632,583	\$11,265,166	\$2,816,292	
	Mixed Use	7	8	\$2,167,342	\$2,167,342	\$4,334,684	\$1,083,671	
	Residential	12	21	\$3,457,540	\$1,728,770	\$5,186,310	\$1,296,578	
	Total	37	60	\$11,257,465	\$9,528,695	\$20,786,160	\$5,196,540	24%
Wheat Ridge	Commercial	8	12	\$2,593,423	\$2,593,423	\$5,186,846	\$1,296,712	
	Exempt	4	6	\$497,426	\$497,426	\$994,852	\$248,713	
	Industrial	11	32	\$6,619,031	\$9,928,547	\$16,547,578	\$4,136,894	
	Residential	310	364	\$97,448,413	\$48,724,207	\$146,172,620	\$36,543,155	

Jurisdiction	Property Type	Improved Parcels	Building Counts	Improved Value	Content Value	Total Value	Estimated Loss (25%)	% of Total Parcels
	Total	333	414	\$107,158,293	\$61,743,602	\$168,901,895	\$42,225,474	3%
Unincorporated	Agriculture	4	4	\$83,279	\$83,279	\$166,558	\$41,640	
	Commercial	49	63	\$110,506,915	\$110,506,915	\$221,013,830	\$55,253,458	
	Exempt	6	7	\$415,435	\$415,435	\$830,870	\$207,718	
	Industrial	9	12	\$8,938,011	\$13,407,017	\$22,345,028	\$5,586,257	
	Mixed Use	6	7	\$997,670	\$997,670	\$1,995,340	\$498,835	
	Residential	487	543	\$168,378,340	\$84,189,170	\$252,567,510	\$63,141,878	
	Total	561	636	\$289,319,650	\$209,599,486	\$498,919,136	\$124,729,784	1%
Grand Total		1,875	2,228	\$864,338,225	\$554,396,329	\$1,417,453,541	\$354,363,385	1%

Source: Wood analysis with Jefferson County Assessor's Data,

Table 4-41 Improved Properties at Risk of 0.2% Annual Chance Flood by Jurisdiction

Jurisdiction	Property Type	Improved Parcels	Building Counts	Improved Value	Content Value	Total Value	Estimated Loss (25%)	% of Total Parcels
Arvada	Agriculture	3	3	\$265,224	\$265,224	\$530,448	\$132,612	
	Commercial	44	63	\$68,906,209	\$68,906,209	\$137,812,418	\$34,453,105	
	Exempt	2	2	\$2,159,510	\$2,159,510	\$4,319,020	\$1,079,755	
	Industrial	35	42	\$54,539,458	\$81,809,187	\$136,348,645	\$34,087,161	
	Mixed Use	6	10	\$18,373,402	\$18,373,402	\$36,746,804	\$9,186,701	
	Residential	632	684	\$220,130,395	\$110,065,198	\$330,195,593	\$82,548,898	
	Total	722	804	\$364,374,198	\$281,578,730	\$645,952,928	\$161,488,232	2%
Edgewater	Commercial	2	2	\$908,775	\$908,775	\$1,817,550	\$454,388	
	Exempt	1	1	\$28,499	\$28,499	\$56,998	\$14,250	
	Mixed Use	1	3	\$887,171	\$887,171	\$1,774,342	\$443,586	
	Residential	148	160	\$28,309,534	\$14,154,767	\$42,464,301	\$10,616,075	
	Total	152	166	\$30,133,979	\$15,979,212	\$46,113,191	\$11,528,298	10%
Golden	Commercial	19	19	\$29,186,056	\$29,186,056	\$58,372,112	\$14,593,028	
	Exempt	2	2	\$4,019,419	\$4,019,419	\$8,038,838	\$2,009,710	
	Industrial	1	1	\$167,454	\$251,181	\$418,635	\$104,659	

Jurisdiction	Property Type	Improved Parcels	Building Counts	Improved Value	Content Value	Total Value	Estimated Loss (25%)	% of Total Parcels
	Mixed Use	15	15	\$4,386,252	\$4,386,252	\$8,772,504	\$2,193,126	
	Residential	208	219	\$107,239,961	\$53,619,981	\$160,859,942	\$40,214,985	
	Total	245	256	\$144,999,142	\$91,462,889	\$236,462,031	\$59,115,508	4%
Lakewood	Commercial	7	7	\$12,183,005	\$12,183,005	\$24,366,010	\$6,091,503	
	Residential	290	302	\$92,410,771	\$46,205,386	\$138,616,157	\$34,654,039	
	Total	297	309	\$104,593,776	\$58,388,391	\$162,982,167	\$40,745,542	1%
Morrison	Commercial	1	3	\$467,746	\$467,746	\$935,492	\$233,873	
	Exempt	2	2	\$139,723	\$139,723	\$279,446	\$69,862	
	Mixed Use	1	1	\$30,010	\$30,010	\$60,020	\$15,005	
	Residential	17	19	\$4,776,486	\$2,388,243	\$7,164,729	\$1,791,182	
	Total	21	25	\$5,413,965	\$3,025,722	\$8,439,687	\$2,109,922	14%
Wheat Ridge	Agriculture	1	1	\$11,380	\$11,380	\$22,760	\$5,690	
	Commercial	30	38	\$29,597,739	\$29,597,739	\$59,195,478	\$14,798,870	
	Exempt	2	2	\$333,766	\$333,766	\$667,532	\$166,883	
	Industrial	4	7	\$3,171,115	\$4,756,673	\$7,927,788	\$1,981,947	
	Mixed Use	4	4	\$939,180	\$939,180	\$1,878,360	\$469,590	
	Residential	737	975	\$253,897,472	\$126,948,736	\$380,846,208	\$95,211,552	
	Total	778	1,027	\$287,950,652	\$162,587,474	\$450,538,126	\$112,634,531	7%
Unincorporated	Commercial	33	48	\$107,855,057	\$107,855,057	\$215,710,114	\$53,927,529	
	Exempt	2	2	\$1,253,533	\$1,253,533	\$2,507,066	\$626,767	
	Industrial	31	110	\$28,252,214	\$42,378,321	\$70,630,535	\$17,657,634	
	Mixed Use	6	7	\$1,382,838	\$1,382,838	\$2,765,676	\$691,419	
	Residential	243	249	\$73,808,479	\$36,904,240	\$110,712,719	\$27,678,180	
	Total	315	416	\$212,552,121	\$189,773,989	\$402,326,110	\$100,581,527	0.4%
Grand Total		2,530	3,003	\$1,150,017,833	\$802,796,405	\$1,952,814,238	\$488,203,559	1%

Source: Wood analysis with Jefferson County Assessor's Data

Based on this analysis, Arvada, Wheat Ridge and unincorporated parts of the County have the most total vulnerable buildings to the 1% annual chance flood (631, 333 and 561 structures, respectively). Additionally, these same jurisdictions have the most total vulnerable buildings to the 0.2% annual chance flood (722, 778 and 315 structures, respectively).

It is also evident that the jurisdictions of Arvada, Lakewood and the unincorporated parts of the county have the highest total dollar exposure to potential losses from the 1% annual chance flood. The analysis shows potential losses for Arvada at \$80M, Lakewood at \$74M and \$124M for the unincorporated County. In the 0.2% annual chance scenario Arvada, Wheat Ridge and the unincorporated County show the greatest losses at \$161M, \$112M and \$100M, respectively.

Not included in the tables above is analysis of locally regulated floodplains and FEMA Zone D, which are mostly in the southern portion of the County where development is limited (Refer to Figure 4-32 and Figure 4-34). Jefferson County regulates areas in Zone D that are within 50 feet of the thalweg (aka deepest part of a stream channel) of a major drainage tributary area of 130 acres or greater. There are 121 buildings with a total value of \$45,451,637 within Golden, Lakewood and unincorporated areas of the county at risk to flooding in this area. A majority (109) are located within unincorporated Jefferson County including 104 residential properties. The follow table shows the results of the analysis using the county's local flood layers.

Table 4-42 Properties within Local Flood Areas (Zone D)

Jurisdiction	Property Type	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Estimated Loss	Population
Golden	Commercial	1	1	\$6,917	\$6,917	\$13,834	\$3,459	
	Total	1	1	\$6,917	\$6,917	\$13,834	\$3,459	
Lakewood	Commercial	1	1	\$299,234	\$299,234	\$598,468	\$149,617	
	Residential	2	2	\$601,432	\$300,716	\$902,148	\$225,537	5
	Total	3	3	\$900,666	\$599,950	\$1,500,616	\$375,154	5
Unincorporated	Commercial	4	4	\$124,899	\$124,899	\$249,798	\$62,450	
	Exempt	1	1	\$34,143	\$34,143	\$68,286	\$17,072	
	Residential	104	112	\$29,371,455	\$14,685,728	\$44,057,183	\$11,014,296	286
	Total	109	117	\$29,530,497	\$14,844,770	\$44,375,267	\$11,093,817	286
Grand Total		113	121	\$30,438,080	\$15,451,637	\$45,889,717	\$11,472,429	290

Source: Jefferson County Floodplain Administrator, Wood Analysis

People

Table 4-40 and Table 4-41 show estimates of population affected by both the 1% annual chance and the 0.2% annual chance flood scenarios. Consistent with the building and value vulnerabilities, Arvada, Wheat Ridge and the unincorporated County are most at-risk, although Wheat Ridge has a far greater number (2,067 persons) potentially vulnerable to the 0.2% annual chance compared to the building and value vulnerabilities. The numbers are based on multiplying the counts of residential structures within the flood hazard areas by the average household size for the County based on data from the State of Colorado Office of Demography.

Critical Facilities and Infrastructure

To estimate the potential impact of floods on critical facilities, a GIS overlay was performed of the flood hazard layer for critical facility point locations. Critical facilities at-risk to the 1% annual chance flood are listed in Table 4-43. Critical facilities at-risk to the 0.2% annual chance flood are shown in Table 4-44.

Replacement values were not available with the data thus an estimate of potential monetary loss could not be performed. Impacts to any of these facilities could have wide ranging ramifications, in addition to property damage. As expected, most bridges and other critical facilities are located in the urbanized northeastern part of the county where the majority of the population is located. Nevertheless, the critical

facilities in the southern part of the County are extremely important as failure of one of these could require assistance and emergency services to be brought in from distant locations. Bridges and road infrastructure in Coal Creek Canyon and the canyons of Boulder and Larimer County were severely impacted in the 2013 floods. The bridge maps indicate concentrations of bridges along Highway 74 west of Morrison.

Table 4-43 Critical Facilities in 1% Annual Chance Flood Hazard Areas

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	38
	Microwave Service Towers	7
	Total	45
Energy	Electric Substation	2
	Power Plant	2
	Total	4
Food, Water, Shelter	Wastewater Plant	3
	Water Facility	1
	Total	4
Hazardous Material	RMP Facility	1
	Tier II	6
	Total	7
Safety and Security	Fire Station	2
	Government Facility	2
	Total	4
Transportation	Bridge	138
	Total	138
Grand Total		202

Source: HIFLD and CERC

Table 4-44 Critical Facilities in 0.2% Annual Chance Flood Hazard Areas

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	15
	Paging Transmission	1
	Total	16
Food, Water, Shelter	Water Facility	1
	Total	1
Hazardous Material	Tier II	7
	Total	7
Health and Medical	Nursing Home	2
	Total	2
Safety and Security	EOC	1
	Fire Station	2
	Government Facility	3
	Law Enforcement	2

FEMA Lifeline	Critical Facility Type	Count
	School	2
	Total	10
Transportation	Bridge	45
	Total	45
Grand Total		81

Source: HIFLD and CERC

Bridges

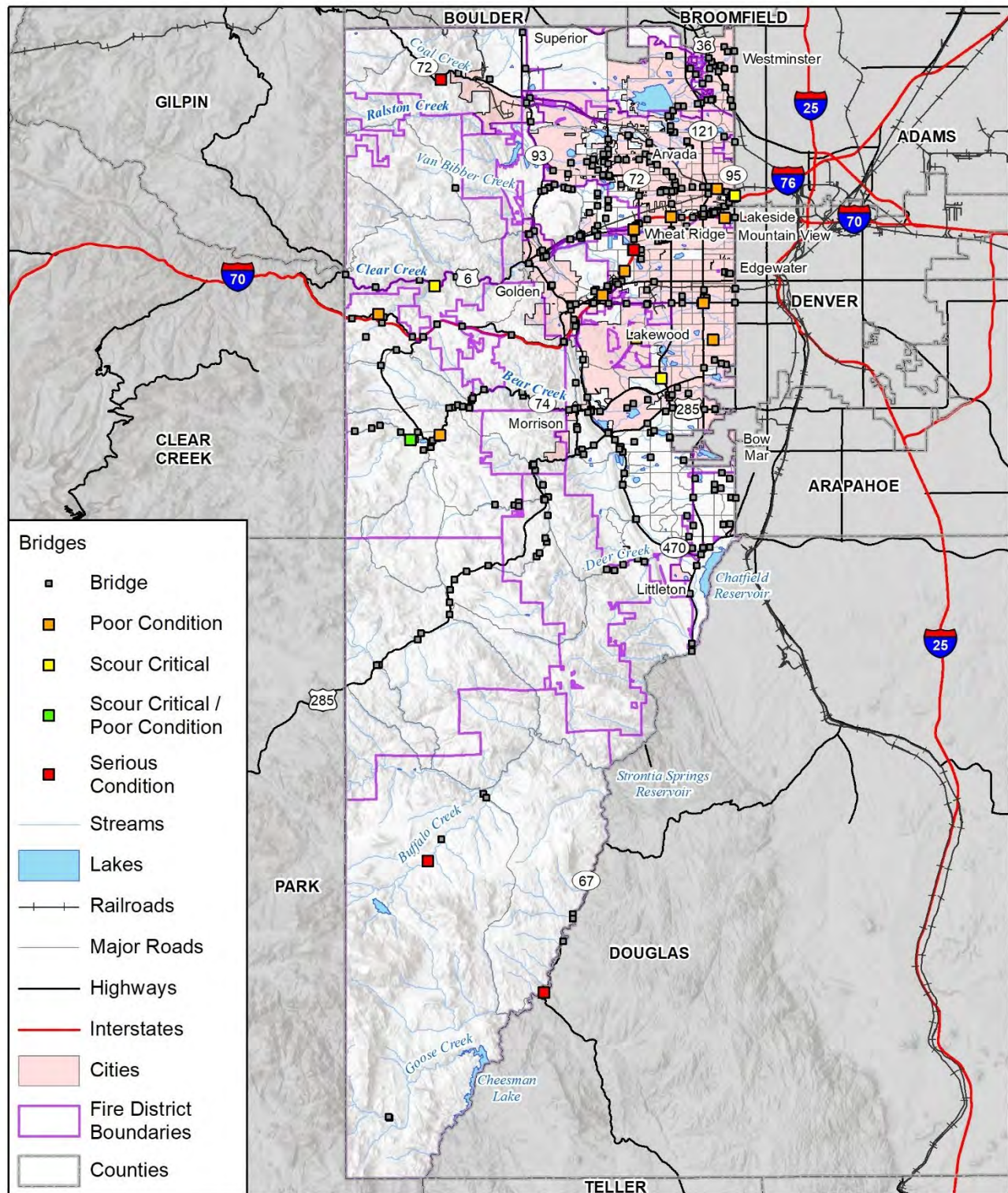
Jefferson County does have a number of bridges of concern, including scour critical (a bridge with a foundation element determined to be unstable for the observed or evaluated scour condition) structurally deficient (when key components like the superstructure are inspected and rated 'poor' or worse by a bridge engineer) and functionally obsolete (when design components are outdated) facilities. Based on a search of the National Bridge inventory there are 9 bridges that fall within these categories, 3 of which are located across Clear Creek. Table 4-45 and Figure 4-37 show the counts and locations for each critical factor listed above.

Table 4-45 Jefferson County Bridges of Concern

Critical Factor	Waterway
Structurally Deficient	Buffalo Creek
Scour Critical/Structurally Deficient	Bear Creek
Scour Critical	Clear Creek
Scour Critical	Clear Creek
Scour Critical	Iliff Gulch
Functionally Obsolete	Coal Creek
Functionally Obsolete	Clear Creek
Functionally Obsolete	I 70 ML
Functionally Obsolete	Bear Creek

Source: National Bridge Inventory

Figure 4-37 Jefferson County Bridges



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
National Inventory of Bridges

0 5 10 Miles



Economy

Flooding can have a major economic impact on the economy, including indirect losses such as business interruption, lost wages, reduced tourism and visitation, and other downtime costs. Flooding often coincides with the summer tourism months and may hence impact, directly or indirectly (such as from the negative perception of potential danger to his hazard), the revenues of tourist agencies, hotel bookings, outdoor activity companies, and other such businesses in the commercial and industrial sectors.

The Colorado Water Conservation Board (CWCB), Future Avoided Cost Explorer (FACE) tool which estimates annual damages from flooding, Jefferson County could potentially experience an average annual loss of \$12 million in total damages and \$20 total damages per person due to flooding under current population and climate scenarios.

Historical, Cultural, and Natural Resources

There are significant historic, cultural, and natural resources and assets located throughout the County (e.g. trails and natural spaces, lakes). Natural areas within the floodplain often benefit from periodic flooding as a naturally recurring phenomenon. These natural areas often reduce flood impacts by allowing absorption and infiltration of floodwaters. Natural resources are generally resistant to flooding except where natural landscapes and soil compositions have been altered for human development or after periods of previous disasters such as drought and fire. Wetlands, for example, exist because of natural flooding incidents. Areas that are no longer wetlands may suffer from oversaturation of water, as will areas that are particularly impacted by drought. Areas which may have recently suffered from wildfire damage may erode because of flooding, which can permanently alter an ecological system.

National Flood Insurance Program/Community Rating System

The National Flood Insurance Program (NFIP) is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses. A jurisdiction's eligibility to participate is premised on their adoption and enforcement of state and community floodplain management regulations intended to prevent unsafe development in the floodplain, thereby reducing future flood damages. Thus, participation in the NFIP is based on an agreement between communities and the federal government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the federal government will make flood insurance available within the community as a financial protection against flood losses. Table 4-46 shows the dates the jurisdictions in Jefferson County joined the NFIP, the date of the most recent FIRM maps, total number of claims since joining and total dollar value of claims. The data shows that the unincorporated parts of the county have the highest dollar value of claims, with Lakewood the highest number of claims.

Table 4-46 NFIP Data, Jefferson County

Jurisdiction	Date Joined	Effective FIRM Date	Number of Claims	Claims Totals
Arvada, City of	6/23/1972	1/15/2021	71	\$66,412
Edgewater, City of	8/15/1989	2/5/2014	27	\$51,637
Golden, City of	5/15/1985	12/20/2019	14	\$48,938
Lakewood, City of	7/21/1972	2/5/2014	157	\$649,522
Morrison, Town of	12/1/1982	2/5/2014	8	\$1,231
Westminster, City of	9/30/1988	12/20/2019	39	\$260,098
Wheat Ridge, City of	5/26/1972	2/5/2014	45	\$97,251
Unincorporated	8/5/1986	1/15/2021	138	\$1,407,172

Source: FEMA Community Information Systems, Accessed: January 2021

Table 4-47 shows the trends of policies in force from 2015 to 2020; with the exception of Golden all jurisdictions in Jefferson County have decreased numbers of policies in force. Reductions in some cases,

notably Arvada, also reflect flood reduction projects that were implemented in recent years (e.g. along Ralston Creek near Independence St) that have reduced the SFHA and the requirement for flood insurance.

Table 4-47 NFIP Policies in Force, 2015 to 2020

Jurisdiction	Policies in Force		Change 2015 to 2020
	2015	2020	
Arvada	484	360	-124
Edgewater	42	35	-7
Golden	93	94	1
Lakewood	412	371	-41
Morrison	12	8	-4
Westminster	121	97	-24
Wheat Ridge	254	222	-32
Unincorporated	597	415	-182

Source: FEMA Community Information Systems, Accessed: January 2021

Table 4-48 shows the same data, in terms of total dollar amounts insured. This analysis shows most jurisdictions in the County have decreased net dollar amounts insured, reflecting reduced flood vulnerability.

Table 4-48 NFIP Insurance in Force, 2015 to 2020 (Non-Adjusted US Dollars)

Jurisdiction	Insurance in Force		Change 2015 to 2020
	2015	2020	
Arvada	\$114,839,400	\$95,962,300	-\$18,877,100
Edgewater	\$8,859,200	\$9,177,800	\$318,600
Golden	\$25,629,000	\$26,368,500	\$739,500
Lakewood	\$113,461,100	\$107,586,600	-\$5,874,500
Morrison	\$2,590,000	\$2,756,300	\$166,300
Westminster	\$33,447,400	\$27,283,700	-\$6,163,700
Wheat Ridge	\$58,590,100	\$55,482,200	-\$3,107,900
Unincorporated	\$150,687,200	\$113,566,400	-\$37,120,800

Source: FEMA Community Information Systems, Accessed: January 2021

The Community Rating System (CRS) was created in 1990 to recognize communities whose floodplain management activities go above and beyond the NFIP's minimum requirements. Under the CRS, if a community implements certain program activities, such as public information, mapping, regulatory, loss reduction, and/or flood preparedness activities, then its residents can qualify for a flood insurance premium rate reduction.

Table 4-49 shows how jurisdictions in Jefferson County have progressed in the CRS system since 2010.

Table 4-49 Jefferson County Jurisdictions, CRS Rating Trends 2010 - 2020

Jurisdiction	CRS Rating			Change in Class 2015 to 2020
	2010	2015	2020	
Arvada	6	5	5	0
Golden	9	7	7	0
Lakewood	6	6	6	0
Morrison	9	9	8	+1
Westminster	6	6	6	0
Wheat Ridge	7	6	5	+1
Unincorporated	9	6	5	+1

Source: FEMA Community Information Systems, Accessed: January 2021

All jurisdictions in Jefferson County maintained status quo or achieved an improved CRS rating since 2015, suggesting progress in the floodplain management and flood mitigation efforts.

A repetitive loss property is one that has received two or more flood insurance claim payments for at least \$1,000 each in any 10-year period since 1978. A repetitive loss property may or may not be currently insured by the NFIP. According to NFIP data from the Colorado Water Conservation Board (CWCB), accessed January 2021, there are a total of 15 repetitive loss buildings and have been 41 total losses in Jefferson County. Of the claims, 31 losses were associated with the City of Lakewood, 5 with unincorporated county and 5 with the City Arvada. In total there have been \$794,936 repetitive loss payments, \$687,717 is related to buildings and \$107,219 are payments for contents. Table 4-50 shows these repetitive loss buildings by occupancy type.

Table 4-50 Repetitive Loss Properties

Community	Building Type (Occupancy)	# of Losses	NFIP Insured (y/n)
Arvada	Single Family	3	Yes
	Single Family	2	No
Evergreen	Other Non-residential	2	No
Lakewood	Other Residential	1	No
	Other Non-residential	2	No
	Other Non-residential	2	No
	Single Family	6	No
	Single Family	4	No
	Single Family	4	No
	Single Family	4	No
	Single Family	3	No
	Single Family	2	No
	Single Family	2	Yes
	Single Family	2	No
Littleton	Single Family	2	No
Total	15	41	

Source: CWCB

Severe repetitive loss properties (SRL) are those for which the program has either made at least four payments for buildings and/or contents of more than \$5,000 or at least two building- only payments that

exceeded the value of the property. As of January 2021, there were no severe repetitive loss (SRL) structures located within Jefferson County.

Future Development

An analysis of the Year Built field in County Assessor's Office data shows that from 2015 through 2020, 21 new structures have been built in the 1% floodplain and 71 structures were built in the 0.2% floodplain. While not a large number compared to the total structures at risk described above, it does show that new development is continuing in flood prone areas. New development in the 1% floodplain is mitigated per local floodplain regulations. In general development in the 0.2% floodplain is not regulated; based on this trend and the analysis shown in the vulnerability assessment a 0.2% flood, while less likely, has potential to do extensive damage.

Jefferson County's continued population, housing, and employment growth creates pressure for land use change and the supporting infrastructure improvements. Floodplain management practices implemented through local floodplain management ordinances should mitigate the flood risk to new development in floodplains. Urbanization and increasing impervious surface areas tend to increase both the rate and the volume of stormwater runoff. Thus, the largest issue with future development trends is urbanization and stormwater drainage issues that add to the peak discharge and volume of floodwaters in floodplains.

The Colorado Water Conservation Board (CWCB), Future Avoided Cost Explorer (FACE) provides an in-depth look at the potential economic impacts and expected annual damages from future flood, drought and wildfire events. The tool looks at three different climate scenarios (current climate conditions, 2050 future – moderately warmer climate and 2050 – severely warmer climate) as well as compares current population to low, medium and high growth population scenarios. The following table compares the estimated annual damages for Jefferson County due to drought events for each of the climate and population scenarios.

Table 4-51 Potential Future Economic Losses from Flooding in Jefferson County

Climate Scenarios	Population Scenarios		
	Low Growth (~653,000)	Medium Growth (~695,000)	High Growth (~740,000)
Current Conditions	Total damages: \$12M	Total damages: \$12M	Total damages: \$13M
	Total damages per person: \$20	Total damages per person: \$20	Total damages per person: \$20
Moderate or More Severe Climate	Total damages: \$20M	Total damages: \$20M	Total damages: \$20M
	Total damages per person: \$30	Total damages per person: \$30	Total damages per person: \$30

Source: Colorado Water Conservation Board (CWCB) Future Avoided Cost Explorer: Hazards <https://cwcb.colorado.gov/FACE>

Overall Hazard Significance

Floods in Jefferson County can have a particular impact on the planning area. Widespread flooding is less frequent, but the 2013 flood demonstrated that these events happen. Flash floods and flooding in small pockets of the County happens with regularity. The geographic extent of the hazard is considered **limited**. The probability of future occurrences is considered **likely** and the magnitude/severity for the event of record is **critical**. In addition, the HMPC considers the hazard to have a **high** overall impact rating on the County. This equates to an overall impact rating of **high**.

4.3.10 Hailstorms

Description

Hailstorms are any storm events where hailstones fall. Hail forms when updrafts carry raindrops into extremely cold areas of the atmosphere where the drops freeze into ice. Hail falls when it becomes heavy enough to overcome the strength of the updraft and is pulled by gravity towards the earth. The process of falling, thawing, moving up into the updraft and refreezing before falling again may repeat many times, increasing the size of the hailstone. Hailstones are usually less than two-inches in diameter, but have been reported much larger and may fall at speeds of up to 120 mph. Hailstorms occur throughout the spring, summer, and fall in the region, but are more frequent in late spring and early summer. These events are often associated with thunderstorms that may also cause high winds and tornadoes. Hail causes nearly \$1 billion in damage to crops and property each year in the United States. Hail is also one of the requirements which the National Weather Service uses to classify thunderstorms as severe. If hail more than $\frac{3}{4}$ of an inch is produced in a thunderstorm, it qualifies as severe.

The National Weather Service classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. The table below indicates the hailstone measurements utilized by the National Weather Service.

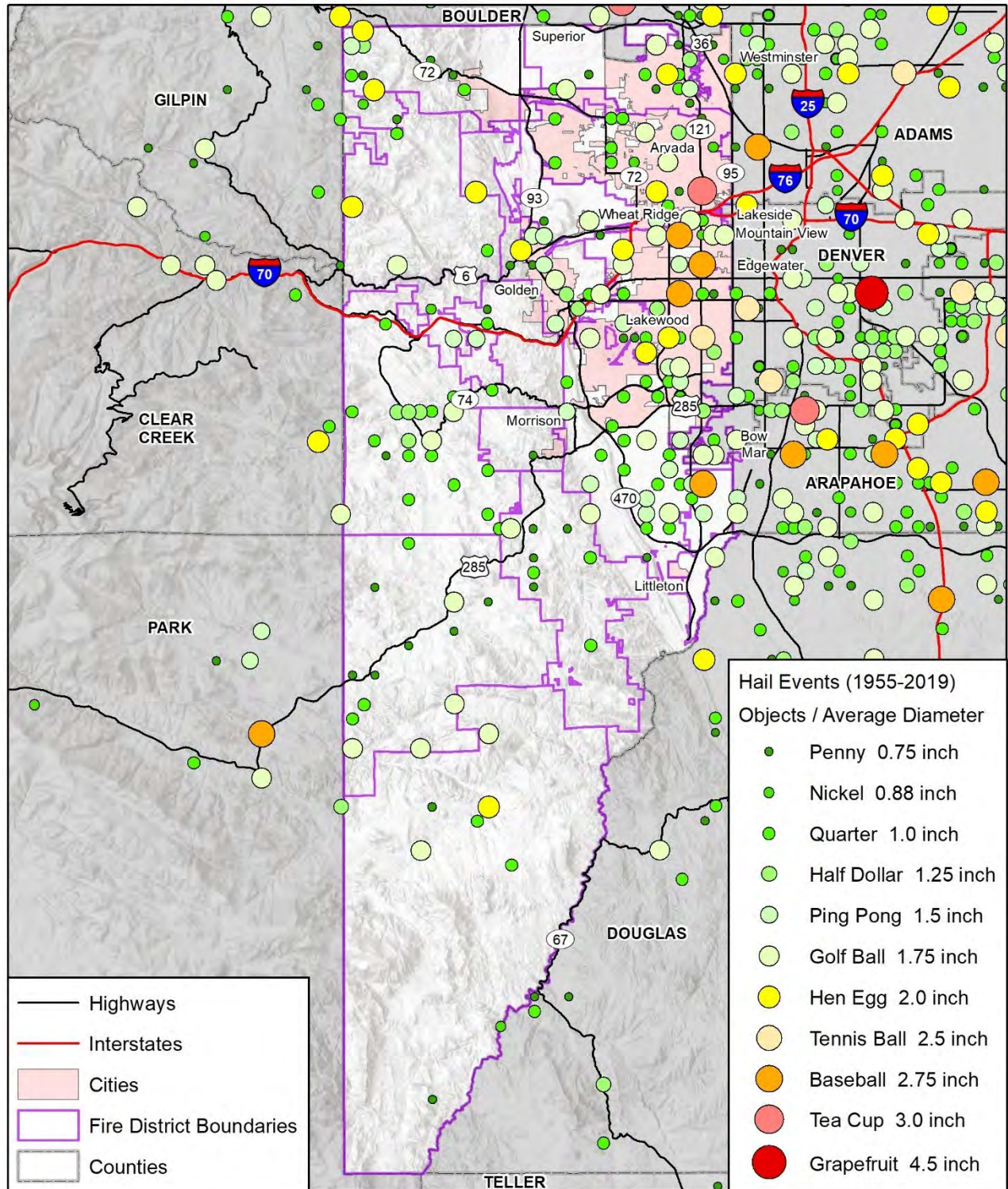
Table 4-52 Hailstone Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

In Colorado, hail is one of the most damaging of natural hazards. In fact, the 1996 July hailstorm set a record for most damaging hailstorm on a national level at that time. According to the 2018 State Hazard Mitigation Plan, the damaging hail season in Colorado ranges from mid-April to mid-August. Colorado's Front Range, including the entire planning area, is located in the heart of Hail Alley, which receives the highest frequency of large hail in North America and most of the world. According to an April 2020 report from the National Insurance Crime Bureau (NICB), Colorado had the second highest number of insurance claims involving hail from 2017-2019. The Rocky Mountain Insurance Information Association (RMIIA) also reports that hailstorms have caused upwards of \$5 billion over the last 10 years.

Figure 4-38 Jefferson County Hail Events



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
NOAA, National Weather Services SVRGIS 2019

Geographic Extent

Hailstorms occur during severe storms, which are regional in nature. However, just as the amount of precipitation in the form of snow or rain may vary significantly within a single storm, so may the amount, size, and duration of hail within a severe storm. In general, hail can fall anywhere in Colorado. The areas where hail is most frequently reported with damaging effects are in the eastern plains, where hail damages crops and livestock, and in the Denver metro area, where hailstorms damage buildings, cars and trees, and may cause driving conditions to deteriorate. The extent of impact ranges from limited, where a single community within the planning area is affected, to significant, where more than 50% of the County was impacted. There are no known incidents where a single hailstorm impacted more than 75% of the County; however, so while hail is *possible* anywhere in the planning area, it is not likely to affect the entire area simultaneously. Figure 4-38 below illustrates the location and magnitude of hail events within and adjacent to the planning area from 1955-2019.

Based on this information, the geographic extent rating for hailstorms is **significant**.

Previous Occurrences

Since hailstorms are so prevalent in Colorado, the most useful previous occurrences to examine are those which caused a particularly high amount of damage or incurred some other unique cost or impact. The NCEI database records 422 hail events in the planning area between January 1, 1950 and December 31, 2020. Nineteen of those storms reported hailstones at least two inches in diameter; however, some of these individual storm records reflect the different size hailstones for the same storm event, so the data is somewhat skewed. Several selected incidents, including some not captured in the NCEI database, are profiled below. These selections illustrate the severity of the hail hazard for the jurisdiction and are representative of the range and risk but are not comprehensive.

June 13, 1984 – A mega rain/hailstorm occurred on June 13, 1984. Severe thunderstorms crossed northern Jefferson County and western Adams County dropping 2 to 4" rain and 1" to 3.5" diameter hail. There was serious flooding in Arvada, Westminster, Wheat Ridge and Lakewood. Damage was estimated at \$350-\$400 million (\$723-\$825 million in 2008 dollars) damage in Jefferson County.

July 11, 1990 – A storm with hailstones of up to 2.75" in diameter incurred 13 injuries in the planning area. A companion entry for the same date indicated the hail size was 1.75" but that 47 injuries were reported, which were mostly documented in Elitch Gardens (then located in Denver County). The RMIIA placed the total insured hail damages for the affected area at \$625 million (\$1.03 billion in 2009 dollars). The storm impacted Adams, Arapahoe, Boulder, Denver, Elbert, Jefferson and Larimer counties, with the heaviest damages reported in Jefferson County. Additional accounts indicate that this was the costliest hailstorm in U.S. history, as hail ranged along the entire Front Range. Jefferson County also suffered severe damages to aircraft at the Jefferson County Airport, power and utilities were disrupted to thousands of residents, and storm drains clogged with hail flooded roads three to six feet deep in Arvada.

June 1, 1991 – Intense thunderstorms formed in northern Jefferson County on June 1, 1991. These storms flooded streets and urban streams from Columbine County Club through Lakewood into Golden with 0.75" to 1.5" diameter hail and 1.5" to 3.5" rainfall in less than 1 hour. I didn't have information on the estimated damage for this event.

October 1, 1994 – An afternoon hailstorm, lasting for nearly three hours as it crossed the Denver metro area, produced hail ranging from pea to golf ball sizes. Damages and incidents reported in the planning area include Arvada, Edgewater, and Wheat Ridge. Other impacted areas included Denver, Boulder, Last Chance, Bennett, Strasburg, Wiggins, Penrose, and the Buckley Air National Guard Base near Aurora. Overall insured estimates, sourced by RMIIA, totaled at \$225 million (\$326 million in 2009 dollars).

May 22, 1996 – A severe thunderstorm producing large hail ranging in size from 3/4 to two inches in diameter rumbled across the northwest and northern portions of the Denver metropolitan area. The thunderstorm apparently developed from an outflow boundary generated from the supercell thunderstorm that moved across extreme northeastern Colorado earlier in the evening. The storm developed near the foothills and moved east northeast across northern portions of the metro area. The hardest hit areas were cities of Arvada and Westminster, northwest of Denver. The insurance industry estimated \$60 million in damage to homes and personal property and \$62 million in damage to automobiles for a total of \$122

million in insured losses (\$166.8 million in 2009 dollars). This estimate also included the cities of Golden, Thornton, and Wheat Ridge.

June 8, 2004 – A series of hailstorms stretching along the Front Range from Colorado Springs to Larimer County and out to the eastern border of the state dropped hailstones ranging from dime to golf ball sized. The hail in Jefferson County fell mostly between 7:00 and 8:00 pm across Evergreen and Golden. The next afternoon, Morrison, Conifer, and Lakewood were all impacted by large hailstorms as well. Statewide, insurance damages were reported at \$146.5 million (\$166.4 million in 2009 dollars). This storm was classified as the eighth most costly hailstorm event in Colorado history as of July 2009.

May 24, 2007 – Several fast-moving storms dropped substantial amounts of hail in the foothills southwest of Denver. One hailstorm impacted U.S. Highway 285 near Aspen Park, where state patrol reported two inches of pea-sized hail fell on the highway, causing it to become snow packed and slick. Four associated accidents were reported shortly thereafter, including three roll-overs in a 10-minute period of time. No injuries were reported, and damages were estimated at \$20,000 (\$20,700 in 2009 dollars (most recent data available)).

July 20, 2009 – In an unusual overnight storm, rain, winds and golf-ball sized hail battered roofs, uprooted trees, damaged homes, and pounded vehicles in Wheat Ridge, Lakewood, Arvada and Englewood. Most of the damage in this storm are attributed to property losses, with 32,900 homeowner claims and 19,500 automobile claims filed as of July 27, 2009, which amounts to \$350 million in insurance claims based on preliminary estimates. While the entire Denver metro area was impacted by the storm, the most significant damages were reported in Jefferson County. This storm is projected to be the second costliest natural disaster in Colorado, in terms of insured losses.

May 8, 2017 – A severe afternoon thunderstorm produced what would become the most expensive insured catastrophe in Colorado state history, and the second costliest hailstorm in US history. Hailstones recorded in the event ranged in size from 0.75 inches to 2.75 inches in diameter depending on the location and impacted a large highly populated area of Jefferson County including the cities of Lakewood, Arvada, and Wheat Ridge. According to NCEI, an estimated 150,000 auto insurance claims and 50,000 homeowner insurance claims were filed. The event severely damaged and forced a six month closure of the Colorado Mills Mall in Lakewood, resulting in an estimated monthly loss of \$350,000 in lost sales tax revenue in addition to lost business revenue. The total damage cost of the event totaled around \$2.3 billion.

Probability of Future Occurrences

The record of previous occurrences, as discussed earlier, is incomplete as well, but provides a useful reference for hailstorms which produced significant size stones and/or caused damage. Calculating that Jefferson County experiences six hail events per year is less useful than determining how frequently the planning area may experience a severe event. According to RMIIA, there have been eight severe hailstorms which caused more than \$100 million in damages that impacted Jefferson County in some way since 1990. Since the last plan update, the NCEI records have been updated to include the 2017 event and an event in Columbine that caused over \$350 million in damage to property. This data will be used to determine the probability of a severe hailstorm in Jefferson County.

There have been 87 severe incidents, defined as hailstones 1 inch or greater in diameter in the 2018 Colorado State Hazard Mitigation Plan, involving Jefferson County since 1990. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a severe hailstorm occurring in any given year is 290%. If the same methodology is applied to all hailstorms (including those that cause minimal damage), then there have been 422 events since 1950, for a span of 70 years. This indicates that Jefferson County can expect an average of 6 hailstorms per year.

This corresponds to a probability of future occurrences rating of **highly likely**.

Magnitude and Severity

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a

reflection of common occurrence. The event of record for Jefferson County occurred on May 8, 2017. According to the RMIAA, the event caused \$2.3 billion in damages to property in the jurisdiction. This storm was the costliest in Colorado history and the second costliest storm in US history.

Also of note are the July 20, 2009 and July 11, 1990 hail events. The former of these events resulted in \$767.6 million in insured damages according to the RMIAA. The latter resulted in 60 direct injuries in the duration of the event, and damages inflicted on critical facilities and services (critical infrastructure) resulted in a loss or disruption of services for a minimal amount of time. Documented injuries were considered critical, though the medical response of the jurisdiction was considered minimally impacted.

According to the RMIAA, eight of the top ten hazard events in Colorado by the amount of insured loss were either entirely hail-related or involved hail as a hazard. RMIAA also ranks Colorado 2nd in the U.S. for hail insurance claims.

Based on these factors, the magnitude severity rating for hailstorms is considered **critical**.

Climate Change Considerations

According to the 2018 Colorado State Hazard Mitigation Plan, the future impacts of climate change are expected to influence future hail events. Ongoing efforts to reduce Colorado's greenhouse gas emissions and adapt to a changing climate, such as the Colorado Climate Plan and the Climate Change in Colorado Report, will help to reduce the impacts of climate induced hazard such as hail.

Vulnerability Assessment

All assets located in Jefferson County can be considered at risk from severe hail events. This includes 100% of the County's population, and all buildings and infrastructure within the County.

General Property

Research into the damages inflicted by this hazard indicates the hazard has a high impact on the entire planning area, and perhaps the greatest economic impacts. Hail impacts anything exposed to the event, including structures, infrastructure, landscaping, personal property and vehicles, people, agriculture, and livestock. Jefferson County has the highest number of reported injuries due to hail in the state. Hail is also the costliest insured-losses natural disaster to impact the state of Colorado, with nine separate incidents falling within the top ten disasters list for the state. Existing development remains exposed to hail with minimal mitigation opportunities. Individuals can mitigate exposure by remaining indoors and away from windows during hailstorm events. Vehicles can be parked under shelters to help minimize damage costs incurred in that arena. However, in many cases it is impossible to move existing development away from the impact areas. For example, hail heavily impacts the economic contributors who house merchandize outdoors, such as car retailers, home improvement stores and gardening stores. Damage to landscape and agriculture is also almost impossible to prevent, as the plants cannot be transported indoors for the storm.

People

Exposure is the greatest danger to people from hail, for those caught outside in the open without shelter. Large hail has the potential to cause significant bruising, concussions, the potential for broken bones, and even death. The impacts of hail on vulnerable populations can be more severe. Low income families are more likely to live in poorly constructed homes that are more likely to be damaged, and are more likely to be uninsured or underinsured, making it more difficult for them to recover from hail events. Individuals with disabilities may need more assistance after a major event, especially if transportation or utility services are disrupted. Severe weather warnings must use methods that reach vision or hearing-impaired people and those with limited English proficiency.

Critical Facilities and Infrastructure

Hail can lead to the temporary incapacitation of roads when small hail stones build up so deep, they block roads. Hail has also been observed to block storm drains and prevent proper runoff, potentially resulting in flooding as a secondary hazard. Most structures, including the County's critical facilities, should be able to provide adequate protection from hail but the structures could suffer broken windows and dented exteriors. Those facilities with back-up generators are better equipped to handle a severe weather situation should the power go out.

Economy

The economic impact from hail can be severe on impacted areas, and potentially long lasting. As mentioned throughout this section, hail is the costliest hazard experienced in the planning area. Direct damages have totaled \$5 billion over the last 10 years (averaging to \$500,000,000 per year), but severe indirect economic impacts can also be felt through businesses forced to close for repairs. For example, the 2017 event led to the city of Lakewood losing an estimated \$350,000 in monthly sales tax revenue due to a several month closure of the Colorado Mills mall. Impacts such as these can result in lost revenue and employment, adding to the impact of direct damage costs. Insurance helps to offset some, but not all, of these losses.

Historical, Cultural, and Natural Resources

While hail is a natural environmental process, it can cause significant environmental damage, breaking tree limbs, damaging trees and other plants in bloom, and destroying crops. Some cultural and historic properties may also potentially be at risk of damage from hail.

Future Development

Consideration for future development may include the use of resilient landscaping or the construction of covered parking to minimize those losses. The increased availability of accurate, real-time weather forecasting and alerts the most some protection to both residents and visitors. In some cases, the costs of future mitigation efforts, even in new future development, may outweigh the potential insurance losses; for example, Jefferson County does not generally consider shelters a cost effective mitigation effort in built environments.

Overall Hazard Significance

Hailstorms in Jefferson County have a significant impact on the planning area. The costs of hailstorms are higher than any other natural disaster currently documented for the planning area. In addition, Jefferson County reports the highest number of hail-related injuries in the state at 60. The geographic extent of the hazard is considered **significant**. The probability of future occurrences is considered **highly likely** and the magnitude/severity for the event of record is **critical**. The HMPC considers the hazard to have an overall impact rating of low on the County. The data indicates, however, that an overall impact rating of **high** is most appropriate.

While hailstorms are not as high profile as other natural disasters such as tornadoes, blizzards, or floods, the amount of damage they inflict on the planning area is hugely significant. The hazard is frequent enough in occurrence to pose a significant financial risk to the planning area, and though mitigation measures are limited, the hazard deserves due consideration in the overall profile effort.

4.3.11 Landslides, Debris Flows, and Rockfalls

Description

Landslide

Landslides are a serious geologic hazard common to almost every state in the United States. It is estimated that nationally they cause up to \$2 billion in damages and from 25 to 50 deaths annually. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide include saturation by water, erosion or construction, alternate freezing or thawing, earthquake shaking, and volcanic eruptions.

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Generally significant landslides follow periods of above-average precipitation over an extended period, followed by several days of intense rainfall. It is on these days of intense rainfall that slides are most likely.

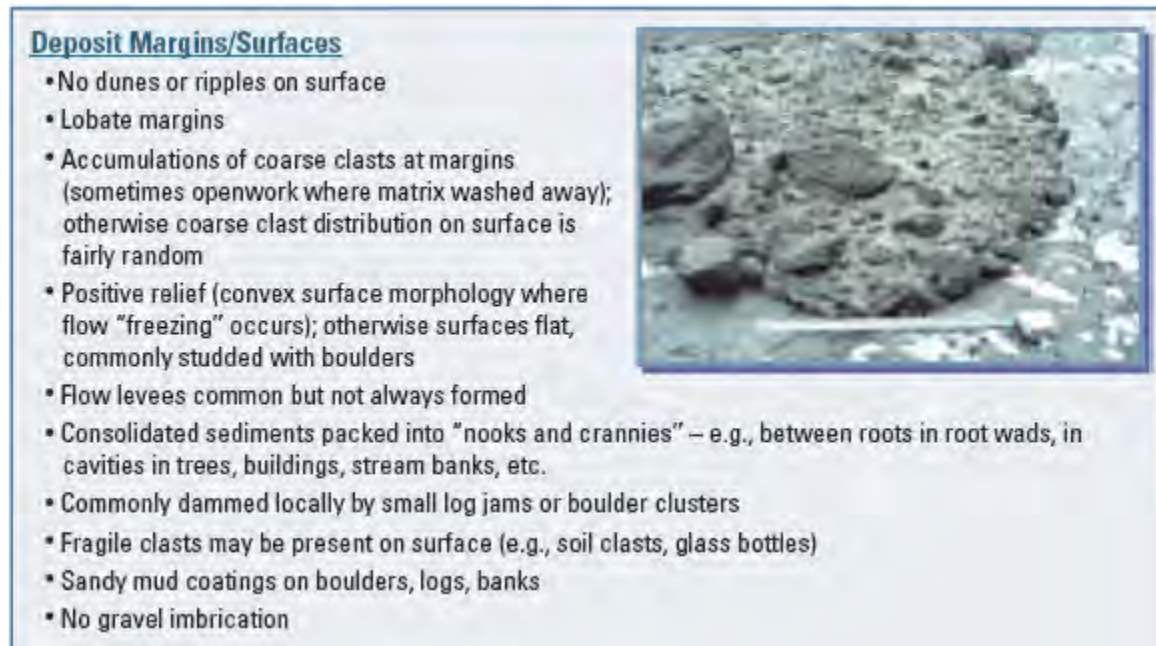
Areas that are generally prone to landslide hazards include existing old landslides; the bases of steep slopes; the bases of drainage channels; and developed hillsides where leach-field septic systems are used. The most vulnerable areas are the mountain corridors and the urbanized areas along the Rocky Mountain Front Range. Landslides are often a secondary hazard related to other natural disasters. Landslide triggering rainstorms often produce damaging floods. Earthquakes often induce landslides that can cause additional damage.

Slope failures typically damage or destroy portions of roads and railroads, sewer and water lines, homes and public buildings, and other utility lines. Even small-scale landslides are expensive due to clean up costs that may include debris clearance from streets, drains, streams and reservoirs; new or renewed support for road and rail embankments and slopes; minor vehicle and building damage; personal injury; and livestock, timber, crop and fencing losses and damaged utility systems.

The identification of areas susceptible to landslides is necessary to support grading, building, foundation design, housing density, and other land development regulations in reducing the risk of property damage and personal injury. Some work has been done to prevent development on top of or below slopes subject to sliding. More needs to be done to educate the public and to prevent development in vulnerable areas. Jefferson County has developed a dipping bedrock overlay zone that is designed to mitigate development in these areas that could be damaged by landslides (FEMA, Colorado Geological Survey).

Debris Flow

Debris flows, sometimes referred to as mudslides, mudflows, lahars, or debris avalanches, are common types of fast-moving landslides. They are a combination of fast-moving water and a great volume of sediment and debris that surges down slope with tremendous force. These flows generally occur during periods of intense rainfall or rapid snowmelt and may occur with little onset warning, similar to a flash flood. They usually start on steep hillsides as shallow landslides that liquefy and accelerate to speeds that are typically about 10 miles per hour but can exceed 35 miles per hour. The consistency of debris flow ranges from watery mud to thick, rocky mud that can carry large items such as boulders, trees, and cars. Debris flows from many different sources can combine in channels, and their destructive power may be greatly increased. When the flows reach flatter ground, the debris spreads over a broad area, sometimes accumulating in thick deposits that can wreak havoc in developed areas. Mudflows are covered under the National Flood Insurance Program; however, landslides are not. Figure 4-39 gives a description of debris flows, characteristics, and provides a picture of the leading edge of a debris flow.

Figure 4-39 Field Evidence of Debris Flow

Source: USGS publication "Distinguishing between Debris Flows and Floods from Field Evidence in Small Watersheds"

A drainage may have several debris flows a year, or none for several years or decades. They are common events in the steep terrain of Colorado and vary widely in size and destructiveness. Cloudbursts provide the usual source of water for a debris flow in Colorado.

Debris flows ruin substantial improvements with the force of the flow itself and the burying or erosion of them by mud and debris. The heavy mass pushes in walls, removes buildings from foundations, fills in basements and excavations and sweeps away cars, trucks heavy equipment and other substantial objects. Boulders and trees swept along by the muddy mass demolish buildings and flatten fences and utility poles. In mountain areas, portions of valleys have been eroded to a depth of several feet by the flow process.

Removal of vegetation on steep slopes, dumping debris and fill in a mud flow path, and improper road building or earth moving can contribute to a debris flow. The failure of a dam, irrigation ditch or other water management structure can initiate debris flows if the escaping water can swiftly accumulate a large volume of soil materials. Similarly, a landslide that temporarily blocks a stream may cause or contribute to a debris flow.

Rockfall

Rockfalls are the fastest type of landslide and occur most frequently in mountains or other steep areas during early spring when there is abundant moisture and repeated freezing and thawing. The rocks may freefall or carom down in an erratic sequence of tumbling, rolling, and sliding. When a large number of rocks plummet downward at high velocity, it is called a rock avalanche.

Rockfall can be a continuous process over a considerable period of time or a single or series of single, intermittent events. Simultaneous activation of a large mass of rock can result in a rockfall avalanche or very rapid down slope and spreading movement of a large quantity of rock material.

Rockfalls are caused by the loss of support from underneath or detachment from a larger rock mass. Ice wedging, root growth, or ground shaking, as well as a loss of support through erosion or chemical weathering may start the fall.

Rockfalls can demolish structures and kill people. Rocks falling on highways may strike vehicles, block traffic, cause accidents, and sometimes damage the road. Minor but costly consequences are the work of

clearing highways and borrow ditches in rockfall areas. Any structure in the path of a large rockfall is subject to damage or destruction.

Geographic Extent

This hazard is most prevalent in the foothills of western Jefferson County, particularly in the canyons that dissect the region, most of which have County roads or State highways running through them, and some residential development.

US Highway 6 in Clear Creek Canyon is prone to rockfall hazards. North and South Table Mountain in Golden can also produce rockfalls from the namesake basalt cliffs that formed them. The base of the foothills in Golden on the northwest side of the intersection of highways 6 and 93 has also been prone to landslides. This landslide sits directly on top of the Golden Fault. Homes were developed just to the north of this landslide area shortly after the landslide was mitigated. The north side of Green Mountain in Lakewood has also had landslide problems.

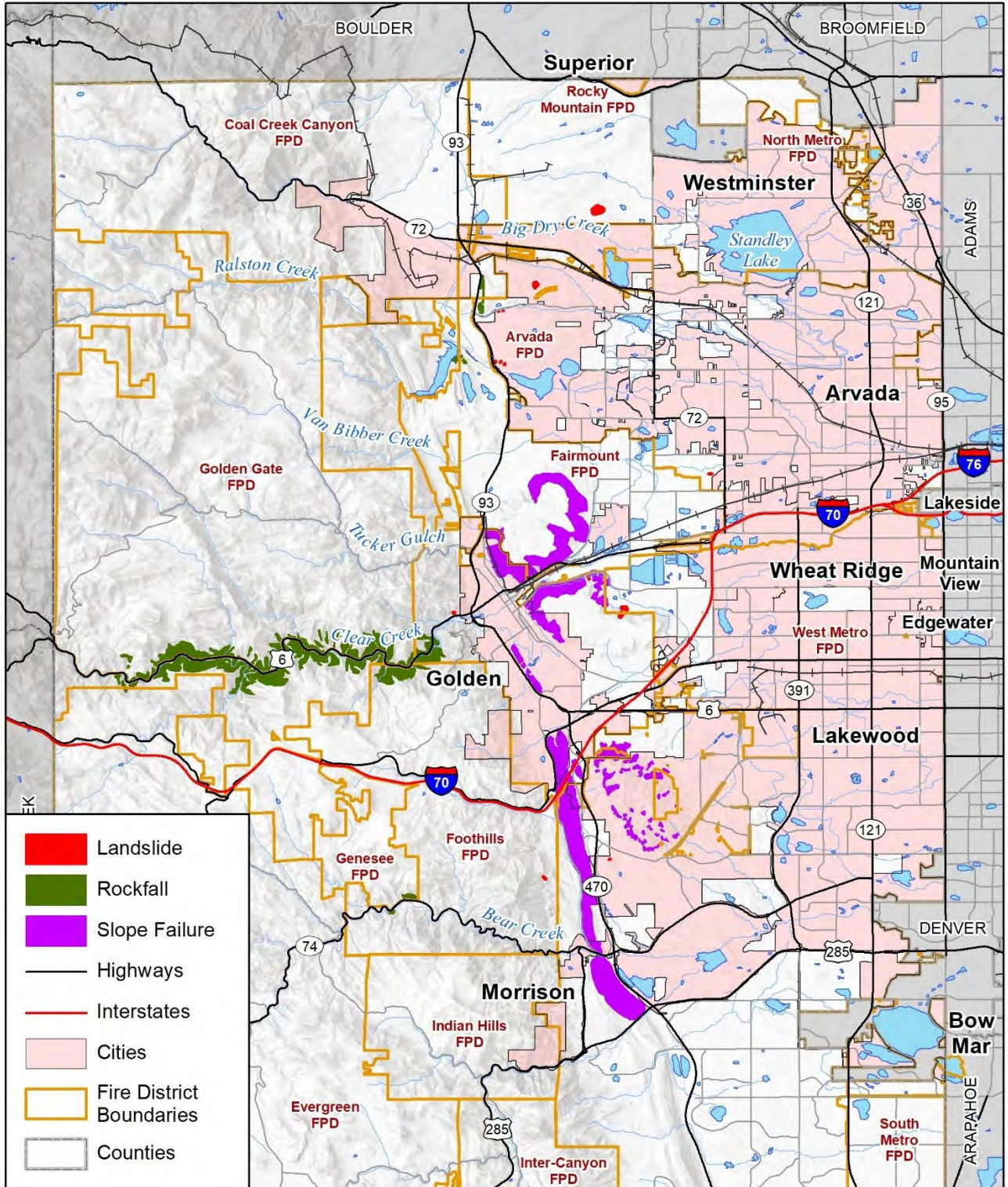
The Colorado Landslide Hazard Mitigation Plan, developed in 1988 and updated in 2002, identified 49 areas in Colorado where landslides could have the "most serious or immediate potential impact on communities, transportation corridors, lifelines, or the economy." A Year 2002 Review and Priority List was done as part of an update of the 1988 Colorado Landslide Mitigation Plan. The update is a status report on 49 locations believed to pose the most serious landslide risk in Colorado that were identified in the 1988 plan. The hazard areas (landslide/rockfall or debris flow) are categorized into three tiers. Tier One listings are serious cases needing immediate or ongoing action or attention because of the severity of potential impacts. Tier Two listings are very significant but less severe; or where adequate information and/or some mitigation is in place, or where current development pressures are less extreme. Tier Three listings are similar to Tier Two but with less severe consequences or primarily local impact.

Rockfall areas along US HWY 6 in Clear Creek Canyon are considered Tier One rockfall areas. This area is considered a state priority due to the increased traffic and vulnerability of the traveling public to the gambling destinations of Blackhawk and Central City.

Two areas were identified as Tier One debris flow areas including the foothills of Jefferson County burned by the Hi Meadows wildfire in 2000 and the Schoonover wildfire in 2002. In addition, the burn area of the Hayman Fire must be considered a particularly vulnerable area. These wildfires leave the potential for debris flows, rockfalls, and extreme erosion in the area around the fire. Minor landslides will likely continue in susceptible areas because of post-fire conditions or when heavy precipitation occurs.

Two Tier Three landslide areas are identified: Golden to Boulder along CO Hwy 93 and the Morrison Town water plant. The report noted that impacts to Hwy 93 have lessened with roadway improvements and sound engineering practices. The Morrison Town water plant landslide has been mitigated but it is recommended that good drainage be maintained, and that no construction or expansion of the facility be done without thorough geological evaluation and engineering design.

Figure 4-40 Landslide, Rockfall, and Slope Failure Hazards in Jefferson County



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT

0 5 10 Miles



As demonstrated in Figure 4-40, a minimal portion of the planning area is prone to occurrences of landslide and rockfall hazards, and of that, only areas with development (such as highways, roads, and subdivisions) are particularly vulnerable to the direct impacts. It should be noted, however, that when this hazard causes road closures, the overall area affected indirectly can be much larger than the slide area itself, with impacts extending into multiple counties on both ends of the incident.

Based on this information, the geographic extent rating for landslide, debris flow, and rockfall is considered **limited**.

Previous Occurrences

Since landslides, debris flows, and rockfalls have a high level of prevalence in Colorado, and a moderate level of prevalence in Jefferson County, the most useful previous occurrences to examine are those which caused a particular high amount of damage or incurred some other cost or impact. Several selected incidents are profiled below. There is no public database or information clearinghouse for this hazard. Information regarding these incidents was sourced from multiple sources. This is not an exhaustive list, but it does illustrate the severity of impacts that landslides, debris flows, and rockfalls exert on Jefferson County.

March 1974 – A boulder the size of a small car hurtled down the steep west side of the hogbacks in Jefferson County. It bounced into a new subdivision and stopped after penetrating a wall in the back of an expensive home. No one was injured. Property damage was about \$10,000, including the cost of measures to prevent similar incidents at that site in the immediate future. The incident could have been prevented easily in the subdivision development stage, but it was not recognized.

1985 – A landslide directly upslope from the Morrison's water treatment plant became active in the spring of 1985. The problem was mitigated by removing most of the landslide-prone material and has not had problems since (CO Landslide Mitigation Plan 2002 update).

1993-1994 – The Highway 93 Golden bypass at the base of the foothills in Golden on the northwest side of the intersection of Highways 6 and 93 was affected by a landslide shortly after its construction. CDOT spent \$3 million in 1994 to mitigate the problem.

August 31, 1997 – Rock and debris were deposited on the southbound lanes of Highway 285 at the base of the south and north flanks of the slide. Two cars on highway 285 were damaged due to the slide; one drove into rocks and debris on the highway and a second then ran into the first. North and south bound lanes of Highway 285, a major commuter route to and from Denver, were closed and traffic was diverted through Tiny Town along Turkey Creek Road. The southbound lane was closed for over one month. Movement was believed to have been triggered by the cumulative effect of above average rainfall in August.

1998 – Renewed movement of an older landslide deposit on the north side of Green Mountain resulted in three homes being damaged beyond repair and two other homes severely damaged. Earth anchors and drainage improvements have been installed to mitigate future movement.

2000 – On U.S. 6 in Clear Creek Canyon, a vehicle crashed into a 2-ton rock on the highway. There were no serious injuries reported. In a separate incident, a motorist was injured when a basketball sized rock crashed through the windshield and hit him in leg.

2003 – Heavy rains in June of 2003 resulted in flash floods that moved substantial amounts of sediment, causing road obstructions, flooding, and extreme siltation of the South Platte River near Deckers, Colorado. This was a result of the burned out area caused by the Schoonover fire in 2002.

2005 – On U.S. 6 in Clear Creek Canyon 1,400 tons of rock fell during a rockfall. Two truck drivers and a motorist escaped injury. One boulder was measured to be the size of a minivan.

2006 – On U.S. 6 in Clear Creek Canyon, a car (unoccupied at the time) was flattened under a slab of rock.

2006 – In West Creek and Deckers, there were boulders and debris flows during rainstorms over areas previously affected by a wildfire burn.

2007 – On US 6, a rock crashed through the roof of an SUV. The driver of the SUV sustained minor injuries. The rock was measured and reported to be the size of a beach ball.

July 21, 2009 – Highway 126 north of Deckers near Cheesman Reservoir was washed out due to a severe rainstorm, placing trees and debris on the road. Jefferson County closed the highway down to Deckers. No one was killed or injured. The road was severely undercut and washed away in several places. Jefferson County Road and Bridge performed maintenance on the area periodically for two to three weeks to repair the damage done to the roadway.

September 2013 – Rainfall on September 9-13th triggered at least 1,138 debris flows along the Colorado Front Range. According to the HMPC there were debris flows blocking US 6 in Clear Creek Canyon, Golden Gate Canyon, Coal Creek Canyon, and Upper Bear Creek above Evergreen Dam all at the same time on September 12th.

February 24, 2015 – US 6 was closed in both directions between Golden and Colorado 119 as a number of rocks slid off Clear Creek Canyon approximately 6 miles west of Golden. One car was severely damaged; a passenger in the car was transported to the hospital in good condition.

2020 – Landslide in Leyden Rock in an open space area in Arvada (City of Arvada 2020).

Probability of Future Occurrences

Mitigation efforts have been taken to decrease probability of future occurrences. A rockfall mitigation project has been underway in Bear Creek Canyon between Idledale and Morrison since September 2020. The mitigation project will enhance safety for motorists and cyclists along Highway 74 with a goal of preventing roadway damage or unexpected closures due to a landslide or rockfall (CDOT 2020).

Based on the history of landslides, debris flow incidents, and rockfalls in Jefferson County (15 incidents over 46 years events) since 1974 a damaging event occurs on average every three years. Rockfalls in the canyons typically occur annually and usually in the winter and spring during freeze-thaw cycles. Since the hazards are profiled together due to common onset and impacts, the probability of future occurrence is established collectively. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a landslide-type event occurring in any given year is 33%. This corresponds to a probability of future occurrences rating of **likely**.

Magnitude and Severity

The overall magnitude and severity rating is a reflection of the common occurrence of this hazard. Property damages from these hazards has been in the millions of dollars, but generally limited in extent and periodic, typically during wet cycles. The damages inflicted on critical facilities and services (critical infrastructure) are primarily highways in the planning region. This has resulted in a loss or disruption of services periodically in the Clear Creek Canyon HWY 6 corridor. By a combination of mitigation efforts and luck there has not been documented deaths from rockfall in Clear Creek Canyon, but the potential remains. Based on these factors, the magnitude severity ratings for landslide, debris flow, and rockfall are considered **limited**.

Climate Change Considerations

Increased temperatures are projected to contribute to more water evaporation making drought more common, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. Wildfires and earthquakes destabilize soil on steep slopes increasing landslide and debris flow risk. Erosion caused by development on steep hillsides increases risk of landslides. Since the 1950s, snow precipitation and duration of snowpack have both decreased while rising temperatures have increase rate of water evaporating into the air, creating drier soil conditions in Colorado (EPA 2016).

Vulnerability Assessment

Research in the hazard profile for landslide, debris flow, and rockfall events revealed sporadic impacts, particularly in the canyons that dissect the region, most of which have County roads or State highways running through them, and repetitive debris flow issues in areas that have had recent wildfire burns. Future property losses to existing developments would likely be minor, based on patterns of previous events, and impact mostly infrastructure.

General Property

GIS was used to create a risk assessment for geological hazards in Jefferson County. Landslide, rockfall, slope failure and subsidence hazard data were overlaid on Jefferson County parcel and assessor's data.

For the purposes of this analysis, an address point layer in GIS was used to approximate the center of buildings. Geologic hazard data was then overlaid on the address points. For the purposes of this analysis, the hazard zone that intersected an address point was assigned the hazard for the entire parcel. The model assumes that every parcel with a structure value greater than zero is improved in some way. Specifically, an improved parcel assumes there is a building.

These counts are listed in Table 4-53. Critical facilities at risk to slope failure are listed in Table 4-54. The model did not identify any buildings at risk to rockfall hazards.

These tables show the value of developed parcels identified as being exposed to the landslide or slope failure hazard. No parcels were exposed to the rockfall hazard. Results are sorted by occupancy type and by jurisdiction to demonstrate how the hazard's risk varies across the planning area. Maps that display the parcels affected by these hazards can be referenced in the applicable jurisdictional annexes. Overall, the total value exposed to landslide or slope failure increased from approximately \$354 million in 2016 to nearly \$427 million in 2020. The jurisdiction with the greatest exposure to landslide or slope failure is Golden with nearly \$349 million of total value exposed. A more site-specific analysis would need to be done to further determine if exposure equates to vulnerability, as this analysis does not take into account mitigation or strategic building siting that might have occurred during development.

Table 4-53 Building Exposure to Landslides or Slope Failure

Jurisdiction	Property Type	Improved Parcels	Building Counts	Total Value	Population
Golden	Exempt	1	1	\$95,600	
	Industrial	1	1	\$1,289,075	
	Mixed Use	1	2	\$103,992,458	
	Residential	292	292	\$243,596,070	654
	Total	295	296	\$348,973,203	654
Lakewood	Exempt	1	1	\$95,600	
	Industrial	1	1	\$176,850	
	Residential	16	16	\$8,135,145	36
	Total	18	18	\$8,407,595	36
Morrison	Exempt	1	1	\$50,528	
	Mixed Use	3	3	\$1,039,080	
	Residential	4	4	\$1,086,720	8
	Total	8	8	\$2,176,328	8
Unincorporated	Commercial	4	5	\$14,402,494	
	Exempt	1	1	\$88,334	
	Residential	60	60	\$52,631,627	153
	Total	65	66	\$67,122,455	153
	Grand Total	386	388	\$426,679,581	852

Source: Based on analysis of Jefferson County GIS and Assessor's Data

People

Past landslides in Jefferson County have not caused loss of life or major injuries to date, although the potential for both exists. As shown in Table 4-53, 852 people live in areas at risk of landslide or slope failure. Exposure is the greatest danger to people in remote locations in areas of steep slopes and higher precipitation areas in the western to central portion of the county. People who travel along these

roadways or highways that are susceptible to landslides and rockslides are also exposed. Landslides have closed down highways for hours to days, which can affect essential services for rural populations. As population, tourism, and development increases in landslide prone areas, landslide occurrence interacting with people and development will also increase.

Critical Facilities and Infrastructure

Critical facilities exposed to landslides or slope failure increased from three in Golden in 2016 to six in 2020. And the unincorporated jurisdiction now has four critical facilities exposed.

Table 4-54 Critical Facilities At-Risk to Landslides or Slope Failure

Jurisdiction	FEMA Lifeline	Critical Facility Type	Count
Golden	Communications	Microwave Service Towers	3
	Hazardous Material	Household Hazardous Waste	1
	Safety and Security	Government Facility	2
Unincorporated	Communications	Land Mobile Private Towers	3
	Hazardous Material	Tier II	1

Source: HIFLD and CERC

Economy

Rockfall impacts on Jefferson County foothill highways and County roads have the potential to cause significant indirect economic loss. The most significant road that could be impacted by rockfall and related road closures is Highway 6 in Jefferson County in Clear Creek Canyon. Economic losses from this road closure and resulting detours could be estimated with traffic counts and detour mileage.

Historical, Cultural, and Natural Resources

Landslides/rockslides are a natural environmental process. Environmental impacts include the removal of vegetation, soil, and rock.

Future Development

Steep slope regulations limit problems from these hazards for future development, thus the exposure of infrastructure to these hazards is not anticipated to grow. As expansion of the gambling communities grows in nearby Gilpin County, the amount of traffic along the Clear Creek Canyon Highway 6 corridor will increase, and thus the amount of people exposed to danger from rockfall hazards may increase. While mitigation projects are in place to reduce dangers to drivers from falling rock along this corridor, more may be necessary in the future.

Overall Hazard Significance

Landslides, debris flow, and rockfall in Jefferson County periodically impact on the planning area. The geographic extent of the hazard is considered **limited**. The probability of future occurrences is considered **likely** and the magnitude/severity for the event of record is **limited**. This equates to an overall impact rating of **medium**. While landslides, debris flow, and rockfall do occur with some regularity in Jefferson County, the direct effect on the populace is low, but the potential for severe injury or death remains from rockfall. Singular individuals or small groups may be affected by the direct effects of landslides, debris flow, and rockfall. The secondary effect of closed roads is a greater threat to the larger populace, especially if the closed roads cut off emergency personnel from those who need assistance.

4.3.12 Lightning

Description

Lightning is an electrical discharge between positive and negative regions of a thunderstorm. A lightning flash is composed of a series of strokes with an average of about four. The length and duration of each lightning stroke vary, but typically average about 30 microseconds. Typically, thunderstorms include rain, hail, or other forms of precipitation. However, it is possible for a thunderstorm to produce lightning with no delivery of precipitation. These events are called 'dry thunderstorms.'

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous form of lightning, though it is less common than intra-cloud occurrences. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, some flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm, and can strike as far as 5 or 10 miles from the storm and occur in areas where common observers may not recognize the danger. Positive lightning also has a longer duration, so fires are more easily ignited. Positive lightning strikes usually carry a high peak electrical current, which may potentially result in greater damage.

The ratio of cloud-to-ground and intra-cloud lightning varies significantly between storms. Depending upon cloud height above ground and changes in electric field strength between cloud and earth, the discharge either stays within the cloud or makes direct contact with the earth. If the field strength is highest in the lower regions of the cloud, a downward flash may occur from cloud to earth. Using a network of lightning detection systems, the United States monitors an average of 22 million strokes of lightning from the cloud-to-ground every year.

According to the Colorado Division of Homeland Security and Emergency Management, lightning is the number one life threatening weather hazard. Each year, lightning is responsible for deaths, injuries, and millions of dollars in property damage, including damage to buildings, communications systems, power lines, and electrical systems. Lightning also causes forest and brush fires, and deaths and injuries to livestock and other animals. According to the National Lightning Safety Institute, lightning causes more than 24,600 fires in the United States each year. The Institute estimates annual damages from lightning to be approximately \$4-5 billion in the US. Lightning is so significant in Colorado that the Governor declares an annual Lightning and Wildfire Awareness Week each summer. According to NOAA, Colorado ranks 5th out of all states in total lightning caused fatalities from 1959 to 2016. Additionally, NOAA ranks Colorado 19th in the nation in the number of cloud-to-ground lightning flashes and 32nd in the nation in overall flash density with 4.8 flashes per square kilometer.

Previous Occurrences

There are approximately 2,000 thunderstorms occurring globally at any one time, with 75-100 cloud-to-ground lightning strikes per second. The NCEI storm events database lists 33 significant lightning strike events since 1995 in Jefferson County. Impacts of these strikes generally can be drawn into two categories:

- Strikes that are notable because of human injury or fatality (7 strikes). These primarily occur when the victim is unsheltered during a lightning storm.
- Strikes that are notable because of property damage (12 strikes). Most damages occurred to single properties.

The selections below demonstrate some events which caused notable injury, death, or property damage, and those events which triggered wildfires. (See Section 4.3.17 for more information on wildfire risk.) These records, drawn from the NCEI database, illustrate the wide variety of impacts that lightning poses to the planning area.

May 29, 1995 – Lightning struck a soccer goal post and injured six adults viewing a soccer game. Although no one received a direct hit, one woman was hospitalized.

September 4, 1995 – Two people were injured when lightning struck their home. The lightning entered in the attic where it sparked a small fire. It then travelled through the walls exploding a mirror that sprayed glass on the residents. Damages were estimated at \$4,500.

July 3 - 5, 1996 – Lightning from a fast moving thunderstorm blasted a large hole in the side of a house in Lakewood, southwest of Denver. Lightning sparked a small fire near Buffalo Creek. Only one acre was burned before the fire was contained.

September 2, 1996 – Lightning sparked a brush fire in the south buffer zone of the Rocky Flats Environmental Test Facility. No structures were damaged but the fire burned approximately 100 acres of grassland before it was contained.

July 29, 1997 – A woman received minor injuries when lightning struck her when it passed through the office window. She suffered temporary blindness for approximately 15 minutes.

August 13, 2000 – Lightning sparked three separate grassfires near Golden. The fires were quickly contained, however.

May 30, 2001 – Lightning ignited a fire which destroyed a luxury home on Bear Mountain near Evergreen, resulting in a recorded \$1 million in property damage.

May 27, 2002 – Lightning sparked a wildfire near Deckers. Extremely dry conditions and very strong winds the following day allowed the fire to consume 3,860 acres before it could be contained. Thirteen structures were destroyed, including 4 homes. This incident is discussed further in the wildfire hazard profile.

June 19, 2002 – Lightning damaged the Evergreen Fire Protection District (EFPD) repeater. One microwave transmitter, the main fire channel transmitter and two solar panel controllers were ruined. Damage costs were estimated at \$5,000.

August 1, 2001 – Lightning coupled with strong thunderstorm winds knocked out power to approximately 10,000 Xcel Energy customers in Golden.

May 29, 2004 – A father and son practicing on the driving range at the Meadows Golf Club were struck by lightning. The father was killed and the teenage boy was seriously injured. Three other people standing nearby only received minor injuries.

July 23, 2004 – Lightning caused a power outage in Arvada, leaving approximately 9,800 customers without power for 90 minutes.

July 27, 2007 – A man was struck and killed by lightning while jogging at Matthews Winters Park in Morrison. The thunderstorm produced numerous lightning strikes and caused a power outage at Red Rocks Amphitheatre, which forced the cancellation of a concert later in the evening. Damages were reported at \$5,000.

August 4, 2008 – Lightning sparked a grassfire that consumed 300 acres on the northern edge of Green Mountain. Gusty winds and very dry conditions allowed the fire to spread quickly and threaten several homes. Only minor damage was reported, caused by smoke and melted siding. Damages were estimated at \$100,000.

August 16, 2010 – Lightning struck a tree in Morrison; separately, a lightning strike sparked a small grass fire near Quaker Street and Golden Road in Golden. It was quickly extinguished by emergency responders.

May 23, 2011 – Lightning struck a park ranger's office in Evergreen and destroyed a nearby gasoline storage tank. Damages were estimated at \$1,000.

June 6, 2012 – Lightning struck a home in Lakewood, causing extensive electrical damage. Damages were estimated at \$20,000.

July 7, 2014 – A man in Arvada was injured by a nearby lightning strike while he recorded a video of a thunderstorm with his cell phone. He was standing in his garage, when a nearby lightning bolt knocked him out. He suffered overall body aches and had a ringing sensation in one of his ears.

August 8, 2014 – A man in Evergreen suffered minor injuries when he was struck by lightning, which entered through his finger, traveled down his body, and exited his foot.

July 19, 2016 – Two men at the Indian Tree Golf Course in Arvada were struck by lightning when they sought shelter beneath a tree during a rapidly developing thunderstorm. One man suffered minor injuries, while the other died from his injuries.

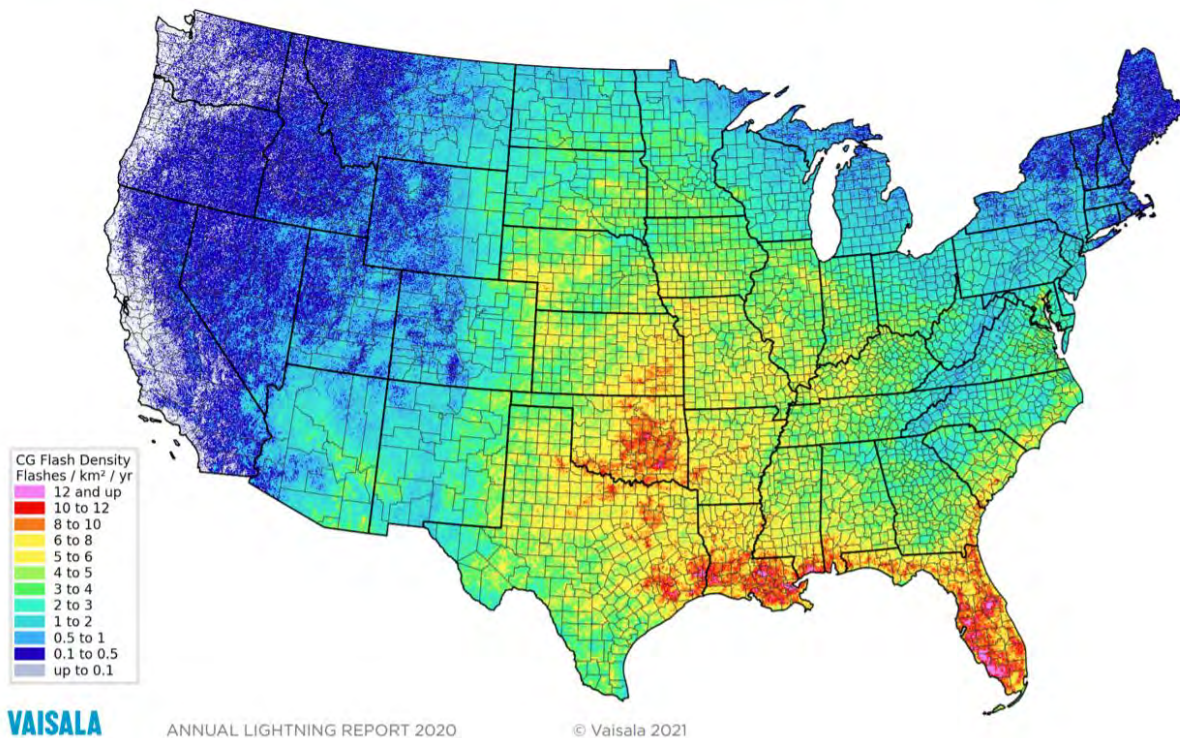
Geographic Extent

The geographic extent for lightning may be examined in two ways. In one regard, 'lightning' is a regional hazard measured by the possible places of occurrence. In the other, 'lightning incidents' refer to single-point occurrences and are measured according to density. Examining the density of the lightning flashes may yield more useful information, particularly when the impacts of the hazard are examined. According to the NOAA, Jefferson County averages 7,000 lightning strikes per year. This results in approximately 8.9 lightning strikes per square mile per year ($7000/785 \text{ mi}^2$). Figure 4-41 indicates that, for the most part, Colorado's Front Range experiences an average density rating that is higher than the rest of the state and much of the country. Therefore, while 100% of the planning area is vulnerable to lightning strikes, the density of these single-point occurrences is fairly limited.

Based on this information, the geographic extent rating for lightning is **limited**.

Figure 4-41 Cloud-to-Ground Lightning Density

Average U.S. cloud-to-ground flash density in 2015–2019



Source: Vaisala 2020 Annual Lightning Report, <https://www.vaisala.com/sites/default/files/documents/WEA-MET-Annual-Lightning-Report-2020-B212260EN-A.pdf>

Probability of Future Occurrences

As identified earlier, lightning occurs thousands of times a year in Colorado alone. According to information retrieved from NOAA, the planning area receives an average of 8.9 lightning strikes per square mile. This means the planning area, which is 785 square miles in size, experiences an average of 6,987 cloud-to-ground strikes of lightning a year. Knowing that the probability of any lightning event occurring in the future is highly likely helps underscore the importance of increased public education about the hazard. In order to fairly compare the lightning hazard to other hazards in the planning area, the probability of future occurrences for a lightning event that causes damage should also be computed.

The NCEI database is the only available dataset for county-specific lightning incidents that includes property and fire damages. Although this dataset is probably incomplete, it will be used as the source for the probability of occurrence calculation below. If additional lightning data becomes available for Jefferson County, then this section may need to be revisited. However, as all other data sets available reflect information that is consistent with the NCEI effort, the information calculated below is expected to remain fairly consistent with the application of a more comprehensive dataset. There have been 33 NCEI-recorded lightning strikes in Jefferson County since 1995; of these, there were 10 damaging incidents reported in Jefferson County between 1995 and 2020. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. Based on this formula the probability of a damaging lightning strike occurring in any given year is 40%. This corresponds to a probability of future occurrences rating of **highly likely**.

Magnitude and Severity

Impacts for lightning are both direct and indirect. People or objects are directly impacted when struck, or indirectly damaged when the current of the bolt passes through or near the person or object. Other impacts include the ignition of wildfires. The Colorado Division of Homeland Security and Emergency Management estimates that more than half of all forest fires in Colorado are ignited by lightning, in addition to the rangeland and wheat-field fires that lightning causes. Lightning is most likely to cause wildfires during dry conditions or during dry thunderstorms. Records of previous incidents in the NCEI database indicates that most events damage only personal property, and do not significantly impact the availability of critical services or infrastructure, corresponding to negligible severity ratings in both categories. Isolated cases, usually those which trigger large wildfires, have a more significant impact on property damages, but the ratings are still classified as limited.

The National Weather Service Pueblo Lightning Page indicates that between 1980 and 2016, nine people have been killed and 38 people have been injured by lightning strikes in Jefferson County. This equates to 9.1% of all killed and 7.8% of all injured reports for the state. The majority of lightning strikes with casualties for Colorado occurred between the hours of noon and 5:00 pm, peaking between 2:00 and 4:00 pm. This correlates to the times when the population are most exposed, as well: during the temperate summer months, on days where people are most likely to be outside, during peak times of day where outdoor activities are expected to occur. The injury and fatality rates associated with lightning are the greatest indicators of magnitude and severity. It is particularly telling when the flash density of the State is considered. As discussed in the geographic extent section, Colorado experiences an average number of cloud-to-ground strikes when compared to the nation. However, Colorado's injury and fatality ratings are consistently in the top five, or top three when adjusted for population. Therefore, the magnitude and severity of lightning on the population is critical.

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. For lightning, there is no outstanding event of record, so the overall magnitude and severity rating for the County is determined based on the comprehensive discussion of severity contained above. Lightning events typically damage less than 10% of the property in the County. The damages inflicted on critical facilities and services (critical infrastructure) typically result in a loss or disruption of services for less than 24 hours. While direct impacts may be negligible, the indirect impacts listed above, particularly the link to wildfire ignition, raises the magnitude severity ratings for lightning strikes to **limited**.

Climate Change Considerations

According to the 2018 Colorado State Hazard Mitigation Plan, the future impacts of climate induced lightning in Colorado are still unclear. No clear projected trend in the frequency or intensity of warm-season convective storms has been identified for Colorado. Therefore, the intensity and extent of thunderstorm and lightning events is not projected to change. However, according to studies referenced by the National Lightning Safety Institute, it could be possible globally to see an increase of 10-20% in the incidence of lightning with each degree Celsius of global temperature increase. This could potentially lead to higher frequency of occurrence in Colorado.

Vulnerability Assessment

General Property

It is difficult to quantify where specific losses will occur due to the random nature of this hazard. Given the lightning statistics for Colorado and Jefferson County, the County remains at risk and is vulnerable to the effects of lightning. According to NCEI data, \$1.44 million dollars in property damage and \$12,000 in crop damage was reported in Jefferson County over a 20 year period.

People

Persons recreating or working outdoors during the months of April through September will be most at risk to lightning strikes. It is difficult to quantify future deaths and injuries due to lightning, other than to note that future occurrences are likely without increased public education.

Critical Facilities and Infrastructure

Critical facilities and infrastructure will have the greatest consequences if damaged by a lightning strike. The effect of wind, combined with lightning, rain and hail, on power delivery is a significant factor when assessing current development exposure. An analysis of this impact is described in the hail vulnerability section. According to the 2018 Colorado State Hazard Mitigation Plan, statewide between 2008 and 2017, the Office of Risk Management (ORM) reported that 48 severe thunderstorm and lightning events damaged state assets. In this timeframe, these events resulted in \$1,041,989 in losses, some of which occurred to critical facilities such as within the state correctional system. Forty-five of the 48 events were due to lightning strikes, equating to \$1,010,944 of the \$1,041,989 in losses. These lightning strikes resulted in damages to building contents such as electric and power equipment connected to the electrical system more than causing structural damage.

Economy

Economic impact of a severe thunderstorm is typically short term. Lightning and high wind events can cause power outages and fires. Generally, long-term economic impacts center more around hazards that cascade from a severe thunderstorm, including wildfires ignited by lightning. Similarly with the previous section, lightning can cause structural damage or damage to electrical systems to private buildings as well as critical infrastructure.

Historical, Cultural, and Natural Resources

According to NCEI data, the average significant lightning strike in Jefferson County occurs every 1.5 years. The strike most likely occurs in the summer, between 12 PM and 5 PM. Thirty-eight percent of damaging lightning strikes cause damage to either property or crops. The greatest losses from lightning result from the secondary hazard of wildfire, which can have cascading impacts on natural resources.

Future Development

New critical facilities such as communications towers should be built with lightning protection measures. As the population continues to increase and the number of people exposed to the hazard increases, it is reasonable to assume that injuries and deaths will also increase proportionately. Construction of lightning shelters at outdoor venues and increased public awareness campaigns may help minimize increased effects of lightning on growing populations.

Overall Hazard Significance

Lightning strikes in Jefferson County have a range of impacts on the planning area. The most serious impacts are the potential for injuries and deaths, with the most serious indirect impact associated with wildfire caused by lightning. The geographic extent of the hazard is considered **limited**. The probability of future occurrences is considered **highly likely** and the magnitude/severity for the event of record is **limited**. The HMPC considers the hazard to have a **low** overall impact on the County. Together, this equates to an overall impact rating of **medium**. This rating recognizes that other hazards may be a higher priority for the County or may possess more actionable mitigation solutions, while still addressing the significant threat that lightning poses to personal life safety for the jurisdiction's citizens. This is also consistent with the efforts of the Colorado Division of Homeland Security and Emergency Management to increase lightning safety and awareness.

4.3.13 Severe Winter Storms

Description

The National Weather Service defines a storm as “any disturbed state of the atmosphere, especially affecting the Earth’s surface, and strongly implying destructive and otherwise unpleasant weather.” Winter storms, then, are storms that occur during the winter months and produce snow, ice, freezing rain, sleet, etc. Winter storms are a yearly occurrence in climates where precipitation may freeze and are not always considered a disaster or hazard. For the purposes of this plan, severe winter storms are those which produce heavy snow, significant ice accumulation, or prolonged blizzard conditions. Disasters occur when the severe storms impact the operations of the affected community by damaging property, stalling the delivery of critical services, or causing injuries or deaths among the population.

Winter storm watches and warnings may be helpful for determining the difference between a seasonal winter storm and a severe winter storm. Warnings are issued if the storm is producing or suspected of producing heavy snow or significant ice accumulations. Watches are usually issued 24 to 36 hours in advance for storms capable of producing those conditions, though criteria may vary between locations. Winter Weather Advisories are issued when a low pressure system produces a combination of winter weather that presents a hazard but does not meet warning criteria. A blizzard warning is issued when conditions are expected to prevail for a period of three hours or longer: sustained wind or frequent gusts to 35 miles an hour or greater; and considerable falling and/or blowing snow (i.e., reducing visibility frequently to less than a ¼ mile).

Heavy snow can immobilize a region, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse roofs and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. The cost of snow removal, damage repair, and business losses can have a tremendous impact on cities and towns. Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days until damages are repaired. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

Some winter storms are accompanied by strong winds, creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chills. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines. Blowing snow can reduce visibilities to only a few feet in areas where there are no trees or buildings. Serious vehicle accidents can result with injuries and deaths.

Winter storms in Jefferson County, including strong winds and blizzard conditions, may cause localized power and phone outages, closures of streets, highways, schools, businesses, and non-essential government operations, and increase the likelihood of winter-weather related injury or death. People may be stranded in vehicles or other locations not suited to sheltering operations or isolated from essential services. A winter storm can escalate, creating life threatening situations when emergency response is limited by severe winter conditions. Other issues associated with severe winter storms include the threat of physical overexertion that may lead to heart attacks or strokes. Snow removal costs can pose significant budget impacts, as can repairing the associated damages caused by downed power lines, trees, structural damages, etc. Heavy snowfall during winter can also lead to flooding or landslides during the spring if the area snowpack saturates soils and melts too quickly.

Geographic Extent

Winter storms are a yearly feature of the Colorado climate and may occur anywhere in Jefferson County. Generally, severe winter storm events are considered regional, which implies the storms impact multiple counties simultaneously, often for extended time periods. It is possible for the geographic extent of the hazard to vary significantly within a single county- a regional storm may directly impact only a small portion of the planning area while still extending over a large portion of the surrounding area. However, even in these instances, the impacts and effects of a regional hazard are still felt within the planning area. Therefore, while the percent of the planning area directly affected ranges from less than 10% to 100% depending on the specific circumstances, if any portion of the planning area is impacted by the storm, then the entire planning area suffers indirect impacts.

Based on this information, the geographic extent rating for severe winter storms is **extensive**.

Previous Occurrences

According to the National Centers for Environmental Information (NCEI) database, there were 274 events reported as impacting Jefferson County over the 20-year period between 2000 and 2020. Events included anything categorized as Blizzard (4 events), Heavy Snow (64 events), or Winter Storm (206). Many of these events impacted multiple counties and spanned several days. Several notable events for the planning area are summarized below.

March 6, 1990 – Winds gusting up to 58 mph and heavy snow whipped into drifts 3 to 4 feet deep pummeled the Metro Denver Area. Streets and highways became impassable as many stores and schools closed. Police and National Guard rescued hundreds of stranded motorists, including the Governor who was stranded on Highway 36. An airliner with 82 passengers aboard skidded off a runway at Stapleton International Airport. Snowfall totaled 18 to 50" in the foothills and between 9 to 24" west of Interstate 25, including most of urbanized Jefferson County.

March 8 - 9, 1992 – A springtime blizzard struck the Metro Denver Area with snowfall amounts of up to a foot and a half blown in on north winds at speeds of 30 to 40 mph with gusts as high as 52mph. Many roads were closed including Interstate 70 east of Denver and Interstate 25 north and south of Denver. Many homes and businesses lost power.

October 24-25, 1997 – One of the worst blizzards of the 1990s dumped 14 to 31 inches of snow across the Metro Denver Area. The heaviest snow occurred in the foothills west and southwest of Denver, including in Jefferson County, where 2' to 4' of snow were measured. Sustained winds of 40 mph with gusts as high as 60 mph reduced visibilities to zero and produced extremely cold wind chill temperatures of -25°F to -40°F. The strong winds also piled snow into drifts ranging from 4' to 10' deep. Several major roads and highways were closed as travel became impossible and Red Cross shelters were set up for hundreds of stranded travelers forced to abandon their vehicles. Two people were severely injured and five people were killed as a direct result of the event. At Denver International Airport, 4,000 travelers were stranded when the airport was forced to close, and air carriers estimated losses at \$20 million (\$26.7 million 2009 dollars). Snowfall totaled 21.9", setting a new 24-hour snowfall record of 19.1" for the month.

March 17 - 20, 2003 – A major snowstorm dumped more than 2' of snow in the Rocky Mountain Region, which closed highways in Colorado and wide sections of Wyoming. Wind gusts of 30 mph reduced visibility across Denver, including the main boulevard leading to Denver International Airport, stranding travelers at the airport and along the roadways. Avalanche warnings were issued for Colorado mountainous areas where up to 29" of snow fell. Upwards of 8' of snow were reported in the Evergreen and Conifer areas of Jefferson County by members of the HMPC. This late season snowstorm stranded hundreds of people and resulted in a Presidential Emergency Declaration to help ease the burden of clean-up costs, which amounted to more than \$8 million. The insurance industry estimates this blizzard to be the most costly winter storm in Colorado history, reporting at least \$93.3 million (\$131.2 million in 2020 dollars) in claims. Jefferson County was designated for emergency public assistance from this event. Figure 4-42 shows the distribution and snow totals in inches for the storm for the County and surrounding areas.

December 2006 – Back-to-back major storms occurred the third and fourth weeks of the month of December across the Front Range and Eastern Colorado. Heavy snow accumulated over three feet deep in some areas. Strong wind drifted the snow into 12' to 20' drifts and thousands of animals in the eastern plain were stranded from shelter and food by the snow. Travel was hampered for days in the hardest hit areas, including the Denver International Airport. Combined, these events qualified for a Presidential Emergency Declaration to assist communities with costs in the aftermath. Jefferson County was designated for public assistance after the first storm.

April 16, 2008 – Storm totals ranged from 9" to 13". A storm system brought heavy snow to parts of the North-Central Mountains, Front Range Foothills and Palmer Divide. The heaviest snow fell mainly south of the Interstate 70 corridor. Storm totals in the mountains and foothills ranged from 8" to nearly 15".

January 12, 2009 – A fast moving storm system brought heavy snow to the foothills of Boulder and Jefferson Counties as well as the western and southern suburbs of the metropolitan Denver. The storm

resulted in multiple accidents along the Urban Corridor. In the foothills storm totals ranged from 6 to 8". In the suburbs, Lakewood reported 8", with variances across the area ranging from 4.5 to 11".

March 26, 2009 – At Denver International Airport, hundreds of flights were canceled. In addition, schools throughout the region were shut down and many roads closed due to multiple accidents. Dozens of vehicles slid off Interstate 25 and an accident between Fort Collins and Cheyenne, Wyoming involved up to 75 vehicles. Portions of U.S. Highway 36, between Denver and Boulder, were also closed during the day. The Red Cross opened six shelters for stranded motorists. Snow totals in and near Jefferson County averaged 11.5 inches.

May 11-12, 2014 – A strong storm system moved from southwest Colorado and produced heavy snow over the Front Range and adjacent plains. The snow was heaviest over the Front Range foothills where up to 2-1/2 feet of snow was observed. In the mountains and foothills, storm totals included: 12 inches at Arapahoe Ridge and Columbine; 11 inches at Evergreen and Fremont Pass. Along the urban corridor and Palmer Divide, storm totals included: 10 inches at Ken Caryl; 9 inches at Superior; 8 inches near Morrison; 7 inches in Denver, near Franktown, Golden, Lakewood and Highlands Ranch; 6 inches, 5 miles northeast of Westminster, 7 miles south of Lyons, near Parker and Shaw.

April 15-17, 2016 – A powerful spring snowstorm brought heavy, wet snow to areas in and near the Front Range Foothills and Palmer Divide. Storm totals generally ranged from 2 to 4 feet in the Foothills with 1 to 2 feet across the Mountains and Palmer Divide. Front Range Urban Corridor had amounts ranging from 6 to 20 inches with the highest totals across the western and southern suburbs. Numerous but mostly temporary road closures from 1 to 5 hours occurred throughout the storm, including major routes like I-70 and Highway 103 throughout Jefferson County. Snow accumulations totaled 46 inches in Conifer, 42 inches in Genesee, and 29.5 inches near Evergreen. Several hundred flights were reported cancelled at Denver International Airport in this event.

March 13, 2019 – A rare "bomb cyclone" blizzard brought record low barometric conditions to the Denver Metro area, creating widespread blizzard conditions and heavy snow, leading to significant road, school, and business closures.

March 13-14, 2021 – The 4th largest snowstorm in Denver's recorded history dropped 27.1" of snow in the Denver Metro area, making March 2021 the second snowiest March on record. Overall impacts in Jefferson County were relatively minor, but it took several days to fully clear the roads.

Often, total snowfall is one of the major considerations in tallying a 'severe' winter storm. The top ten snowfall storms for the Denver Metro region since 1946, according to the National Weather Association, are listed in Table 4-55. It is helpful to remember that the official reckoning for snowfall in Denver is at the airport (Stapleton Airport until February 1995 and currently at Denver International Airport) and that snowfall totals may actually be higher for Jefferson County, particularly in the western communities.

Table 4-55 Top Ten Snowfall Storms in the Denver Metro Area since 1946

Date	Snowfall in Inches
March 18, 2003	31.8"
November 3, 1946	30.4"
March 13-14, 2021	27.1"
December 24, 1982	23.8"
October 25, 1997	21.9"
November 27, 1983	21.5"
November 19, 1991	21.2"
December 20, 2006	20.7"
March 5, 1983	18.7"
November 19, 1979	17.7"

Source: National Weather Service Weather Forecast Office: Denver/Boulder area

Probability of Future Occurrences

Winter storms are a yearly feature in Colorado, often occurring multiple times each winter, and thus are considered a seasonal feature. In that regard, these hazards are considered a highly likely occurrence. When an event is seasonal and an anticipated element in a given climate, it is also important to examine the probability of future severe occurrences of the hazard.

According to the NCEI database, there have been 274 catalogued events over a 20-year period, or approximately 14 events per year. There have been at least 10 incidents of severe winter storms that have resulted in severe impacts to Jefferson County since 1990. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a severe winter storm occurring in any given is almost certain. This corresponds to a probability of future occurrences rating of **highly likely**.

Magnitude and Severity

The damages caused by severe winter storms and blizzards vary and are dependent on several factors: the duration of the storm; the geographic extent; the time of year; meteorological factors such as wind, moisture content of the snow, ground and air temperatures; and the advance warning of the storm. Impacts from the storm dictate the magnitude of the event, emphasizing that how much snow falls may not always directly correlate to how bad the storm is. Damaged power lines and dangerous or impassable roadways may forestall the delivery of critical services such as medical and emergency assistance, the delivery of food supplies and medications, or even the provision of basic utilities such as heat and running water. When events happen with a long warning time, it is possible to pre-mitigate the effects of insufficient supply levels or to pre-test emergency generators, which may prevent some of the previously described impacts from occurring. Unanticipated storms increase the number of people stranded, both in cars and at public locations, which may increase the number of injuries and deaths attributed to the event (often caused by exposure) and place uneven and unanticipated strains on public sheltering capacities. The weight of the snow, driven by the water content of the fall, increases the potential for damages caused to structures and trees. Lighter snow caused by extreme cold increases the damages caused to livestock, agriculture, and landscaping due to freezing conditions. Winter storms which go through periods of thaw and freeze prolong dangerous icy conditions, increasing the likelihood of frozen and damaged water pipes, impassable or dangerous roadways, damaged communication lines, or more extensive damages to infrastructure and structures caused by seeping water freezing under roofs, porches, patios, inside sidings, or causing damage to vehicles.

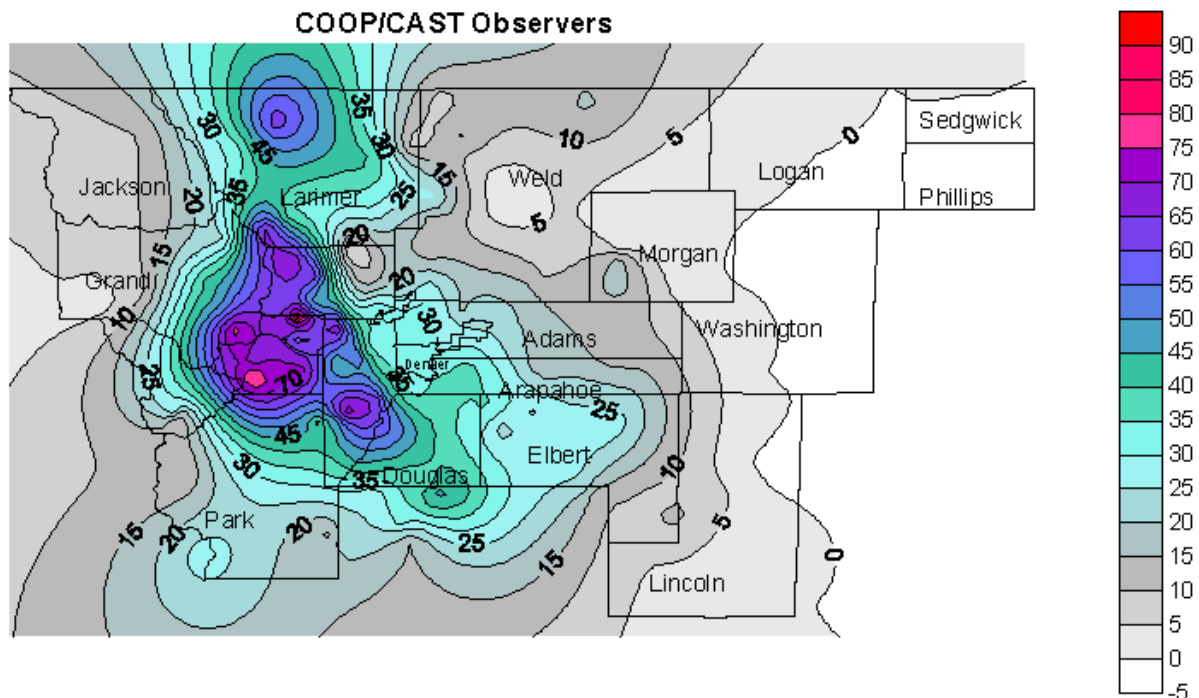
Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others it is a reflection of common occurrence. The most damaging event of record for Jefferson County occurred between March 17 and March 20, 2003. This is distinct from the snowstorm with the greatest amount of snowfall, which occurred from December 1-6, 1913, and officially documented 45.7 inches of snow. In order to reflect the significance of each, both events are considered in developing the severity and magnitude ratings.

As noted, the December 1913 storm snow totals in the metro area were officially recorded at 45.7 inches. Snow totals were even deeper in the mountains, where Georgetown reported 86 inches total. The high winds caused significant drifting which completely blocked all transportation. The Rocky Mountain News reported that one rescue party and eight miners were lost in the storm and thousands more moved into hotels for shelter. The city opened the auditorium and other public buildings to shelter the homeless during the event. Of interesting note, the snow removal costs were considered an economic advantage, citing that over 780 men found employment and at least \$700 (\$18,300 in 2020) was spent in snow removal costs. The paper also reported that "(m)illions of dollars [in] additional wealth to Colorado were brought yesterday by the snowfall...it rang up the curtain on the 1914 crop outlook, revealing visions of unprecedented prosperity to every line of industry and bountiful harvest to the farmers."

The March 17-20, 2003 snowfall in the metro area was officially tabulated at 31.8 inches, though up to eight feet of snow was reported in the Evergreen and Conifer areas. Detailed snowfall totals across the

region from this event are depicted in Figure 4-42. The event damaged huge amounts of infrastructure and property, with insurance losses alone estimated at more than \$93.3 million (\$131.3 million in 2020 dollars). Insurance losses note that more than 90% of those damages were based on homeowner's insurance claims, and that of the auto insurance claims, most were a result of the vehicle being crushed by the weight of the snow rather than weather-related accidents. The event also resulted in a Presidential Emergency Declaration. The damages inflicted on critical facilities and services (critical infrastructure) resulted in a loss or disruption of services for several days, including power, telephone, and in some cases, heat. Emergency response personnel were hindered from response due to impassible roadways. Documented illnesses and injuries were considered critical, with two serious reported injuries and five directly attributed deaths. The medical response of the region was considered impaired to a limited extent.

Figure 4-42 March 17-20, 2003 Snowfall Totals



Source: National Weather Service Forecast Office: Denver/Boulder CO

Based on these factors, the magnitude severity potential for severe winter storms which may impact Jefferson County are considered **critical**.

Climate Change Considerations

Climate change has the potential to exacerbate the severity and intensity of winter storms, including potential heavy amounts of snow. A warming climate may also result in warmer winters, the benefits of which may include lower winter heating demand, less cold stress on humans and animals, and a longer growing season. However, these benefits are expected to be offset by the negative consequences of warmer summer temperatures.

Vulnerability Assessment

All assets located in Jefferson County can be considered at risk from severe winter storms, although based on historic records they are a higher risk for areas between 6,000 and 9,000 feet and areas higher in the mountain above 9,000 feet. Severe winter storms affect the entire planning area and its jurisdictions including all above-ground structures and infrastructure. Although losses to structures are typically minimal and covered by insurance, there can be impacts with lost time, maintenance costs, and contents

within structures. A timely forecast may not be able to mitigate the property loss but could reduce the casualties and associated injury.

General Property

High snow loads can cause damage to buildings and roofs. Most property damages with winter storms are related to the heavy snow loads and vehicle accidents. Older buildings are more at risk, as are buildings with large flat rooftops (often found in public buildings such as schools). Vulnerability is influenced both by architecture and type of construction material and should be assessed on a building-by-building basis.

People

The threat to public safety is typically the greatest concern when it comes to impacts of winter storms. The highest risk will be to travelers that attempt to drive during adverse conditions. People can also become isolated from essential services in their homes and vehicles. While virtually all aspects of the population are vulnerable to the potential indirect impacts of a winter storm, others may be more vulnerable, such as individuals with access and functional needs, who may become isolated to essential services.

The weight of heavy snowfall and/or ice accumulating on power lines often brings them to the ground, causing service disruptions for thousands of customers. According to data from the U.S. Department of Health and Human Services' emPOWER mapping site, 12,629 of the 115,998 Medicare Beneficiaries in the county rely on electricity-dependent medical equipment such as ventilators to live independent in their homes. In addition, prolonged power outages can also have economic impacts if there is a loss of food in grocery stores and other businesses.

Cold and extreme cold temperatures have been the main cause of winter weather related casualties in the County. Infants, elderly, and the homeless population are most vulnerable to the impacts of extreme cold. Exposure to extreme cold can cause frostbite or hypothermia and, in some cases, even death.

The region can experience high winds and drifting snow during winter storms that can occasionally isolate individuals and entire communities and lead to serious damage to infrastructure. Travelers on I-70 and Highway 285 in the mountainous portions of the planning area, can become isolated and visitors can become stranded, requiring search and rescue assistance and shelter provisions.

Critical Facilities and Infrastructure

Roads are especially susceptible to the effects of a severe winter storm, which can temporarily hinder transportation and require resources for snow removal. As noted under the people section, heavy snow accumulation may also lead to downed power lines not only causing disruption to customers but also have potentially negative impacts on critical facilities in the county which may have cascading impacts on the local governments' ability to operate.

Economy

Closure of major transportation routes during severe winter storms could temporarily isolate communities in Jefferson County and further isolate the more remote areas of the County. Depending on the length of the closure it could also hinder the local economy by disrupting tourism and out of county visitors, and as well as the potential impacts to shipping delays from a closure of I-70. Snow removal costs can also impact budgets significantly.

Power outages may lead to business closures as was seen in the 2019 Bomb Cyclone event with impacts lasting for multiple days in some areas.

Xcel Energy provided data for the number customers within their service area who experienced loss of power supply caused by snow and ice. As with extreme temperatures and wind/hail, Xcel estimates that outages cost the utility approximately \$50,000 per 20,000 people affected.

In a typical year (based on historic Xcel data from 2006-2009) utility customers in Jefferson County experience 2 days of service interruption due to snow and ice per year impacting (on average) 48,809 people per outage. FEMA standard values for loss of service for utilities estimate that a power supply

interruption costs the average person \$126 per day of service outage. This equates to an average annual loss of \$12,299,868 based on power outages due to snow and ice.

Historical, Cultural, and Natural Resources

Natural resources may be damaged by the severe winter weather, including broken trees and death of wildlife. Unseasonable storms may damage or kill plants and wildlife, which may impact natural food chains until the next growing seasons. Most of these impacts would be short-term. As noted previously, older, historic buildings could potentially be more vulnerable to roof and structural damage from heavy snow.

Future Development

Future residential or commercial buildings built to code should be able to withstand snow loads from severe winter storms. Population and commercial growth in the County will increase the potential for complications with traffic and commerce interruptions associated winter storms, as well as increased exposed populations vulnerable to the impacts of a severe winter storm such as power outages or delays in vital services. Future power outages or delays in power delivery to future developments may be mitigated by construction considerations such as buried power lines. Future development will also require future considerations for snow removal capacity including equipment, personnel, logistical support, and planning for snow storage areas. Adequate planning will help establish the cost-effective balance.

Public education efforts may help minimize the risks to future populations by increasing knowledge of appropriate mitigation behaviors, clothing, sheltering capacities, and decision making regarding snow totals, icy roads, driving conditions, and outdoor activities (all of which are contributors to decreased public safety during severe winter storms.) New establishments or increased populations who are particularly vulnerable to severe winter storms (such as those with health concerns or those who live in communities that may be isolated for extended periods of time due to the hazard) should be encouraged to maintain at least a 72-hour self-sufficiency as recommended by FEMA. Encouraging contingency planning for businesses may help alleviate future economic losses caused by such hazards while simultaneously limiting the population exposed to the hazards during commuting or commerce-driven activities.

Overall Hazard Significance

Severe winter storms in Jefferson County have a significant impact on and presence in the planning area. Damages from winter storms are the second highest cause of insurance-related costs and claims for the County. The planning area is subjected to damaged trees and structures, icy and dangerous roadways, and the large costs associated with snow removal and cleanup after severe events. In addition, the hazard is regional in nature, indicating that if the planning area is impacted, it is likely that the planning area's immediate neighbors will also be impacted, reducing the available resources and aid capacities for response and recovery from the event.

The geographic extent of the hazard is considered **extensive**. The probability of future occurrences is considered **likely** and the magnitude/severity for the event of record is **critical**. In addition, the HMPC considers the hazard to have **high** impact on the County. This equates to an overall impact rating of **high**.

4.3.14 Subsidence

Description

The Colorado Geological Survey defines land subsidence as the sinking of the land over manmade or natural underground voids. Subsidence occurs naturally and also through man-driven or technologically exacerbated circumstances. Natural causes of subsidence occur when water in the ground dissolves minerals and other materials in the earth, creating pockets or voids. When the void can no longer support the weight of the earth above it, it collapses, causing a sinkhole depression in the landscape. Often, natural subsidence is associated with limestone erosion, but may also occur with other water-soluble minerals. Man-driven or technology-exacerbated subsidence conditions are associated with the lowering of water tables, extraction of natural gas, or subsurface mining activities. As the underground voids caused by these activities settle or collapse, subsidence occurs on the surface. In Jefferson County, past coal and clay mining activities have created surface subsidence in some areas and created the potential for subsidence in other areas. Any area where past sub-surface mining was documented has some risk of subsidence; however, tracking these areas is difficult. In some cases, coal was “poached” or more coal was removed from an area than would be noted on the mine map. Also, many mines were incorrectly located relative to surface features due to surveying errors. As such, maps of past mine workings and extents may be incorrect, but rough estimates are available.

Extraction of coal and clay from mines in Jefferson County varied based on the location of the material beds and the available technology. Prior to World War II, nearly all mines in the County were worked using the room and pillar mining pattern. In the room and pillar technique, an opening was followed by a shaft that was driven or dug to the layer of coal or clay. Passageways were excavated in the material seam, and rooms were created when the materials were dug out along the original tunnel. The materials were then worked in the direction that correlated to the bed. Between the rooms, pillars of the material were left in place to support the roof of the mine, although sometimes the pillars were replaced with timbers. Subsidence occurs when the stopes collapse, either due to overhead pressure or when the support structures collapse. Other subsidence incidents may occur over air shafts and man shafts. This subsidence forms pits, which may range in diameters of 5' to 20' and range in depth from a few feet to 20', depending on the amount of in-filling which has occurred since the mine was abandoned. Because subsidence incidents are often incomplete, an event may occur multiple times over the same area, increasing the risk and danger of this particular type of subsidence.

Troughs, or long lengths of subsidence, tend to occur over tunnels and slope entries, and may range in length from 10' to 80' and in depth from 5' to 15' or more. Once they collapse, they present a reduced additional risk, as the subsidence is generally complete along the entire length of the tunnel. Another common form of subsidence in Jefferson County occurs when pits and trenches open over stopes that were extended to, or very close to, the surface during the mining process. These features are particularly evident along the east side of the Dakota Hogback from I-70 north to Coal Creek Canyon and range in length from 10' to 100' and in widths of 5' to 40'. This form of subsidence forms a minimal risk in the planning area, as it occurs in areas where development is highly regulated, but additional risks from these features are documented below. Subsidence over reclaimed land occurs when open pit mines are cosmetically back-filled, but the fill is not as compacted as the enclosing bedrock. When construction on the fill material occurs, the weight causes the fill material to compress more than the bedrock, creating a stress or bending movement in the structure, which can result in significant damage to the structures.

Subsidence may result in serious structural damage to buildings, roads, irrigation ditches, underground utilities, and pipelines. It can disrupt and alter the flow of surface or underground water. Weight, including surface developments such as roads, reservoirs, and buildings and manmade vibrations from such activities as blasting or heavy truck or train traffic can accelerate natural processes of subsidence, or incur subsidence over manmade voids. Fluctuations in the level of underground water caused by pumping or by injecting fluids into the earth can initiate sinking to fill the empty space previously occupied by water or soluble minerals. The consequences of improper use of land subject to ground subsidence can be excessive economic losses, including the high costs of repair and maintenance for buildings, irrigation works, highways, utilities, and other structures. This results in direct economic losses to citizens as well as indirect economic losses through increased taxes and decreased property values.

Geographic Extent

Areas of Jefferson County at risk for subsidence are shown in Figure 4-21 on the map of dipping bedrock and subsidence. Coal deposits in Jefferson County were located mostly along the northeastern borders shared with Boulder, Adams, Denver and Arapahoe counties. Known coal mines in the County were confined along a narrow strip of land along Highway 93 from Arvada to approximately the junction with C-470, and then along the C-470 corridor, without known extent into the northeastern portion of the coal field. As such, the location of inactive coal mines in the County is limited compared to other counties (see Figure 4-43).

Previous Occurrences

Most known areas of potential subsidence in the planning area occur in rural, undeveloped areas and, therefore, have caused no damage. However, there are few records on subsidence. In addition, the planning area exercises specific planning and zoning regulations to minimize the structures permitted on vulnerable lands, as demonstrated in Table 4-57.

While actual events of subsidence are visible throughout the County, extensive research on the hazard produced only one reportable incident. A family housing section built on the Colorado School of Mines campus, located in Golden, suffered damage when subsidence occurred over a reclaimed open-pit clay mine. Though the structures were built with mitigation techniques, differential compaction still occurred. Streets and sidewalks suffered damage, as did the structural integrity of several buildings. This report is contained in a County profile issued in 1978 and additional confirmation of the event, along the fate of the structures and associated damage estimates, are not currently available.

Figure 4-43 **Locations of Inactive Coal Mines, State of Colorado**

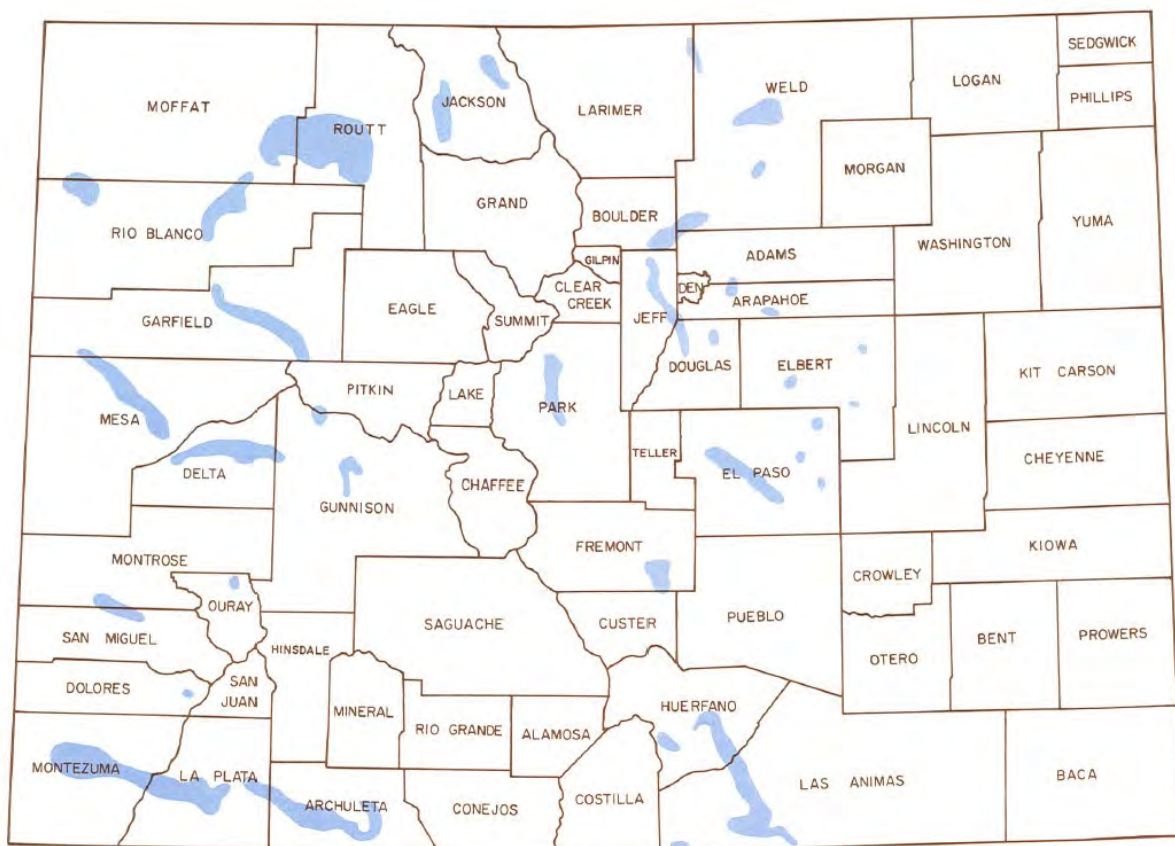


Figure 5. General locations of Inactive Coal Mines in Colorado.

Source: Subsidence above Inactive Coal Mines

According to the State Hazard Mitigation Plan, Jefferson County hosts 48 abandoned coal mines and 100 other types of abandoned mines. According to the Colorado Division of Reclamation and Safety, as of February 2021 there are 111 mine permits in the County and 17 of those permits are active. The majority of the mines permitted, inactive and active, are for sand and gravel, followed by clay, and then aggregate. There is one permitted, but inactive, coal mine in the County in Township 6S 69W.

Figure 4-21 illustrates the areas of suspected or known subsidence for Jefferson County, as determined by the County Geological Hazards data layer. The area, marked brown, only minimally corresponds to the areas of inactive coal mines in the County, and accounts for some subsidence vulnerabilities due to clay mining. Of note is the large area of vulnerability in unincorporated Jefferson County and portions of the City of Arvada, which is located south of Rocky Flats Lake and north of Arvada Reservoir, which extends east from Highway 93. While some of this area is open space, there is residential housing development that has occurred within the suspected area. In Golden, developments along Highway 93 are exposed to the risk as well from the northern edge of the city down until just north of the junction of Highway 93 and Highway 6. In the areas east and north of C-470, subsidence hazard areas are located along several developments along Kipling in Lakewood and the unincorporated County. Other potential subsidence areas are in western Lakewood on the south side of Green Mountain, near the recent Solterra development. This amounts to only a small portion of the total developed landmass in the County - somewhere between 10% and 25%.

Based on this information, the geographic extent rating for subsidence is **limited**.

Probability of Future Occurrences

This assessment was conducted to maintain consistency with other hazards profiled in this planning effort but represents some significant problems. As the data of previous occurrence is skewed, the accuracy of future probability predictions is heavily impeded. In addition, the existing mitigation efforts in the planning area heavily restrict development in subsidence-prone areas, which reduces the number of occurrences that cause damages, and therefore, reduces the number of occurrences that are reported.

There has only been 1 reported incident in Jefferson County that caused property damage since 1978. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of subsidence occurring in any given year is 2.4%. This corresponds to a probability of future occurrences rating of **occasional**.

Magnitude and Severity

The greatest dangers associated with subsidence are related to property damages incurred by the hazard. There are minimal risks to injury and death from unexpected subsidence or accidental exposure to it, but the risk is possible. No injuries or deaths related to subsidence have been reported in the planning area, but the State Hazard Mitigation plan documented two injuries related to subsidence in the state.

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it reflects common occurrence. In this case, there is no event of record for the County related to subsidence. Instead, estimates based on predicted areas of vulnerability are used to complete the assessment for comparison purposes to other hazards profiled in this plan. The developed areas with the greatest vulnerability to known subsidence areas is in the neighborhoods just north and just south of the C-470 corridor on the western border of the urbanized planning area in Lakewood. Widespread subsidence in the area could damage houses, retail facilities, roads, sidewalks, utilities infrastructure, and critical infrastructure facilities located in the area. Such an event would not be expected to impact overall delivery of essential services and functions to the planning area, though the affected community may be affected for weeks as water, gas, power lines, roads, and houses are repaired. If events are severe enough, structures may be deemed unsafe for continued occupancy, forcing residents to relocate. Injuries or deaths are possible, but not expected, in such an event.

Based on these factors, the magnitude severity ratings for subsidence are considered **limited**, based on the dollar amount of property damage incurred.

Climate Change Considerations

Changing climate conditions are not anticipated to affect subsidence.

Vulnerability Assessment

Existing Development

Existing development makes up almost all of the risk to subsidence in the planning area; the hazard rating for subsidence was elevated based on the existing development vulnerabilities and losses. The areas of subsidence vulnerability, as identified earlier in this section, make up a fairly limited area of the County. However, there are areas of Golden, Arvada, Lakewood, and the unincorporated County that are already developed, which means there is exposure to the hazard. Once the land is developed, subsidence mitigation becomes extremely expensive. In addition, poor or inaccurate mapping of former mining efforts may lead to unknown areas of vulnerability which are only discovered after the land is developed, when pre-emptive techniques are unavailable. Vulnerable construction includes roads, homes, business, and landscaped recreational areas. Dangers include damage caused to structures or roads and the secondary impacts such as injuries to occupants or passers-by, the rapid development of deep holes under people or cars which results in injury, death and/or property damage, and the fiscal cost of the damages.

Methodology

GIS was used to create a risk assessment for geological hazards in Jefferson County. Subsidence hazard data was overlaid on Jefferson County parcel and assessor's data. For the purposes of this analysis, a GIS layer of address points was used to identify potential structures exposed to the hazard, combined with parcel-based information. Subsidence hazard data was then overlaid on the address points. If the address point intersects the hazard layer, the hazard is assigned for the entire parcel. The model assumes that every parcel with a structure value greater than zero is improved in some way. Specifically, an improved parcel assumes there is a building. The parcel, its improvement value and estimated content value are listed in Table 4-56 and Table 4-57.

Results are sorted by occupancy type and by jurisdiction to demonstrate how the hazard's risk varies for all property types across the planning area. According to this analysis, all jurisdictions have seen an extremely large increase of exposed properties to subsidence since 2016. Over \$38 billion of total structure value is exposed to subsidence. This is a 50-fold increase from \$750 million of total value of exposed properties in the 2016 plan. It is difficult to estimate potential losses beyond this exposure analysis, however these values are included as a reference. Unincorporated jurisdictions have the greatest exposure to the hazard, with a total of nearly \$17 billion of exposed structure total value and over 67,000 persons. Arvada also surpassed Golden with greater total value exposure to subsidence since the 2016 plan. This analysis does not account for site investigations or mitigation that may have occurred during subdivision development.

Table 4-56 Improved Properties Exposed to Subsidence in Jefferson County

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Arvada	11,116	11,411	\$4,468,492,106	\$2,401,836,700	\$6,870,328,806	27,850
Golden	5,134	6,221	\$3,272,708,675	\$2,320,286,196	\$5,592,994,871	12,277
Lakewood	14,172	14,987	\$5,559,542,300	\$3,055,937,501	\$8,615,479,801	33,231
Littleton	730	730	\$323,311,784	\$161,655,892	\$484,967,676	2,206
Morrison	155	188	\$65,397,995	\$42,503,428	\$107,901,423	279
Unincorporated	26,264	27,162	\$10,899,622,635	\$6,010,852,181	\$16,910,474,816	67,445
Total	57,571	60,699	\$24,589,075,495	\$13,993,071,898	\$38,582,147,393	143,289

Source: Jefferson County GIS

Table 4-57 Improved Properties Exposed to Subsidence in Jefferson County by Building Type

Jurisdiction	Property Type	Improved Parcels	Building Parcels	Total Value	Population
Arvada	Agriculture	1	1	\$3,146,514	
	Commercial	75	120	\$299,008,526	
	Exempt	16	20	\$135,097,064	
	Industrial	26	28	\$107,768,630	
	Mixed Use	9	12	\$60,680,674	
	Residential	10,989	11,230	\$6,264,627,398	27,850
	Total	11,116	11,411	\$6,870,328,806	27,850
Golden	Agriculture	1	1	\$70,874	
	Commercial	261	360	\$1,034,458,800	
	Exempt	59	124	\$652,011,360	
	Industrial	159	176	\$515,077,410	
	Mixed Use	62	79	\$225,062,544	
	Residential	4,592	5,481	\$3,166,313,883	12,277
	Total	5,134	6,221	\$5,592,994,871	12,277
Lakewood	Commercial	141	259	\$719,468,156	
	Exempt	39	49	\$312,706,774	
	Industrial	6	9	\$19,943,388	
	Mixed Use	27	31	\$40,581,054	
	Residential	13,959	14,639	\$7,522,780,430	33,231
	Total	14,172	14,987	\$8,615,479,801	33,231
Littleton	Commercial	1	1	\$1,524,450	
	Exempt	1	1	\$3,131,988	
	Residential	728	728	\$480,311,238	2,206
	Total	730	730	\$484,967,676	2,206
Morrison	Commercial	20	36	\$13,052,412	
	Exempt	6	6	\$19,840,302	
	Industrial	2	2	\$1,206,440	
	Mixed Use	8	9	\$4,394,704	
	Residential	119	135	\$69,407,565	279
	Total	155	188	\$107,901,423	279
Unincorporated	Agriculture	21	23	\$6,921,186	
	Commercial	282	448	\$1,256,358,358	
	Exempt	76	99	\$431,633,214	
	Industrial	49	110	\$230,856,088	
	Mixed Use	27	33	\$179,880,956	
	Residential	25,809	26,449	\$14,804,825,015	67,445
	Total	26,264	27,162	\$16,910,474,816	67,445
Grand Total		57,571	60,699	\$38,582,147,393	143,289

Source: Jefferson County GIS

*The Assessor's Office values buildings for the specific purpose of valuation for ad valorem tax purposes and values represented do not reflect actual building replacement values.

**The Assessor does not have data about the contents of structures and the contents values shown in the table are not derived from Assessor data but are estimates based upon the structure value using FEMA recommended values.

Table 4-58 displays the critical facilities at risk to subsidence in the planning area. Golden contains the most critical facilities exposed to subsidence with 15, an increase from seven in 2016. Arvada and unincorporated jurisdictions have seven and five critical facilities exposed to subsidence, respectively.

Table 4-58 Critical Facility Exposure to Subsidence

Jurisdiction	FEMA Lifeline	Critical Facility Type	Count
Arvada	Communications	Land Mobile Private Towers	2
	Communications	Microwave Service Towers	2
	Energy	Electric Substation	2
	Energy	Power Plant	1
		Total	7
Golden	Communications	Land Mobile Private Towers	4
	Communications	Microwave Service Towers	5
	Food, Water, Shelter	Water Facility	1
	Safety and Security	Government Facility	2
	Safety and Security	School	1
	Transportation	Bridge	2
		Total	15
Unincorporated	Communications	Land Mobile Private Towers	3
	Hazardous Material	Tier II	2
		Total	5

Source: HIFLD and CERC

Future Development

As noted in the hazard profile section there are areas of western Arvada, Lakewood and unincorporated areas along the highway 93 and 470 corridors that are experiencing growth in and near potential subsidence hazard areas. Subsidence-resistant construction and mitigation efforts during construction are more cost effective than retroactive mitigation efforts and helps prevent damage from occurring. As such, vulnerability to this hazard is not anticipated to increase with new development, provided that land use planning and engineering regulations and practices are followed. Increased efforts to monitor mining operations, increased accuracy of mapping of former mining works, and emphasis on appropriate grading and ground compaction during development will help alleviate vulnerability for future development in unknown areas of risk. In many ways, the efforts of Jefferson County to pre-empt the subsidence hazard (along with the erosion and swelling soils hazards) is a best-practices example for successful mitigation efforts and projects.

Other development that could occur in or near potential subsidence areas include the proposed Northwest Parkway, a segment of a toll road that has been studied and planned for several years to connect E470 and C470 north of Golden and through western Arvada.

Overall Hazard Significance

Subsidence events in Jefferson County have had minimal impacts on the planning area, due in large part to careful land use planning. The geographic extent of the hazard is considered **limited**. The probability of future occurrences is considered **occasional** and the magnitude/severity for the event of record is **limited**. In addition, the HMPC considers the hazard to have a **low** overall impact on the jurisdiction. This equates to an overall impact rating of **medium**.

This rating is based on the current development policies in place in the County, which limit construction in vulnerable areas. If previously unknown areas of subsidence are discovered, particularly in already-developed areas, this assessment may change. In addition, as development continues out and below the areas of mines worked in steep-slope conditions, those properties may experience a higher vulnerability to landslides caused by subsidence in those areas. This information is also addressed in the landslides profile and can be avoided with continued good mitigation practices.

DRAFT

4.3.15 Tornado

Description

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. They can have the same pressure differential that fuels 300 mile wide hurricanes across a path less than 300 yards wide. Closely associated with tornadoes are funnel clouds, which are rotating columns of air and condensed water droplets that unlike tornadoes, do not make contact with the ground.

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also generate a tremendous amount of flying debris or "missiles," which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less spectacular damage is much more common.

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis, better correlation between damage and wind speed. It is also more precise because it takes into account the materials affected and the construction of structures damaged by a tornado. Table 4-59 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at various levels of intensity. Table 4-59 shows the wind speeds associated with the Enhanced Fujita Scale ratings compared to the original Fujita scale.

Table 4-59 Original and Enhanced Fujita Scales

Fujita Scale		Enhanced Fujita Scale	
F Number	Wind Speed (mph)	EF Number	Wind Speed (mph)
0	40-72	0	65-85
1	73-112	1	86-110
2	113-157	2	111-135
3	158-207	3	136-165
4	208-260	4	166-200
5	261-318	5	201+

Source: National Oceanic and Atmospheric Administration

Tornadoes form when cool, dry air sits on top of warm, moist air. In Colorado, this most often happens in the spring and early summer (i.e., May, June, and July) when cool, dry mountain air rolls east over the warm, moist air of the plains during the late afternoon and early evening hours. However, tornadoes are possible anywhere in the state, at any time of year and at any point during the day.

Tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, most injuries and deaths result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Tornadoes which affect the developed portions of Jefferson County are more likely to cause high dollar damage amounts.

Geographic Extent

Tornadoes are possible anywhere in Colorado, even in mountainous terrain. In 2007, a tornado damaged thousands of trees outside of Woodland Park in Pike National Forest in Teller County. Teller County intersects the southeastern-most corner of Jefferson County. The severe weather conditions that spawn tornadoes are regional events which may impact any extent of the County at a given time, and in this

regard, the possible geographic extent for tornadoes is **extensive**. However, tornadoes as a stand-alone event are single-point (or limited point) occurrences similar to lightning. While knowing that the entire planning area is vulnerable to a tornado, the realistic assessment of tornado occurrences indicates that these single point events occur in a **negligible** density. An average of the two extremes may yield the most likely extent rating.

Based on this information, the geographic extent rating for tornadoes is **limited**.

Previous Occurrences

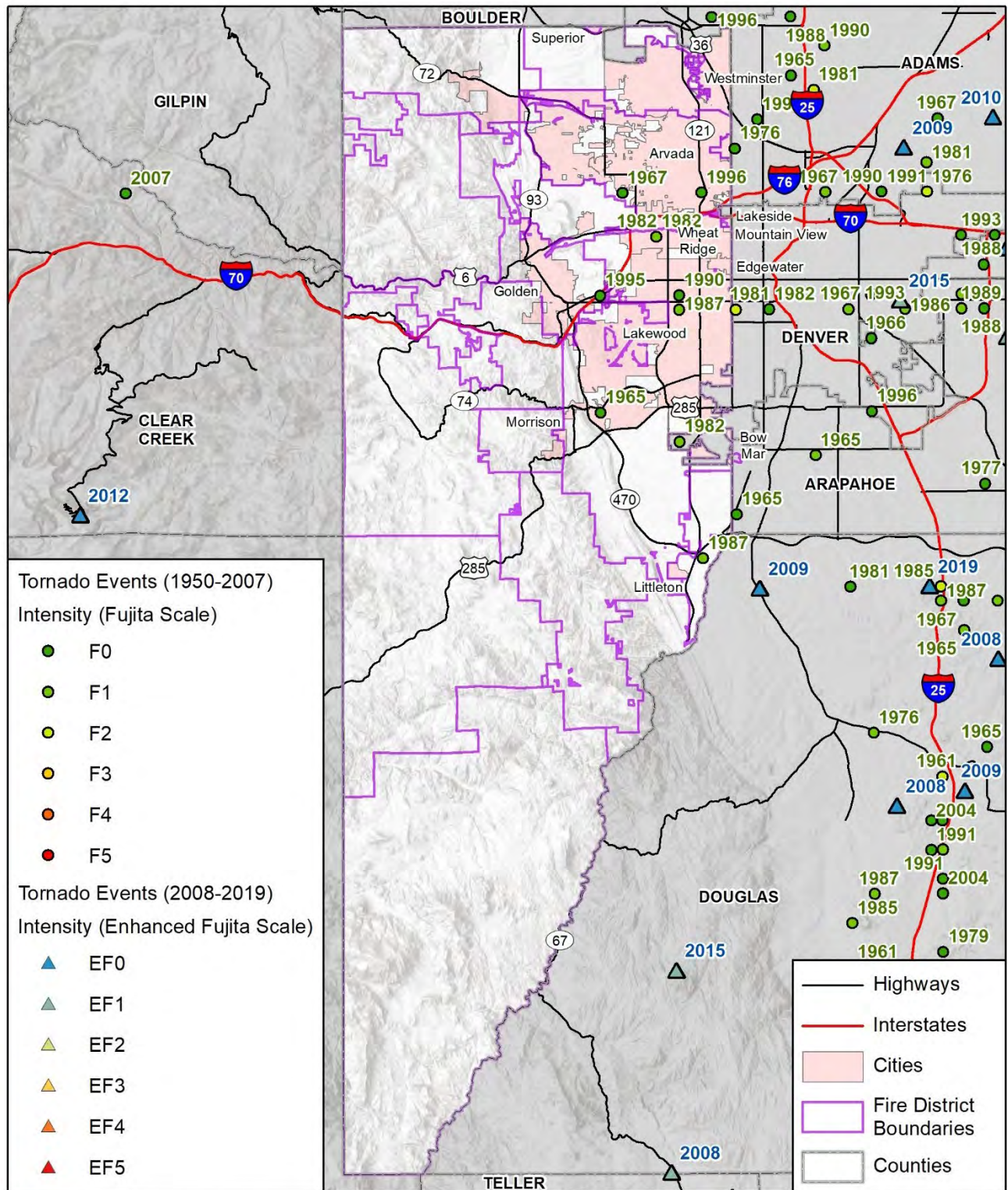
According to the NCEI database, 13 documented tornadoes have occurred in Jefferson County since 1965. The majority of the events were F0 and F1 tornadoes with unknown durations and little to no reported damages. All of the tornadoes have occurred in June and July, with no reported injuries or deaths. A map of previous tornado occurrences in Jefferson County is shown below in Figure 4-44. The following are notable tornadoes that have occurred in or near Jefferson County:

June 3, 1981 – An F2 tornado impacted Jefferson County, touching down just a few blocks east of the Jefferson County line in the City and County of Denver and tracking northeast. This tornado passed over a fairly dense residential area and crossed the US 6 Freeway, causing \$2.5 million in damages. Specific details on the duration and length of the tornado were not recorded and specifics regarding the damages were unavailable, but no deaths or injuries were reported.

June 15, 1988 – An F3 tornado touched down in Denver County. The event was reported at 200 yards wide and traveled for 3 miles, causing \$25 million in damages. While no one was killed, seven people were injured during the storm.

May 22, 2008 – An F3 tornado estimated at a mile wide at times, traveled for 39 miles across Weld County and into Larimer County, beginning just west of Greeley and extending over the community of Windsor before ending just east of Severance. One man was killed, and more than 75 injuries were reported. With damages estimated at more than \$147 million, the storm is one of the most costly disasters in Colorado history. Of special note, Jefferson County provided assistance to the affected communities.

Figure 4-44 Previous Tornado Occurrences in Jefferson County



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
NOAA, National Weather Services SVRGIS 2019

Probability of Future Occurrences

There have been 13 documented incidents in Jefferson County over the 55 year period since 1965. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a tornado occurring in any given year is 23.6%. This corresponds to a probability of future occurrences rating of **likely**.

Magnitude and Severity

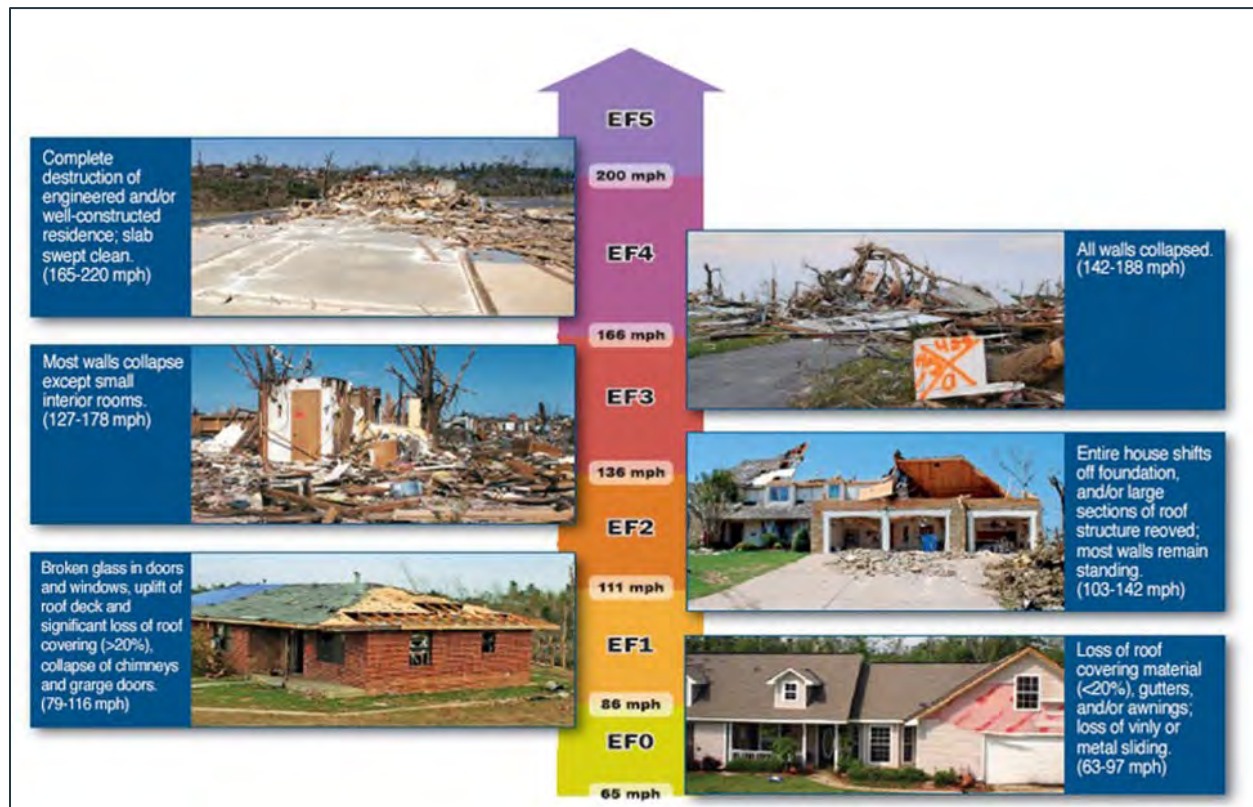
Table 4-60 shows the wind speeds associated with the Enhanced Fujita Scale ratings and the associated damage indicators associated with each rating. Visual examples of the degree of damage which could be expected with each EF rating are shown in Figure 4-45 below.

Table 4-60 Enhanced Fujita Scale with Damage Descriptions

Enhanced Fujita Scale			
Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e. those that remain in open fields) are always rated EF0).
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	10.7%	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	3.4%	Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166-200	0.7%	Devastating. Well-constructed houses and whole frame houses completely levelled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses levelled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: National Oceanic and Atmospheric Administration

Figure 4-45 Potential Damage Impacts from a Tornado



Source: National Oceanic and Atmospheric Administration

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. The event of record for Jefferson County is the June 3, 1981 which was an F2. The damages inflicted on critical facilities and services (critical infrastructure) resulted in no loss or disruption of services. Documented deaths and injuries were considered minimal (as none were reported) and the medical response of the County was considered non-impacted. However, \$2.5 million dollars of damage (\$7.1 million in 2020 dollars) was reported. Based on these factors, the magnitude severity rating for tornadoes is considered **limited**.

Climate Change Considerations

There presently is not enough data or research to quantify the magnitude of change that climate change may have related to tornado frequency and intensity. NASA's Earth Observatory has conducted studies which aim to understand the interaction between climate induced tornadoes. Based on these studies meteorologists are unsure why some thunderstorms generate tornadoes and others don't, beyond knowing that they require a certain type of wind shear. Tornadoes spawn from approximately one percent of thunderstorms, usually supercell thunderstorms that are in a wind shear environment that promotes rotation. Some studies show a potential for a decrease in wind shear in mid-latitude areas. Because of uncertainty of climate induced tornadoes, future updates to the mitigation plan should include the latest research on how the tornado hazard frequency and severity could change. The level of significance of this hazard should be revisited over time.

Vulnerability Assessment

All assets located in Jefferson County can be considered at risk from tornadoes although based on historic tornado paths, the risk for communities in the eastern portion is higher compared to those in western and southern portions of the county which are more mountainous. Most structures, including the

County's critical facilities, should be able to withstand and provide adequate protection from tornadoes rated up to EF4. Those facilities with back-up generators should be fully equipped to handle tornado events should the power go out.

General Property

General damages can be both direct and indirect. Direct damage refers to what the wind event physically destroys. Indirect damage focuses on additional costs, damages and losses from secondary hazards spawned by the event. Depending on the magnitude of the wind events as well as the size of the tornado and its path, a tornado is capable of damaging and eventually destroying almost anything. Construction practices and building codes can help maximize the resistance of the structures to damage. Mobile homes, which are most often occupied by low-income, socially vulnerable residents, are the most dangerous places during a tornado. Studies indicate that 45% of all fatalities during tornadoes occur in mobile homes, compared to 26% in traditional site-built homes (Ashley 2008).

Secondary impacts of damage caused by wind events often result from damage to infrastructure. Downed power and communications transmission lines, coupled with disruptions to transportation, create difficulties in reporting and responding to emergencies. These indirect impacts of a wind event put tremendous strain on a community. In the immediate aftermath, the focus is on emergency services.

People

Community members are the most vulnerable to tornado events. Over the past 70 years there have been no deaths reported in Jefferson County due to a tornado event. During the same time period, there have been no reported injuries from tornadoes. The availability of sheltered locations such as basements, buildings constructed using tornado-resistant materials and methods, and public storm shelters, all reduce the exposure of the population. However, there are also segments of the population that are especially exposed to the indirect impacts of damaging winds and tornadoes, particularly the loss of electrical power. These populations include the elderly or disabled, especially those with medical needs and treatments dependent on electricity. Nursing homes, community-based residential facilities, and other special needs housing facilities are also vulnerable if electrical outages are prolonged, since backup power generally operates only minimal functions for a short time.

Critical Facilities and Infrastructure

Inventory assets exposed to severe wind is dependent on the age of the building, type, construction material used, and condition of the structure. Possible losses to critical infrastructure include:

- Electric power disruption
- Communication disruption
- Water and fuel shortages
- Road closures
- Damaged infrastructure components, such as sewer lift stations and treatment plants
- Damage to homes, structures, and shelters

Because of the unpredictability of wind events' strength and path, most critical infrastructure that is above ground is equally exposed to the storm's impacts.

Economy

Tornadoes can impact exposed critical infrastructure; depending on the impact and the function, this could cause a short-term economic disruption. The most common problems associated with tornadoes and damaging winds are loss of utilities. Downed power lines can cause power outages, leaving large parts of the County isolated, and without electricity, water, and communication. Damage may also limit timely emergency response and the number of evacuation routes. Downed electrical lines following a storm can also increase the potential for lethal electrical shock and can also lead to other hazard events such as wildfires.

Historical, Cultural, and Natural Resources

Damaging winds and tornadoes can cause massive damage to the built and natural environment, uprooting trees and other debris. Historic properties listed on the National Register and the State Register throughout the county may have increased vulnerability to the wind speeds generated by a tornado.

Future Development

As the County continues to develop, the number of people and housing developments exposed to the hazard increases. Proper education on building techniques, strict adherence to building codes, and the use of sturdy building materials, basements, attached foundations, and other structural techniques may minimize the property vulnerabilities. The increased availability of accurate, real-time weather forecasting and alerts the most some protection to both residents and visitors. In some cases, the costs of future mitigation efforts, even in new future development, may outweigh the potential insurance losses; for example, Jefferson County does not generally consider shelters a cost effective mitigation effort in built environments.

Overall Hazard Significance

Historically, tornadoes in Jefferson County do not have a particularly large or frequent impact on the planning area. The geographic extent of the hazard is considered **limited**. The probability of future occurrences is considered **likely** and the magnitude/severity for the event of record is **limited**. In addition, the HMPC considers the hazard to have a **medium** overall impact rating on the County. This equates to an overall impact rating of **medium**.

4.3.16 Wildfire

Description

Wildfires are an annual concern for Jefferson County, potentially causing casualties, fatalities, and environmental damage as well as costing millions of dollars in fire suppression costs. While wildfires can occur year-round in Jefferson County, severe fires are most likely from mid-spring to late fall and are most prominent during the driest summer months of July and August. Fire conditions are impacted by hot weather, vegetation growth, and low moisture content in air and fuel. These conditions, especially when combined with high winds and years of drought, increase the potential for wildfire to occur.

Generally, there are three major factors that sustain wildfires and determine a given area's potential to burn. These factors are fuel, topography, and weather.

Fuel - Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse, and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Manmade structures, such as homes and associated combustibles, are also potential fuel sources. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for fire spread. "Ladder fuels" are fuels low to the ground that can spread a surface fire upward through brush and into tree tops. These fires, known as crown fires, burn in the upper canopy of forests and are nearly impossible to control. The volume of available fuel is described in terms of fuel loading. Many areas in and surrounding Jefferson County are extremely vulnerable to wildfires as a result of dense vegetation combined with urban interface living.

Another important aspect to know about fuels is the condition of the types of fuels and how that will further fuel or diminish the fire behavior.

Energy Release Component (ERC) is a National Fire Danger Rating System (NFDRS) index related to how hot a fire could burn. It is related to the 24-hour potential worst case total energy (BTUs) released per unit area (square foot) within the flaming front at the head of a fire. Since wind and slope do not enter into the ERC calculation, the daily variations in ERC will be relatively small. Daily variations are due to changes in moisture content of the various fuels present, both live and dead. The ERC is a cumulative or "build-up" type of index. As live fuels cure and dead fuels dry, the ERC values get higher thus providing a good reflection of drought conditions.

1000-Hour Fuel Moisture (1000-hr FM) represents the modeled moisture content in dead fuels in the 3 to 8 inch diameter class and the layer of the forest floor about four inches below the surface. The 1000-hr FM value is based on a running seven-day computed average using length of day, daily temperature, relative humidity extremes (maximum and minimum values), and the 24-hour precipitation duration values.

100-Hour Fuel Moisture (100-hr FM) represents the modeled moisture content of dead fuels in the 1 to 3 inch diameter class. It can also be used as a very rough estimate of the average moisture content of the forest floor from three-fourths inch to four inches below the surface. The 100-hr FM value is computed using length of day, maximum and minimum temperature, relative humidity, and precipitation duration in the previous 24 hours.

Fuel Model G is used for dense conifer stands where there is a heavy accumulation of litter and downed woody material. Such stands are typically over-mature and may also be suffering insect, disease, wind, or ice damage -- natural events that create a very heavy buildup of dead material on the forest floor. The duff and litter are deep and much of the woody material is more than 3 inches in diameter. The undergrowth is variable, but shrubs are usually restricted to openings.

Examples of fuels in Jefferson County include the presence of fine fuels and needle cast combined with the cumulative effects of previous drought years, vegetation mortality, and tree mortality. Forest blowdowns, which are unexplained windfalls that blow down or break numerous trees in an area, are another example. Fuel is the only factor that can generally be addressed by human-driven mitigation.

Topography – An area's terrain and land slopes affect its susceptibility to wildfire spread. Both the fire intensity and the rate of spread increase as slope increases due to the tendency of heat from a fire to rise

via convection. The arrangement and types of vegetation throughout a hillside can also contribute to increased fire activity on slopes. In addition, topography impacts the ability of firefighters to combat the blaze by hampering access for equipment, supplies, materials and personnel.

Weather – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfires. High temperatures and low relative humidity dry out the fuels that feed the wildfire, increasing the odds that fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater the wind, the faster a fire will spread, and the more intense it will be. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, which are often in terrain that is difficult for firefighters to reach. Drought conditions contribute to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases. There are no known effective measures for human mitigation of weather conditions. Careful monitoring of weather conditions that drive the activation and enforcement of fire-safety measures and programs, such as bans on open fires, are ongoing weather-related mitigation activities.

The county completed a Community Wildfire Protection Plan (CWPP) in 2012. The CWPP takes an in-depth look at the risk to the county from wildfire, along with actions to mitigate fire vulnerability and impacts. Additionally, the following communities and fire protection districts have completed CWPPs; those plans marked with an asterisk are in the process of being updated as of March 2021:

- City of Golden (2007)*
- Coal Creek Canyon Fire Protection District (2008)
- Elk Creek Fire Protection District (2005)*
- Evergreen Fire Protection District (2020)
- Fairmount Fire Protection District (2007)
- Foothills Fire Protection District (2020)
- Genesee Fire Protection District (2021)*
- Golden Gate Fire Protection District (2011)
- Indian Hills Fire Protection District (2007)*
- Inter-Canyon Fire Protection District (2007)*
- Lower North Fork Fire Protection District (2007)
- North Fork Fire Protection District (2011)
- South Platte (2007)
- West Metro Fire Protection District (2006)*

Insect Infestation

A related threat to forest health with wildfire hazard implications are insect infestations. Increased insect and disease outbreaks among trees are another outcome of the rise in drought conditions in recent decades. Insect infestations can kill trees across wide areas, leading to significant fuel buildup. Dead trees are much more susceptible to burning while the needles are still on the trees; however, once the needles fall off, live trees with needles become a greater hazard than dead needle-free trees.

The Colorado State Forest Service (CSFS) closely tracks insect infestations and their impacts of the health of Colorado forests. The following information is taken from CSFS' 2019 Report on the Health of Colorado's Forests, an extract from which is shown in Figure 4-46.

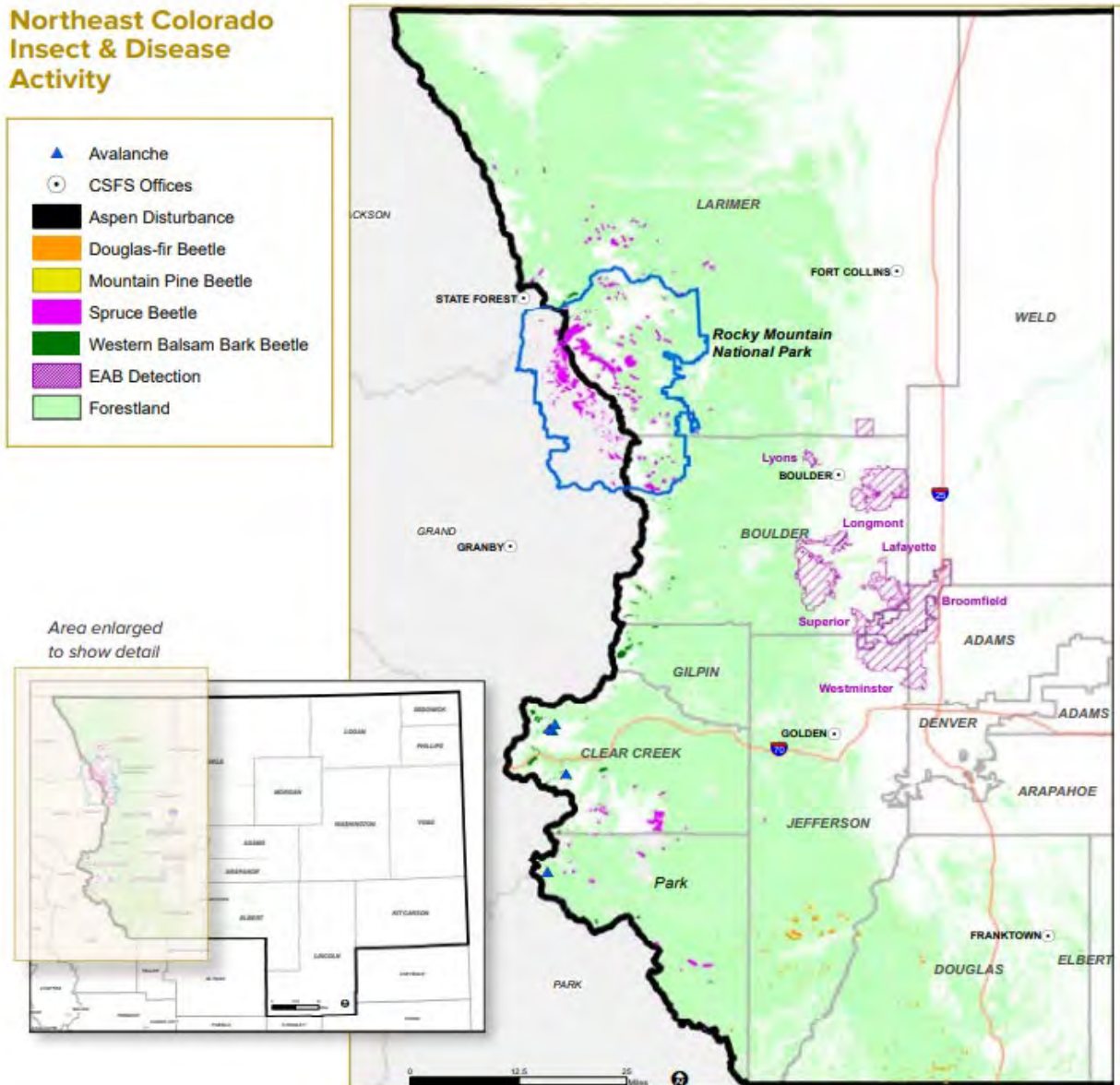
Mountain pine beetle infestations in Colorado began to increase sharply in the early 2000s, reaching a peak from 2008-2013. Infestation levels have declined significantly since then and are no longer considered a major threat in Jefferson County.

Spruce beetle infestations also started to be seen during this period, spiked in the early 2010s, and reached their peak in 2013-2015. The spruce beetle remains Colorado's most widespread and destructive insect pest, infecting 25,000 new acres statewide in 2019; while this is a significant decline from 2013-2015 when 400,000 new acres were infected each year, it remains a significant threat. While spruce beetle infestations are still significant in many surrounding counties, they are not currently a significant threat in Jefferson County.

The Douglas-fir beetle, a close relative of spruce beetle and mountain pine beetle, mainly inhabits overly-dense growths of mature Douglas-fir trees. Approximately 7,400 new acres were infected in 2019, down from 11,000 acres in 2018. As of February 2021 the Douglas-fir beetle is the most active insect threat to the forests of Jefferson County, particularly in the southern portion of the County.

Another emerging concern is the emerald ash borer, which was first detected in Boulder County in 2013, and has begun to spread outside of Boulder County, to include detections in Westminster in 2019. While a significant threat to ash trees, which make up roughly 20% of trees in Colorado's urban communities, it is less of a threat in wildland areas.

Figure 4-46 Colorado Forest Insect and Disease Activity 2019



Source: Colorado State Forest Service 2019 Report on the Health of Colorado's Forests

Geographic Extent

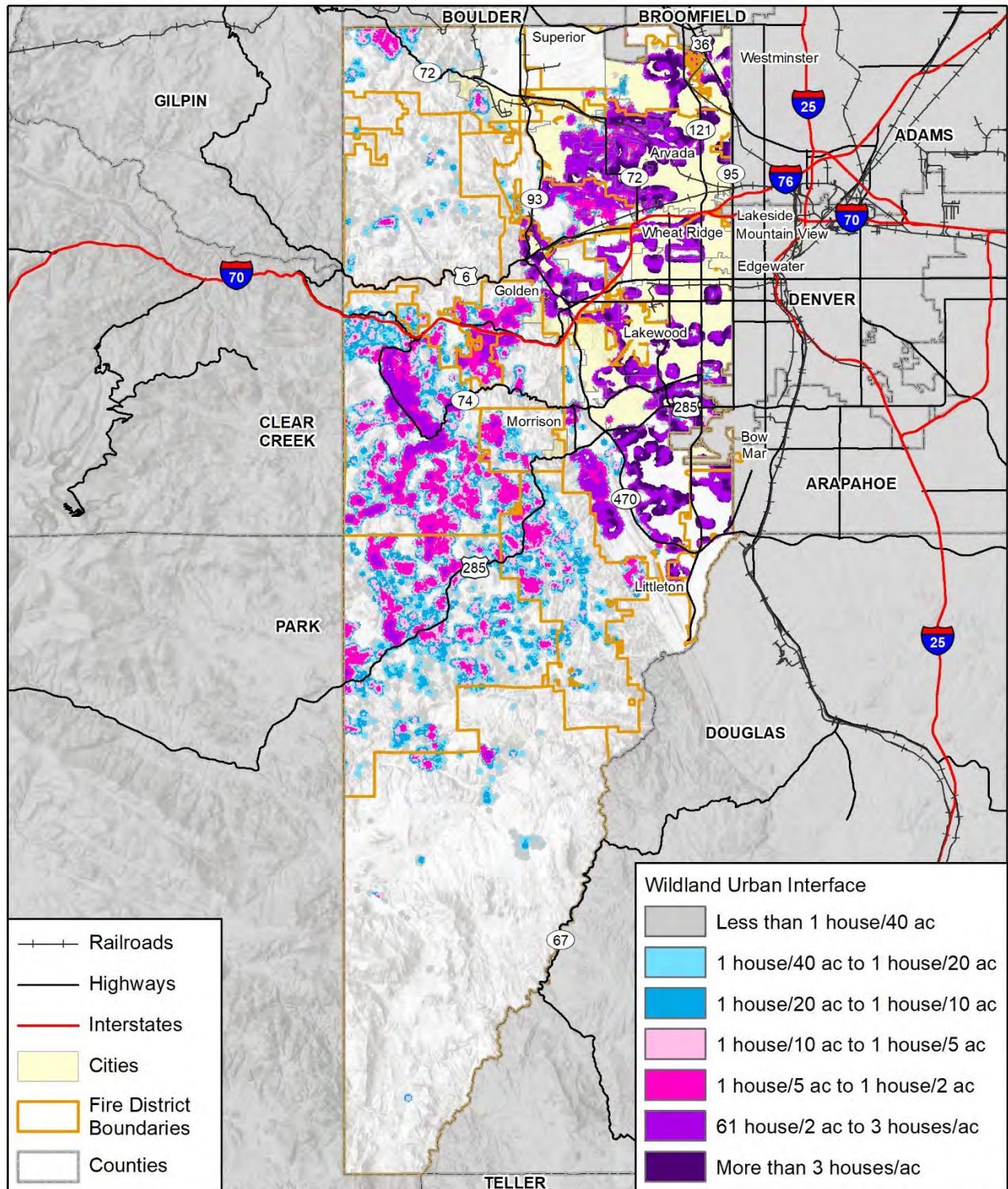
Most of the County is susceptible to wildland fires, with highest risk areas located in the Front Range foothills in western and southern Jefferson County. The Colorado Forest Atlas, formerly known as the Colorado Wildfire Risk Assessment Project (CO-WRAP) is an initiative led by the Colorado State Forest

Service to provide information to the public and wildfire professionals to identify areas in need of wildfire planning, disseminate information, encourage collaboration, plan response actions and prioritize fuels treatments in the state.

The areas of greatest concern for wildfire risk are in the wildland-urban interface (WUI), where development is interspersed or adjacent to landscapes that support wildland fire. While traditionally associated with forested mountain areas, WUI areas are also present in grasslands, prairies, valleys, or in any area where a sustained wildfire may occur and impact developed areas. Fires in the WUI may result in major losses of property and structures, threaten greater numbers of human lives, and incur larger financial costs. In addition, WUI fires may be more dangerous than wildfires that do not threaten developed areas, as firefighters may continue to work on more dangerous conditions in order to protect structures such as businesses and homes. Increased development in WUI areas puts more people and structures potentially at risk. Figure 4-47 shows WUI areas within Jefferson County as determined by the Colorado Forest Atlas. CO-WRAP defines the WUI using housing density data to delineate where people and structures meet and intermix with wildland fuels.

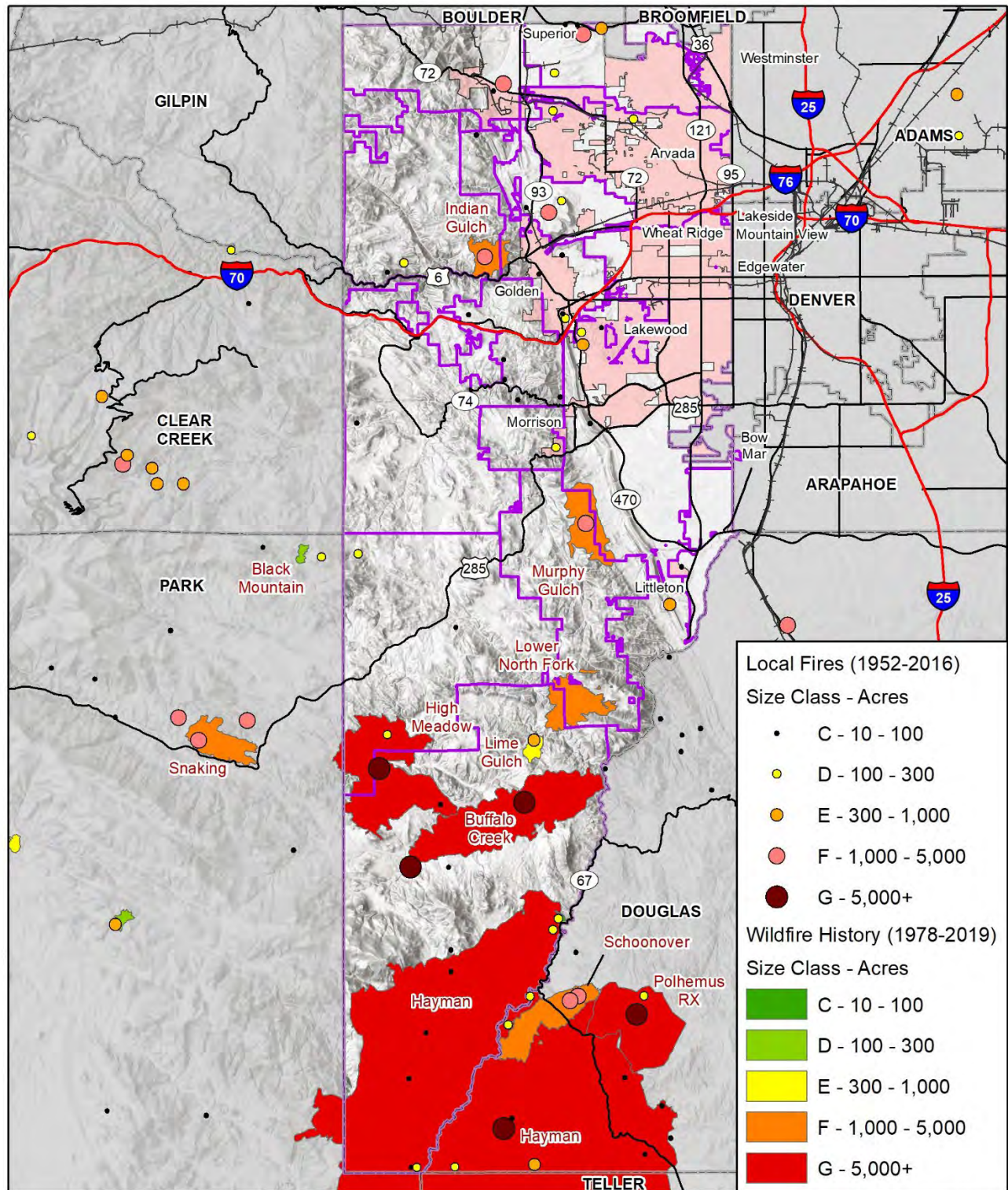
Based on this assessment the geographic extent is classified as **significant**. However, the impacts of major wildfires on air quality can affect much larger areas in and outside Jefferson County.

Figure 4-47 Jefferson County Wildland Urban Interface (WUI) Areas



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado Forest Atlas - Colorado State Forest Service

Figure 4-48 Jefferson County Historic Fires, 1952 to 2019



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado State Forest Service CO-WRAP, USGS

0 5 10 Miles



Previous Occurrences

Jefferson County has been impacted by several significant wildfire events, as shown in Figure 4-48. Particularly severe or significant events are profiled below.

September 21-24, 1978 – The Murphy Gulch fire burned approximately 3,300 acres. The first Emergency Fire Fund fire in the Front Range, several structures were lost to the blaze and many subdivisions were evacuated. Interagency resources were ordered to supplement local fire departments. The Federal Type 2 Team took over and managed the closeout. The agencies involved were the Inter-Canyon Fire Protection District (FPD) and Bancroft FPD. The fire burned along the foothills west of the Ken-Caryl Ranch subdivision.

September 7-9, 1988 – The North Table Mountain Fire burned between 1,300 and 2,000 acres. The human caused fire started off CO 93 and crossed the mountain, which threatened subdivisions on east side of mountain. Over 250 firefighters from 20 fire departments, the National Guard, and local law enforcement officers responded, in addition to a helicopter. In many areas, the focus was on structure protection and evacuation. The fire involved the Fairmount FPD as well as a helicopter. The area included the top, west, and east sides of North Table Mountain.

April 23-24, 1989 – The Mt. Falcon fire burned approximately 125 acres. The fire burned in open space properties, which lead to the voluntary fire reimbursement program by the County open space agencies to local fire departments to support the initial attack of the burn.

March 24-25, 1991 – The O'Fallon fire burned approximately 52 acres. Though small in comparison to other fires in this record, the fire occurred in the Denver Mountain Parks' open space areas, which lead to 100 firefighters from 5 different departments responding. Dry winter conditions, gusty winds, and limited access slowed the control efforts, underscoring the role of weather and terrain in fire response.

May 14-15, 1991 – The Elk Creek fire in the Golden Gate FPD burned 102 acres. The steep terrain with limited access led to the use of hand crews formed from 80+ firefighters from 15 departments and ranging across multiple counties. The fire was managed jointly by the FPDs and the Jefferson County Sheriff's Office's newly formed Incident Management Group (IMG).

July 9-11, 1994 – The Carpenter Peak/Chatfield fires each burned small amounts. The fires were caused by dry lightning, as part of a larger fire bust that sparked across the entire Front Range. These particular fires resulted in evacuations from Roxborough Park, and involved 300 firefighters, 40 engines, and National Guard helicopters.

May 18-25, 1996 – The Buffalo Creek fire burned approximately 10,400 acres. High winds caused extreme fire behavior, leading to a 10 mile run in only six hours. 10 homes or other outbuildings were lost. This fire marked the first large WUI fire in the Front Range. Costs for the fire were estimated at \$3,835,000.

June 27 – July 5, 1998 – The Beartracks fire burned 500 acres. Heavy fuel loading in roadless area and human caused fire leads to heavy initial attack and extended attack by local fire agencies along with air resources. The fire posed a threat to the Upper Bear Creek drainage area and numerous homes. The Federal Type 2 Incident Management Team (IMT) relieved the IMG on day 3 and managed to closeout.

June 12-25, 2000 – The Hi Meadow fire, caused by humans, fell under initial attack by the local FPD and burned approximately 10,800 acres. The fire 'blew up' on the same day as the 10,000 acre Bobcat fire in Larimer County, causing a Front Range-wide stress on resources. 52 homes were lost along with other miscellaneous structures. This fire was considered the "benchmark" WUI fire for Colorado until the Hayman fire in 2002. The fire burned from Burland Ranchettes on the west to Colorado Highway 126 on the east, and south to the Buffalo Creek Fire burn area and the town of Pine.

The Bobcat Fire also lasted several days and was started by a campfire, though the area had a long history of fire, included several caused by lightning. The control costs were estimated at \$3.5 million (\$4.3 in 2008) with no private losses, but the fire heavily impacted the watershed and water quality in the surrounding communities. The concurrence of the two fires is significant due to the strains caused on the regional resources and mutual aid capabilities.

2002 Fire Season

The 2002 fire season is the most severe fire season on record in the state of Colorado and in particular for Jefferson County and the Front Range communities. 2002 was one of the most severe droughts on record in Colorado. During 2002, total suppression costs for the fires exceeded \$152 million. 3,409 fires were documented during the year for a cumulative total of 244,252 burned acres. This is the highest number of fires in any year in Colorado since 1990 and accounted for more than three times as many burned acres as the next-largest recorded damages for one season. More than 16,500 firefighters responded to the events. Nine firefighters were killed during the year, and one air tanker and one helicopter were lost, killing three additional people. 384 homes were lost statewide, with an additional 624 structures lost.

Four of the fires that Jefferson County suffered during this year resulted in Fire Management Assistance Declarations: the Schoonover, Black Mountain, Snaking and Hayman fires. The first three fires burned from the end of April through the end of May, collectively, and the Hayman fire burned for more than a month. These fires are further profiled below, using information provided by the Jefferson County Office of Emergency Management and the 2008 State Hazard Mitigation Plan.

May 20-27, 2002 – Lightning sparked a wildfire near Deckers. Extremely dry conditions and very strong winds the following day allowed the fire to consume 3,860 acres before it could be contained. Thirteen structures were destroyed, including 4 homes.

April 22 – May 2, 2002 – The Snaking Fire burned approximately 3,000 acres. Caused by humans outside of the 'normal' fire season, the event was exacerbated by high winds. The initial and extended attacks were coordinated mostly through Jefferson and Park Counties, with assistance from air resources. The fire threatened numerous homes and burned north of U.S. Highway 285 from Platte Canyon High School to Crow Hill, with 2 lost structures. The NRCS Emergency Watershed Protection Program authorized \$72,883 in response and recovery funds.

May 5-11, 2002 – The Black Mountain Fire burned approximately 300 acres. While smaller than the other fires meriting emergency assistance in the County, the heavy fuel loading and steep terrain of the fire led to many difficulties in the suppression efforts. Local agencies from Jefferson and Park Counties responded along with air resources; with additional assistance from Clear Creek County, the United States Fire Service, Elk Creek FPD and the Evergreen FPD. The fire posed major threats to multiple subdivisions in Conifer and Evergreen and burned north of Conifer Mountain and south of Brook Forest. One injury was reported.

May 21-31, 2002 – The Schoonover Fire was caused by lightning and burned approximately 3,000 acres. Initially under attack by USFS and local FPDs, the fire 'blew up' on the second day to make a 3,000 acre (four mile) run in steep terrain. The fire threatened homes, camps, businesses, watersheds, regional power lines, and other structures. 12 structures and 1 bridge were lost and 2 injuries were reported. The burn area included the area immediately south across the South Platte River from Jefferson County and burned from west of Deckers to near Moonridge. The NRCS Emergency Watershed Protection Program authorized \$74,951 in response and recovery funds.

June 8 – Mid-July, 2002 – The Hayman Fire burned more than 138,000 acres. The human caused fire expanded on the second day for a historic 19-mile run and 70,000 acres. Multiple evacuations over a two-week period were required as the fire made additional 'runs' in multiple counties. Over 150 homes and structures were lost, and large areas of damage were caused to Cheeseman Reservoir and South Platte Watershed areas. The fire is considered a nationally significant WUI fire for Colorado and the Rocky Mountain region. The fire is the event of record for the planning area. Insured losses were documented at \$38.7 million and more than \$5.6 million in recovery and response funds from the NRCS Emergency Watershed Protection Program. The Forest Service spent \$38 million in suppression costs and projections for rehabilitation were estimated at \$74 million.

July 22-24, 2005 – The North Table Mountain Fire of 2005 burned significantly less land than the previous event in 1988, but threatened multiple subdivisions on all sides. The steep terrain allowed the fire to escape the initial attack. Heavy use of air resources facilitated the transition between the initial attacks to structure protection response on the first day. The fire burned the top, east, north, and west sides of Table Mountain outside of Golden and was started by kids playing with fireworks.

April 2, 2006 – Rocky Flats Fire burned 1,200 acres. The fire was started by humans and exacerbated by high winds to cause an outside of ‘normal fire season’ event. The fire moved through the open space areas of Rocky Flats NWR and the adjacent lands. The rate of spread, flame lengths, and limited access contributed to the fire threatening to cross several roads and endangered multiple subdivisions, businesses, and Rocky Mountain Airport. A multi-county approach, including Jefferson, Boulder, Gilpin, and Adams was requested. Wind conditions prevented the use of air resources. Difficulties with communications and fire management across multiple jurisdictions were documented.

July 21-23, 2006 – The Centennial Cone Fire burned in the no-man’s land adjacent to the Golden Gate FPD. The fire, which burned 22 acres, remained entirely contained within the open space park. However, the significant fire activity in steep terrain with no road access during the height of the 2006 national fire season limited the initial attack. The fire threatened U.S. Highway 6 in Clear Creek Canyon and those subdivisions. Limited air resources helped slow the spread of the fire, and an interagency “hotshot” hand crew supplemented local fire resources on the second day for a direct attack. Summer monsoons helped reduce fire danger on day three as the fire was controlled.

March 26-31, 2012 – The Lower North Fork Wildfire south of Conifer scorched a total of 4,150 acres. Strong southwest winds ahead of an approaching cold front produced high to extreme fire danger across the Front Range Foothills and Palmer Divide. As a result, a 50-acre prescribed burn that had been conducted the previous week reignited in the foothills of Jefferson County, southwest of Denver. The strong wind gusts carried embers from the interior of the burn area, across containment lines and into very dry fuels which initiated the wildfire. It then spread into the crowns of the trees and driven by the strong winds, quickly advanced to the northeast onto private lands. Local firefighters immediately responded to the wildfire, but were unable to contain it, due to the extreme winds and dry and abundant fuels. The combination of very strong winds, record warm temperatures, and extremely dry conditions for most of March all contributed to a rapid increase in fire growth during the afternoon of March 26th. A total of 900 homes were evacuated on the 26th. The fire destroyed 27 homes and resulted in the deaths of three local residents. The property damage alone was estimated to be \$11 million. The wildfire was not 100 percent contained until April 2nd.

August 15, 2019 – The Deer Creek Canyon Fire burned 25 acres, doing minimal damage but costing \$62,000 in fire suppression, incident support, and restoration.

July 14, 2020 – The Elephant Butte Fire burned 51 acres, mostly on Denver Mountain Parks land near Evergreen, resulting in a State Disaster Declaration. Fire suppression, incident support and restoration costs totaled approximately \$900,000.

October 11, 2020 – A wildfire started at Pioneer Landscaping property and burned 40+ acres extending towards the western edge of Spring Mesa subdivision with multiple homes in direct line of fire front, necessitating several evacuations. Approximately \$10,000 worth of fence was destroyed, but further loss of property was averted by mitigation efforts with the HOA and utilities prior to the event.

February 7, 2021 – A large grass fire driven by high winds and unusually dry conditions burned 446 acres near Bear Creek Lake Park and Fox Hollow Golf Course. No buildings were damaged but evacuation orders were given to residents east of the fire from Owens Lane to Kipling. The fire was suspected to be human caused.

Probability of Future Occurrences

Since 1980 there have been 23 fire incidents in Jefferson County that have burned 10 or more acres. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a severe wildfire occurring in any given year is 57.5%. This corresponds to a probability of future occurrences rating of **likely**.

Magnitude and Severity

Wildfire is a significant natural hazard in Jefferson County. The wildland-urban interface is especially at risk as decades of fire suppression have resulted in large concentrations of downed timber and fuels. This problem is exacerbated by the significant amount of residential development in the semi-urban and rural portions of the region. Potential losses from wildfire include human life; structures and other improvements; natural and cultural resources; quality and quantity of the water supply; assets such as

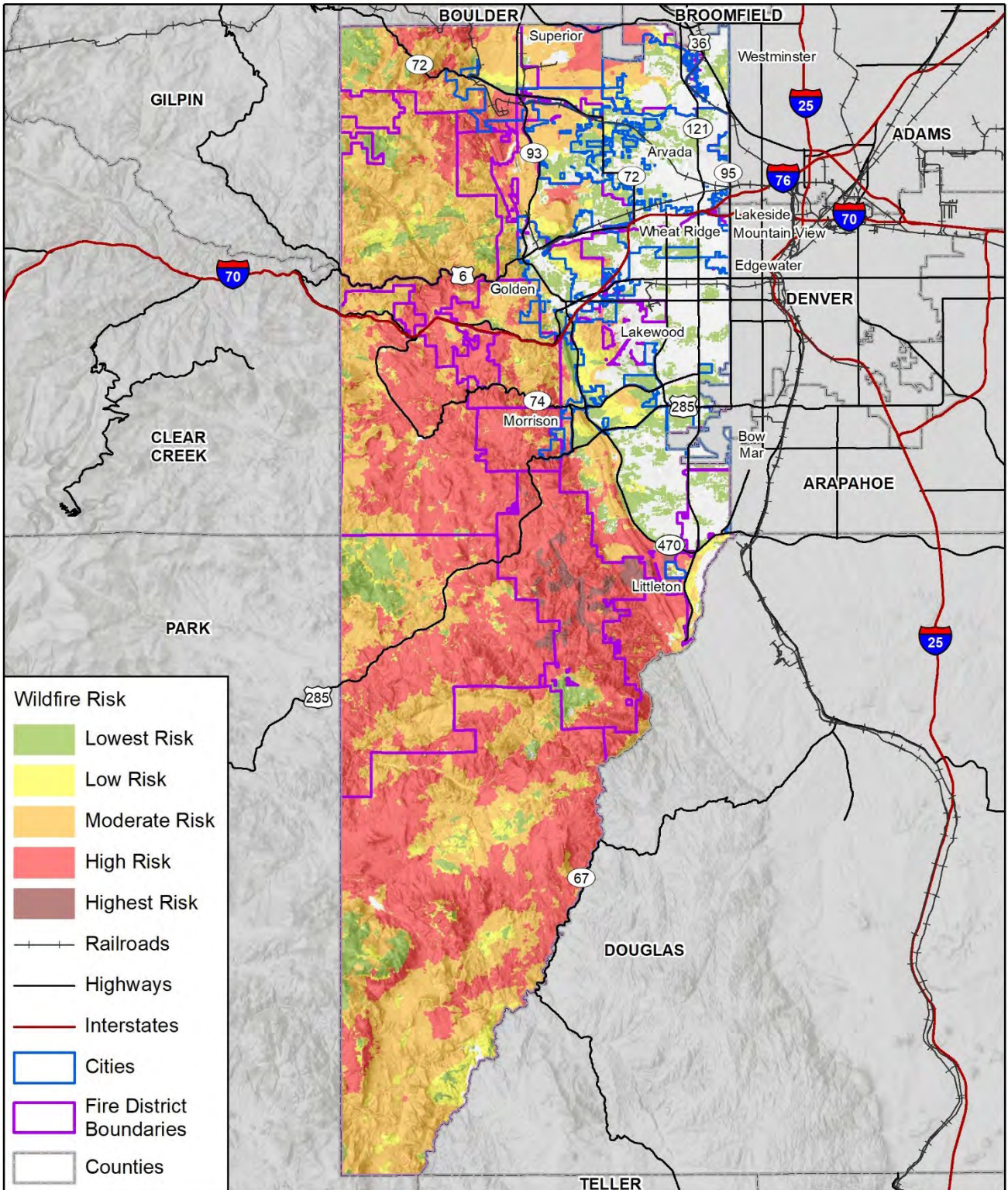
timber, range and crop land, and recreational opportunities; and economic losses. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can lead to secondary impacts or losses, such as future flooding and landslides during heavy rains.

The Colorado Forest Atlas calculates a composite risk rating, defined as the possibility of loss or harm occurring from a wildfire. It identifies areas with the greatest potential impacts from a wildfire – i.e. those areas most at risk - considering all values and assets combined together – WUI Risk, Drinking Water Risk, Forest Assets Risk and Riparian Areas Risk. This risk index has been calculated consistently for all areas in Colorado, allowing for comparison and ordination of areas across the entire state. The Wildfire Risk Classes for Jefferson County are shown in Figure 4-49.

The Colorado Forest Atlas also provides an analysis for Wildland-Urban Interface (WUI) risk based on housing density consistent with Federal Register National standards. The location of people living in the wildland-urban interface and rural areas is essential for defining potential wildfire impacts to people and homes. To calculate the WUI Risk Index, the WUI housing density data was combined with flame length data and response functions were defined to represent potential impacts. The response functions were defined by a team of experts led by Colorado State Forest Service staff. By combining flame length with the WUI housing density data, it is possible to determine where the greatest potential impact to homes and people is likely to occur. The range of values is from -1 to -9, with -1 representing the least negative impact and -9 representing the most negative impact. For example, areas with high housing density and high flame lengths are rated -9, while areas with low housing density and low flame lengths are rated -1. Data is modeled at a 30-meter cell resolution, which is consistent with other Colorado WRA layers. WUI Risk for Jefferson County is mapped in Figure 4-50.

The Colorado Forest Atlas also conducts a Fire Intensity Scale (FIS) analysis, which uses fuels, topography and weather as inputs to determine the relative intensity (from Class 1, lowest to Class 5, highest) of a potential wildfire. According to data from the FIS, the majority of the County has at least a moderate intensity rating with the highest potential wildfire intensity areas south of Littleton and north of the Strontia Springs Reservoir in the Pleasant Park Corridor, see Figure 4-51.

Figure 4-49 Jefferson County Wildfire Risk

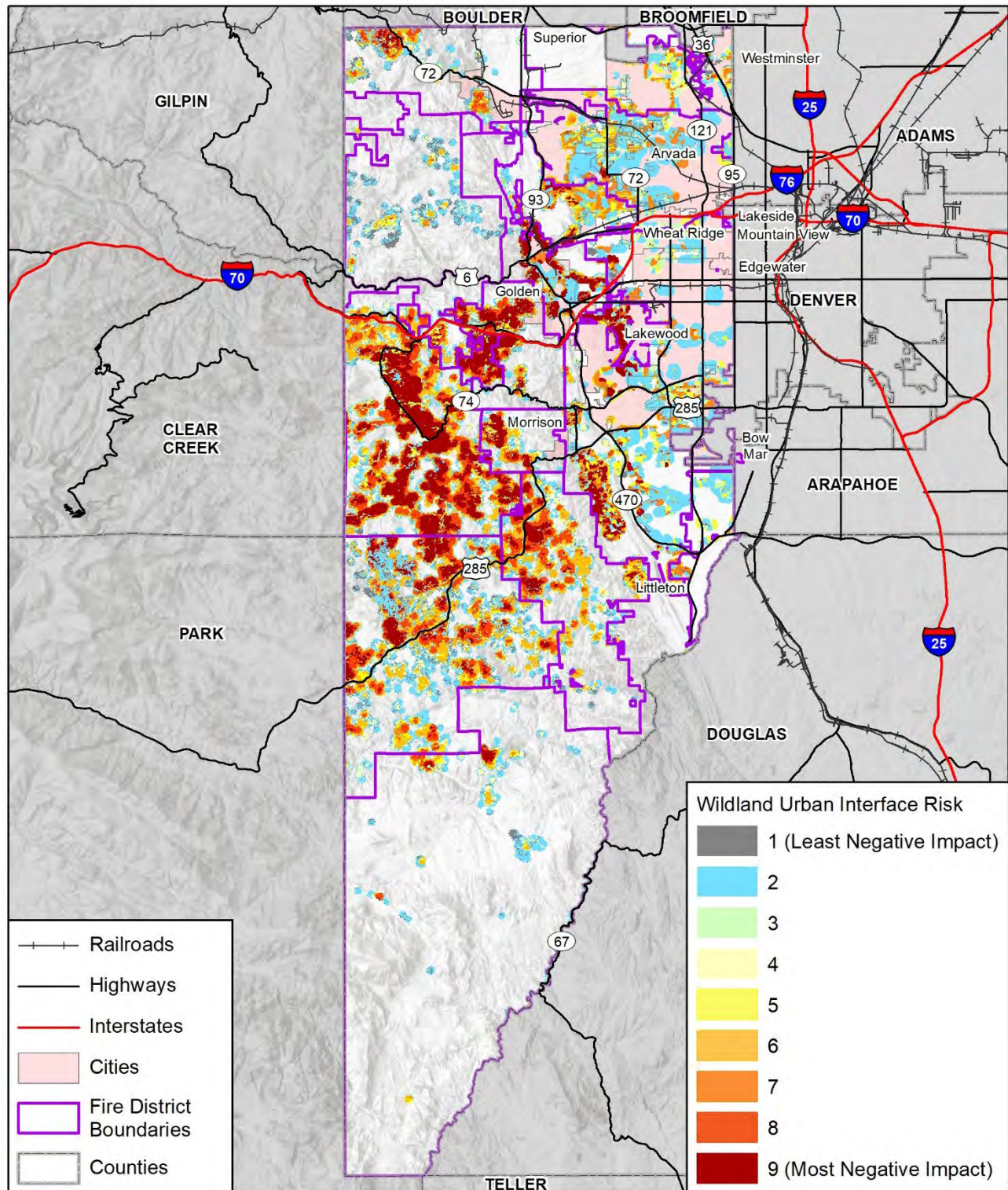


Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado State Forest Service CO-WRAP

0 5 10 Miles



Figure 4-50 Jefferson County WUI Communities and WUI Risk



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado Forest Atlas - Colorado State Forest Service

0 5 10 Miles



This map displays Fire District 1, outlined in purple, across a region including parts of Boulder, Broomfield, Adams, Arapahoe, Douglas, Teller, Clear Creek, and Gilpin counties. The map uses a color-coded fire intensity scale: Non-Burnable (white), Lowest Intensity (light green), Low (yellow), Moderate (orange), Moderate to High Intensity (dark orange), and Highest Intensity (red). Major highways (Interstates 70, 25, 76, 78, 67, 95, 36, 121, 93, 6, 74, 285, 470) and railroads are shown. Cities and towns within or near the district include Superior, Arvada, Wheat Ridge, Mountain View, Edgewater, Golden, Lakewood, Morrison, Littleton, and Bow Mar. The map also shows the boundaries of surrounding counties and the city of Denver.

Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
Colorado Forest Atlas - Colorado State Forest Service

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. The event of record for Jefferson County is the Hayman fire, which occurred in June and July of 2002. The event damaged 41,408 acres in the County, or about one fifth of the total acres burned. 600 buildings were destroyed, 5 wildland firefighters were killed (this was an indirect result of the wildfire, as the firefighters were from Oregon and were killed in a car accident near Grand Junction) and numerous people were evacuated or displaced due to the fire. At that time, the Hayman fire is the most expensive fire in Colorado history, and took more than three weeks to contain and is considered a nationally-significant WUI fire. Based on these factors, the magnitude severity rating for wildfire is considered **critical**.

Climate Change Considerations

Climate is a major determinant of wildfire through its control of weather, as well as through its interaction with fuel availability, fuel distribution and flammability at the global, regional and local levels. With hotter temperatures, drier soil and worsening drought conditions in the County, wildfires have the potential to become more extreme. Currently humans are the main cause of fire ignition globally, although lightning has been predominantly responsible for large fires in Jefferson County. Colorado and the Western United States have seen significant increases in forest area burned in recent years, and the risk of wildfires in the future are expected to increase due to a lengthening fire season and drier conditions. According to a report from the International Panel on Climate Change:

Fire season has already lengthened by 18.7% globally between 1979 and 2013, with statistically significant increases across 25.3% but decreases only across 10.7% of Earth's land surface covered with vegetation; with even sharper changes being observed during the second half of this period. Correspondingly, the global area experiencing long fire weather season has increased by 3.1% per annum or 108.1% during 1979–2013. Fire frequencies under 2050 conditions are projected to increase by approximately 27% globally, relative to the 2000 levels, with changes in future fire meteorology playing the most important role in enhancing global wildfires, followed by land cover changes, lightning activities and land use, while changes in population density exhibit the opposite effects.

Land use, vegetation, available fuels, and weather conditions (including wind, low humidity, and lack of precipitation) are chief factors in determining the number and size of fires in Colorado each year. Generally, fires are more likely when vegetation is dry from a winter with little snow and/or a spring and summer with sparse rainfall. As a result, climate induced hazards in Colorado (specifically, a pattern of extended drought conditions) have contributed to increased concern about wildfire in Jefferson County.

The frequency, intensity, and duration of wildfires have increased across the Western United States since the 1980s. The US Department of Agriculture's "Effects of Climate Variability and Change on Forest Ecosystems" General Technical Report, published in December 2012, found that the Colorado region, among others, will face an even greater fire risk over time. The report expects Colorado to experience up to a five-fold increase in acres burned by 2050. The report's findings are consistent with previous studies on the relationship between climate change and fire risk. Colorado landscapes, including those that characterize Jefferson County, are expected to become hotter and drier as the planet warms, which in turn is expected to increase regional wildfire risk.

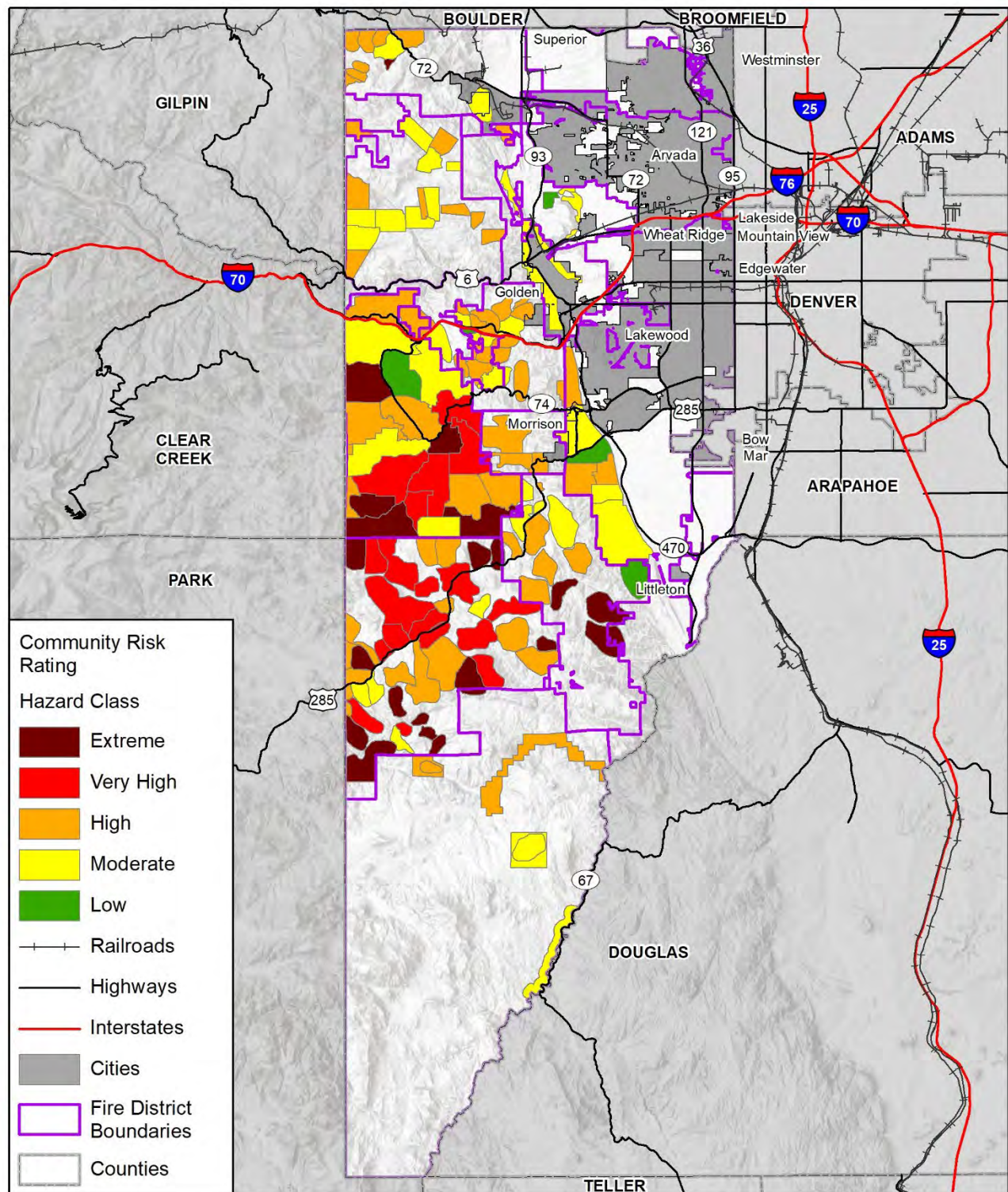
Vulnerability Assessment

Wildfire has the potential to cause widespread damage and loss of life in Jefferson County. The significance of this hazard and the availability of digital hazard data in GIS enables a more detailed vulnerability assessment than many hazards. Because the nature of the wildfire threat to the rural parts of the County is very different from the threat to the urban areas, two different analyses were conducted.

Wildfire threat and risk data was downloaded from the Colorado Forest Atlas (formerly COWRAP) and compared against Jefferson County parcel layer provided by the Assessor's Office. This provided a parcel level count of buildings, people, and critical facilities at risk in the incorporated municipalities and the unincorporated county as a whole.

A second analysis was conducted using Community Wildfire Protection Plan (CWPP) data to give a better picture of the varying wildfire risk in the unincorporated areas of the County.

Figure 4-52 Jefferson County WUI Communities and Hazard Classifications



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
2011 Jefferson County CWPP, 2021 Evergreen FPD CWPP,
Colorado State Forest Service

General Property

Jefferson County's parcel and associated assessor's data were used as the basis for the inventory of developed parcels. Parcels and their attributes, including building and contents value and occupancy type (i.e. residential, commercial, industrial) were compiled and intersected with the wildfire hazard zones defined by the Colorado Forest Atlas, from highest to lowest risk, as shown in Figure 4-49. An address point layer was used to estimate building locations. The results are displayed in Table 4-61 through 4-66.

Table 4-61 Properties at Highest Wildfire Risk

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Unincorporated	499	518	\$233,296,256	\$116,674,851	\$349,864,215	1,316
Total	499	518	\$233,296,256	\$116,674,851	\$349,864,215	1,316

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table 4-62 Properties at High Wildfire Risk

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Arvada	349	350	\$156,009,447	\$78,438,745	\$234,448,192	863
Golden	16	16	\$14,685,895	\$11,878,165	\$26,564,060	27
Lakewood	31	32	\$9,570,885	\$4,795,243	\$14,366,128	70
Unincorporated	13,040	13,648	\$5,781,699,522	\$2,953,906,398	\$8,735,605,920	34,094
Total	13,436	14,046	\$5,961,965,749	\$3,049,018,551	\$9,010,984,300	35,054

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table 4-63 Properties at Moderate Wildfire Risk

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Arvada	2,674	2,721	\$1,166,995,414	\$594,702,219	\$1,761,697,633	6,726
Golden	81	82	\$71,051,900	\$53,043,803	\$124,095,703	152
Lakewood	511	516	\$313,914,377	\$157,025,189	\$470,939,566	1,167
Morrison	21	22	\$7,028,841	\$3,865,949	\$10,894,790	43
Unincorporated	6,465	6,521	\$2,942,059,910	\$1,561,373,799	\$4,503,433,709	16,629
Total	9,752	9,862	\$4,501,050,442	\$2,370,010,959	\$6,871,061,401	24,717

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table 4-64 Properties at Low Wildfire Risk

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Arvada	359	372	\$153,370,581	\$77,764,195	\$231,134,776	913
Golden	29	29	\$22,671,461	\$19,460,915	\$42,132,376	52
Lakewood	279	283	\$190,257,165	\$96,588,927	\$286,846,092	629
Morrison	2	2	\$179,353	\$89,677	\$269,030	4
Unincorporated	1,547	1,569	\$732,068,080	\$381,329,188	\$1,113,397,268	3,894
Total	2,216	2,255	\$1,098,546,640	\$575,232,900	\$1,673,779,540	5,491

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table 4-65 Properties at Lowest Wildfire Risk

Jurisdiction	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Arvada	1,976	2,107	\$1,166,279,560	\$637,000,048	\$1,803,279,608	5,052
Golden	259	264	\$358,763,100	\$285,661,344	\$644,424,444	526
Lakewood	1,202	1,272	\$816,577,558	\$431,585,331	\$1,248,162,889	2,788
Morrison	28	28	\$10,286,039	\$5,680,512	\$15,966,551	52
Wheat Ridge	580	658	\$240,475,070	\$123,662,864	\$364,137,934	1,376
Unincorporated	5,115	5,189	\$2,459,734,233	\$1,321,375,963	\$3,781,110,196	12,679
Total	9,160	9,518	\$5,052,115,560	\$2,804,966,061	\$7,857,081,621	22,472

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Based on this analysis, there are an estimated 35,063 parcels and 36,199 structures at risk of wildfire, with a combined total value exceeding \$25.7 billion. Roughly 40% of those are in high or highest risk areas. The greatest concentration of assets at risk are in the unincorporated County, followed by the Cities of Arvada and Lakewood.

The second analysis used the Wildland Urban Interface community layer to indicate where groups of structures define a 'community' in the WUI. These communities have hazard ratings assigned during the CWPP planning process, generally based on NFPA methodologies that evaluate hazard based on types of construction, fuels, topography, and community access/egress. For the WUI analysis in this section, hazard classifications for wildland-urban communities were referenced from the corresponding local CWPPs. In a few instances the hazard classification was modified during the County CWPP process, but based on discussion with the County Wildland Fire Coordinator the preference was to use the hazard classifications originally assigned (this included fire protection districts of: Coal Creek, Elk Creek, Evergreen, Fairmount, Foothills, Genesee, Golden, Golden Gate, Indian Hills, Inter-Canyon, North Fork and West Metro). The community boundaries and hazard classifications used in the analysis are shown above in Figure 4-52. It should be noted that there are large areas within a wildfire hazard area but not a designated WUI community. These areas include portions of northern Jefferson County generally west of Highways 93 and C470, as well as all of southern Jefferson County and generally coincide with the County's Wildfire Hazard Overlay District Zone. Development within these areas was assigned an 'unrated' hazard class.

Results were sorted by risk ranking (extreme to low), and then organized by Fire Protection District (FPD). Table 4-66 through Table 4-70 display the value of structures at risk including estimated contents values, and population estimates. Based on this analysis, there are an estimated 31,130 parcels and 32,755 structures at risk of wildfire, with a combined total value exceeding \$20 billion. Roughly 70% of those are in extreme, high or very high risk areas. The greatest concentration of assets at risk are in the unincorporated County, followed by the Cities of Arvada and Lakewood.

Table 4-66 Properties within Extreme Risk CWPP Communities

Fire Protection District	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Coal Creek	35	36	\$6,984,756	\$3,492,378	\$10,477,134	92
Elk Creek	851	954	\$253,322,261	\$128,293,083	\$381,615,344	2,407
Evergreen	1,193	1,275	\$439,340,082	\$226,724,346	\$666,064,428	3,114
Inter-Canyon	148	152	\$57,079,102	\$28,566,580	\$85,645,682	383
Total	2,227	2,417	\$756,726,201	\$387,076,386	\$1,143,802,587	5,995

Source: Jefferson County Assessor's Office data and CWPPs

Table 4-67 Properties within Very High Risk CWPP Communities

Fire Protection District	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Elk Creek	2,851	2,977	\$1,099,942,690	\$578,757,220	\$1,678,699,910	7,364
Evergreen	2,195	2,354	\$835,022,339	\$429,765,139	\$1,264,787,478	5,822
Inter-Canyon	5,050	5,335	\$1,936,605,396	\$1,009,342,542	\$2,945,947,938	13,196
Total	10,096	10,666	\$3,871,570,425	\$2,017,864,900	\$5,889,435,325	26,382

Source: Jefferson County Assessor's Office data and CWPPs

Table 4-68 Properties within High Risk CWPP Communities

Fire Protection District	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Coal Creek	523	532	\$188,756,665	\$95,472,261	\$284,228,926	1,344
Elk Creek	1,097	1,135	\$402,446,646	\$209,155,550	\$611,602,196	2,731
Evergreen	3,108	3,300	\$1,330,684,459	\$715,828,362	\$2,046,512,821	7,324
Fairmount	14	14	\$6,894,984	\$3,463,620	\$10,358,604	33
Foothills	1,326	1,483	\$639,581,059	\$324,189,473	\$963,770,532	3,613
Genesee	647	648	\$324,913,152	\$162,533,987	\$487,447,139	1,645
Golden Gate	113	114	\$50,755,564	\$25,442,279	\$76,197,843	286
Indian Hills	664	736	\$237,385,751	\$124,552,947	\$361,938,698	1,826
Inter-Canyon	844	855	\$330,938,271	\$166,230,391	\$497,168,662	2,168
North Fork	316	408	\$59,282,700	\$30,211,630	\$89,494,330	1,012
West Metro	629	641	\$361,778,887	\$182,315,079	\$544,093,966	1,601
Total	9,281	9,866	3,933,418,138	\$2,039,395,577	\$5,972,813,715	23,582

Source: Jefferson County Assessor's Office data and CWPPs

Table 4-69 Properties within Moderate Risk CWPP Communities

Fire Protection District	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Coal Creek	369	374	\$129,299,391	\$65,854,900	\$195,154,291	928
Elk Creek	355	359	\$158,691,279	\$82,041,126	\$240,732,405	910
Evergreen	1,438	1,480	\$789,530,450	\$427,564,065	\$1,217,094,515	3,471
Fairmount	482	487	\$215,725,102	\$107,974,617	\$323,699,719	1,232
Foothills	374	403	\$235,286,893	\$119,116,484	\$354,403,377	992
Genesee	568	583	\$274,662,080	\$138,270,848	\$412,932,928	1,479
Golden	2,426	2,487	\$1,172,661,501	\$651,736,176	\$1,824,397,677	5,893
Golden Gate	191	196	\$90,574,892	\$45,318,795	\$135,893,687	492
Inter-Canyon	309	312	\$181,836,597	\$90,943,807	\$272,780,404	793
North Fork	84	112	\$27,096,774	\$13,842,312	\$40,939,086	281
West Metro	2,244	2,296	\$1,149,732,885	\$605,660,241	\$1,755,393,126	5,704
Total	8,840	9,089	\$4,425,097,844	\$2,348,323,368	\$6,773,421,212	22,175

Source: Jefferson County Assessor's Office data and CWPPs

Table 4-70 Properties within Low Risk CWPP Communities

Fire Protection District	Improved Parcels	Building Count	Improved Value	Content Value	Total Value	Population
Evergreen	1,506	1,548	\$805,909,137	\$435,132,407	\$1,241,041,544	3,710
Fairmount	334	335	\$148,320,246	\$74,328,744	\$222,648,990	852
Genesee	23	34	\$20,760,905	\$20,760,905	\$41,521,810	-
Inter-Canyon	140	142	\$89,126,810	\$44,563,405	\$133,690,215	362
West Metro	546	575	\$328,925,720	\$165,115,578	\$494,041,298	1,441
Total	686	717	\$418,052,530	\$209,678,983	\$627,731,513	6,365

Source: Jefferson County Assessor's Office data and CWPPs

People

Populations living in areas at risk of wildfire are shown in the above tables, and summarized by municipality in Table 4-71 and by fire protection district in Table 4-72. Population was estimated by applying American Community Survey estimated average household size by jurisdiction to the count of residential structures within the WUI hazard class zone.

While the two methodologies understandably yield slightly different results, they both estimate that 84,000 to 89,000 Jefferson County residents live in areas at risk of wildfire. This equates to roughly 15% of the County's population. This represents a significant increase since the 2016 Plan, which identified 55,230 people at risk; however, this increase may be due largely to changes in methodology.

Table 4-71 Population At-Risk to Wildfire

Jurisdiction	Lowest	Low	Moderate	High	Highest	Total
Arvada	5,052	913	6,726	863	-	13,553
Golden	526	52	152	27	-	757
Lakewood	2,788	629	1,167	70	-	4,653
Morrison	52	4	43	-	-	99
Wheat Ridge	1,376	-	-	-	-	1,376
Unincorporated	12,679	3,894	16,629	34,094	1,316	68,611
Total	22,472	5,491	24,717	35,054	1,316	89,050

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table 4-72 Population At-Risk within the CWPP Communities by Fire Protection District

Fire Protection District	Low	Moderate	High	Very High	Extreme	Total
Coal Creek	-	928	1,344	-	92	2,364
Elk Creek	-	910	2,731	7,364	2,407	13,412
Evergreen	3,710	3,471	7,324	5,822	3,114	23,440
Fairmount	852	1,232	33	-	-	2,117
Foothills	-	992	3,613	-	-	4,605
Genesee	-	1,479	1,645	-	-	3,124
Golden	-	5,893	-	-	-	5,893
Golden Gate	-	492	286	-	-	778

Fire Protection District	Low	Moderate	High	Very High	Extreme	Total
Indian Hills	-	-	1,826	-	-	1,826
Inter-Canyon	362	793	2,168	13,196	383	16,902
North Fork	-	281	1,012	-	-	1,293
West Metro	1,441	5,704	1,601	-	-	8,747
Total	6,365	22,175	23,582	26,382	5,996	84,500

Source: Jefferson County Assessor's Office data and CWPP's

Critical Facilities and Infrastructure

To estimate the potential impact of wildfires on critical facilities, the list of facilities identified in Section 4.2 was compared to the wildfire risk layers developed above. The results are shown in Table 4-73 and Table 4-74. All told, 696 critical facilities are located in areas at risk of wildfire, representing 30% of the County's critical facilities. The number at high or highest risk is 163 (7%). The lifeline category of assets with the most exposure is communications facilities; followed by energy; food, water & shelter; and hazardous materials.

Table 4-73 Critical Facilities Located in Fire Hazard Zones by Jurisdiction

Jurisdiction	Lowest	Low	Moderate	High	Highest	Total	%
Arvada	15	3	12	1	0	31	11%
Golden	14	2	5		0	21	14%
Lakewood	21	1	14		0	36	8%
Morrison	2	1	1	2	0	6	27%
Wheat Ridge	8	0	0		0	8	5%
Unincorporated	70	72	289	157	6	594	47%
Total	130	79	321	160	6	696	30%

Source: HIFLD and CERC

Table 4-74 Critical Facilities Located in Fire Hazard Zones by Lifeline Category

Lifeline	Lowest	Low	Moderate	High	Highest	Total	%
Communications	80	62	257	112	5	516	44%
Energy	1	3	8	0	0	12	27%
Food, Water, Shelter	0	1	3	3	0	7	20%
Hazardous Material	7	2	11	5	0	25	20%
Health and Medical	14	0	0	0	0	14	8%
Safety and Security	9	3	20	11	1	44	13%
Transportation	19	9	22	29	0	79	17%
TOTAL	130	80	321	160	6	697	30%

Source: HIFLD and CERC

Economy

In addition to the significant direct costs listed above, fires can extensively impact the economy of an affected area, including agricultural, recreation and tourism industries, and water resources. Businesses in affected areas can be impacted due to evacuation, lack of utility service, or through destruction of property.

Historical, Cultural, and Natural Resources

Wildfire is a consistent threat to natural resources in the County, particularly the county's parks and forests. Fire is a natural part of forest growth cycles but can also cause cascading threats to natural resources. After wildfires, the risk of floods and debris flows increases due to the exposure of bare ground and the loss of vegetation. Secondary effects of wildfires also include erosion, landslides, introduction of invasive species, and changes in water quality. It should be noted that many of the historic and cultural resources mentioned in Table 4-9 are located in wildfire hazard areas.

Future Development

Growth in the wildland urban interface has been significant in the past 25 years in Jefferson County. Despite the known risks, these areas continue to be seen as desirable to a great many people. An analysis of the Year Built field in County Assessor's Office data shows that from 2015 through 2020, 6,237 new structures have been built in wildfire risk areas, including 604 in areas at high or highest risk. This shows that development of primary and secondary residences in wildfire hazard areas continues. Wildfire risk to future development in these areas is tempered by the County's land use regulations. However, lots created prior to the adoption of those regulations can still be built upon.

West Metro Fire cited concerns about growth and development occurring both within and outside of the wildland/urban interface, increasing wildfire vulnerability in those areas.

Arvada Fire Protection District cited concerns about growth on the western edge of their jurisdiction in areas that are prone to high winds and have large open areas of vegetation. If fires begin in these areas, they are highly likely to spread directly towards these developments.

The County has adopted sections of the WUI code, to include fire resistive construction requirements, mitigation standards, and road & driveway standards. However, the fire protection water supply and fire sprinkler requirements sections of the WUI Code have not been adopted. The County might wish to review the WUI code in conjunction with wildland representatives to identify additional provisions it might be beneficial to adopt. The Future Avoided Cost Explorer (FACE) developed by the Colorado Water Conservation Board provides an in-depth look at the potential economic impacts and expected annual damages from future flood, drought and wildfire events. The tool looks at three different climate scenarios (current climate conditions, 2050 future – moderately warmer climate and 2050 – severely warmer climate) as well as compares current population to low, medium and high growth population scenarios.

Table 4-75 compares the estimated annual damages for Jefferson County due to wildfires for each of the climate and population scenarios. The tool estimates current losses of \$32M annually, or \$50/person, the highest in the State. Under current climate conditions, this is anticipated to increase to \$32-\$33M annually based on population growth; an increasingly warmer climate could increase that to \$53-\$54 M annually.

Table 4-75 Potential Future Economic Losses from Wildfires in Jefferson County

Climate Scenarios	Population Scenarios		
	Low Growth (~653,000)	Medium Growth (~695,000)	High Growth (~740,000)
Current Conditions	Total damages: \$32 M	Total damages: \$33 M	Total damages: \$33 M
	Total damages per person: less than \$50	Total damages per person: less than \$50	Total damages per person: less than \$40
Moderate-Severely Warmer Climate by 2050	Total damages: \$53 M	Total damages: \$53-\$54 M	Total damages: \$53-\$54 M
	Total damages per person: less than \$80	Total damages per person: less than \$80	Total damages per person: less than \$70

Source: Colorado Water Conservation Board (CWCB) Future Avoided Cost Explorer: Hazards <https://cwcb.colorado.gov/FACE>

Overall Hazard Significance

Wildfires in Jefferson County are a significant concern. The geographic extent of the hazard is considered **significant**. The probability of future occurrences is considered **likely**, and the magnitude/severity for the event of record is **critical**. In addition, the HMPC considers the hazard to have a **high** impact on the County. This equates to an overall impact rating of **high**.

4.3.17 Windstorm

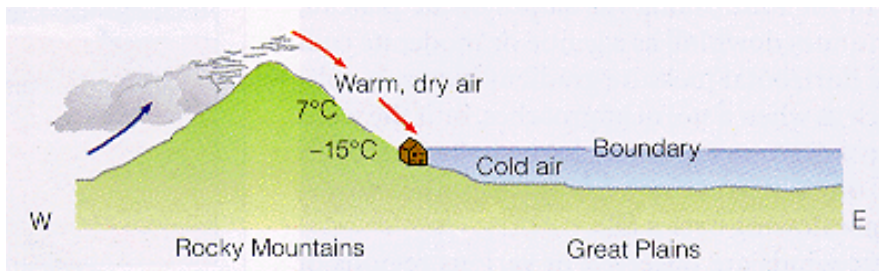
Description

High winds can occur year-round in Jefferson County. In the spring and summer, high winds often accompany severe thunderstorms. Damaging winds are typically those which exceed 60 mph. There are seven types of damaging winds:

- **Straight-line winds**—Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdrafts**—A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts**—A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts**—A small, concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front**—A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho**—A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word “derecho” is of Spanish origin and means “straight ahead.” Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo**—A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

Straight-line winds may exacerbate existing weather conditions, such as blizzards, by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snowstorms. High winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel, such as tumbleweeds, around the region, and increasing the ferocity of existing fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris. Shorter duration winds, such as wind gusts, can cause substantial damage to power lines. Winds with an intermediate duration, which sharply increase and last for a minute, are called squalls. Long-duration wind speeds have various names associated with their average strength, such as breeze, gale, storm, hurricane, and typhoon.

Downslope winds in Colorado are referred to as Chinook winds, after the Native American tribe of the Pacific Northwest. As shown in Figure 4-53, these downslope winds can occur with violent intensity in areas where mountains stand in the path of strong air currents. These warm and dry winds occur when the winds from the west blow across the Continental Divide and descend from the foothills and out onto the plains.

Figure 4-53 Chinook Wind Pattern

Source: University of Colorado at Boulder ATOC Weather Lab

Wind can be very dangerous. Areas of wind shear, caused by various weather phenomena, can make treacherous situations for airplanes and other flying aircraft. When winds become too strong on the ground, boats can capsize, trees can be stripped of their branches or uprooted, and man-made structures become vulnerable to damage or destruction. The NWS can issue High Wind Watch, High Wind Warning, and Wind Advisory to the public. The following are the definitions of these issuances:

- **High Wind Watch**—This is issued when there is the potential of high wind speeds developing that may pose a hazard or are life-threatening.
- **High Wind Warning**—The 1-minute surface winds of 35 knots (40 mph) or greater lasting for one hour or longer, or winds gusting to 50 knots (58 mph) or greater, regardless of duration, that are either expected or observed over land.
- **High Wind Advisory**—This is issued when high wind speeds may pose a hazard. Sustained winds 25 to 39 mph and/or gusts to 57 mph.

Jefferson County wind patterns range from light and breezy to severe gale force winds. There is usually some level of a constant breeze due to Jefferson County's mountainous, Front Range, and plains topography.

Geographic Extent

The entire planning area is susceptible to wind, windstorms, and wind associated with other storm systems that can have negative impacts on a community. Depending on the origination of the atmospheric system, its direction of travel, and its duration, a part of the planning area can be affected or the entire County. Figure 4-54 depicts wind zones for the United States. The map shows that the majority of the County falls into Zone II which is characterized by high winds of 160 mph. Typically, however, the hazard is predicted to affect between 50% and 75% of the planning area. Based on this information, the geographic extent rating for windstorms is **significant**.

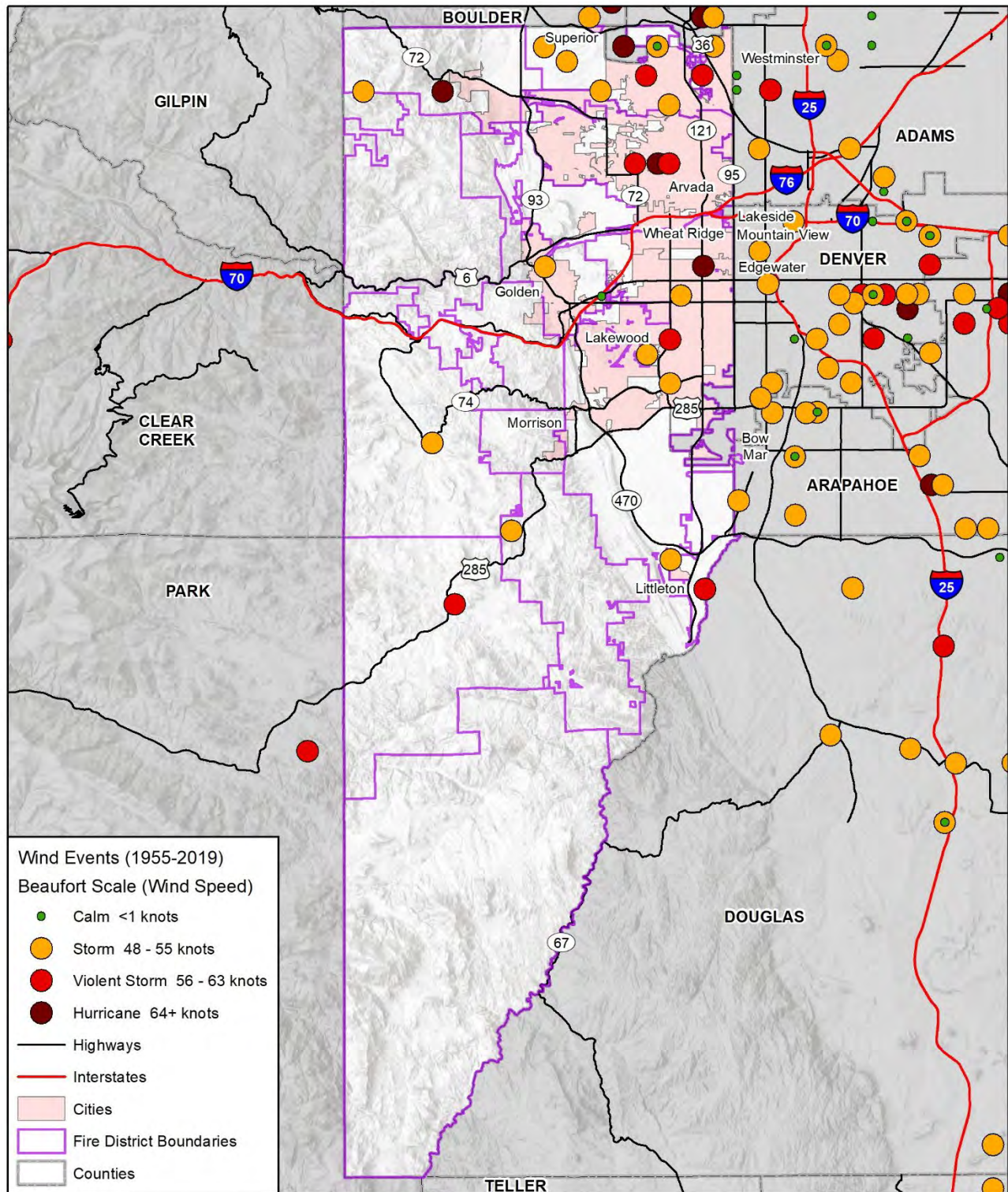
Figure 4-54 Wind Zones in the United States



Previous Occurrences

High winds associated with other severe weather and stand-alone windstorms are common occurrences in Jefferson County. The mountainous terrain and foothills topography lends itself to regular conflicts between systems of high and low pressure. Most of Colorado's most costly storms are hail-related and occurred in the Denver-metro area. Hail is usually accompanied by high winds; however the damages are not broken out to distinguish hail from wind damage. Figure 4-55 below shows recorded high wind events in Jefferson County between 1955 and 2019.

Figure 4-55 Jefferson County High Wind Events 1955-2019



Map compiled 4/2021;
intended for planning purposes only.
Data Source: Jefferson County, CDOT,
NOAA, National Weather Services SVRGIS 2019

The NCEI database recorded 184 separate High Wind events between January of 2000 and December of 2020 with wind speeds over 50 knots (approximately 57 mph). The most significant of those events are recorded below.

June 14, 1976 – 78 mph winds recorded at the Jefferson County Airport near Broomfield, 66 mph at Littleton.

June 6, 1983 – Report of a thunderstorm with associated winds measured at 61 knots (70 mph).

August 15, 1982 – Report of a thunderstorm with associated winds measured at 61 knots (70 mph).

August 13, 1983 – Report of a thunderstorm with associated winds measured at 84 knots (97 mph).

June 9, 1987 – Report of a thunderstorm with associated winds measured at 63 knots (73 mph). One death reported.

April 19, 1989 – Report of a thunderstorm with associated winds measured at 68 knots (78mph).

May 16, 1990 – Report of a thunderstorm with associated winds measured at 60 knots (69 mph).

May 26, 1993 – Report of a thunderstorm with associated winds measured at 70 knots (81mph).

October 26, 1995 – Report of a thunderstorm associated winds measured at 61 knots in Coal Creek Canyon (70 mph).

June 22, 1997 – Report of a dry microburst which produced 69 mph winds at the Jefferson County Airport.

June 10, 2000 – Report of a dry microburst which produced 67 mph winds at the Jefferson County Airport.

July 30, 2004 – Report of a thunderstorm associated winds measured at 62 knots (71 mph) in Evergreen.

July 20, 2009 – Golf ball-sized hail and strong winds battered roofs, uprooted trees and pounded vehicles in Wheat Ridge, Lakewood, and Arvada, and portions of neighboring Arapahoe County. The insured losses are totaled at more than \$767.6 million in damage for Colorado's 2009 severe weather season as of August 2009.

November 12, 2011 – Hurricane force winds up to 115 mph downed trees and power lines across the Front Range Mountains and foothills. The event resulted in 4 reported injuries and several thousand residential power outages.

April 17, 2018 – A powerful damaging wind event with gusts ranging from 60 to 90 mph. Approximately 64,000 Xcel Energy customers experienced some type of outage. One woman died as a result of the event after being struck in the head by a falling tree branch.

February 10, 2020 – Strong winds blew down power lines and power poles in the Town of Morrison. No property damage was reported, but downed power lines caused several power outages that forced some school and business closures.

Probability of Future Occurrences

According to the NCEI, there have been 184 separate events with NCEI-recorded high winds above 57 mph (50 knots) in Jefferson County from January 2000 to December 2020. The methodology for calculating the probability of future occurrences is described in Section 4.3.1. This formula evaluates that the probability of a Windstorm occurring in any given year is 100%.

This corresponds to a probability of future occurrences rating of **highly likely**.

Magnitude and Severity

Damage from windstorms can be difficult to quantify. Wind, by itself, has not historically caused high insured dollar losses. For the insurance industry to track a weather event, it must be a large enough storm that insurance companies may declare it a catastrophe, and then damage estimates for auto and homeowner claims are collected and published. This generally equates to damages in excess of \$25

million, though significant events impacting small communities are also tracked occasionally. Figure 4-56 demonstrates how destructive wind can be.

Figure 4-56 July 20, 2009 Damage in Wheat Ridge



Source: Fox News Online Photo Gallery

Table 4-76 shows The Beaufort Wind Scale. The replication of the scale only reflects land-based effects.

Table 4-76 The Beaufort Wind Scale

Beaufort Number	Description	Windspeed (Knots)	Land Conditions
0	Calm	<1	Calm. Smoke rises vertically.
1	Light air	1 – 3	Wind motion visible in smoke.
2	Light breeze	4 – 6	Wind felt on exposed skin. Leaves rustle.
3	Gentle breeze	7 – 10	Leaves and smaller twigs in constant motion.
4	Moderate breeze	11 – 16	Dust and loose paper raised. Small branches begin to move.
5	Fresh breeze	17 – 21	Branches of a moderate size move. Small trees begin to sway.
6	Strong breeze	22 – 27	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic garbage cans tip over.
7	Near Gale	28 – 33	Whole trees in motion. Effort needed to walk against the wind.
8	Gale	34 – 40	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.
9	Strong gale	41 – 47	Slight structural damage occurs; slate blows off roofs
10	Storm	48 – 55	Seldom experienced on land; trees uprooted or broken; considerable structural damage
11	Violent storm	56-63	
12	Hurricane	64+	

Source: National Oceanographic and Atmospheric Association

Table 4-77 and Table 4-78 show typical levels of damage that can be expected based on windspeed.

Table 4-77 Damage to Institutional Buildings from High Wind

Damage Description	Wind Speed Range (Expected Speed)
Threshold of visible damage	59-88 MPH (72 MPH)
Loss of roof covering (<20%)	72-109 MPH (86 MPH)

Damage Description	Wind Speed Range (Expected Speed)
Damage to penthouse roof & walls, loss of rooftop HVAC equipment	75-111 MPH (92 MPH)
Broken glass in windows or doors	78-115 MPH (95 MPH)
Uplift of lightweight roof deck & insulation, significant loss of roofing material (>20%)	95-136 MPH (114 MPH)
Façade components torn from structure	97-140 MPH (118 MPH)
Damage to curtain walls or other wall cladding	110-152 MPH (131 MPH)
Uplift of pre-cast concrete roof slabs	119-163 MPH (142 MPH)
Uplift of metal deck with concrete fill slab	118-170 MPH (146 MPH)
Collapse of some top building envelope	127-172 MPH (148 MPH)
Significant damage to building envelope	178-268 MPH (210 MPH)

Source: National Oceanographic and Atmospheric Association

Table 4-78 Damage to Electric Transmission Lines from High Wind

Damage Description	Wind Speed Range (Expected Speed)
Threshold of visible damage	70-98 MPH (83 MPH)
Broken wood cross member	80-114 MPH (99 MPH)
Wood poles leaning	85-130 MPH (108 MPH)
Broken wood poles	98-142 MPH (118 MPH)

Source: National Oceanographic and Atmospheric Association

Information from the event of record is used to calculate a magnitude and severity rating for comparison with other hazards, and to assist in assessing the overall impact of the hazard on the planning area. In some cases, the event of record represents an anticipated worst-case scenario, and in others, it is a reflection of common occurrence. The significant wind and windstorm events of record for Jefferson County are identified in the Previous Occurrences section of the windstorm hazard profile. Wind damage is usually identified by the number of insurance claims made as a result of a severe weather event. Wind is not broken out from a hailstorm, rainstorm, or a tornado. The damages inflicted on critical facilities and services (critical infrastructure) for Jefferson County are not specific to windstorm activity alone.

Based on these factors, the magnitude severity ratings for windstorm in Jefferson County would be **negligible**; however, if the windstorm is considered a component of the larger weather system its magnitude and severity rating would be upgraded to **limited**.

Climate Change Considerations

According to the best data available at the time of this plan update, the future impacts of climate induced severe wind events are unclear.

Vulnerability Assessment

It can be assumed that the entire planning area is exposed to some extent to high wind events. Certain areas are more exposed due to geographic location and local weather patterns. Populations living at higher elevations with large stands of trees or power lines may be more susceptible to wind damage and black out. It is not uncommon for residents living in more remote areas of the county to be isolated after such events.

General Property

All property is vulnerable during high wind events, but properties in poor condition or in particularly vulnerable locations may risk the most damage. Generally, damage is minimal and goes unreported. Property located at higher elevations and on ridges may be more prone to wind damage. Property located under or near overhead lines or near large trees may be damaged in the event of a collapse. Wind

pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift and suction forces that act to pull building components and surfaces outward. The effects of winds are magnified in the upper levels of multi-story structures. As positive and negative forces impact the building's protective envelope (doors, windows, and walls), the result can be roof or building component failures and considerable structural damage.

People

Windstorms can cause injury and death in Jefferson County. The highest risk demographic is to first responders who are dealing with emergency situations resulting from the windstorm. Those working or recreating outdoors will be susceptible to injury from wind borne debris. Winds can also be hazardous to hikers in areas of beetle or fire killed trees, which occurred when a hiker was killed by a falling tree in Rocky Mountain National Park in 2007.

Vulnerable populations also include the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life threatening to those dependent on electricity for life support. In Jefferson County, 11% of Medicare Beneficiaries rely on electricity to live independently in their homes. Isolation of these populations is a significant concern. These populations face isolation and exposure during wind events and could suffer more secondary effects of the hazard. Hikers and climbers in the area may also be more vulnerable to severe wind events.

Critical Facilities and Infrastructure

High winds can cause significant damage to trees and power lines, blocking roads with debris, incapacitating transportation, isolating population, and disrupting ingress and egress. Of particular concern are roads providing access to isolated areas and to the elderly. Severe windstorms and downed trees can create serious impacts on power and above-ground communication lines. Loss of electricity and phone connection would leave certain populations isolated because residents would be unable to call for assistance.

Economy

Economic impacts of severe wind are typically short term. These events can disrupt travel into and out of all areas of the county and create perilous conditions for residents, tourists, and nature alike.

The effect of high winds on power delivery is a relevant factor when assessing current development exposure. Xcel Energy provided data from one high wind event in 2009 when 2 days of high winds interrupted power for 67,128 customers. Xcel estimated it cost \$167,820 to repair the outage equating to a cost of roughly \$25,000 for every 10,000 customers impacted by high winds. FEMA Standard Values for Loss of Service for Utilities, located in Appendix C of the FEMA BCA Reference Guide, estimates that a power supply interruption costs the average person \$126 per day of service outage. By this estimate, this event caused \$16,916,256 in economic impacts or \$8,458,128 per day of service interruption due to high winds.

Historical, Cultural, and Natural Resources

The environment is highly exposed to high winds. Environmental impacts include the downing of trees and localized flattening of plants by high wind. Natural habitats such as streams and trees risk major damage and destruction.

Future Development

Construction sites are particularly vulnerable to windstorms. Wind-borne construction materials can become hazards to life and property. New construction designed in accordance with the Jefferson County wind load map should be able to withstand or at least resist wind damage if properly constructed. Backup power systems in critical facilities could help mitigate impacts from power outages associated with windstorms.

The ongoing development along State Highway 93 is in a region of the County that is very vulnerable to high winds. Construction sites, both residential and transportation related (the Jefferson Parkway, a multi-

lane arterial planned to connect Highway 93 to Highway 36 through Arvada) could be at risk of wind borne construction materials.

Overall Hazard Significance

Windstorms in Jefferson County can have a particular impact on the planning area. Alone they can rip roofs from houses, collapse fences, tear off siding, project flying debris through windows, and uproot large trees. When accompanying other severe weather, like hail, damages are compounded. The geographic extent of the hazard is considered **significant**. The probability of future occurrences is considered **highly likely** and the magnitude/severity for the event of record is **limited**. The HMPC considers the hazard to have an overall impact rating of **medium** on Jefferson County. Overall, the data indicates that the overall hazard significance rating is **medium**.

4.3.18 Cyber Attack

Description

The 2018 Colorado State Hazard Mitigation Plan defines cyber attacks as “deliberate exploitation of computer systems, technology-dependent enterprises, and networks.” Cyber-attacks use malicious code to alter computer operations or data. The vulnerability of computer systems to attacks is a growing concern as people and institutions become more dependent upon networked technologies. The Federal Bureau of Investigation (FBI) reports that, “cyber intrusions are becoming more commonplace, more dangerous, and more sophisticated,” with implications for private- and public-sector networks. Cyber threats can take many forms, including:

Phishing attacks: Phishing attacks are fraudulent communications that appear to come from legitimate sources. Phishing attacks typically come through email but may come through text messages as well. Phishing may also be considered a type of social engineering meant to exploit employees into paying fake invoices, providing passwords, or sending sensitive information.

Malware attacks: Malware is malicious code that may infect a computer system. Malware typically gains a foothold when a user visits an unsafe site, downloads untrusted software, or may be downloaded in conjunction with a phishing attack. Malware can remain undetected for years and spread across an entire network.

Ransomware: Ransomware typically blocks access to a jurisdiction's/agency's/ business' data by encrypting it. Perpetrators will ask for a ransom to provide the security key and decrypt the data, although many ransomware victims never get their data back even after paying the ransom.

Distributed Denial of Service (DDoS) attack: Perhaps the most common type of cyber attack, a DDoS attack seeks to overwhelm a network and causes it to either be inaccessible or shut down. A DDoS typically uses other infected systems and internet connected devices to “request” information from a specific network or server that is not configured or powerful enough to handle the traffic.

Data breach: Hackers gaining access to large amounts of personal, sensitive, or confidential information has become increasingly common in recent years. In addition to networked systems, data breaches can occur due to the mishandling of external drives.

Critical Infrastructure/SCADA System attack: There have been recent critical infrastructure Supervisory Control and Data Acquisition (SCADA) system attacks aimed at taking down lifelines such as power plants and wastewater facilities. These attacks typically combine a form of phishing, malware, or other social engineering mechanisms to gain access to the system.

The 2018 Colorado State Hazard Mitigation Plan concludes: “This is a newly developing threat, so as more resources are devoted to countering the hazard, the risk of a disruption would hopefully decrease. Mitigation opportunities for this hazard include continued diligence of the state's Office of Information Technology (OIT), as well as for other government and private sector entities to continue to monitor, block, and report cyber-attacks, and continually assess the vulnerability of systems.”

Geographic Extent

Cyber-attacks can and have occurred in every location regardless of geography, demographics, and security posture. Incidents may involve a single location or multiple geographic areas. A disruption can have far-reaching effects beyond the location of the targeted system; disruptions that occur far outside the state can still impact people, businesses, and institutions within the county. All the populated areas of Jefferson County are potentially susceptible to cyber-attacks, making the geographic extent **significant**.

Previous Occurrences

The cybersecurity firm Verizon DBIR reports there were a total of 3,950 data breaches worldwide in 2020, including 346 public sector systems. The number of breaches has continued to increase, and the average number of identities stolen has increased to almost one million per incident.

The Privacy Rights Clearinghouse, a nonprofit organization based in San Diego, maintains a timeline of 9,741 data breaches resulting from computer hacking incidents in the United States from 2005-2019. The database lists 47 data breaches against systems located in Colorado, totaling over 400,000 impacted

records; it is difficult to know how many of those affected Jefferson County residents. Attacks happening outside of the state can also impact local businesses, personally identifiable information, and credit card information. Table 4-79 shows several of the more significant cyber attacks in Colorado in recent years.

Table 4-79 Major Cyber Attacks Impacting Colorado, 2005-2020

Date Reported	Target	Total Records	Description
July 21, 2005	University of Colorado, Boulder	49,000	Data exposure/ personal identifiable information
August 2, 2005	University of Colorado, Denver	36,000	Data exposure/ personal identifiable information
July 17, 2007	Western Union, Greenwood Village	20,000	Credit card breach
April 22, 2014	Centura Health, Englewood	12,286	Health information breach
July 3, 2017	PVHS-ICM Employee Health and Wellness, Fort Collins	10,143	Data exposure/health information
February 2018	Colorado Department of Transportation (CDOT)	N/A	Data encryption/ ransomware
February 2019	Fort Collins Loveland Water District	Unknown	Ransomware
August 2019	Regis University	N/A	DDoS
Fall 2019	Town of Erie	N/A	Hacked email account led to \$1 million being wired to a falsified contractor's account.
November 2019	Archuleta County	N/A	Ransomware
December, 2019	Southeast Metro Storm Water Authority (SEMSWA)	N/A	Ransomware
December 2019	Aurora Water	2% of customers	Data Breach
April 2020	Rangely District Hospital	N/A	Ransomware
June 2020	Children's Hospital Colorado	2,553	Data Breach
June 2020	Colorado Information Analysis Center (CIAC)	Unknown	Data Breach
July 2020	City of Lafayette	N/A	Ransomware

Source: Privacy Rights Clearinghouse, Colorado Sun

A 2017 study found ransomware payments over a two-year period totaled more than \$16 million. Even if a victim is perfectly prepared with full offline data backups, recovery from a sophisticated ransomware attack typically costs far more than the demanded ransom. However, according to a 2016 study by Kaspersky Lab, roughly one in five ransomware victims who pay their attackers never recover their data.

Recent years have seen a major increase in ransomware attacks, particularly against local government systems, and Colorado has been no exception. In February 2018, Colorado Department of Transportation

computers were hit by ransomware; the State refused to pay the ransom and spent \$1.7 million to contain and recover lost data. In November 2019, a ransomware attack on Archuleta County resulted in a 12-day outage and severe impact to its dispatch system; attackers demanded \$300,000. Rangely District Hospital in Rangely, Colorado, fell victim to a ransomware attack that encrypted files that included patient health information in April of 2020; the hospital said it did not pay the ransom. In July 2020 the City of Lafayette had to shut down their computer network after a ransomware attack; the city reportedly paid the \$45,000 ransom.

Reports of successful attacks against SCADA systems are less common. In February 2021, a hacker gained system access to a water treatment plant in Oldsmar, Florida and increased the levels of sodium hydroxide to dangerous levels; however this change was immediately detected by plant staff and corrected.

A large, sophisticated malware attack, known as Olympic Destroyer, was launched against the 2018 Winter Olympics in PyeongChang, South Korea. The attack initially took down servers, email, Wi-Fi, and ticketing systems, which could have severely disrupted the games. Fortunately, the organizing committee had a robust cybersecurity group that was able to quickly restore most functions.

Probability of Future Occurrences

Small-scale cyber attacks such as DDoS attacks occur daily, but most have negligible impacts at the local or regional level. Data breaches are also extremely common, but again most have only minor impacts on government services.

Perhaps of greatest concern to Jefferson County are ransomware attacks, which are becoming increasingly common. It is difficult to predict the odds of Jefferson County being hit with a successful ransomware attack in any given year, but it is safe to say it is **likely** to be attacked in the coming years.

The possibility of a larger disruption affecting systems within the county is a constant threat, but it is difficult to quantify the exact probability due to such highly variable factors as the type of attack and intent of the attacker. Major attacks specifically targeting systems or infrastructure in the county cannot be ruled out.

Magnitude and Severity

There is no universally accepted scale to explain the severity of cyber-attacks. The strength of a DDoS attack is often explained in terms of a data transmission rate. One of the largest DDoS disruptions ever, the October 21, 2016 Dyn attack, peaked at 1.2 terabytes per second and impacted some of the internet's most popular sites to include Amazon, Netflix, PayPal, Twitter, and several news organizations.

Data breaches are often described in terms of the number of records or identities exposed. The largest data breach ever reported occurred in August 2013, when hackers gained access to all three billion Yahoo accounts. The hacking incidents associated with Colorado in the Privacy Rights Clearinghouse database are of a smaller scale, ranging from just 32 records to approximately 60,000, along with several cases in which an indeterminate number of records may have been stolen.

Ransomware attacks are often described in terms of the amount of ransom requested, or by the amount of time and money spent to recover from the attack. Increasingly, they can also be described in terms of services impacted, such as phone, email, websites, or even 911 services. One report from cybersecurity firm Emsisoft estimates the average successful ransomware attack costs \$81 million and can take 287 days to recover from. Overall the potential magnitude of a cyber attack can be seen as **limited** due to the lack of deaths and injuries, but the economic costs can be significant.

Climate Change Considerations

There are no known effects of climate induced impacts on human-caused hazards such as cyber attacks.

Vulnerability Assessment

The impact of a cyber-attack can vary depending on the type of attack and the intent of the malicious actor. Though a cyber disruption can have limited impacts within a system's own operations, it may cause cascading impacts.

People

Most cyber attacks do not cause injuries or fatalities, and impacts to the public are more likely to be financial losses and an inability to access systems such as public websites and permitting sites. Indirect impacts could include interruptions to traffic control systems or other infrastructure, which could result in casualties. More significantly, a ransomware attack or similar attack on a hospital or 911 system could have significant life safety impacts.

Data breaches and subsequent identity thefts can have huge impacts on the public. The Internet Crime Complaint Center (IC3) estimates that identity theft alone resulted in \$2.7 billion in losses to businesses and \$149 million in losses to individuals.

According to the Cyber & Infrastructure Security Agency (CISA), cyber risks to 9-1-1 systems can have “severe impacts, including loss of life or property; job disruption for affected network users; and financial costs for the misuse of data and subsequent resolution.” CISA also compiled a recent list of attacks on 9-1-1 systems including a DDoS in Arizona, unauthorized access with stolen credentials in Canada, a network outage in New York, and a ransomware attack in Baltimore.

General Property

The vast majority of cyber attacks affect only data and computer systems and have minimal impact on general property.

Critical Facilities and Infrastructure

While the vast majority of cyber attacks affect only data and computer systems, sophisticated attacks against utilities and infrastructure sites have occurred. Such attacks typically target the Supervisory Control and Data Acquisition (SCADA) systems of critical infrastructure, which can potentially result in system failures on a scale equal with natural disasters. Facilities and infrastructure, such as the electrical grid, could become unusable as a result of a cyber attack. A cyber attack took down the power grid in Ukraine in 2015, leaving over 230,000 people without power. Agencies that rely on electronic backup of critical files are vulnerable.

The delivery of services can be impacted since governments rely to a great extent upon electronic delivery of services. Most agencies rely on server backups, electronic backups, and remote options for Continuity of Operations/Continuity of Government. Some departments in the participating jurisdictions have the option to move to a paper method including permitting, DMV services, payments to and from the county, and payroll. However, access to documents on the network, OneDrive access, and other operations that require collaboration across the county will be significantly impacted.

Loss of government servers due to a cyber attack could affect the ability of responders to do their jobs. Cyber-attacks can interfere with emergency response communications, access to mobile data terminals, and access to critical preplans and response documents.

The delivery of services can be impacted since governments rely, to a great extent, upon electronic delivery of services. An attack could raise questions regarding the security of using electronic systems for government services.

Jefferson County Business Innovation & Technology recommends the following free actions be adopted by all participating jurisdictions, many of which have done so:

- Sign up for the MS-ISAC. <https://learn.cisecurity.org/ms-isac-registration>
- Sign up for CTIS <https://www.anomali.com/learn/isacs/ctis>
- Sign up for the DHS CISA external vulnerability scanning. Email vulnerability@cisa.dhs.gov and ncats@hq.dhs.gov
- Sign up and configure MDBR, unless an alternative solution exists. <https://www.cisecurity.org/ms-isac/services/mdbr/>
- Join the Jeffco Monthly IT meetings.
- Annually complete the NCSR. <https://www.cisecurity.org/ms-isac/services/ncsr/>

Economy

Economic impacts from a cyber attack can be debilitating. The cyber attack in 2018 that took down the City of Atlanta cost at least \$2.5 million in contractor costs and an estimated \$9.5 million additional funds to bring everything back online. The attack in Atlanta took “more than a third of the 424 software programs offline” and recovery lasted more than 6 months. The 2018 cyber attack on the Colorado Department of Transportation (CDOT) cost an estimated \$1.5 million. None of these statistics take into account the economic losses to businesses and ongoing IT configuration to mitigate from a future cyber-attack. In all, the FBI’s Internet Crime Complaint Center (IC3) reports that cybercrime have caused \$10.2B in losses from 2015-2019; 2019 alone saw \$3.5 billion in economic losses, including \$65 million in Colorado.

Historical, Cultural, and Natural Resources

The vast majority of cyber incidents have little to no impact on historic, cultural or natural resources. A major cyber terrorism attack could potentially impact the environment by triggering a release of a hazardous materials, or by causing an accident involving hazardous materials by disrupting traffic-control devices.

Future Development

Changes in development have no impact to the threat, vulnerability, and consequences of a cyber attack. Cyber attacks can and have targeted small and large jurisdictions, multi-billion dollar companies, small mom-and-pop shops, and individual citizens. The decentralized nature of the internet and data centers means that the cyber threat is shared by all, regardless of new construction and changes in development.

Overall Hazard Significance

The geographic extent of the hazard is considered **significant**. The probability of future occurrences is considered likely and the magnitude/severity for the event of record is limited. The HMPC considers the hazard to have an overall impact rating of medium on Jefferson County.

4.3.19 Pandemic

Description

A pandemic can be defined as a public health emergency that attacks a large population across great geographic distances. Pandemics are larger than epidemics in terms of geographic area and number of people affected. Epidemics tend to occur seasonally and affect much smaller areas. Pandemics, on the other hand, are most often caused by new subtypes of viruses or bacteria for which humans have little or no natural resistance. Consequently, pandemics typically result in more deaths, social disruption, and economic loss than epidemics.

There are three conditions that must be met before a pandemic begins:

1. A new virus subtype must emerge that has not previously circulated in humans (and therefore there is no pre-existing immunity),
2. This new subtype must be able to cause disease in humans, and
3. The virus must be easily transmissible from human to human.

As of January 2021, Jefferson County, the nation, and the world are dealing with the COVID-19 pandemic, confirming that pandemic is a key public health hazard in the county. This hazard risk assessment includes an analysis of pandemic risk in Jefferson County and an analysis of the impacts of the hazards profiled in this plan on public health.

A pandemic has much greater potential for loss of life and significant social disruption due to higher rates of transmission and more severe health impacts. The COVID-19 virus has a much higher rate of transmission than the seasonal flu, primarily by airborne transmission of droplets/bodily fluid. Common symptoms include fever, cough, fatigue, shortness of breath or breathing difficulties, and loss of smell and taste. While most people have mild symptoms, some people develop acute respiratory distress syndrome with roughly one in five requiring hospitalization and a fatality rate of approximately 1%. A key challenge in containing the spread has been the fact that it can be transmitted by people who are asymptomatic.

Geographic Extent

Pandemics occur not only on a county or state level, but on a national and global scale. It is likely that most communities in Jefferson County would be affected, either directly or by secondary impacts. More highly-populated areas may be affected sooner and may experience higher infection rates.

The current COVID-19 pandemic has affected all 64 Colorado counties. Jefferson County has reported 33,961 cases and 707 deaths, as of January 25, 2021. All communities in the county are likely to be impacted, either directly or indirectly. Some indirect consequences may be the diversion of resources that may be otherwise available.

Previous Occurrences

Since the early 1900s, five lethal pandemics have swept the globe:

- **1918-1919 Spanish Flu:** The Spanish Flu was the most severe pandemic in recent history. The number of deaths was estimated to be 50-100 million worldwide and 675,000 in the United States. Its primary victims were mostly young, healthy adults. At one point, more than 10 percent of the American workforce was bedridden.
- **1957-1958 Asian Flu:** The 1957 Asian Flu pandemic killed 1-2 million people worldwide, including about 70,000 people in the United States, mostly the elderly and chronically ill. Fortunately, the virus was quickly identified, and vaccine production began in May 1957.
- **1968-1969 H3N2 Hong Kong Flu:** The 1968 Hong Kong Flu pandemic killed 34,000 Americans. Again, the elderly were more severely affected. This pandemic peaked during school holidays in December, limiting student-related infections, which may have kept the number of infections down. Also, people infected by the Asian Flu ten years earlier may have gained some resistance to the new virus.
- **2009-2010 H1N1 Swine Flu:** This influenza pandemic emerged from Mexico in early 2009 and was declared a public health emergency in the U.S. on April 26. By June, approximately 18,000 cases had been reported in the U.S. and the virus had spread to 74 countries. Most cases were fairly mild, with symptoms similar to the seasonal flu, but there were cases of severe disease requiring hospitalization

and a number of deaths. The CDC estimates that 43-89 million people were infected worldwide, with an estimated 8,870 to 18,300 H1N1 related deaths, including 12,469 deaths in the United States.

- **2020-Ongoing COVID-19:** The COVID-19 or novel coronavirus pandemic began in December 2019 and was declared a pandemic in March of 2020. As of February 25, 2021, 99.4 million cases have been reported around the world with over 2 million deaths, including 28 million cases and 503,000 deaths in the US. Jefferson County has seen 33,961 cases so far resulting in 1,882 hospitalizations and 707 deaths. The pandemic is expected to last through much of 2021.

Probability of Future Occurrences

Even before the COVID-19 pandemic began, the Colorado Department of Public Health and Environment (CDPHE) considered a pandemic to be inevitable. However, there is no definite way to predict when the next pandemic might happen. Some indicators will be present, but not every new virus turns into a pandemic. Based on the five pandemics that have affected the United States in roughly the last 100 years, a pandemic occurs on average roughly every 20 years, giving it a probability of **occasional**.

Magnitude and Severity

The magnitude of a public health emergency will range significantly depending on the aggressiveness of the virus in question and the ease of transmission. Pandemic influenza, for example, is more easily transmitted from person-to-person but advances in medical technologies have greatly reduced the number of deaths caused by influenza over time.

Today, a much larger percentage of the world's population is clustered in cities, making them ideal breeding grounds for epidemics. Additionally, the explosive growth in air travel means the virus could literally be spread around the globe within hours. Under such conditions, there may be very little warning time. Most experts believe we will have just one to six months between the time that a dangerous new influenza strain is identified and the time that outbreaks begin to occur in the United States. Outbreaks are expected to occur simultaneously throughout much of the nation, preventing shifts in human and material resources that normally occur with other natural disasters. These and many other aspects make influenza pandemic unlike any other public health emergency or community disaster. Pandemics typically last for several months to 1-2 years, and can have **critical** or even catastrophic impacts.

The Pandemic Intervals Framework (PIF) is a six-phased approach to defining the progression of an influenza pandemic. This framework is used to guide influenza pandemic planning and provides recommendations for risk assessment, decision-making, and action. While the PIF is specifically tailored to an influenza pandemic, the intervals provide a common method to describe pandemic activity which can inform public health actions. The duration of each pandemic interval might vary depending on the characteristics of the virus and the public health response.

The six-phase approach was designed for the easy incorporation of recommendations into existing national and local preparedness and response plans. Phases 1 through 3 correlate with preparedness in the pre-pandemic interval, including capacity development and response planning activities, while Phases 4 through 6 signal the need for response and mitigation efforts during the pandemic interval.

Pre-Pandemic Interval

In nature, influenza viruses circulate continuously among animals (primarily birds). Even though such viruses might develop into pandemic viruses, in Phase 1 no viruses circulating among animals have been reported to cause infections in humans.

Phase 1 is the natural state in which influenza viruses circulate continuously among animals but do not affect humans.

In Phase 2 an animal influenza virus circulating among domesticated or wild animals is known to have caused infection in humans and is thus considered a potential pandemic threat. Phase 2 involves cases of animal influenza that have circulated among domesticated or wild animals and have caused specific cases of infection among humans.

In Phase 3 an animal or human-animal influenza virus has caused sporadic cases or small clusters of disease in people but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. Limited human-to-human transmission may occur under some circumstances, for

examples, when there is close contact between an infected person and an unprotected caregiver. Limited transmission under these circumstances does not indicate that the virus has gained the level of transmissibility among humans necessary to cause a pandemic. Phase 3 represents the mutation of the animal influenza virus in humans so that it can be transmitted to other humans under certain circumstances (usually very close contact between individuals). At this point, small clusters of infection have occurred.

Pandemic Interval

Phase 4 is characterized by verified human to human transmission of the virus able to cause “community-level outbreaks.” The ability to cause sustained disease outbreaks in a community marks a significant upward shift in the risk for a pandemic. Phase 4 involves community-wide outbreaks as the virus continues to mutate and become more easily transmitted between people (for example, transmission through the air)

Phase 5 is characterized by verified human to human spread of the virus into at least two countries in one World Health Organization (WHO) region. While most countries will not be affected at this stage, the declaration of Phase 5 is a strong signal that a pandemic is imminent and that the time to finalize the organization, communication, and implementation of the planned mitigation measures is short. Phase 5 represents human-to-human transmission of the virus in at least two countries.

Phase 6, the pandemic phase, is characterized by community-level outbreaks in at least one other country in a different WHO region in addition to the criteria defined in Phase 5. Designation of this phase will indicate that a global pandemic is underway. Phase 6 is the pandemic phase, characterized by community-level influenza outbreaks.

Climate Change Considerations

According to the best available data, the changing climate is expected to exacerbate future pandemics. Climate change will influence vector-borne disease prevalence, although the direction of the effects (increased or decreased incidence) will be location- and disease specific. The intensity and extent of certain diseases is projected to increase. Climate induced hazards threatens to increase the spread of infectious diseases because changing heat, rain, and humidity levels allow disease carrying vectors and pathogens to come into closer contact with humans. If Colorado's climate becomes warmer, mosquito populations could swell, making the region more favorable for disease transmission. Warmer weather could also play a role in elevated seasonal deer mouse populations. Disadvantaged populations such as people with compromised health and the economically disadvantaged are expected to bear a greater burden as a result of their current reduced access to medical care and limited resources for adaptation strategies.

Additional research is needed to determine the effects of climate change on the frequency and duration of epidemics and pandemics. Ongoing efforts to reduce Colorado's greenhouse gas emissions and adapt to a changing climate, such as the Colorado Climate Plan, may help to reduce the impacts of climate induced on pandemics.

Vulnerability Assessment

Preparing for, responding to, and recovering from a pandemic requires a strategy that includes a holistic suite of public health activities designed to lessen the impact on morbidity and mortality. These activities include education, vaccination, prophylaxis, isolation/quarantine, a robust contact tracing program, and the closure of public facilities. In addition, clear, concise communication with the public and with other agencies remains a critical component, as does the ability of the involved agencies to achieve collaboration and coordination. By their very nature, most pandemics, once started, will not be stopped until they have run their course. This course can be shortened and weakened by a number of factors, with vaccination being the most effective method for protecting the population. Pandemic plans describe strategies of preparedness, response, and recovery to attempt to decrease illnesses and deaths during the pandemic period to manageable levels (i.e., that do not overwhelm the critical infrastructures of the State), and to promote community resiliency and rapid recovery.

People

Pandemics have the ability to affect large segments of the population for long periods of time. The number of hospitalizations and deaths will depend on the virulence of the virus. Risk groups cannot be predicted with certainty; the elderly, people with underlying medical conditions, and young children are usually at higher risk, but as discussed above this is not always true for all influenza strains. People without health coverage or access to good medical care are also likely to be more adversely affected. Mental health of the public could also be impacted depending on the length of the event and public health guidance on prevention. Medications may be limited to help prevent or treat the disease. Vaccines typically take several months to years to manufacture and would likely become available in small quantities at first. It may become necessary to ration limited amounts of medications, vaccinations, and other health care supplies.

As noted under Previous Occurrences, the COVID-19 pandemic has resulted in 99.4 million cases worldwide with over 2 million deaths as of January 25, 2021. The U.S. has seen 25 million cases with 420,000 deaths, and Jefferson County specifically has seen 33,961 cases resulting in 1,882 hospitalizations and 707 deaths. In addition to the direct impacts, the pandemic has completely disrupted life for many people. Most large gatherings have had to be cancelled, and many schools have closed. Sheltering in place and social distancing have been highly encouraged and, in some places, mandated, leaving some individuals isolated for months.

Medical staff can become overburdened with hundreds of additional cases on top of their normal workload. All other responders will be impacted in similar proportions to the general public, thereby reducing available responders. Adverse impacts are expected to be severe for unprotected personnel and uncertain for trained and protected personnel, depending on the nature of the incident.

The COVID-19 pandemic has had severe impacts on healthcare workers and other responders. The difficulty of trying to protect themselves and their families while still doing their jobs was exacerbated initially by shortages of personal protective equipment (PPE). The mental health impacts on responders and healthcare workers have not been fully quantified but are likely to have impacts for months if not years to come.

General Property

For the most part, property itself is not generally impacted by a human disease epidemic or pandemic. However, as concerns about contamination increase, property may be quarantined or destroyed as a precaution against spreading illness. Additionally, traditional sheltering facilities including homeless shelters or facilities stood up to support displaced persons due to an evacuation or other reason due to a simultaneous disaster occurring cannot be done in a congregate setting. This requires additional planning considerations or use of facilities that allow for non-congregate shelter settings which may require an approval of a request to FEMA for non-congregate sheltering, and may have an increased cost (such as the use of individual hotel rooms) as opposed to traditional congregate sheltering facilities.

Critical Facilities and Infrastructure

Hospitals and morgues will be heavily affected and may be overwhelmed. Other critical facilities and infrastructure are not directly affected by a pandemic but may have difficulty maintaining operations and maintenance activities due to a significantly decreased workforce. Schools may be forced to close.

Medical staff can become overburdened with hundreds of additional cases on top of their normal workload. All other responders will be impacted in similar proportions to the general public, thereby reducing available responders. Adverse impacts are expected to be severe for unprotected personnel and uncertain for trained and protected personnel, depending on the nature of the incident.

The COVID-19 pandemic has had severe impacts on healthcare workers and other responders. The difficulty of trying to protect themselves and their families while still doing their jobs was exacerbated initially by shortages of personal protective equipment (PPE). The mental health impacts on responders and healthcare workers have not been fully quantified but are likely to have impacts for months if not years to come.

Other responders will be impacted similarly to the general public, although the nature of their jobs may make social distancing more difficult which could potentially lead to higher infection rates, thereby reducing available responders.

Unscheduled sick leave from a large portion of the workforce could result in loss of productivity and delivery of services. Even without large numbers of infected workers, social distancing requirements and workplace closures can have a major impact on the government's ability to deliver services, as seen during the COVID-19 pandemic. As residents are quarantined due to the pandemic, as seen during the COVID-19 pandemic the demand for deliveries of essential goods will also increase.

Ability to respond and recover may be questioned and challenged if planning, response, and recovery are not timely and effective. Help from the federal government and from other states would likely be limited, as all personnel would be deployed throughout the country already. While the federal government would do what they can, communities would have to rely on their own resources for a much longer period of time as compared to other disasters. It is expected that the government will work towards a solution that will end the pandemic, typically by helping to distribute vaccines and antiviral agents. Continual public messaging and outreach is vital.

Economy

In a normal year, lost productivity due to illness costs U.S. employers an estimated \$530 billion. During a pandemic, that figure would likely be considerably high and could trigger a recession or even a depression. Local economy and finances may be adversely affected, possibly for an extended period of time. Unscheduled sick leave from a large portion of the workforce could result in millions, even billions, of dollars lost in productivity. Business restrictions due to social distancing requirements can also be significant. In a normal year, lost productivity due to illness costs U.S. employers an estimated \$530 billion. During a pandemic, that figure would likely be considerably high and could trigger a recession or even a depression.

The economic impact of the COVID-19 pandemic and associated closures has been significant, triggering a recession and high unemployment; the unemployment rate jumped for 4.4% in March of 2020 to 14.7% in April and stayed in the double-digits through most of the summer. Some studies estimate that 1 in 5 renters are at risk of eviction. The stock market suffered major losses in the early days of the pandemic. The restaurant, retail, and oil and gas industries have been particularly hard hit, with numerous businesses closing or filing for bankruptcy. And among household with children, food insecurity – defined as when a household does not have sufficient food for its members to maintain healthy and active lives and lacks the resources to obtain more food – has more than doubled from 14% in 2018 to 32% in July 2020.

Historical, Cultural, and Natural Resources

Impacts to these resources are typically minimal. However, reduced tourism during outbreaks could lead to additional economic impacts.

Future Development

Population growth and development contribute to pandemic exposure. Future development in and around Jefferson County has the potential to change how infectious diseases spread through the community and impact human health in both the short and long term. New development may increase the number of people and facilities exposed to public health hazards and greater population concentrations (often found in special needs facilities and businesses) put more people at risk. During a disease outbreak those in the immediate isolation area would have little to no warning, whereas the population further away in the dispersion path may have some time to prepare and mitigate against disease depending on the hazard, its transmission, and public notification.

Overall Hazard Significance

The geographic extent of the hazard is considered **extensive**. The probability of future occurrences is **occasional**, and the magnitude/severity for the event of record is **critical**. The HMPC considers the hazard to have an overall impact rating of **high** for Jefferson County.

5 Mitigation Strategy

Requirement §201.6(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for the Jefferson County Hazard Mitigation Plan. This section describes how the County accomplished Phase 3 of FEMA's 4-phase guidance - Develop the Mitigation Plan - and includes the following from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the HMPC led to the mitigation strategy and mitigation action plan for this LHMP update. As part of the plan update process, a comprehensive review and update of the mitigation strategy portion of the plan was conducted by the HMPC. As part of this process, the goals and objectives from the 2016 Plan were reviewed and reaffirmed. While the goals were not changed, some objectives were modified to better reflect current priorities. The mitigation actions from the 2016 Plan were also reviewed, assessed for progress, and evaluated for their inclusion in this plan update. Section 5.1 below identifies the updated goals and objectives of this plan; Section 5.2 details the progress on 2016 mitigation actions; Section 5.3.1 describes how new actions were identified and prioritized; and Section 5.4 summarizes the updated mitigation action plan.

5.1 Goals and Objectives

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the Hazard Mitigation Planning Committee (HMPC) has organized resources, assessed natural hazards and risks, and documented mitigation capabilities. A profile of the County's vulnerability to natural hazards resulted from this effort, which is documented in the preceding section. The resulting goals, objectives, and mitigation actions were originally developed based on this profile in 2010 and updated in 2016 and have again been updated for 2021. The HMPC developed the updated mitigation strategy based on a series of meetings and worksheets designed to achieve a collaborative mitigation planning effort, as described further in this section.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

Goals are stated without regard for implementation, that is, implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that the goals are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable. Mitigation Actions are specific actions that help achieve goals and objectives.

To facilitate the goals update of this plan HMPC members were provided a breakdown of the list of goals from the 2016 Jefferson County Multi Hazard Multi Jurisdiction plan, along with goals and objectives from a number of related plans, including the 2018 State of Colorado Hazard Mitigation Plan. This review was

conducted to ensure the plan's mitigation strategy reflected current policies and priorities, updated risk assessment information, and was integrated with existing plans and policies. They were told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind.

The team reaffirmed the three goals from the 2016 plan, however, the language was revised slightly to include human-caused hazards. Several objectives were revised as well. These were compiled into a document which was discussed and accepted with minor revisions and consensus of the HMPC at a follow-up mitigation planning meeting.

Based upon the risk assessment review and goal setting process, the HMPC approved these goals and objectives for the 2021 plan.

Goal 1: Increase public education and awareness about natural and human-caused hazards and how to mitigate against them.

- a) Continue public outreach efforts on the hazards identified in this plan.
- b) Improve plans, procedures, and systems for public notification and warning.
- c) Provide education on hazard resistant construction techniques and create incentives for the public to mitigate hazards on their own property.
- d) Engage constituency to take personal responsibility for their own exposure and mitigation.
- e) Increase public awareness of the need for funding for disaster mitigation & preparedness.
- f) Understand the impacts of climate change on severity and frequency of hazards.

Goal 2: Reduce impacts of hazards on life, property, and the environment.

- a) Continue to manage development and placement of structures in hazard-prone areas.
- b) Protect existing property to the extent possible.
- c) Utilize the risk assessment as the basis for jurisdictional response and evacuation plans.
- d) Protect critical facilities and infrastructure to minimize loss of critical services following an event.
- e) Strongly communicate wildfire mitigation with all land use proposals and existing land uses.
- f) Continue CWPP efforts including periodic updates and implementation of wildfire mitigation including wildfire fuel breaks, wildfire safe zones and defensible space, fuels reduction and biomass use.
- g) Increase wildfire mitigation efforts specifically on public lands and open space.
- h) Reduce the economic impact to public and private entities from hazards.
- i) Enhance ability of businesses to mitigate and recover from disasters.
- j) Continue to reduce flood losses through compliance with National Flood Insurance Program, and continue to participate with Community Rating System, where applicable.
- k) Encourage measures to enable the County and jurisdictions to better withstand a multi-year drought.
- l) Improve wildfire education and training for dispatchers and emergency responders.
- m) Improve the ability of local government and the private sector to defend against and recover from cyber attacks.
- n) More systemic preparation/adaptation to reduce more chronic but widespread impacts, such as strain on the power grid and premature aging of infrastructure.
- o) Maintain and strengthen existing natural systems/ecosystems/biodiversity to improve disaster resilience.

Goal 3: Strengthen and develop partnerships in regard to mitigating hazard impacts.

- a) Promote planning efforts that foster cooperation and coordination among jurisdictions, agencies, and community aide organizations involved in hazard mitigation and response.
- b) Maximize the use of shared resources and community resilience projects to leverage funding for hazard mitigation projects between all levels of government and the private sector.
- c) Encourage coordination between mitigation efforts on public land and adjacent private properties.
- d) Develop links between emergency planning and land and water use planning.
- e) Strengthen community partnerships to enhance the ability of local government to adapt to changing climate conditions and mitigate and respond to hazard events.
- f) Create a standing multi-jurisdictional hazard mitigation committee to provide mitigation fund governance, track plan implementation, and coordinate mitigation activities throughout the County.
- g) Implement the recommendations of the Wildfire Risk Reduction Task Force 2020 report.

5.2 Progress on Previous Mitigation Actions

Jefferson County and the majority of the participating jurisdictions have been successful in implementing actions identified in the 2016 Plan. The 2016 mitigation strategy contained a total of 74 mitigation actions, 12 of which were identified as having been completed. Seven actions were deleted as being no longer relevant. These completed and deleted actions are shown in Table 5-1

Table 5-1 2016 Mitigation Actions Completed or Deleted

Jurisdiction	Mitigation Action Title	Hazard	2020 Status
Jefferson County	Massey Draw Floodplain Improvements	Flood	Completed
Jefferson County	Beer Sisters Reservoir Rehabilitation	Dam Failure and Flood	Completed
Arvada	Multi-Jurisdictional Storm Ready Program Participation	Hail, Extreme Heat, Winter Storms, Lightning, Tornado, Severe Wind	Completed
Lakewood	Revise Emergency Operations Plan (EOP) for Maple Grove Reservoir	Dam Failure	Completed
Lakewood	Lakewood Energy Assurance Plan Update	All	Completed
Lakewood	Multi-Jurisdictional Storm Ready Program Participation	Hail, Extreme Heat, Winter Storms, Lightning, Tornado, Severe Wind	Completed
Wheat Ridge	Maple Grove Dam operations plan	Flood	Completed
Wheat Ridge	NFIP/CRS/CIP/Stormwater Utility.	Dam Failure, Flood	Completed
Denver Water	Flood inundation maps.	Flood	Completed
Denver Water	Training/exercising at Foothills Treatment Plant	Wildfire	Completed
Jefferson Conservation District	Last Resort Creek and Kennedy Gulch Fuels Reduction	Wildfire	Completed
Lookout Mountain Water	Expand storage capacity at upper Beaver Brook reservoir	Drought	Completed
Jefferson County	Drake outfall	Flood	Deleted
Jefferson County	Fairmount drainage improvement program	Flood	Deleted
Edgewater	Continued Validation of Flood Response Protocol Identified in 2007 EOP through Practical Training and Exercises Design.	Flood	Deleted (not participating for 2021)
Lakewood	Burying Power Lines to Green Mountain Repeater Site	Severe Wind, Winter Storm, Tornadoes, Lightning	Deleted
Mountain View	Storm Water Drainage	Flood	Deleted (not participating for 2021)
Denver Water	Sediment removal from Strontia Springs Dam.	Dam Failure	Deleted
Jefferson Conservation District	Educate Homeowners on Wildfire Hazards and Mitigation	Wildfire	Deleted
Jefferson Conservation District	Doubleheader Ranch Hazardous Fuels Reduction	Wildfire	Deleted
Pleasant View Metro District	Flood mitigation of Lena Gulch through West Blade Park located at 16780 Mt Vernon Road.	Flood	Deleted (not participating for 2021)

Source: HMPD

While only 12 actions were reported as having been fully completed, considerable progress has been made on other actions. Many others were reported as being in progress or are already being implemented on an annual basis. Furthermore, some mitigation actions included multiple related projects. For example, while Jefferson Conservation District is shown as only having completed one action, that action actually reflects two to five wildfire projects per year, averaging 300 acres per year treated.

Some of the challenges of implementation of projects included:

- Lack of funding, including ability to provide matching funds.
- Difficulty passing benefit cost analysis required for certain FEMA grants.
- Public opposition to fire mitigation in JeffCo Open Space – specifically in Apex Open Space where there was public opposition to reducing fuel loads.
- Conflicting priorities, and intervention of major hazard events

5.2.1 Continued Compliance with NFIP

Recognizing the importance of the National Flood Insurance Program (NFIP) in mitigating flood losses, an emphasis will be placed on continued compliance with the NFIP by Jefferson County and all participating communities have been mapped for flood hazards: Arvada, Edgewater, Golden, Lakewood, Morrison, and Wheat Ridge. As NFIP participants, these communities have and will continue to make every effort to remain in good standing with NFIP. This includes continuing to comply with the NFIP's standards for updating and adopting floodplain maps and maintaining and updating the floodplain zoning ordinance. Jefferson County and the communities of Arvada, Golden, Lakewood, Morrison, and Wheat Ridge will also continue to participate in the Community Rating System (CRS) to go above and beyond the requirements of the NFIP, and have continued to improve their CRS ratings as described in Section 2.7.4.

Additional details related to NFIP participation are discussed in Section 2.7 and in the flood vulnerability discussion in Section 4.3.9.

5.3 Identification of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation measures to support the mitigation goals, each hazard identified in Section 4.1: Identifying Hazards was evaluated in regard to the various options for mitigation. Hazards that pose a significant threat to the community were considered the priority in the development of hazard specific mitigation measures.

The Planning Team considered the following categories of mitigation actions, as defined in FEMA's 2013 *Local Mitigation Planning Handbook*:

- **Plans and regulations:** These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.
- **Structure and infrastructure projects:** These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.
- **Natural systems protection:** These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.
- **Education and awareness:** These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise Communities. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.

The Planning Team also considered the following categories as defined in the Community Rating System:

- **Prevention:** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
- **Property protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.
- **Structural:** Actions that involve the construction of structures to reduce the impact of a hazard.

- **Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- **Emergency services:** Actions that protect people and property during and immediately after a disaster or hazard event.
- **Public information/education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

At planning meeting #3, the Planning Team was provided with handouts describing the categories and listing examples of potential mitigation actions for each category, as well as for the identified hazards. FEMA's 2013 document *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards* was referenced and made available for reference, along with FEMA's 2020 *Mitigation Action Portfolio*. Attendees were then asked to submit mitigation action ideas via an online poll. Action submissions included details describing how the actions will be implemented and administered, to include cost estimates, potential funding sources, and estimated timeline for completion. Each action was required to be tied to one or more of the goals and objectives.

It was not always feasible or realistic for every jurisdiction to develop mitigation actions against every identified hazard. However, actions were compared against identified hazards to ensure that the plan contains a comprehensive range of mitigation actions and projects for each of the most high risk hazards. An emphasis on new and existing buildings and infrastructure was stressed. While the Planning Team focused primarily on those hazards identified as posing the highest risk to the jurisdiction, mitigation actions were also suggested for some low priority hazards.

Similarly, while the primary focus was on developing mitigation actions in the categories described above, some jurisdictions identified actions that do not fall into one of the above categories and which may be better defined as planning or preparedness actions. Some of these actions were nonetheless included in the plan, as the jurisdiction felt they were important actions to reduce losses from future disasters even if they do not meet the strict definition of mitigation.

HMPC members considered actions that would mitigate impacts to both new and existing buildings and infrastructure. The HMPC noted that the Hazard section of the Jefferson County Comprehensive Land Use Plan and related Land Use Code is oriented towards reducing impacts to future development and will be used as the primary implementation mechanism for ongoing land use planning related to hazards. This plan works in tandem with the Land Use Plan and puts forth recommendations that will reduce losses to both new and existing infrastructure but can be viewed as having a primary focus on reducing impacts to existing buildings, populations, and infrastructure.

5.3.1 Prioritization Process

Once the new mitigation actions were identified, the HMPC members were provided with several sets of decision-making tools, including FEMA's recommended criteria, STAPLE/E (which considers social, technical, administrative, political, legal, economic, and environmental constraints and benefits).

- **Social:** Does the measure treat people fairly?
- **Technical:** Will it work? (Does it solve the problem? Is it feasible?)
- **Administrative:** Is there capacity to implement and manage the project?
- **Political:** Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support the project?
- **Legal:** Does your organization have the authority to implement? Is it legal? Are there liability implications?
- **Economic:** Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development? Does it reduce direct property losses or indirect economic losses?
- **Environmental:** Does it comply with environmental regulations or have adverse environmental impacts?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining project priority (the 'economic' factor of STAPLE/E). Other criteria used to recommend what actions might be more important, more effective, or more likely to be implemented than another included:

- Does the action protect lives?
- Does the action address hazards or areas with the highest risk?
- Does the action protect critical facilities, infrastructure or community assets?
- Does the action meet multiple objectives (Multiple Objective Management)?

The above criteria were used to prioritize actions in an iterative process over the course of the plan update process. At the start of the process, participating jurisdictions were asked to validate or update the priorities of their continuing actions from the 2016 Plan. When submitting new mitigation actions, planning team members were asked to prioritize those as well. Finally, once all new and continuing actions had been collated into a draft mitigation strategy, jurisdictions were asked to verify or update the priorities of each action compared to their other actions.

5.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This section outlines the development of the final updated mitigation action plan. The action plan consists of the specific projects, or actions, designed to meet the plan's goals. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals.

The total number of actions identified by each jurisdiction is summarized in Table 5-2, including those actions completed, deleted, or continued from the 2016 HMP.

Table 5-2 Mitigation Actions Summary by Jurisdiction

Jurisdiction	# of Actions in 2016 HMP	# of Actions Completed	# of Actions Deleted	# of Actions Continued	New Actions Added	# of Actions in 2021 HMP
Jefferson County	20	2	2	16	22	38
City of Arvada	6	1	0	5	11	16
City of Edgewater	3	0	1	2	3	5
City of Golden	2	0	0	2	7	9
City of Lakewood	6	3	1	2	6	8
Town of Morrison	2	0	0	2	7	9
City of Wheat Ridge	10	2	0	8	2	10
Arvada Fire Protection District	NA	NA	NA	NA	2	2
Elk Creek Fire Protection District	NA	NA	NA	NA	2	2
Evergreen Fire Rescue	2	0	0	2	2	4
Fairmount Fire Rescue	2	0	0	2	2	4
Foothills Fire Protection District	NA	NA	NA	NA	2	2
Genesee Fire Protection District	NA	NA	NA	NA	1	1
Golden Gate Fire	2	0	0	2	1	3
Indian Hills Fire Protection District	1	0	0	1	1	2
Inter-Canyon Fire Protection District	NA	NA	NA	NA	1	1
North Fork Fire Protection District	2	0	0	2	1	3
West Metro Fire Protection District	1	0	0	1	1	2
Denver Water	6	2	1	3	1	4

Jurisdiction	# of Actions in 2016 HMP	# of Actions Completed	# of Actions Deleted	# of Actions Continued	New Actions Added	# of Actions in 2021 HMP
Lookout Mountain Water District	6	1	0	5	6	11
Jefferson Conservation District	3	1	2	0	1	1
Total	74	12	7	55	82	137

Source: HMPC

The 2021 Jefferson County mitigation action plan lists the actions developed and prioritized as described above, to include continuing actions from the 2016 Plan. The action plan details how the participating jurisdictions will reduce the vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. All actions are tied to specific goals and objectives to ensure alignment with the Plan's overall mitigation strategy. Additionally, projects were tied to specific infrastructure Lifeline categories, to better align with the latest FEMA guidance and grant requirements. Over time the implementation of these projects will be tracked as a measure of demonstrated progress on meeting the plan's goals.

Many of these mitigation actions are intended to reduce impacts to existing development. In addition actions are identified to reduce impacts to future development. These actions include those that promote wise development and hazard avoidance, such as building code, mapping, and zoning improvements, and continued enforcement of floodplain development regulations. Actions that protect critical infrastructure note which lifeline category is protected using the following abbreviations:

- COM: Communications
- ENG: Energy
- FWS: Food, Water, Sheltering
- HAZ: Hazardous Waste
- H&M: Health & Medical
- S&S: Safety & Security
- TRN: Transportation

Jefferson County's mitigation actions are listed in Table 5-3 below. Mitigation actions for the other participating jurisdictions are summarized in Table 5-2 above and detailed in each jurisdiction's Annex.

Table 5-3 Jefferson County Mitigation Action Plan

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 1	Major drainageway culvert improvements with Mile High Flood District. Multiple locations of roadway crossings with significantly undersized culverts to be replaced with culverts to accommodate the 100 year flood flows. Benefits include reduced flood losses safety for emergency vehicles and the public during major flood events.	Flood	Goals 2,3; Lifelines S&S, TRN	Jefferson County Transportation and Engineering in conjunction with the Mile High Flood District	\$9,000,000; MHFD	Medium	Design phase in 2016-2019 & proposed construction in 2018-2021	Annual Implementation. Structures identified and replaced yearly
Jefferson County 2	Minor culvert improvements. Multiple locations of roadways with existing culvert crossings either failing or in eminent danger of failure. Benefits include reduced flood losses and provide for public safety	Flood	Goals 2; Lifelines S&S, TRN	Jefferson County Transportation and Engineering, Jefferson County Road and Bridge	\$1,000,000 per year County General Fund	High	Continuing, with culvert inspection and replacement ongoing.	Annual Implementation. Structures identified and replaced yearly
Jefferson County 3	Weaver Creek major drainageway master plan and FHAD. The Weaver Creek Drainageway has many areas in which the existing channel and culverts lack the capacity to safely convey the major flood events. A Master Plan is needed to properly plan and budget for needed improvements. The current Flood Hazard Area Delineation was prepared over 35 years ago and needs to be updated to accurately reflect the regulatory 100 year floodplain. Benefits include reduced flood losses.	Flood	Goals 2,3; Lifelines S&S, TRN	Jefferson County Transportation and Engineering in conjunction with the Mile High Flood District and the City of Lakewood	\$250,000 Mile High Flood District, \$150,000, County \$93,000, City of Lakewood \$7,000	Medium	Ongoing	In Progress. Master Plan complete. FHAD nearing completion.
Jefferson County 4	Notification polygons for dam failure and flash flooding. Develop pre-established notification polygons or equivalent for citizens who reside in dam failure hazard areas. Can also be established for floodplains. The technology currently exists in the CodeRED system employed by all county 911 entities. The project will require taking the dam inundation maps and floodplain	Dam Failure; Flood	Goals 1,2; Lifelines COM, FWS, H&M, S&S	Jefferson County Emergency Communication Authority (JCECA); Dam owners, floodplain managers, Mile	Minimal, need in-kind labor In-kind	High	Ongoing	In Progress. Jefferson County SO and County staff time; dams are done. Flood polygons are incomplete but JCOS GIS created a tool to build them

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	maps for the targeted areas and creating a polygon in the CodeRED system. Benefits include Faster notification will give citizens more time to evacuate from flood-prone areas which could prevent injury or death from flooding.			High Flood District				
Jefferson County 5	Update CWPPs to reflect changing conditions and new development. This project will update Community Wildfire Protection Plans (CWPPs) to reflect changing conditions and new development. Most plans were crafted in 2010 and with new development and changing conditions the accuracy of the data is questionable. Implementation would most likely require the hiring of a specific consulting firm to gather data and create new plans. Benefits include Better data will ultimately lead to better mitigation activities, better planning, and ultimately a more effective response.	Wildfire	Goals 2,3; Lifelines COM, ENG, FWS, S&S, TRN	Jefferson County OEM	To be determined based on community size, but approximately \$15-40k per plan Grant funding – state and federal	High	Ongoing	Finalize. The FMO will use the updated AOP, HMP, and fire district CWPPs to update the county CWPP
Jefferson County 6	Mitigate wildfire hazards on public lands and open space properties. There are fuel load concerns on County and other open space properties. Residential and other development are potentially at risk due to extensive WUI. This project will perform hazard fuel mitigation in areas identified as high-hazard in countywide and individual CWPPs. Different methods might include tree thinning, mastication, and controlled burning. Benefits include reduced wildfire losses	Wildfire	Goals 2; Lifelines COM, ENG, S&S	Jefferson County OEM and Open Space. ID other partners - USFS, State, FPDs, JeffCo Conservation District, Denver Mountain Parks, municipalities etc.	Varies depending on the fuel type and acreage. \$2,000 per acre is a good estimate. Grant funding – state and federal	High	Ongoing	In Progress. Utilized seasonal fuels crew when Sheriff's Office still held those positions. Jeffco Forest Health Plan IDs fire mitigation strategies, BRIC grant to build capacity for fire mitigation

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 7	Develop partnerships and begin needs assessment for seismic mitigation of critical infrastructure within JeffCo. The Golden Fault and other seismic sources in the region present the potential for a low probability but potentially high consequence earthquake event. This project would begin with a needs assessment to identify critical facilities likely to incur strong ground shaking that could lead to nonstructural and structural damage. Facilities identified for further review would undergo a FEMA rapid visual assessment (FEMA 154) to identify building hazards and potential mitigation options. Benefits include While the risk of earthquake in the area is low, the potential damage could be catastrophic. Performing seismic mitigation would help ensure uninterrupted governmental service for critical infrastructure. This is the first step in reducing earthquake losses including reduced potential for injuries; reduced potential for facility damage and loss of function.	Earthquake	Goals 2,3; Lifelines COM, ENG, FWS, HAZ, H&M, S&S, TRN	Jefferson County Planning & Zoning; USGS, CGS	\$30-80K depending on scope and number of facilities assessed NEHRP, FEMA, DHSEM	Low	Ongoing	Not Started. Low priority considering risk.
Jefferson County 8	Education and awareness of geologic hazards. Due to relative infrequency of geologic hazards in the planning area, the public is not generally well informed about the risks associated with this type of hazard. Work in conjunction with Jill Carlson at Colorado Geological Survey; create GIS layers available to public that identify hazards such as landslide and debris flow and disseminate information. Benefits include While the risk of earthquake in the area is low, the potential damage could be catastrophic. Raising awareness of hazards will enable the public to understand how to survive an earthquake. Improved mapping of debris	Avalanche, Earthquake, Erosion and Deposition, Expansive Soils, Landslide/ Debris Flow/ Rockfall, Subsidence	Goals 1; Lifelines NA	Jefferson County OEM, Local Government (interested parties)	To be determined Grant funding – state and federal	Medium	Ongoing	In Progress. Preparedness campaign update. Hazard study, mitigation and education on Dinosaur Ridge

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	flow and landslide areas could lead to targeted mitigation projects.							
Jefferson County 9	Flood education and outreach. Increase the flood awareness of residents of Jefferson County to protect people and property. This project would build upon annual floodplain notification efforts associated with the County's CRS program participation. Efforts include distributing the MHFD flood awareness brochure to residents in the floodplain. Benefits include increased awareness of the risk and dangers of flooding can reduce the impact of flooding to the citizens of Jefferson County.	Flood	Goals 1,3; Lifelines NA	Jefferson County Planning and Zoning, OEM, MHFD	TBD	Medium	Ongoing with annual efforts	In Progress. Preparedness campaign update. Continued public outreach
Jefferson County 10	Perform hazard fuel mitigation in areas identified as high hazard in countywide and individual CWPPs. This project will perform hazard fuel mitigation in areas that have been identified as high-hazard in countywide and individual CWPPs. Different methods might include tree thinning, mastication, and controlled burning. The CWPP will be referenced for specific areas and recommended treatments. Benefits include fuel mitigation projects improve public safety, reduce risk to firefighters, reduce potential for structure losses and help forest ecology.	Wildfire	Goals 2; Lifelines COM, ENG, S&S	Jefferson County Sheriff's Office in partnership with Jefferson County fire districts and Jefferson Conservation District	Varies depending on the fuel type and acreage. \$2,000 per acre is a typical estimate Grant funding – state (CSFS) and federal (FEMA PDM or HMGP)	High	Ongoing	In Progress. Utilized seasonal fuels crew when Sheriff's Office still held those positions. Mitigated fuels on 250 acres of JCOS land 2016-2020; Mitigating 1,000 acres by 2025. JCD also completed 1400 acres of fuel reduction treatments from 2016-2020
Jefferson County 11	South Weir Gulch rehabilitation. This project provides for the construction of a combination of channel improvements and drop structures to control severe erosion and safely convey runoff from Union Boulevard east to Pierson Street south of Florida Avenue. Currently this section of the South Wier Gulch drainageway is very steep and is rapidly eroding the existing channel. This has resulted in a portion of the channel with almost vertical walls 15-20 feet deep. This erosion has progressed	Dam Failure	Goals 2; Lifelines FWS, S&S	Jefferson County Transportation and Engineering, Mile High Flood District. (The property is privately owned)	\$200,000 Design; \$2,500,000 Construction Mile High Flood District up to 50% of the cost.	Low	TBD	Not Started. Due to cost and a higher priority of replacing failing culverts this project is no longer a project to be completed on the 5 year plan.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	to the rear yard fences of adjacent residences. Benefits include reduction of erosion, improve long term water quality of the stream. Reduction of property loss in area and it will eliminate a safety hazard in the area.							
Jefferson County 12	National Flood Insurance Program (NFIP) and Community Rating System (CRS) participation. This project provides for the continual participation in both the NFIP and CRS floodplain management programs, which enables properties within the county to get flood insurance at reduced rates. In addition, the floodplain management regulations reduce the flood risks for new and reconstructed buildings within the county. Benefits include reducing flood losses for new construction within the county and allow older properties access to flood insurance to help protect existing buildings.	Flood	Goals 1,2,3; Lifelines COM, ENG, FWS, HAZ, H&M, S&S, TRN	Jefferson County Planning and Zoning	Within current county budget. Programs are funded from the county's general fund.	High	Ongoing	Ongoing. Moved up to a Class 5
Jefferson County 13	Storm Ready program participation. This is a National Weather Service (NWS) Program helps communities to better prepare to save lives from the onslaught of severe weather through advanced planning, education and awareness. This is an accredited program through the National Oceanic & Atmospheric Administration & the National Weather Service. Benefits include Once Application has been submitted to the NWS, the application will be reviewed and the Storm Ready chair will assign a team to visit the applicant and discuss options. The end result being a Certified Storm Ready Office and serving residents and County Offices better. An added benefit to this is, once a Community is certified as Storm Ready the Insurance Services	Extreme Temps, Hailstorm, Lightning, Severe Winter Storms, Tornado, Windstorm	Goals 1,2,3; Lifelines COM, ENG, FWS, HAZ, H&M, S&S, TRN	Jefferson County Office of Emergency Management	None or \$5,000, if it is necessary to upgrade equipment, training, staff hours, OT hours, and/or host trainings. EMPG	Medium	Ongoing	In Progress. Application submitted to NWS, will update based on recommendations.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	Organization can provide Community Rating System points which may be applied to lower National Flood Insurance Program (NFIP) flood insurance rates.							
Jefferson County 14	Bi-lingual publications for Jeffco residents. This program will allow publications such as Colorado Life Trak, Jeffco emergency preparedness campaigns, pamphlets to be translated for our Spanish speaking residents of Jeffco. A language assessment should be completed to see if other translations are needed for our residents. Benefits include Giving the Jefferson county bi-lingual speaking communities a resource to use in preparing their homes/families for potential hazards.	Avalanche; Cyber; Dam Failure; Drought; Earthquake; Erosion/ Deposition; Expansive Soils; Extreme Temps; Flood; Hailstorm; Landslides; Lightning; Pandemic; Winter Storms; Subsidence; Tornado; Wildfire; Windstorm	Goals 1; Lifelines NA	Jefferson County Office of Emergency Management	\$10,000 for the translation \$2,000 for the assessment Possible Grants with 50/50 match	Medium	TBD	Not Started.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 15	Public awareness for those in dam inundation areas. There are 30 High Hazard and 11 Significant Risk dam in Jefferson County. Currently there is no notification system to those living downstream of the dam or information that they live in a potentially hazardous area. Our goal is to create and distribute a pamphlet notifying home and business owners that are in a dam inundation area. It will be similar to the mailer distributed to people that live in flood plains. Part of this project is to create digital map layers of the inundation maps that can be incorporated into the county's GIS database. Benefits include Notification of those living in dam inundation areas will increase their awareness that they are in a higher hazard area. Or hope is that this awareness will improve preparedness for those in the area. This, along with better mapping will improve warning capabilities that will potentially save lives in case of a disaster.	Dam Failure	Goals 1,2; Lifelines NA	Jefferson County Office of Emergency Management; Jefferson County Emergency Communication Authority, Jefferson County GIS, Colorado Dam Safety	45000 Possible CDEM/PDM Grants	Medium	TBD	Not Started.
Jefferson County 16	Geographic Information System layer updates. Much of Jefferson County is considered to be in the Wildland Urban Interface (WUI). With diversity of land ownership in Jeffco it has been a challenge to develop GIS layers for wildfires and completed fire management (fuels reduction) projects. Benefits include Having these layers available will be useful during wildfire events, developing future fuels reduction projects and reevaluating completed projects for maintenance/ reentry.	Wildfire	Goals 2; Lifelines COM, ENG, FWS, HAZ, H&M, S&S, TRN	Jefferson County Office of Emergency Management; Jefferson County GIS	\$35,000	High	Ongoing	In Progress. County IT ESRI story map developed

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 17	Discovery of a community-wide slash collection center. Community wide slash removal opportunities to a larger more inclusive community wide audience. This opportunity currently does not exist and the operational components or costs have not yet been finalized.	Flood; Tornado; Severe Winter Storms; Wildfire; Windstorm;	Goals 1; 2; 3; Lifelines TRN; S&S; FWS	Jefferson County, Parks. Local municipalities and community partners.	\$100,000 - \$1,000,000 Program use fee and local authority.	High	2023	New in 2021.
Jefferson County 18	Forest health. Update the Jefferson County Open Space Forest Health Plan and reduce tree density and fuel sources on 1,000 of our 17,000 acres of forested lands.	Wildfire;	Goals 1; 2; 3; Lifelines S&S; FWS; ENG; TRN; COM	Jefferson County Open Space Colorado Forest Restoration Institute, Forest Stewards Guild	More than \$1,000,000 Department Budget and Grants	High	2026	New in 2021.
Jefferson County 19	Habitat restoration. Stronger ecosystems are more resilient to catastrophic event such as flooding, fire, and erosion, so restoring our land is essential to preserve natural aesthetics, restore wildlife habitat, and improve water quality.	Drought; Erosion and Deposition;	Goals 1; 2; 3; Lifelines FWS	Jefferson County Open Space	Unknown Department Budget and Grants	Medium	2026	New in 2021.
Jefferson County 20	Fuel break thinning in right-of-way along evacuation routes within the Wildfire Urban Interface. This project will identify areas within Jefferson County and State right-of-way along evacuation routes in the Wildfire Urban Interface where forest growth has encroached on public streets and roads. Once identified, fuel breaks and debris removal will be enacted within areas that require mitigation. Benefits include safer ingress and egress for citizens and first responders in the event of an emergency.	Dam Failure; Flood; Landslides; Severe Winter Storms; Wildfire	Goals 1; 2; 3; Lifelines S&S; TRN; H&M;	Jefferson County Colorado State Forest Service, Colorado DOT, Multiple Fire Districts, Jefferson County Sheriff, Coalition for the Upper South Platte	Unknown Grants	High	2022-2026	New in 2021.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 21	Stabilize the landslide near the reinforced soil slope (RSS) at the Rocky Mountain Metropolitan Airport (RMMA). The RSS was constructed as part of the safety area at the RMMA in 2014. Since that time, inclinometers have indicated there has been continued movement along a failure plane. The toe of the slope is near Colorado Highway 128 and failure of the RSS would impact Colorado Highway 128. The preliminary mitigation design includes a series of reinforced concrete piers with a series of tiebacks to stabilize the mass. The benefits include continued operations at the RMMA, public safety and limiting the impact to the state highway system. The RMMA is mainly within Jefferson County, however, the mitigation will occur in an area within the City & County of Broomfield.	Landslides, Debris flows, Rockfalls;	Goals 1,2,3; Lifelines S&S; TRN;	Jefferson County - Rocky Mountain Metropolitan Airport, CDOT, Colorado Geological Survey	More than \$1,000,000 legal settlement, department budget and grants	High	2021-2022	New in 2021.
Jefferson County 22	Defensible space and structure hardening mitigation grant fund. Our current regulations work to create defensible space around new structures. The building code requires fire resistant building materials for new homes and additions. Our regulations do not address creating defensible space around existing structures or requiring upgrades to houses and buildings built years ago. A mitigation grant fund would help finance and incentivize making existing development less susceptible to wildfire risk by helping people afford and incentivizing the installation of defensible space and fire resistant materials. Program would also provide a platform to educate existing mountain area residents about the risks of wildfire and what can be done to mitigate those risks.	Wildfire;	Goals 1; 2; 3; Lifelines S&S; FWS;	Development and Transportation Fire Districts, Emergency Management, Strategy Innovation and Finance, Sheriff, Realtors and Insurance agencies.	\$10,000 - \$100,000 Seek additional grants, work with home owner insurance providers, work with realtors, County general fund	High	Would hope to establish funding that would be distributed on an annual basis.	New in 2021.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 23	County road clear zone fund. The County maintains hundreds of miles of roads serving our mountain communities. These roads provide critical evacuation routes for thousands of county citizens who live, work and/or recreate in the mountains. Most of these roads were built many years ago and have right of ways that barely exceed the width of pavement. This project would help address the concern that roadside trees would fall and block transportation during hazard events such as winter storms, wildfires, floods etc. The project entails establishing a desired clear zone around our roadways. The first phase is determining where the most constrained, important roads are and if they are constrained who owns land on each side of the road. This would require research through property ownership databases. The project would also provide resources to purchase easements/fee simple rights to clear trees and other possible impediments from roadsides. Finally, the grant would help fund the clearance of the roadside clear zone. This project if completed would help to ensure that evacuation routes stand a much higher chance of remaining clear during hazard events.	Avalanche; Dam Failure; Erosion and Deposition; Flood; Landslides; Severe Winter Storms; Wildfire; Windstorm;	Goals 1; 2; 3; Lifelines S&S; H&M; TRN;	Development and Transportation Sheriff, CDOT,	\$100,000 - \$1,000,000 Grants, County Funds,	High	2021-2024 Initial research phase would take 6 months. Remainder of project would be ongoing.	New in 2021.
Jefferson County 24	Modernize existing FEMA Zone A floodplains that are outside the MHFD utilizing Lidar. There are approximately 2000 acres of FEMA Zone A floodplains outside of the MHFD that have limited accuracy. The effective boundaries were based on 10-40 foot contours that have a significant margin of error. Utilizing the available Lidar, the boundaries could be remapped with a higher level of confidence. Accurate maps benefit	Flood;	Goals 1; 2; 3; Lifelines S&S; FWS; H&M; COM; TRN;	Jefferson County P&Z Other Jefferson County divisions/departments, CWCB, FEMA	\$100,000 - \$1,000,000 grants	High	2021-2024	New in 2021.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	property owners, first responders, County staff and FEMA staff.							
Jefferson County 25	Update FEMA Zone AE floodplains that are outside of the MHFD. Update the studies associated with the FEMA Zone AE floodplains that are outside of the MHFD and mainly in the mountain areas of the County. The FEMA Zone AE floodplains include approximately 700 acres. The effective data is based on studies that are generally 30+ years old and have varying degrees of accuracy. The benefits would include accurate mapping in areas that have had increased development in that time period which would benefit the citizen, County staff and FEMA staff.	Flood;	Goals 1; 2; 3; S&S; Lifelines FWS; H&M; ENG; COM; TRN;	Jefferson County P&Z Other Jefferson County departments/divisions, CWCB, FEMA	\$100,000 - \$1,000,000 grants	High	2022-2025	New in 2021.
Jefferson County 26	Update the South Fork of Deer Creek floodplain. The South Fork of Deer Creek is partially within the MHFD and is classified as a flood prone area. Completing a study will better define the floodplain risk associated with this segment.	Flood;	Goals 1; 2; 3; S&S; Lifelines COM;	Jefferson County MHFD, CWCB, FEMA	\$10,000 - \$100,000 grants & MHFD	Medium	2022-2024	New in 2021.
Jefferson County 27	Purchase properties from the SFHA to reduce flood losses. Within the MHFD, utilize the MHFD Property Acquisition Reserve (or similar) to acquire properties within the Floodplain Overlay District. Outside of the MHFD, apply for funding to purchase properties within the SFHA to reduce property damage, injuries and loss of life due to flood risk.	Dam Failure; Flood;	Goals 1; 2; 3; S&S; Lifelines H&M; TRN;	Jefferson County Jefferson County departments/divisions, MHFD, CWCB, FEMA	More than \$1,000,000 grants, MHFD, CIP	High	2021-2026	New in 2021.
Jefferson County 28	Bear Creek bank stabilization. The bank along Bear Creek downstream of the Evergreen Lake dam, requires stabilization to reduce flood risk, sediment transport and deposition. There are outfalls that along this segment that increase sediment loading to Bear Creek. Benefits include reducing the flood risk in	Erosion and Deposition; Flood;	Goals 1; 2; 3; Lifelines FWS, S&S	Jefferson County Jefferson County divisions, CWCB, Bear Creek Watershed	\$100,000 - \$1,000,000 grants	Medium	2022-2026	New in 2021.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	the historic commercial area of Evergreen, improved fisheries and reduction of the sediment load in Bear Creek.			Association & Bear Creek Watershed Foundation				
Jefferson County 29	Development and formalization of a standing Local Hazard Mitigation Committee. Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. Jefferson County will convene and facilitate a hazard mitigation committee for the participating jurisdictions to implement this Plan going forward.	Avalanche; Cyber; Dam Failure; Drought; Earthquake; Erosion/Deposition; Expansive Soils; Extreme Temps; Flood; Hailstorm; Landslides; Lightning; Pandemic; Winter Storms; Subsidence; Tornado; Wildfire; Windstorm	Goals 2; 3; Lifelines COM, ENG, FWS, HAZ, H&M, S&S, TRN	TBD Jefferson County Emergency Management, Jefferson County Planning & Zoning, Jefferson County Open Space, Participating Agencies	Unknown Staff time	High	2021	New in 2021. Was not implemented after last HMP update.
Jefferson County 30	Drainage and Flood Control Improvement for Weaver Creek at Belleview Avenue. Replace three existing corrugated metal culvert crossings of Weaver Creek along Belleview. The existing structures were identified in the 2018 master plan as overtopping during the 10 year flood. New structures will be designed to pass the 1% chance flood. The increased capacity of the three structures will allow for emergency services and residents to use Belleview Avenue during a flood event.	Flood;	Goals 2; Lifelines TRN	Jefferson County Transportation and Engineering Mile High Flood District	More than \$1,000,000 50/50 match of all project costs between Jefferson County and Mile High Flood District	High	2023	New in 2021.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 31	Drainage and Flood Control Improvement for Dutch Creek at Yukon Street. The existing corrugated metal culvert overtops by 2 feet during the 10 year flood and 3 feet during the 100 year event. This amount of overtopping makes the road impassible for emergency vehicles and local traffic during storm events. The new culvert will pass the 100 year flood to allow for vehicle access.	Flood;	Goals 2; Lifelines S&S; TRN	Jefferson County Engineering and Transportation Mile High Flood District	More than \$1,000,000 50/50 split of project cost between Jefferson County and Mile High Flood District	High	2025	New in 2021.
Jefferson County 32	Drainage and Flood Improvements for Leyden Creek at Croke Canal. During the 2013 floods in Colorado Leyden Creek overtopped its banks and excess spill flooded Croke Canal. This additional flow flooded homes and properties downstream of Indiana St. The proposed project would create a low flow channel for Leyden Creek under Indiana St and Croke Canal. A spillway would be installed at Croke Canal to prevent flows from entering the canal.	Flood;	Goals 2; Lifelines FWS; TRN	Jefferson County Engineering and Transportation City of Arvada, Mile High Flood District, CDOT	More than \$1,000,000 Cost share between Jefferson County, City of Arvada, and Mile High Flood District.	Low	2026	New in 2021.
Jefferson County 33	Hazard Education and Outreach. Jeffco Rangers and natural resources staff are tasked with making 350,000 in-person, in-parks educational contacts with park visitors by 2025 through the Conservation Greenprint. Many of these educational contacts include information about natural hazards such as floods, fire, winter storms, rockfall, heat stroke and stress in pets and people; and wildlife safety and awareness.	Extreme Temps; Flood; Landslides; Lightning; Severe Winter Storms; Wildfire;	Goals 1; Lifelines NA	Jeffco Parks, Jeffco Open Space, Jefferson County OEM	this cost is tied to general operations department budget	High	350,000 contacts by 2025	New in 2021. Will integrate with preparedness campaign.
Jefferson County 34	Rockfall Hazard Advisory and Education. Design, fabricate and install bi-lingual pedestrian/hiker/climber-oriented rockfall hazard educational and advisory signs at key park locations such as Dinosaur Ridge, South Table Mountain, North Table Mountain and Clear Creek Canyon. A sign at Dinosaur	Landslides	Goals 1; Lifelines NA	Jeffco Open Space Friends of Dinosaur Ridge	Less than \$10,000 department budget	High	2025	New in 2021.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	Ridge alone will reach over 250,000 people annually.							
Jefferson County 35	Create a county-wide clearinghouse for past, present and future wildfire mitigation efforts. Draw on Geographic Information Systems data or mapping provided by partner agencies to build collective knowledge, prioritize mitigation efforts and enhance collaboration regarding public and private land mitigation efforts. GIS data mapping is now done by Jefferson County Open Space on its land. An inventory of community mitigation efforts across Jefferson County led by different entities such as fire rescue agencies, HOAs, cities, etc. will also help expand activities into additional areas that are not currently served. For example: 1. Home assessment programs in process 2. Community Wildfire Protection Plans 3. Community Wildfire Protection Implementation Plans 4. Homeowner cost share, tax benefits and grants available	Wildfire	Goals 1,2,3; Lifelines FWS, S&S	Jeffco Wildland Risk Reduction Commission	Minimal	Medium	2022	New in 2021. This was a recommendation in the 2020 Jeffco Wildland Risk Reduction Task Force report.
Jefferson County 36	Create, brand, maintain, and promote a one-stop webpage on reducing wildfire risk in Jefferson County. Webpage will focus on wildfire mitigation and emergency preparedness. 1. Identify the target audience and core content with the help of the Community Education working group. 2. Gather the best content used by the county, CSU Extension Service, Colorado State Forest Service and other resources to help populate web page. 3. Package content as a user-friendly "toolbox" of mitigation and emergency preparedness information.	Wildfire	Goals 1,2,3; Lifelines FWS, S&S	Jeffco Wildland Risk Reduction Commission	Minimal	Medium	2023	New in 2021. This was a recommendation in the 2020 Jeffco Wildland Risk Reduction Task Force report.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	4. Link to other websites focused on mitigation, wildfire prevention and emergency preparedness, etc. A number of existing web pages provide helpful models for what Jeffco's one-stop web page could look like such as the highly-touted CAL FIRE or Rotary Wildfire Ready. Jeffco Open Space recently launched TerraSource - a web page that more broadly promotes good land stewardship, including a section on forest health and fire mitigation. 5. Determine where this website will be housed (e.g., on www.jeffco.us, TerraSource, free-standing site, etc.). 6. Promote web page widely among fire rescue districts, HOAs, Chambers of Commerce, service club, real estate groups and others, and encourage them to share information with their distribution lists. Emphasize the value of consistent information when promoting web page. 7. Maintain and update website regularly, tapping task force members and the Task Force Community Education Team as a source and a sounding board for new content.							
Jefferson County 37	Implement residential wildfire mitigation program. Provide funding for fire districts to conduct more home assessments for wildfire mitigation. Implement a defensible space home assessment certification program. Educate HOAs and homeowners. The lead agencies would be broad so I would recommend adding the wildland fire risk reduction commission as the lead, fire districts, HOAs. Funding would be approx. \$500,000. The timeframe would be 2021-2026.	Wildfire	Goals 1,2,3; Lifelines FWS, S&S	Jeffco Wildland Risk Reduction Commission, Fire Districts, HOAs	\$500,000; TBD	Medium	2026	New in 2021.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Jefferson County 38	Polly Deane Reservoir Remediation. Polly Deane Reservoir located in Easton Regional Park is owned by Bergen Ditch and Reservoir Company. A man-made lake that was partially expanded in mid-1970's, it is located in an urban area and is normally used for storage of irrigation water used by Foothills Park and Recreation District, a major Bergen shareholder (including shares leased from JeffCo). Due to seepage below the dam discovered in spring of 2019, the Colorado Dam Safety Branch has placed a restriction on storage within the reservoir. Bergen has secured a FEMA grant for analysis and design of remedial work on the dam and that work is currently in process to be completed September 2021. Preliminary conclusion is that the toe drain system for the reservoir needs to be replaced along with a full replacement of the reservoir outlet drain, including increasing drain capacity through the outlet. The potential flood area in the event of dam failure places it in a high hazard category with loss of structures and public improvements, and potential loss of life. These improvements will allow the dam to meet or exceed current standards and for the storage restriction to be removed.	Dam Failure; Flood	Goals 1,2,3; Lifelines FWS, S&S	Bergen Ditch and Reservoir Company; Colorado Dam Safety, Jefferson County, FEMA for analysis and remedial design	\$100,000 - \$1,000,000; Federal, State, Local Grants; CWCB construction LOAN; assessments paid by Bergen shareholders.	High	Remedial design and cost estimate -- September 2021; construction 2022 or 2023	New in 2021.

Table 5-4 summarizes the above actions by hazards addressed to demonstrate that the plan addresses a broad range of identified hazards. See the Annexes for additional details on jurisdictional actions. The numbers correspond to the mitigation action number in the first column of Table 5-3 or the corresponding table in the jurisdiction's annex.

Table 5-4 Mitigation Actions Summarized by Hazard

Jurisdiction	Avalanche	Cyber	Dam Failure	Drought	Earthquake	Erosion and Deposition	Expansive Soils	Extreme Temps	Flood	Hailstorm	Landslides, etc.	Lightning	Pandemic	Severe Winter Storms	Subsidence	Tornado	Wildfire	Windstorm
Jefferson County	8,14, 23,29	14,29	4,11,14,15,20, 23,27, 29, 38	14,19, 29	7,8,14, 29	8,14, 19,23, 28,29	8,14, 29	13,14, 29,33	1,2,3,4,9,12, 14,17,20,23, 24,25,26,27, 28,29,30,31, 32,33,38	13,14, 29	8,14, 20,21, 23,29, 33	13,14, 29,33, 34	14,29	13,14,17, 20,23,29,33	8,14, 29	13,14, 17,29	5,6,10,14,16, 17,18, 20,22, 23,29, 33,35, 36,37	13,14, 17,23, 29
City of Arvada		14	8,14	6,7,8, 9,10,14, 16	14	3,8,14	8,14	6,7,8, 9,14	1,2,5,6,7,8,9, 11,12,13,14,15	8,9,14	14	14	14	4,6,7, 8,9,14	14	14	6,7,8, 9,10, 14,16	6,7,8, 9,10, 14,16
City of Edgewater	5	4,5	5	5	5	5	5	5	1,2,3,5	5	5	5	5	5	5	5	5	5
City of Golden		6							1,2,3,4								5	
City of Lakewood		5	1,3,7	6,7,8				5,6,7, 8	1,2,3,4,6,7	6,7		7		5,6,7		7		5,6,7
City of Wheat Ridge	7	7	7	7,10	7	7,8	7	6,7,10	1,2,3,4,5,7,9	6,7	7	6,7	7	6,7	7	6,7	7	6,7
Town of Morrison		6,7	8	6,7	3	3	3		1,2,3,4,6,7,8					6,7	3		3	4,5,6, 7
Arvada FPD				1,2													1,2	1,2
Elk Creek FPD			1		1				1		1		1			1	1,2	1
Evergreen FPD																	1,2,3,4	
Fairmount FPD		3						4		4		2		2,4		2	1,2	2
Foothills FPD																	1,2	

Jurisdiction	Avalanche	Cyber	Dam Failure	Drought	Earthquake	Erosion and Deposition	Expansive Soils	Extreme Temps	Flood	Hailstorm	Landslides, etc.	Lightning	Pandemic	Severe Winter Storms	Subsidence	Tornado	Wildfire	Windstorm
Genesee FPD																	1	
Golden Gate FPD																	1,2,3	
Indian Hills FPD																	1,2	
Inter-Canyon FPD																	1	
North Fork FPD																	1,2,3	
West Metro FPD																	1,2	
Denver Water			2	2					4								1,3,4	
Lookout Mountain Water District			8	1,2,3, 5,6,7, 8,9,10, 11					2,3								4,6,7,8,9,10, 11	
Jefferson Conservation District																	1	

6 Plan Implementation and Maintenance

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This is Phase 4 of FEMA's 4 phase process and Step 10 of the 10-step planning process. This section outlines how this plan will be implemented and updated.

6.1 Implementation

Once adopted, the plan faces the truest test of its worth: implementation. While this plan contains many worthwhile projects, the Hazard Mitigation Planning Committee (HMPC) will need to decide which action(s) to undertake first. Two factors will help with making that decision: 1) the priority assigned the actions in the planning process; and 2) funding availability. Low or no-cost projects most easily demonstrate progress toward successful plan implementation.

Implementation will be accomplished by adhering to the schedules identified for each action (see Section 5.4 for County actions and the jurisdictional annexes for jurisdiction specific actions) and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits of each project to the Jefferson County community and its stakeholders. These efforts include the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. The three main components of implementation are:

- **IMPLEMENT** the action plan recommendations of this plan;
- **UTILIZE** existing rules, regulations, policies and procedures already in existence; and
- **COMMUNICATE** the hazard information collected and analyzed through this planning process so that the community better understands what can happen where, and what they can do themselves to be better prepared. Also, publicize the "success stories" that are achieved through the HMPC's ongoing efforts.

Simultaneously to these efforts, the HMPC will constantly monitor funding opportunities that could be leveraged to implement some of the more costly actions. This will include creating and maintaining a bank of ideas on how to meet required local match or participation requirements. When funding does become available, the HMPC will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, special district budgeted funds, state and federal earmarked funds, and other grant programs, including those that can serve or support multi-objective applications.

6.1.1 Role of the All-Hazard Mitigation Planning Committee in Implementation and Maintenance

With adoption of this plan, the Hazard Mitigation Planning Committee (HMPC) will transition into the Jeffco All-Hazard Mitigation Advisory Committee (Jeffco AHMAC) as approved by the Board of County Commissioners (BCC). The AHMAC will act as an advisory body tasked with plan implementation and maintenance. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. This will allow for a single point of centralization for all federally focused mitigation information, strategies, efforts and project prioritization for the entire county. The group will seat its authority and report to the BCC on the status of plan implementation and mitigation opportunities. Additionally, the Jeffco AHMAC supports the forecasted annual reporting requirements by both DHSEM and FEMA.

The scope of the AHMAC will primarily focus efforts around FEMA mitigation dollars, though other funding opportunities may be monitored, including those that can serve or support multi-objective applications. Membership will include, at minimum, the 21 participating agencies that adopted the plan. In adopting the HMP, participating agencies will be eligible for FEMA mitigation dollars. The Chair of the AHMAC will be a rotating position appointed per the group's bylaws (under development).

The Jeffco AHMAC will:

- Act as the County's central forum for all-hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of the HMP and AHMAC recommended actions;
- Keep the concepts of mitigation in the forefront of community decision-makers by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Steward implementation and updates of this plan;
- Report on plan progress and recommended changes to the Jefferson County BCC;
- Inform and solicit input from the public; and
- Assess, prioritize, recommend or deny FEMA mitigation grant applications that are not associated with a participating agency that compliment or conflict with the goals, objectives and pre-identified mitigation projects in the HMP.

Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website and local newspapers.

By adopting this plan, each participating jurisdiction agrees to engage in the ongoing implementation and maintenance activities described in the plan. Each jurisdiction that also meets State of Colorado and FEMA requirements for mitigation grant programs, will identify one representative for the AHMAC, subject to approval by the Jefferson County Board of County Commissioners.

6.2 Plan Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate plan implementation and to update the plan as required or as progress, roadblocks, or changing circumstances are recognized.

6.2.1 Monitoring

In order to track progress and update the mitigation strategies identified in the action plan, the HMPC will revisit this plan annually or after a significant hazard event or disaster declaration. Jefferson OEM is responsible for initiating this review and convening members of the AHMAC on a once yearly basis, or more frequently as needed. The annual review will be held in January of each year, beginning in 2022.

This plan will be updated, approved and adopted within a five-year cycle as per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000. With the initial approval of this plan occurring in mid-2021, the plan will need to be updated, re-approved by the Colorado Division of Homeland Security and Emergency Management (DHSEM) and FEMA Region VIII, and re-adopted by all participating jurisdictions no later than June of 2026. The County will monitor planning grant opportunities from DHSEM and FEMA for funds to assist with mitigation projects, as well as with the 5-year update. These grants should be pursued as early as 2024, as some grants have a three-year performance period to expend the funds, plus there is no guarantee that the grant will be awarded when initially submitted. This allows time to resubmit the grant in 2025 if needed.

6.2.2 Evaluation

Updates to this plan will follow the latest FEMA and DHSEM planning guidance. Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions: and/or
- Increased vulnerability as a result of new development (and/or annexation).

The AHMAC will use the following process to evaluate progress and any changes in vulnerability as a result of plan implementation.

- A representative from the responsible entity identified in each mitigation measure will be responsible for tracking and reporting on an annual basis to the AHMAC on project status and provide input on

whether the project as implemented meets the defined objectives and is likely to be successful in reducing vulnerabilities.

- If the project does not meet identified objectives, the AHMAC will determine what alternate projects may be implemented
- New projects identified will require an individual assigned to be responsible for defining the project scope, implementing the project, and monitoring success of the project.
- Projects that were not ranked high priority but were identified as potential mitigation strategies will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation.
- Changes will be made to the plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with established criteria, the time frame, priorities, and/or funding resources.

6.2.3 Updates

Updates to this plan will:

- Consider changes in vulnerability due to project implementation;
- Document success stories where mitigation efforts have been completed or proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Document hazard events and impacts that occurred within the five-year period;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate documentation of continued public involvement;
- Incorporate documentation to update the planning process that may include new or additional stakeholder involvement;
- Incorporate growth and development-related changes to building inventories;
- Incorporate new project recommendations or changes in project prioritization;
- Include a public involvement process to receive public comment on the updated plan prior to submitting the updated plan to DHSEM/FEMA;
- Align with the latest FEMA and State of Colorado guidance; and
- Include re-adoption by all participating entities following DHSEM/FEMA approval.

6.3 Integration into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is integrating the hazard mitigation plan recommendations and their underlying principles into other existing or new plans and mechanisms. Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The mitigation plan can be considered as the hub of a wheel with spokes radiating out to other related planning mechanisms that will build from the information and recommendations contained herein. Properly implemented, the HMP should serve as one of the foundational documents of the jurisdictions' emergency management programs, since everything emergency management does should relate back in one way or another to the hazards the jurisdiction faces.

As stated in Section 6.1 of this plan, implementation through existing plans and/or programs is recommended, where possible. The County and participating entities already have existing policies and programs to reduce losses to life and property from natural hazards. These are summarized in this plan's capability assessment. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing projects, where possible, through these other program mechanisms. These existing mechanisms include those listed in the Section 2.7 Capability Assessment, as well as those in Section 3.4 of the Planning Process. AHMAC members involved in the updates to these mechanisms will be responsible for integrating the findings and recommendations of this plan with these other plans, as appropriate.

The following sections provides some guidance on how Jefferson County and participating jurisdictions may use the updated HMP to inform and improve other plans, procedures, and programs. Additional

detail on how the jurisdictions will integrate the HMP into their planning mechanisms can be found in the Annexes.

6.3.1 Comprehensive Plans

Integrating hazard mitigation into the jurisdiction's comprehensive or general plan is considered a best practice by both FEMA and the American Planning Association. The Jefferson County Comprehensive Plan was last updated in 2017, and included hazards information from the 2016 HMP, which is cited as a supporting document to the Comprehensive Plan. Jefferson County OEM will work with the Planning Department to ensure that hazards data and mitigation goals and objectives inform the next Comprehensive Plan update.

6.3.2 Threat and Hazard Identification and Risk Assessment (THIRA)

Jefferson County has completed a County-level Threat and Hazard Identification and Risk Assessment (THIRA). CPG201 Threat and Hazard Identification and Risk Assessment (THIRA) establishes Step 1 as "Identify the Threats and Hazards of Concern" and lists HIRAs and HMPs as possible sources of threat/hazard information.

The criteria for selecting which Threats/Hazards are "of concern" are defined as:

- Factor #1: Likelihood of a Threat or Hazard Affecting a Community
- Factor #2: The Impacts of a Threat or Hazard

Each natural and human-caused hazard profiled in the HIRA (Section 4) contains a section analyzing the probability of future events, which provides a data-driven answer to Factor #1. Similarly, the vulnerability assessment section of the hazard profiles address what impacts can realistically be expected from both routine and extreme events of each hazard, which specifically addresses Factor #2.

Step 2 of CPG 201 is to "Give the Threats and Hazards Context" by creating a scenario for each hazard of concern, with specifics like time of day, area, and magnitude of the event, which are then used to establish capability targets for each of the 32 core capabilities. All the hazards profiled in the HIRA contain detailed information to ensure the hazard scenarios are plausible. For some hazards, such as flooding, detailed GIS analysis has been done that can easily be incorporated as THIRA scenarios. Other hazards include details on the most extreme historical events on record that can quickly be updated to modern scenarios.

6.3.3 Recovery Plan

The risk and vulnerability data in the HMP should help inform the post-disaster recovery planning process, especially by ensuring that the recovery elements of those plans fully take into account the dangers posed by other hazards, rather than focusing exclusively on the most recent hazard event. The HMP in turn will be revisited during recovery to help identify opportunities to incorporate mitigation in the recovery and rebuilding process, including maximizing FEMA PA and HMGP funding where applicable.

The FEMA publication "Pre-Disaster Recovery Planning Guide for State Governments" notes:

"...much of the research involved in the development of mitigation plans can be used to inform the pre-disaster recovery planning effort.

"The pre-disaster recovery planning process will benefit from and build upon hazard mitigation as:

- The mitigation planning process identifies local hazards, risks, exposures, and vulnerabilities;
- Implementation of mitigation policies and strategies will reduce the likelihood or degree of disaster-related damage, decreasing demand on resources post-disaster;
- The process will identify potential solutions to future anticipated community problems; and
- Mitigation activities will increase public awareness of the need for disaster preparedness.

"Pre-disaster recovery planning efforts also increase resilience by:

- Establishing partnerships, organizational structures, communication resources, and access to resources that promote a more rapid and inclusive recovery process;
- Describing how hazard mitigation will underlie all considerations for reinvestment;
- Laying out a process for implementation of activities that will increase resilience; and
- Increasing awareness of resilience as an important consideration in all community activities.”

6.3.4 Continuity of Operations Plans (COOP)

All departments and agencies of Jefferson County government are required to maintain a Continuity of Operations Plan (COOP) that details that agency's critical functions and how they will protect those functions in order to continue to provide essential services during a disaster or interruption. By defining and describing the hazards facing the county, including frequency and severity, the HIRA informs agency COOP plans by giving context to what types of disasters or interruptions are most likely to occur. Critical facilities and assets located in hazard areas in Section 4.2 should be prioritized for COOP planning.

6.3.5 Integrated Preparedness Plan (IPP)

Hazard mitigation principles and procedures should be included in Integrated Preparedness Planning Workshops. Any training and exercise needs identified in the Capabilities Assessment (Section 2.7) and Mitigation Strategy (Section 5) should also be included in the jurisdictions' IPP.

6.3.6 Public Awareness and Education Programs

The County's ongoing public education and outreach efforts should reflect the hazards and vulnerabilities described in this Plan. In addition to preparing for disasters, public education should include ways in which the public can reduce their vulnerability to natural and human caused hazards. Furthermore, mitigation activities and success stories should be communicated to the public to show the benefits of effective mitigation planning.

6.3.7 Critical Infrastructure Protection Plan

Critical facilities and assets identified in Section 4.2 should be included in Critical Infrastructure Protection Planning (CIPP), with prioritization given to assets located in hazard-prone areas. Hazardous materials facilities in particular should be viewed both as critical assets in need of protection, and as potential hazards in their own right.

6.3.8 Capital Improvements Plan

Many of the mitigation actions listed in the Mitigation Strategy (Section 5) came from the County's Capital Improvements Plan, and thus have already been identified for funding. Other high-dollar actions listed or identified in the future can also be added to the Capital Improvements Plan to ensure that hazard mitigation projects continue to receive funding. The prioritization of actions listed in Table 5-3, while not binding on capital improvement planning, can be used to inform the prioritization of those actions. Even projects for which the county intends to seek grant funding may also need to be addressed in the Capital Improvements Plan, given that most mitigation grants require significant local matching funds.

6.3.9 Sustainability Plans

Sustainability is a separate area of concern from hazard mitigation, but there are areas where the two fields overlap and influence one another positively or negatively.

Sustainability plans should be reviewed to identify where there may be synergy between sustainability and mitigation/resiliency. For example, sustainability efforts aimed at increasing County's adaptability to climate change can also make the county more resilient to drought and severe weather. Increasing the percentage of food obtained locally could make the county more resilient to supply-chain interruptions or the impacts of disasters in other states. Adding more trees and grass to urban areas to reduce the heat island effect could help mitigate the impact of extreme weather events, as well as reducing flood risk by increasing the amount of permeable surfaces. This may help raise the priority of some sustainability efforts, as well as suggest complimentary mitigation efforts.

It is equally important to identify areas where sustainability efforts may work to reduce the county's resilience to hazards. For example, a sustainability goal of promoting use of public transit and reducing private car ownership could potentially make it harder to evacuate the public during a disaster if public

transit is damaged and offline (as was observed during Hurricane Sandy). Similarly, reduced production of solid waste could lead to a reduction in the number of public resources such as dump trucks, which means that in a disaster those resources would not be available for debris removal and similar tasks. The intent of this review is not to say that sustainability goals should not be pursued, but rather to identify areas of concern that should be considered during implementation of these goals. For example, evacuation plans may need to be revised to reflect a larger percentage of families without cars; or contracts may need to be put in place to obtain additional dump trucks in a disaster.

6.4 Continued Public Involvement

Continued public involvement is also imperative to the overall success of the Plan's implementation. This updated HMP will be posted on the county's website for reference and can be used to help inform the county's ongoing public education and outreach program, such as the completion of mitigation actions that reduce the community's vulnerability, can be shared with the public through forums like the Local Emergency Planning Committee (LEPC), public meetings, and through social media. This helps keep the concept of hazard mitigation alive and helps show the public that their government officials are working to keep them safe.

The update process provides an opportunity to publicize success stories from the Plan implementation and seek additional public comment. When the Planning Team reconvenes for the five-year plan update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the plan. The plan maintenance and update process will include continued public and stakeholder involvement and input through participation in designated committee meetings, surveys, web postings, and press releases to local media.

Continued public outreach and education is an aspect of the mitigation strategy Section 5 of this plan. Activities related to public involvement during the 2021 update are documented in Section 3 and Appendix B.

Annex A. City of Arvada

A.1 Background and Planning Process

This Annex was updated during the development of the 2021 Jefferson County Hazard Mitigation Plan. The City of Arvada fully participated in the 2021 update process as described in Section 3. The City had previously participated in the 2016 Jefferson County Hazard Mitigation Plan and has been active in implementing that plan as described in Section A.7. A review of jurisdictional priorities found no significant changes in priorities since the last update. Individuals who participated in the update process and represented the City on the Planning Team are listed in Appendix B.

More details on the planning process and how the jurisdictions, special districts, and stakeholders participated, as well as how the public was involved, can be found in Chapter 3 of the Base Plan.

A.2 Community Profile

Figure A-1 shows a map of the City of Arvada.

A.2.1 History

The City of Arvada is a Home Rule Municipality located in Jefferson and Adams Counties in the Denver Metropolitan Area of the U.S. State of Colorado.

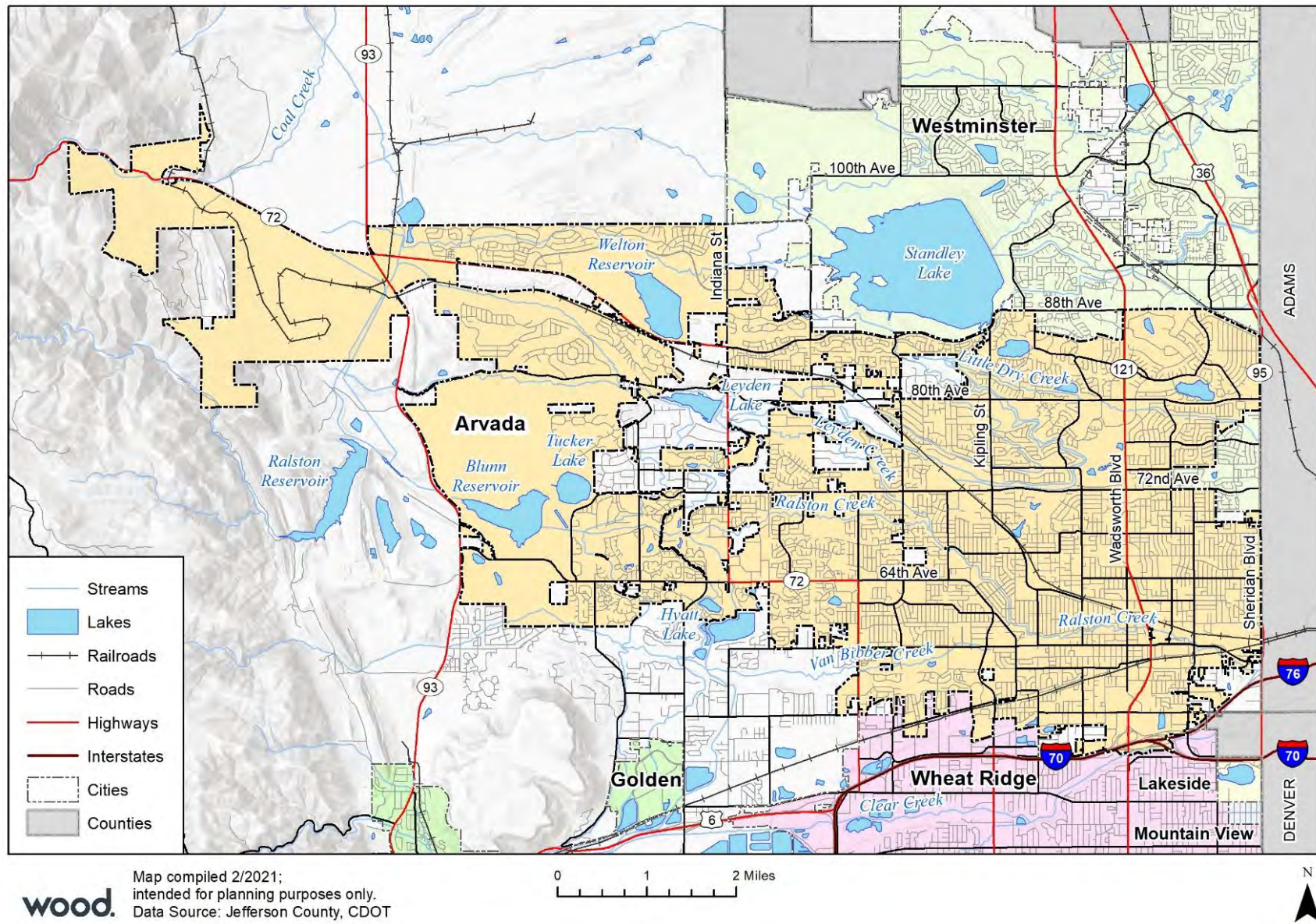
The first documented discovery of gold in the Rocky Mountain region occurred on June 22, 1850, when Lewis Ralston, a Georgia prospector headed for the California gold fields, dipped his sluice pan into a small stream near its mouth at Clear Creek. Ralston found about 1/4 ounce (6 g) of gold, then worth about five dollars. Ralston's companions named the stream Ralston's Creek in his honor, but they all left the next morning, drawn by the lure of the California gold fields.

During the Pike's Peak Gold Rush in 1858, Ralston brought another group of prospectors back to the site of his first discovery. The placer gold in the area soon played out, but hard rock deposits of gold were found in the mountains to the west. Some of the miners abandoned their search for gold and returned to farm the rich bottom land along Ralston Creek and Clear Creek. They found an eager market for their crops among other gold seekers. The Territory of Colorado was formed on February 28, 1861, and the farms in the valley expanded to feed the growing population of the region.

In 1870, the Colorado Central Railroad laid tracks through the area on its route from Golden to link up with the Kansas Pacific Railroad and the Denver Pacific Railroad at Jersey Junction, 3 miles north of Denver. On December 1, 1870, Benjamin F. Wadsworth and Louis A. Reno platted the Ralston Point townsite along the railroad. To avoid confusion with other communities along Ralston Creek, Ralston Point was soon renamed Arvada in honor of Hiram Arvada Haskin. Benjamin Wadsworth became the first postmaster of Arvada. Colorado was granted statehood on August 1, 1876, and the Town of Arvada was formally incorporated on August 14, 1904. A vibrant agricultural community, Arvada claimed the title "Celery Capital of the World."

Arvada grew rapidly during the latter half of the 20th century as a suburb of nearby Denver, the state capital. Arvada became a Statutory City on October 31, 1951, and a Home Rule Municipality on July 23, 1963. By the end of the millennium, the population of Arvada exceeded 100,000.

Figure A-1 City of Arvada



A.2.2 Population

The U. S. Census Bureau's estimated 2019 population of Arvada was 118,746. The following tables and graphs summarize key demographic and social characteristics of the City of Arvada based on the U.S. Census Bureau's American Community Survey, 5-Year Estimates, 2015-2019.

Table A-1 Arvada Demographic and Social Characteristics

Arvada	2015	2019	% Change
Population	111,658	118,746	6.35%
Median Age	40.9	40.2	-1.7%
Total Housing Units	45,887	49,038	6.9%
Housing Occupancy Rate	97.2%	96.9%	-0.3%
% of Housing Units with no Vehicles Available	4.00%	3.2%	-20.0%
Median Home Value	\$257,300	\$384,500	49.4%
Unemployment Rate	6.0%	3.8%	-36.7%
Mean Travel Time to Work (minutes)	27	28	3.7%
Median Household Income	\$69,938	\$84,717	21.1%
Per Capita Income	\$35,158	\$42,921	22.1%
% of Individuals Below Poverty Level	8.4%	5.8%	-31.0%
% Without Health Insurance	11.3%	5.0%	-55.8%
# of Households	46,055	47,507	3.2%
Average Household Size	2.5	2.49	0.0%
% of Population Over 25 with High School Diploma or Higher	94.2%	94.3%	0.1%
% of Population Over 25 with Bachelor's Degree or Higher	39.8%	41.1%	3.3%
% with Disability	11.3%	10.9%	-3.5%
% Speak English less than "Very Well"	2.2%	2.4%	9.1%

Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Table A-2 Arvada Demographic & Social Characteristics Compared to the County & State

Demographic & Social Characteristics (as of 2019)	Arvada	County	Colorado
Median Age	40.2	40.3	36.7
Housing Occupancy Rate	96.9%	96.4%	90.0%
% of Housing Units with no Vehicles Available	3.2%	3.9%	5.1%
Median Home Value	\$384,500	\$397,700	\$343,300
Unemployment	3.8%	3.6%	4.3%
Mean Travel Time to Work (minutes)	28	28	25.8
Median Household Income	\$84,717	\$82,986	\$72,331
Per Capita Income	\$42,921	\$44,119	\$38,226
% of Individuals Below Poverty Level	5.8%	7.1%	10.3%
% Without Health Insurance	5.0%	5.5%	7.6%
Average Household Size	2.49	2.40	2.56

Demographic & Social Characteristics (as of 2019)	Arvada	County	Colorado
% of Population Over 25 with High School Diploma or Higher	94.3%	94.5%	91.7%
% of Population Over 25 with bachelor's degree or Higher	41.1%	45.2%	40.9%
% with Disability	10.9%	10.0%	10.6%
% Speak English less than "Very Well"	2.4%	3.0%	5.8%

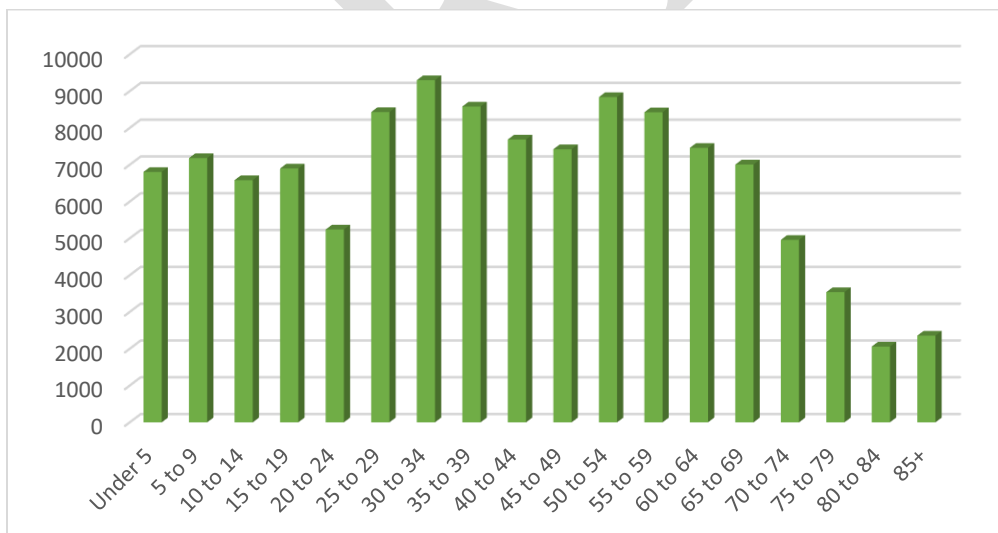
Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Table A-3 Arvada Demographics by Race and Sex

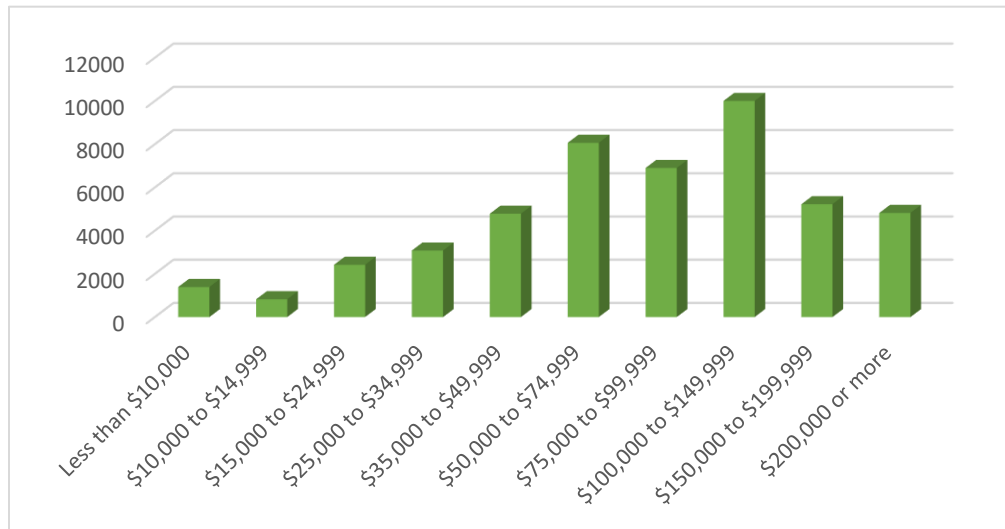
Arvada	Population	%
Total Population	118,746	
Male	58,027	48.9%
Female	60,719	51.1%
White, not Hispanic	94,995	80.0%
Hispanic or Latino	17,032	14.3%
Black	1,423	1.2%
Asian	2,371	2.0%
American Indian and Alaska Native	478	0.4%
Native Hawaiian and Other Pacific Islander	52	0.0%
Some other race	131	0.1%
Two or more races	2,264	1.9%

Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Figure A-2 Arvada Population by Age



Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Figure A-3 Arvada Income Distribution


Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

A.2.3 Social Vulnerability

Social vulnerability scores for the City of Arvada can be seen in Figures 2-2 through 2-6 in Section 2 of the Base Plan. The City of Arvada is characterized by a mix of low (bottom 20% in the county) to high (top 20% in the county) levels of social vulnerability. The more socially vulnerable areas are generally clustered in the eastern part of the City, although some areas in the western part of the City do score above average in housing and transportation vulnerability. Resources and measures to reduce the social determinants of disasters may be most effectively allocated to these areas. Moreover, it is critical that the City analyze the individual social vulnerability indicators that make those parts of the community stand out. Research from other disaster events like Superstorm Sandy shows that social connections among neighbors are a key foundation to resilience and bouncing back after a disaster event. The City of Arvada acknowledges and implements this principle into its Neighbors Connected Program and Resilient Neighborhoods Partnership work to create an environment in Arvada where social cohesion can prosper through mechanisms like block parties, neighborhood improvement grants, and preparedness workshops. Through ongoing evaluation, the City of Arvada will be able to more effectively reduce local social vulnerability and increase their resilience to hazard events. For more discussion of Social Vulnerability, see Section 2.3 of the Base Plan.

A.2.4 Growth and Development Trends

Table A-4 shows the various types and amounts of housing units in the City of Arvada based on data from the American Community Survey Five Year Estimates for 2015-2019. As shown in the table, most housing units (71.5%) are single family homes (1-unit detached) in Arvada.

Table A-4 Arvada Types and Total Housing Units

Type of Housing Units	Total	%
Total housing units	49,038	
1-unit detached	35,040	71.5%
1-unit attached	3,475	7.1%
2 units	443	0.9%
3 or 4 units	1,681	3.4%
5 to 9 units	2,032	4.1%
10 to 19 units	2,312	4.7%

Type of Housing Units	Total	%
20 or more units	3,962	8.1%
Mobile home	74	0.2%
Boat, RV, van, etc.	19	0.0%

Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

Table A-5 illustrates how Arvada has undergone steady growth in terms of population and number of housing units between 2010 and 2019.

Table A-5 Arvada's Change in Population and Housing Units, 2010-2019

2010 Population	2019 Population Estimate	Estimated Percent Change 2010-2019	2010 # of Housing Units	2019 Estimated # of Housing Units	Estimated Percent Change 2010-2019
106,474	118,746	11.5%	43,952	49,038	11.6%

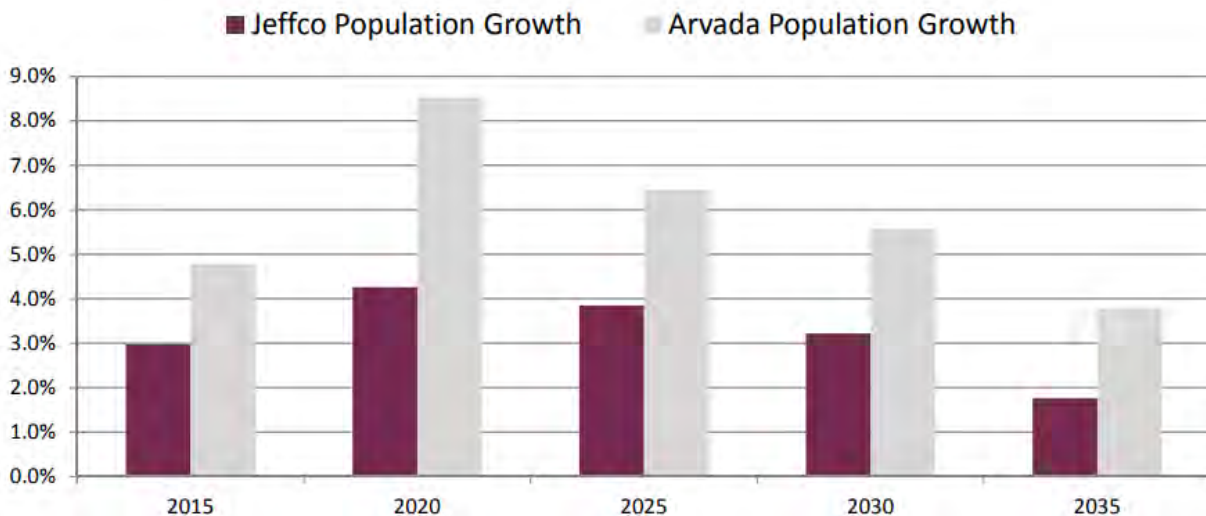
Source: U.S. Census Bureau, American Community Survey, 5-Year Estimates 2015-2019

According to the HMPC, Arvada has seen a general trend in smaller parcel development and the continued development in the western portion of the Candelas development, located in the northeast portion of the City. The Gross Reservoir is also proposed to be built and filled in conjunction with the development in the west. The Candelas development near highways 93 and 72 is an area subject to high winds and brush fires and has mapped areas of subsidence and dipping bedrock.

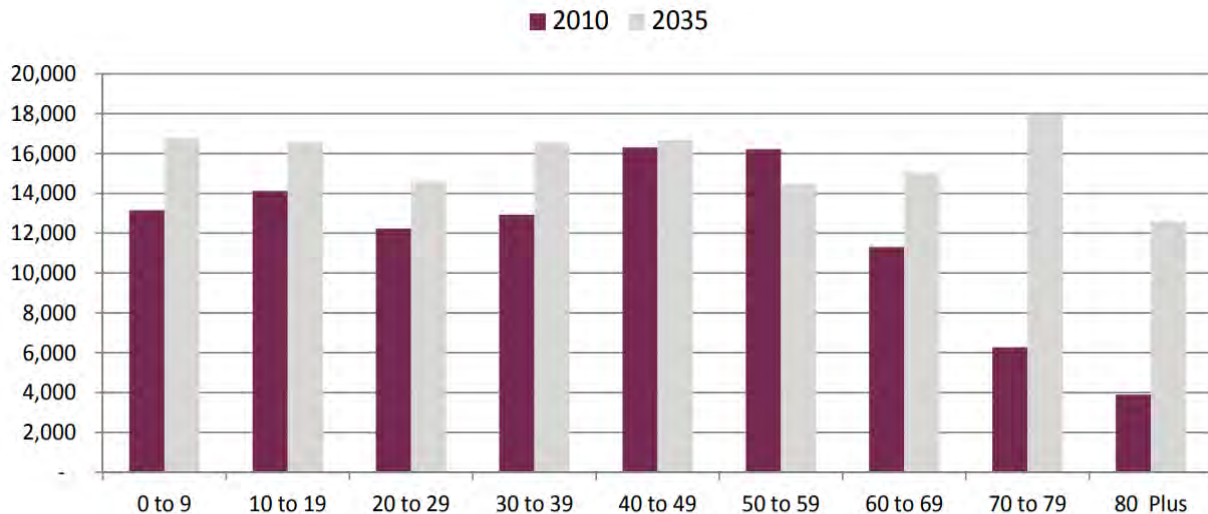
The HMPC also noted there is redevelopment of existing parcels and infill development also occurring and is likely to continue as developable parcels become more limited in the City.

Figure A-4 shows Arvada's estimated population changes through 2035 assuming historic growth patterns compared to Jefferson County. According to the City of Arvada Comprehensive Plan, while Arvada is expected to grow faster than the County as a whole, it will largely depend on the availability of buildable greenfield land, redevelopment opportunities, and the community's feelings toward city growth and the economy (Arvada 2014). Figure A-5 shows the projected changes in age distribution in the City by 2035. The growth in the 60 years and older demographic is projected to increase significantly by 2035.

Figure A-4 City of Arvada Projected Population Growth



Source: City of Arvada Comprehensive Plan, Appendix A Demographic Profile & Projections, Steven B. Fisher and State Demography Office

Figure A-5 City of Arvada Age Distribution 2010 Census vs 2035 Projection


Source: City of Arvada Comprehensive Plan, Appendix A Demographic Profile & Projections, Steven B. Fisher and State Demography Office

A.2.5 Natural, Cultural, and Historic Resources

Assessing the vulnerability of Arvada to disaster also involves an inventory of the natural, historical, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The City of Arvada has an outstanding parks and recreation system, and over 2,175 acres of open space within the Planning Area boundaries, over 90 neighborhood parks, nine regional parks and open space areas, and vast protected areas of open space owned by Jefferson County, and cities of Boulder, Denver, and Westminster adjacent to the Planning Area boundaries. For information about natural resources in Jefferson County, which includes Arvada, see Section 4.2.3 of the Base Plan.

Historic and Cultural Resources

Table A-6 lists the properties in Arvada that are on the National Register of Historic Places and/or the Colorado State Register of Historic Properties; for more information about these registers, see Section 4.2.3 in the Base Plan.

Table A-6 Arvada's Historic Properties/Districts in National and State Registers

Property	Address	Date Listed
Arvada Downtown (Olde Town)	5580-5773 Wadsworth Blvd., 7207-7612 Grandview Ave., 755 Grant Pl., 5690 Yukon St., and 7314-7510 W. 57th Ave.	7/15/1998
Arvada Flour Mill	5580 Wadsworth Blvd.	4/24/1975
Churches Ranch	17999 W. 60 th Ave	7/23/1998

Property	Address	Date Listed
Reno Park Addition Historic District	7799-7899 W. 57th Ave., 7801-7906 Grandview Ave., 7800 & 7884 Ralston Rd., 5603-5720 Yarrow St., 5701-5723 Yukon St., & 5604-5723 Zephyr St.	9/29/1999
Russell-Graves House	5605 Yukon St.	5/9/1983
Seven Day Adventist Church – Arvada Jaycee Hall	5640 Yukon St.	2/24/2011
Stocke, Walter Addition Historic District	6701-7014 Grandview Ave., 5708-7006 Ralston Rd., 5712-5724 Reed St. & 5705-5726 Saulsbury St.	9/24/1999
Enterprise Grange No. 15	7203 Simms St.	State Register 8/11/1999
Ralston Cemetery	14600 Block of 62 nd Ave.	6/30/2011
Ralston Gold Discovery Site (Gold Strike Park)	56th Ave. & Fenton St.	State Register 12/13/1995

Sources: National Register of Historic Places, <https://www.nps.gov/subjects/nationalregister/> and Colorado State Register of Historic Properties: <https://www.historycolorado.org/colorado-state-register-historic-properties>

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. There is currently one Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) building in the City of Arvada.

Table A-7 Architecturally Significant Buildings in Arvada

Property	Address
William Graves House	5250 Marshall St, Arvada Co

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

A.3 Hazard Identification and Risk Assessment

A hazard identification and vulnerability analysis was completed for the City of Arvada using the same methodology as in the base plan. The information to support the hazard identification and risk assessment for this Annex was collected through a Data Collection Guide.

Each participating jurisdiction was in support of the main hazard summary identified in the base plan; however, the hazard summary for each jurisdictional annex may vary slightly due to specific hazard risk and vulnerabilities unique to that jurisdiction. This helps to differentiate the jurisdiction's risk and vulnerabilities from that of the overall County.

Table A-8 lists the significance of each hazard for the City of Arvada based on the updated risk assessment and planning team input. The highest risk hazards were determined to be flood, wildfire, and windstorm.

Table A-8 City of Arvada – Hazards Summary

Hazard	Geographic Extent	Probability of Future Occurrence	Potential Severity/Magnitude	Overall Significance
Avalanche	Limited	Unlikely	Negligible	Low
Cyber Attack	Extensive	Occasional	Significant	Medium
Dam Failure	Significant	Unlikely	Significant	Medium
Drought	Extensive	Occasional	Critical	Medium
Earthquake	Extensive	Unlikely	Negligible	Low
Erosion and Deposition	Significant	Unlikely	Negligible	Low
Expansive Soils	Limited	Likely	Negligible	Low
Extreme Temperatures	Extensive	Occasional	Limited	Medium
Flood	Extensive	Likely	Limited	High
Hailstorm	Extensive	Occasional	Negligible	Medium
Landslide, Debris flow, Rockfall	Limited	Unlikely	Negligible	Low
Lightning	Extensive	Highly	Negligible	Low
Pandemic	Extensive	Occasional	Significant	Medium
Severe Winter Storms	Significant	Likely	Negligible	Low
Subsidence	Limited	Unlikely	Negligible	Low
Tornado	Extensive	Unlikely	Limited	Medium
Wildfire	Significant	Occasional	Limited	High
Windstorm	Extensive	Likely	Negligible	High
Geographic Extent <u>Negligible:</u> Less than 10 percent of planning area or isolated single-point occurrences <u>Limited:</u> 10 to 25 percent of the planning area or limited single-point occurrences <u>Significant:</u> 25 to 75 percent of planning area or frequent single-point occurrences <u>Extensive:</u> 75 to 100 percent of planning area or consistent single-point occurrences Potential Severity/Magnitude <u>Negligible:</u> Less than 10 percent of property is severely damaged, facilities and services are unavailable for less than 24 hours, injuries and illnesses are treatable with first aid or within the response capability of the jurisdiction. <u>Limited:</u> 10 to 25 percent of property is severely damaged, facilities and services are unavailable for between 1 and 7 days, injuries and illnesses require sophisticated medical support that does not strain the response capability of the jurisdiction, or results in very few permanent disabilities. <u>Critical:</u> 25 to 50 percent of property is severely damaged, facilities and services are unavailable or severely hindered for 1 to 2 weeks, injuries and illnesses overwhelm medical support for a brief period of time, or result in many permanent disabilities and a few deaths. <u>Catastrophic:</u> More than 50 percent of property is severely damaged, facilities and services are unavailable or hindered for more than 2 weeks, the medical response system is overwhelmed for an extended period of time or many deaths occur.		Probability of Future Occurrences <u>Unlikely:</u> Less than 1 percent probability of occurrence in the next year or has a recurrence interval of greater than every 100 years. <u>Occasional:</u> Between a 1 and 10 percent probability of occurrence in the next year or has a recurrence interval of 11 to 100 years. <u>Likely:</u> Between 10 and 90 percent probability of occurrence in the next year, or has a recurrence interval of 1 to 10 years <u>Highly Likely:</u> Between 90 and 100 percent probability of occurrence in the next year or has a recurrence interval of less than 1 year. Overall Significance <u>Low:</u> Two or more of the criteria fall in the lower classifications or the event has a minimal impact on the planning area. Also used for hazards with a minimal or unknown record of occurrences and impacts or for hazards with minimal mitigation potential. <u>Medium:</u> The criteria fall mostly in the middle ranges of classifications and the event's impacts on the planning area are noticeable but not devastating. Also used for hazards with a high impact rating but an extremely low frequency. <u>High:</u> The criteria consistently fall along the high ranges of the classification and the event exerts significant and frequent impacts on the planning area. Also used for hazards with a high psychological impact or for hazards that the jurisdiction identifies as particularly relevant.		

A.4 Community Asset Inventory

Table A-9 shows the total number of improved parcels, properties, and their improvement and content values for the City of Arvada. See Section 4.2 of the Base Plan for details and methodology.

Table A-9 City of Arvada's Property Inventory

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value
Agriculture	8	8	\$2,760,667	\$2,760,667	\$5,521,334
Commercial	515	856	\$550,997,194	\$550,997,194	\$1,101,994,388
Exempt	125	144	\$312,137,969	\$312,137,969	\$624,275,938
Industrial	199	247	\$212,035,772	\$318,053,658	\$530,089,430
Mixed Use	147	184	\$130,816,114	\$130,816,114	\$261,632,228
Residential	41,028	42,558	\$13,048,341,862	\$6,524,170,931	\$19,572,512,793
Total	42,022	43,997	\$14,257,089,578	\$7,838,936,533	\$22,096,026,111

Source: Jefferson County Assessor's Office

Table A-10 is a detailed inventory of assets identified by the City's planning team. This inventory includes some critical facilities. For more information about how "critical facility" is defined in this plan, see Section 4.2.2 of the Base Plan.

Table A-10 Summary of Arvada's Assets

Name of Asset	Replacement Value (\$)	Occupancy/ Capacity #	Hazard Specific Info
Arvada City Hall 8101 Ralston Rd, Arvada, CO 80002	\$21 million	Approx. 400	City, PW, and Police administration; EOC
Arvada Center for Performing Arts 6901 Wadsworth Blvd, Arvada, CO 80003	\$25 million	Up to 5000	Mass Casualty
Arvada Municipal Services Facility 6701 Indiana St., Arvada, CO 80007	\$26 million	Approx. 100	Arvada fleet facilities, alternate EOC
Ralston WTP, 18975 W. 66 th Ave., Arvada, CO 80007	\$21 million	Approx. 4	Water treatment plant
Parks Maintenance Facility, 7800 W. 62 nd Ave, Arvada CO 80003	\$7 million	Approx. 50	Maintenance Facility
Wastewater/Stormwater Facility, 5555 W. 56 th Ave, Arvada, CO 80002	\$3 million	Approx. 25	Wastewater system maintenance facility
Hill Petroleum, 6291 Ralston Rd, Arvada, CO 80002		Unknown	Hazardous materials
Industrial Chemical Corp., 4631 W, 58 th Ave., Arvada, CO 80002		Unknown	Hazardous materials
Great West Inorganics		Unknown	Hazardous materials
Plains End Generation Facility		Unknown	Natural gas
Railroad Bridge, 56 th & Wadsworth, Arvada, CO 80002			Railroad bridge
Railroad Lines, Arvada, CO			Railroad lines
Olde Town Arvada, Arvada, CO 80002		Up to 2500	City business center
Schools – see Jefferson County Schools submittal			
Fire Protection District Headquarters	\$3.2 million		

Name of Asset	Replacement Value (\$)	Occupancy/ Capacity #	Hazard Specific Info
Fire Station 1	\$2 million		
Fire Station 2	\$2 million		
Fire Station 3	\$2 million		
Fire Station 4	\$2 million		
Fire Station 5	\$2 million		
Fire Station 6	\$4 million		
Fire Station 7	\$2 million		
Fire Station 8	\$2 million		
Training/Maintenance	\$9 million		
Special Needs Facilities – refer to Jefferson County			

Many of the facilities listed above are also in GIS databases provided by the City of Arvada and Jefferson County. Table A-11 lists summary information about the 289 critical facilities and other community assets identified by the City as important to protect or that provide critical services in the event of a disaster. The critical facilities are organized by FEMA Lifelines. For additional information on the definitions behind each critical facility category, source, and other details refer to Section 4.2.2 of the Base Plan.

Table A-11 Summary of Arvada's Critical Facilities in GIS

FEMA Lifeline	Count
Communications	93
Energy	8
Hazardous Materials	15
Health and Medical	42
Safety and Security	51
Transportation	80
Total	289

Source: HIFLD and CERC

A.5 Vulnerability Assessment

This section provides a refined vulnerability assessment, specific for the City of Arvada, for those hazards where the risk is significantly different from that of Jefferson County overall, or where sufficient data exists to conduct mapping and analysis at the local level. For the following hazards, the City's risk does not differ significantly from the rest of the County, and they are not profiled further:

- Avalanche
- Drought
- Earthquake
- Erosion and Deposition
- Expansive Soils
- Extreme Temperatures
- Hailstorm
- Lightning
- Tornado
- Windstorm
- Winter Storm
- Cyber Attack
- Pandemic/Public Health

The following sections detail vulnerability to specific hazards, where quantifiable, and where it differs from that of the overall County. The results of detailed GIS analyses used to estimate potential for future losses are presented here, in addition to maps of hazard areas. For a discussion of the methodology used to develop the loss estimates refer to Section 4.3 of the Base Plan.

A.5.1 Dam Failure

Past Events

Based on a search of the National Performance of Dams database there have been thirteen incidents in Jefferson County since 1952. Of these incidents reported to the National database, three incidents including one dam failure list Arvada as the nearest town to the event, as shown in Table A-12.

Table A-12 Dam Failure and Incidents

Date	Dam Name	Waterway	Dam Hazard Potential	Event Description	Failure?
1974	Oberon Lake No. 1	Ralston Creek	Significant	Inflow flood-hydrologic event	Yes
Sept. 12, 2013	Leyden	Chase Gulch	High	Hydrologic/flooding	No
Sept. 13, 2013	Tucker Lake – South Dam	S. Platte River	High	Hydrologic/flooding – High Reservoir Level	No

Source: National Performance of Dams database, Stanford University and Association of State Dam Safety Officials Dam Incident Database, City of Arvada

Two of the incidents listed in Table A-12 were related to the September 2013 flood event. While neither dam failed, discharge from the Leyden Dam reached an estimated 1,351 cfs, far exceeding the design discharge for the 3-hour 100-year storm of 373 cfs. Significant downstream flooding occurred, with several roads being overtopped and/or eroded, and several homes along Leyden Creek experiencing damage and sewer backups.

Dams of Concern

Table 4-11 in Section 4.3.3 of the Base Plan lists dams of concern for Jefferson County. Dams upstream of the City of Arvada are shown in Table A-13.

Arvada has eight high hazard, and one significant hazard dams whose failure could impact life and/or property. Note: Hazard class does not indicate dam condition, it merely indicates risks in case of failure. A high hazard dam poses risk to both life and property, a significant hazard dam only poses a risk to property. See discussion the Section 4 of the Base Plan. Dam names with an asterisk (*) next to them have been given a conditionally satisfactory or unsatisfactory rating by the State Engineer, meaning they have storage restrictions due to structural concerns. As of February 2021, 33 dams in Jefferson County were given the conditionally satisfactory or unsatisfactory ratings. While 23 of these are low hazard dams, 2 are rated significant hazard and 8 are rated high hazard. Of these dams, three pose a concern to the City of Arvada.

Table A-13 Dams of Concern to City of Arvada

Dam Name	Stream	Storage Capacity (Acre-Feet)	Emergency Action Plan?	Hazard Rating
Blunn	Ralston Creek	6,361	Yes	High
Hyatt*	Van Bibber Creek	760	Yes	High
Leyden	Leyden Creek	90	Yes	High
Lower Long Lake*	Ralston Creek	292	Yes	High
Ralston	Ralston Creek	10,749	Yes	High
Tucker Lake - North Dam	Ralston Creek	586	Yes	High
Tucker Lake - South Dam	Ralston Creek	882	Yes	High
Upper Long Lake*	Ralston Creek	1,500	Yes	High
Pomona No. 2 And No. 3*	Little Dry Creek	114	Yes	Significant

Source: National Inventory of Dams, NHD

Non-Failure Dam Incidents

As discussed in Section 4.3.3 of the Base Plan, the Colorado Department of Natural Resources, Dam Safety Division, has a statewide database that identifies the potential for non-failure dam inundation to show potential areas of flooding where outlet capacity exceeds the downstream channel capacity. The dams at the highest risk of non-failure inundation are shown in Table 4-14 of the Base Plan. The ranking shown in the table represents the likelihood of hazardous conditions existing below the dams during a worst case, maximum outlet release scenario. Dams are ranked as high, moderate, or low likelihood for outlet releases to cause conditions that could require an emergency response to reduce potential downstream consequences. The ranking is based on a statewide database of high hazard dams that includes 441 high hazard dams that have been analyzed by the Colorado DNR for this aspect of dam incident flooding. The high, moderate, or low designations were assigned by DNR by dividing the total number of ranked dams across the state into thirds. Should there be a need to relieve pressure on the dam (e.g., if there was excess inflow from high rains or snowmelt) releases from the dams ranked as high or moderate may result in downstream flooding. The following dams are within or upstream of Arvada and have a risk of non-failure inundation.

Table A-14 Dams with Risk of Non-Failure Inundation

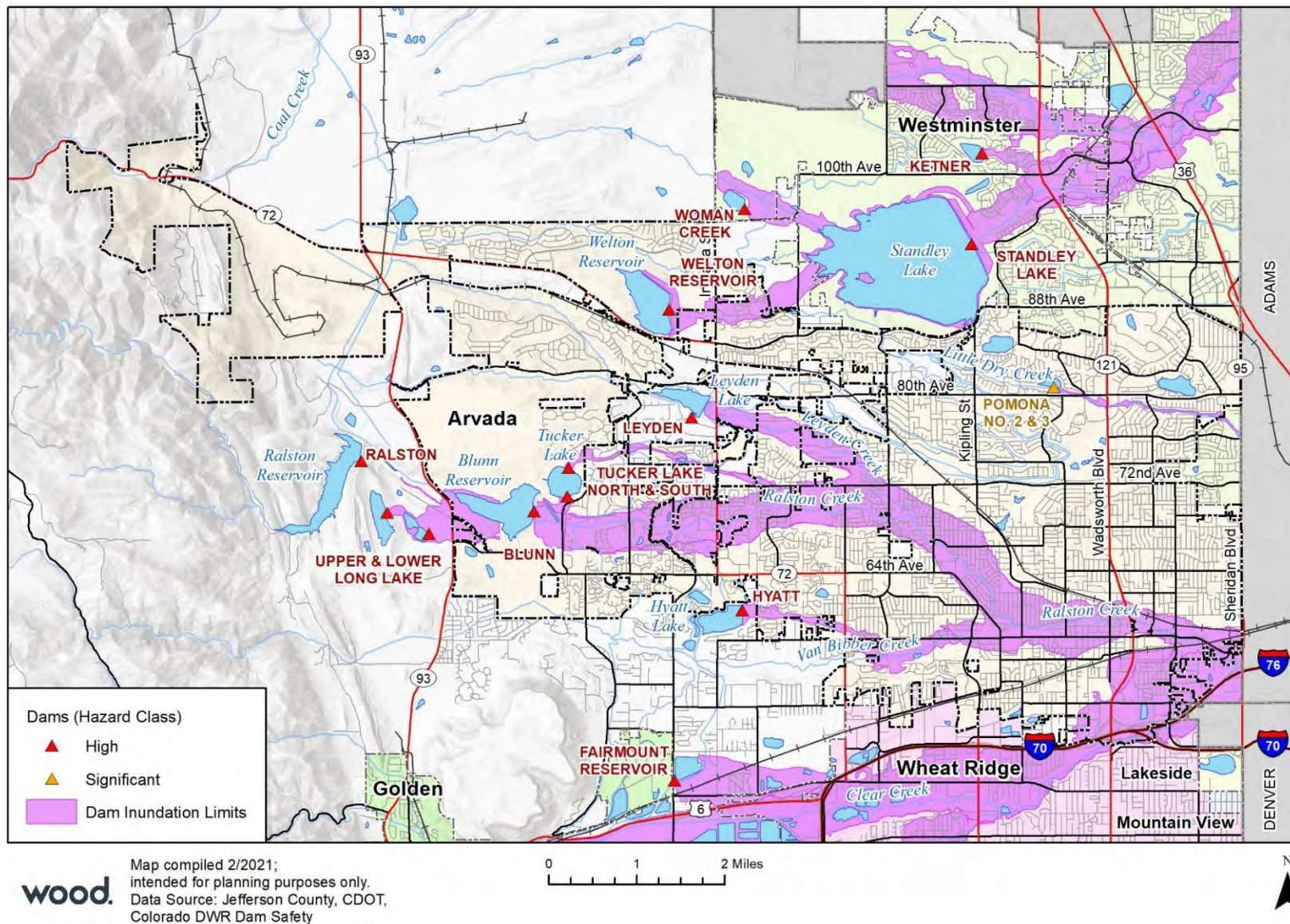
Dam ID	Dam Name	Outlet Description	Max Outlet Release Capacity (cfs)	Ranking	Outlet Release Hazard Rating
070302	Blunn	48" RCP	420	6	High
070209	Leyden	36" CIP	193	23	High
070224	Ralston	60" STEEL	650	8	High
070232	Tucker Lake - South Dam	2- 15" RCP	34	246	Moderate
070136	Hyatt	8"&10" PVC, sliplined old pipes	18	296	Low
070320	Tucker Lake - North Dam	12" RCP	0	348	Low
070114	Upper Long Lake	18" CIP	61	367	Low

Source: State of Colorado Department of Natural Resources, Dam Safety Division

Low Head Dams in City of Arvada

A low head dam is an engineered structure built into and across stream and river channels. Low head dams were historically built for a variety of purposes to support industrial, municipal, and agricultural water usage through the diversion of water from streams. Low head dams have also been built to provide recreational amenities for boating, rafting and tubing as well as improve aquatic habitats (Colorado DNR). Water flows over the dams creating a recirculating current that can trap unknowing river users. Due to the low height of this type of dam, low head dams can be difficult to see by river users that are not aware of them and because of the tranquil pool that gives the appearance there is no danger. There are 5 low head dams identified in the City of Arvada along Ralston Creek. Of these 5 low head dams, 4 are categorized as "grade control structure" and 1 as "diversion dam". Refer to Figure 4-9 in Section 4.3.3 of the Base Plan.

Figure A-6 Dam Inundation Areas in City of Arvada



Estimating Potential Losses

Table A-15 shows that Arvada has the highest number of parcels exposed to dam inundation hazards in the County. There are over 6,000 parcels or 16% of total parcels in the city that are potentially exposed with a total value of \$4.1 Billion. Of the parcels exposed, 6,530 are residential properties potentially exposing 16,194 residents to dam inundation hazards.

Table A-15 Dam Inundation Risk

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Agriculture	3	3	\$265,224	\$265,224	\$530,448	
Commercial	174	238	\$191,228,879	\$191,228,879	\$382,457,758	
Exempt	23	26	\$35,076,293	\$35,076,293	\$70,152,586	
Industrial	135	174	\$140,155,569	\$210,233,354	\$350,388,923	
Mixed Use	56	75	\$43,559,327	\$43,559,327	\$87,118,654	
Residential	6,530	6,911	\$2,165,822,805	\$1,082,911,403	\$3,248,734,208	16,194
Total	6,921	7,427	\$2,576,108,097	\$1,563,274,479	\$4,139,382,576	16,194

Source: Jefferson County Assessor, National Inventory of Dams, NHD

Critical Facilities

There are 98 critical facilities identified in areas at risk of dam inundation in the City of Arvada, shown in Table A-16. Bridges and communication towers are listed most often as exposed to dam inundation hazards.

Table A-16 Critical Facilities Potentially at Risk of Dam Inundation, by FEMA Lifeline

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	22
	Microwave Service Towers	10
Hazardous Material	Tier II	8
Health and Medical	Nursing Home	1
Safety and Security	EOC	1
	Law Enforcement	2
	School	5
Transportation	Bridge	49
Total		98

Source: National Inventory of Dams, HIFLD and CERC

A.5.2 Flood

Past Events

September 2013 Flood

Between September 9 and 14, 2013, the Denver Metro Area and the City of Arvada experienced a significant rain event. Rain in parts of Arvada ranged from 7.24 to 15.16 inches over five consecutive days (Urban Drainage and Flood Control District). Rainfall in the City of Arvada normally averages 18.93 inches *per year* (National Weather Service). The most significant impact from this rain event was felt along the Leyden and Ralston Creek drainage areas, although all areas of the city received significant rainfall.

Jefferson County requested and received a Presidential Declaration that made the City of Arvada eligible for both FEMA Public Assistance and Individual Assistance as well as Federal Highway Administration assistance.

Estimating Potential Losses

Figure A-7 depicts the FEMA flood zones (1% annual chance and 0.2% annual chance) and Figure A-7 shows the locations of properties at risk of flooding in the City of Arvada. Flooding in Arvada is likely to be the result of overbank flooding from Ralston, Leyden, and Little Dry Creeks.

As shown in Table 4-38 in Section 4.3.9 of the Base Plan, the City of Arvada has 631 improved parcels, and 692 buildings within the 1% annual chance flood with an estimated loss of \$80,101,715. Of the buildings in the 1% annual flood area, 654 are considered residential, exposing an estimated 1,622 residents to flooding. There are an additional 722 parcels with 804 buildings located in the 0.2% annual chance flood hazard area, with estimated loss of \$161,488,232. There are 684 residential buildings in the 0.2% annual flood area and an estimated 1,696 residents potentially exposed. Based on this analysis, Arvada has the greatest potential losses in the County from 500-year flooding, based on combining the 1% and 0.2% building counts which roughly total 1,353 buildings exposed to flooding and estimated \$241,589,947 in combined losses. Note that this analysis does not account for properties which may have been built in accordance with local floodplain regulations and mitigated to the 1% annual chance flood.

Table A-17 and Table A-18 show the total parcels and buildings at risk to the 1% and 0.2% annual chance flood. See Section 4 Hazard Profiles of the Base Plan for details on methodology.

Table A-17 Arvada Values At-Risk to 1% Annual Chance Flood

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Estimated Loss (25%)	% of Total Parcels
Commercial	10	20	\$11,938,573	\$11,938,573	\$23,877,146	\$5,969,287	
Exempt	3	4	\$479,778	\$479,778	\$959,556	\$239,889	
Industrial	4	5	\$5,550,988	\$8,326,482	\$13,877,470	\$3,469,368	
Mixed Use	1	9	\$1,760,791	\$479,778	\$959,556	\$239,889	
Residential	613	654	\$187,155,422	\$93,577,711	\$280,733,133	\$70,183,283	
Total	631	692	\$206,885,552	\$114,802,322	\$320,406,861	\$80,101,715	2%

Source: Wood analysis with Jefferson County Assessor's Data

Table A-18 Arvada Values At-Risk to 0.2% Annual Chance Flood

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Estimated Loss (25%)	% of Total Parcels
Agriculture	3	3	\$265,224	\$265,224	\$530,448	\$132,612	
Commercial	44	63	\$68,906,209	\$68,906,209	\$137,812,418	\$34,453,105	
Exempt	2	2	\$2,159,510	\$2,159,510	\$4,319,020	\$1,079,755	
Industrial	35	42	\$54,539,458	\$81,809,187	\$136,348,645	\$34,087,161	
Mixed Use	6	10	\$18,373,402	\$18,373,402	\$36,746,804	\$9,186,701	
Residential	632	684	\$220,130,395	\$110,065,198	\$330,195,593	\$82,548,898	
Total	722	804	\$364,374,198	\$281,578,730	\$645,952,928	\$161,488,232	2%

Source: Wood analysis with Jefferson County Assessor's Data

Figure A-7 City of Arvada FEMA Flood Hazard Areas

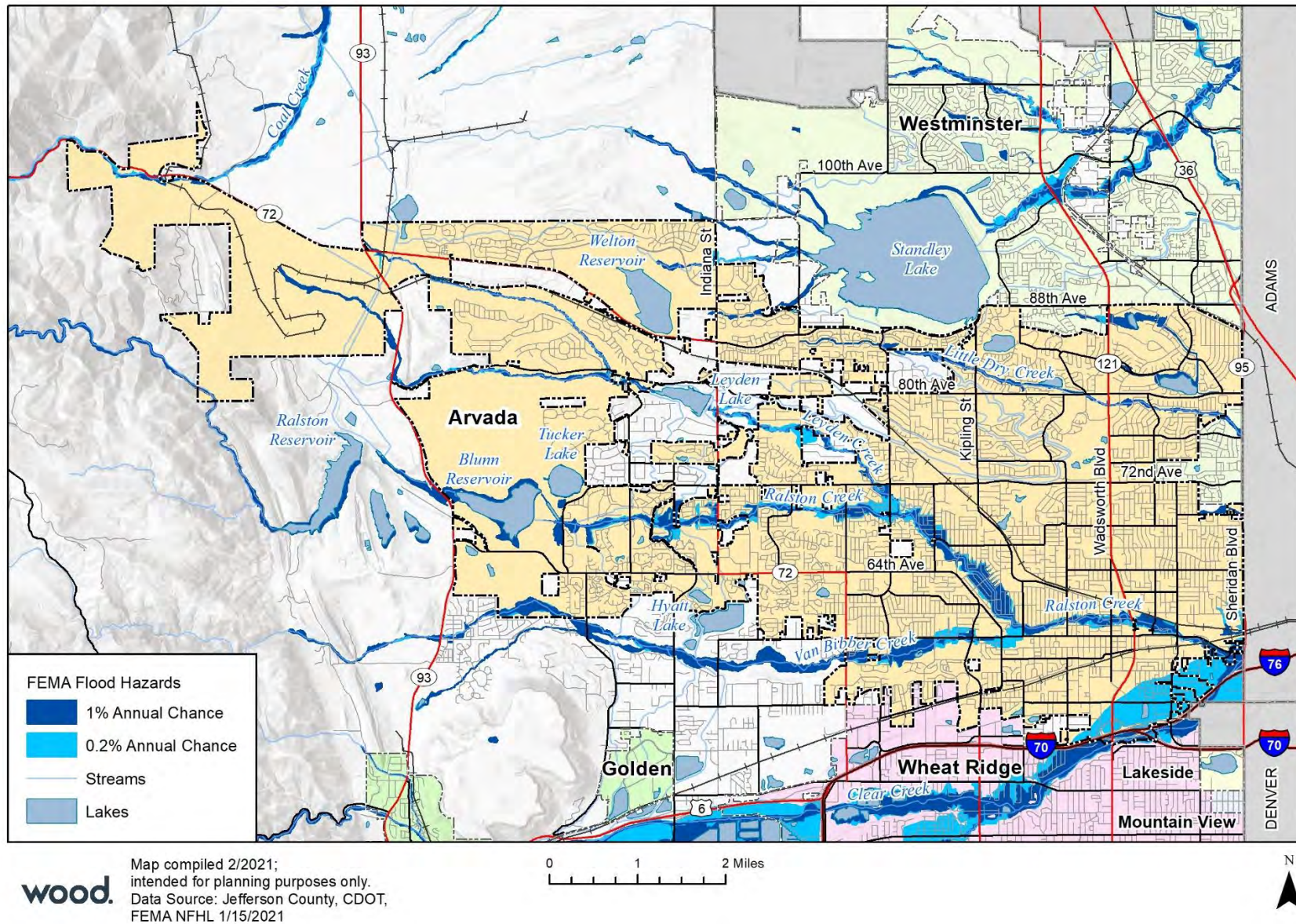
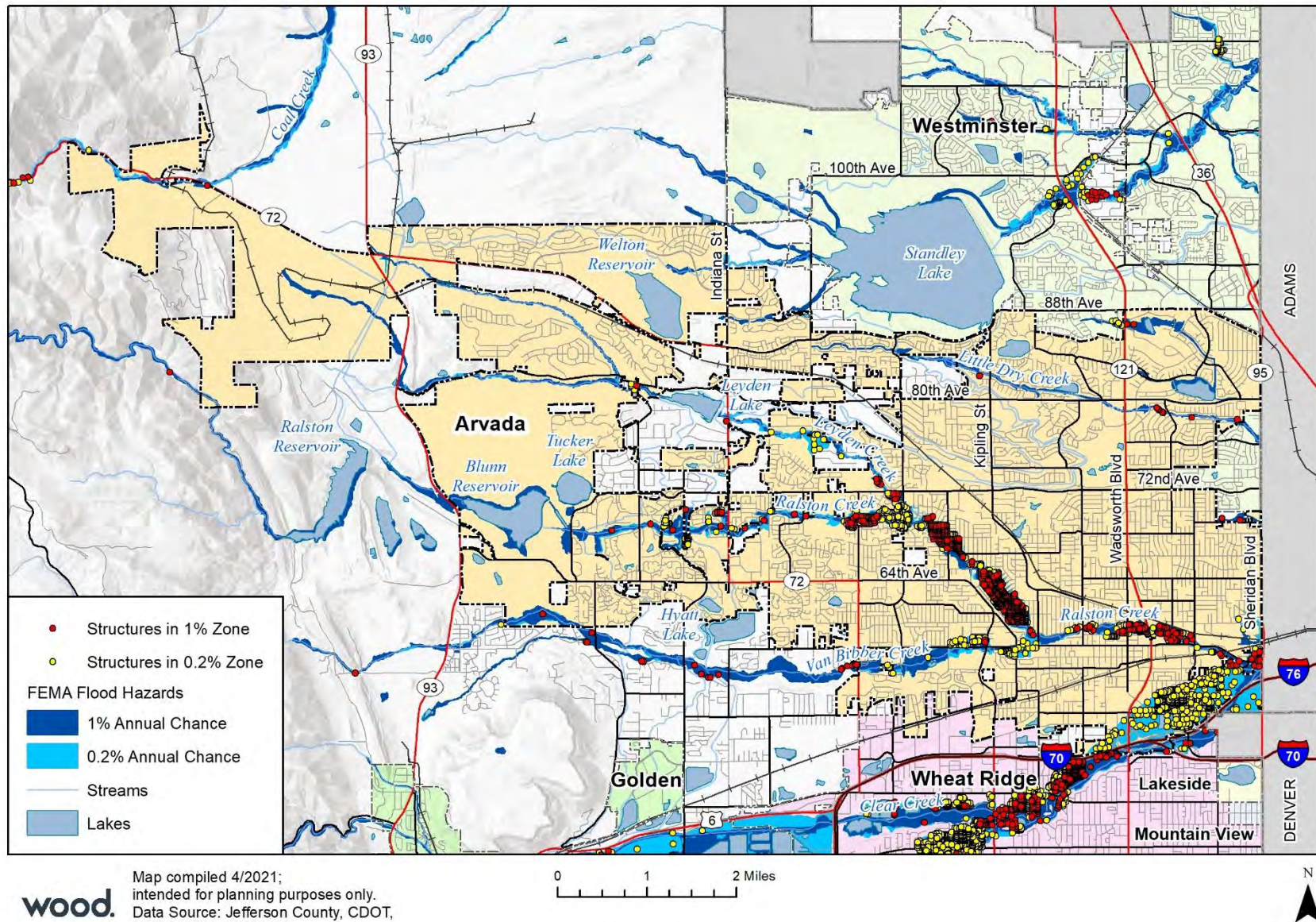


Figure A-8 Properties at Risk of Flooding



Critical Facilities

There are 35 critical facilities in the 1% annual chance flood zone, 30 of which are bridges (Table A-19). The analysis also showed that there are an additional 23 additional critical facilities in the 0.2% annual chance flood zone (Table A-20).

Table A-19 Arvada Critical Facilities in 1% Annual Chance Floodplain

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	4
Hazardous Material	Tier II	1
Transportation	Bridge	30
Total		35

Source: HIFLD and CERC

Table A-20 Arvada Critical Facilities in 0.2% Annual Chance Floodplain

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	4
Hazardous Material	Tier II	4
Health and Medical	Nursing Home	1
Safety and Security	School	2
Transportation	Bridge	12
Total		23

Source: HIFLD and CERC

National Flood Insurance Program

The City of Arvada has participated in the National Flood Insurance Program (NFIP) since 1972. NFIP insurance data shows that as of January 2021 there are 320 flood insurance policies in force in the City providing \$95,962,300 of coverage. There have been 71 historical claims for flood losses, totaling \$66,412. There are two repetitive loss properties as defined by the NFIP, both single family residences, with a total of 5 losses between them; there are no severe repetitive loss structures. In addition to participating in the NFIP, Arvada is also a Community Rating System (CRS) participant and currently a Class 5 CRS community.

A.5.3 Geologic Hazards

Estimating Potential Losses

Arvada has some exposure to geologic hazards including subsidence and dipping bedrock. Most of these areas are and on the western limits of the City, refer to Figure A-9. The HMPC noted a landslide event occurred in Leyden Rock open space areas in 2020. Additional details of the landslide monitoring, movement, and repairs are available in the Leyden Rock Filing 5 Development Files.

Table A-21 summarizes the parcels and values at risk to subsidence and Table A-22 summarizes the parcels and values at risk to dipping bedrock. Content values are estimated and provided as reference but are not generally at-risk for subsidence or dipping bedrock.

Table A-21 City of Arvada Subsidence Risk

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Exempt	1	1	\$70,047	\$70,047	\$140,094	
Industrial	1	1	\$2,079,284	\$3,118,926	\$5,198,210	
Residential	1,500	1,542	\$648,057,161	\$324,028,581	\$972,085,742	3,824
Total	1,502	1,544	\$650,206,492	\$327,217,554	\$977,424,046	3,824

Source: Wood analysis of Jefferson County GIS and Assessor's Data

Table A-22 City of Arvada Dipping Bedrock Risk

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	2	2	\$1,794,739	\$1,794,739	\$3,589,478	
Industrial	2	2	\$3,290,354	\$4,935,531	\$8,225,885	
Residential	203	205	\$85,422,929	\$42,711,465	\$128,134,394	508
Total	207	209	\$90,508,022	\$49,441,735	\$139,949,757	508

Source: Based on analysis of Jefferson County GIS and Assessor's Data

Critical Facilities

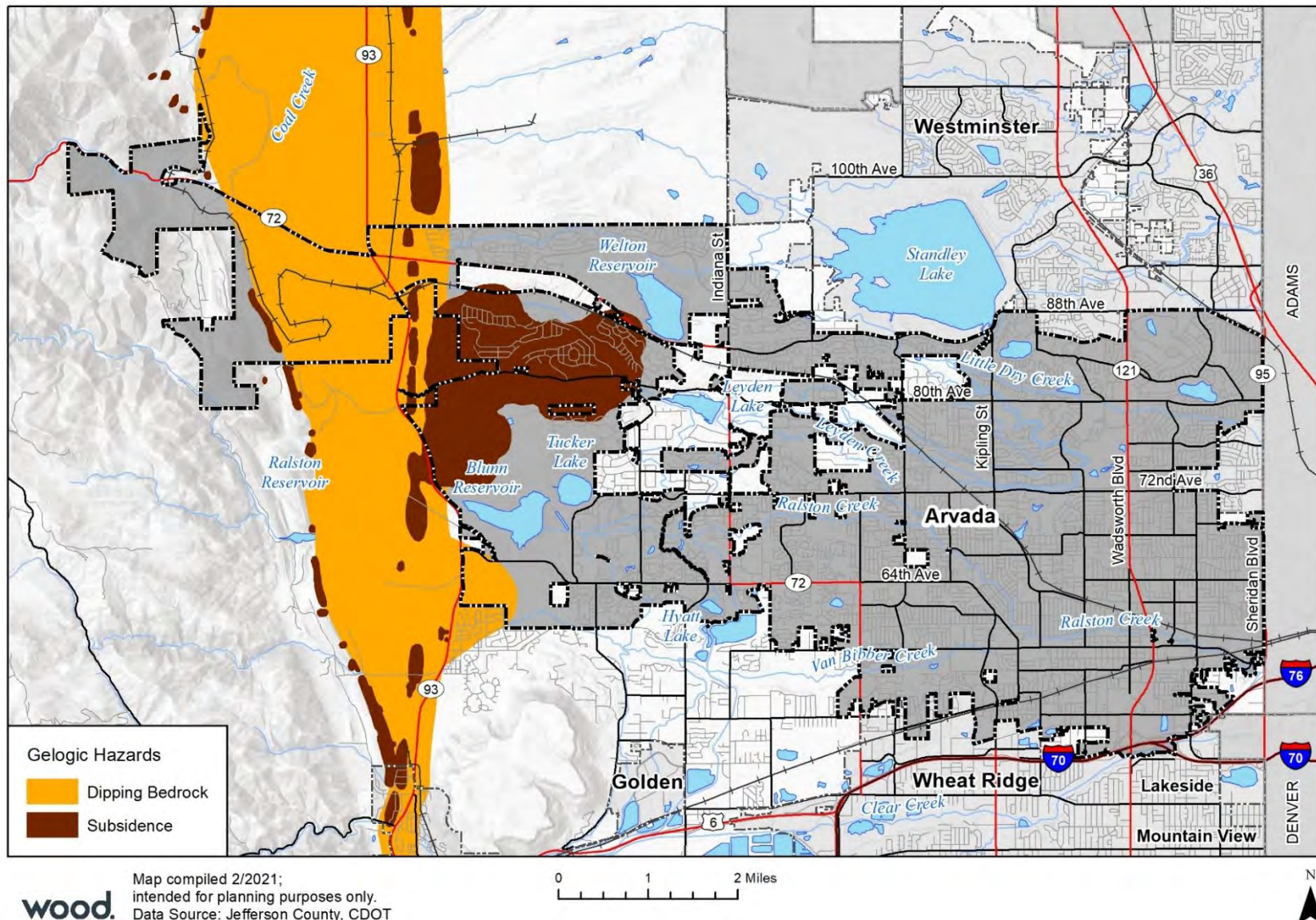
There are seven critical facilities identified in areas at risk of subsidence in the City of Arvada, shown in Table A-23. No critical facilities in the City were identified as being exposed to dipping bedrock hazards.

Table A-23 Critical Facilities Potentially at Risk of Subsidence, by FEMA Lifeline

FEMA Lifeline	Critical Facility Type	Count
Communications	Land Mobile Private Towers	2
	Microwave Service Towers	2
Energy	Electric Substation	2
	Power Plant	1
Total		7

Source: HIFLD and CERC

Figure A-9 City of Arvada Subsidence and Dipping Bedrock Hazards



A.5.4 Wildfire

While not a foothills community, Arvada does have risk to wildfires, particularly grass fires on the western edge of the City where the wildfire risk is considered to be moderate to high, see Figure A-10.

In 2009, one home was burned by a grassfire in northwest Arvada sparked by a train on the Union Pacific railroad.

Estimating Potential Losses

Parcel analysis was conducted using GIS to analyze where parcels, buildings counts, property types and content values intersected with the wildfire hazards zones defined by the Colorado Forest Atlas, from highest to lowest risk. In addition to parcel data, an address point layer was also used to estimate building locations. Results are shown in Table A-24 - Table A-27. Based on this analysis Arvada is among the cities with the greatest concentration of assets at risk of wildfire. Residential property types have the greatest number of parcels at risk of wildfire, in addition there are 13,553 residents exposed to wildfire risk, a majority of which (6,726) are located in the moderate-risk areas.

Table A-24 High Wildfire Risk, By Property Type

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	1	2	\$868,042	\$868,042	\$1,736,084	
Residential	348	348	\$155,141,405	\$77,570,703	\$232,712,108	863
Total	349	350	\$156,009,447	\$78,438,745	\$234,448,192	863

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table A-25 Moderate Wildfire Risk, By Property Type

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	4	4	\$1,912,149	\$1,912,149	\$3,824,298	
Exempt	1	1	\$70,047	\$70,047	\$140,094	
Industrial	2	2	\$3,290,354	\$4,935,531	\$8,225,885	
Mixed Use	2	2	\$13,846,120	\$13,846,120	\$27,692,240	
Residential	2,665	2,712	\$1,147,876,744	\$573,938,372	\$1,721,815,116	6726
Total	2,674	2,721	\$1,166,995,414	\$594,702,219	\$1,761,697,633	6,726

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table A-26 Low Wildfire Risk, By Property Type

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	3	4	\$2,157,808	\$2,157,808	\$4,315,616	
Residential	356	368	\$151,212,773	\$75,606,387	\$226,819,160	913
Total	359	372	\$153,370,581	\$77,764,195	\$231,134,776	913

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Table A-27 Lowest Wildfire Risk, By Property Type

Property Type	Improved Parcels	Buildings	Improved Value	Content Value	Total Value	Population
Commercial	26	37	\$34,459,843	\$34,459,843	\$68,919,686	
Exempt	12	13	\$48,541,684	\$48,541,684	\$97,083,368	
Industrial	18	18	\$11,336,844	\$17,005,266	\$28,342,110	

Property Type	Improved Parcels	Building s	Improved Value	Content Value	Total Value	Population
Mixed Use	2	2	\$2,045,321	\$2,045,321	\$4,090,642	
Residential	1,918	2,037	\$1,069,895,868	\$534,947,934	\$1,604,843,802	5,052
Total	1,976	2,107	\$1,166,279,560	\$637,000,048	\$1,803,279,608	5,052

Source: Colorado Forest Atlas & Jefferson County Assessor's Office data

Critical Facilities

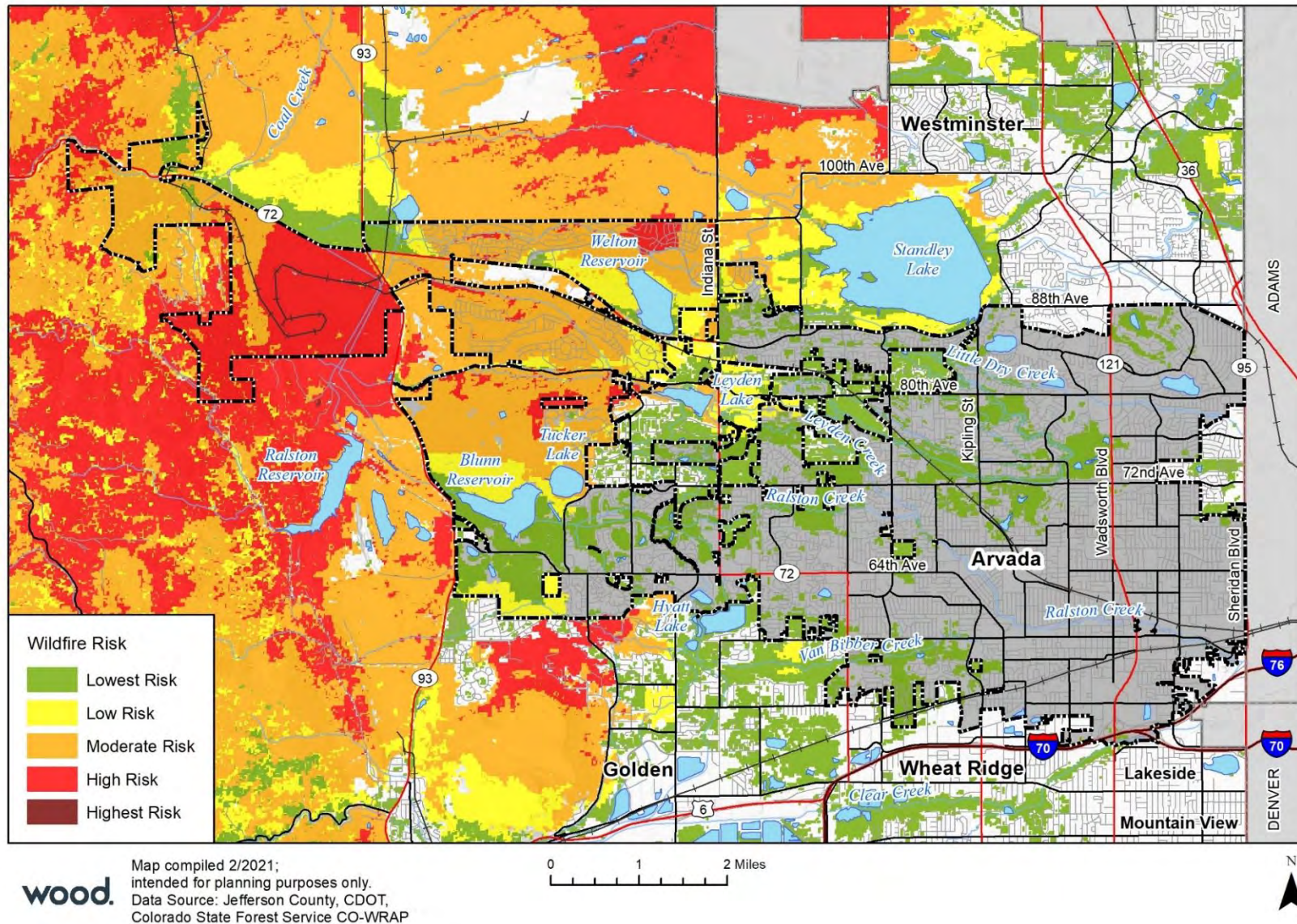
The City of Arvada has a total of 31 critical facilities at risk to wildfire, most of which are within the lowest to moderate wildfire risk areas. The following table shows the results of the GIS analysis and is organized by wildfire risk and FEMA Lifeline. Refer to section 4.3.16 of the Base Plan for more information on the methodology of the GIS analysis.

Table A-28 City of Arvada Critical Facilities At-Risk to Wildfire by Type

Wildfire Risk	FEMA Lifeline	Critical Facility Type	Count
High	Communications	Land Mobile Private Towers	1
Moderate	Communications	Cellular	1
		Land Mobile Private Towers	4
	Energy	Electric Substation	3
		Power Plant	2
	Hazardous Materials	Tier II	1
	Safety and Security	School	1
Low	Communications	Microwave Service Towers	2
	Hazardous Material	Tier II	1
Lowest	Communications	Land Mobile Private Towers	7
	Health and Medical	Nursing Home	6
	Safety and Security	Fire Station	1
	Transportation	Bridge	1
Total			31

Source: HIFLD and CERC

Figure A-10 City of Arvada Wildfire Risk



A.5.5 Other Hazards

In the case of other hazards that are not specific to geography such as drought, hailstorms, winter storms, earthquake, lightning, tornado, and windstorm the entire building inventory and population in the City is potentially exposed. It should be noted that no hazard in this plan is expected to cause widespread impacts to this inventory.

Through the Plan Update Guide, the City of Arvada noted specific historic hazard events to include in the community profile. These events have been incorporated into the appropriate hazard chapters in the base plan. These events had a particular impact on the community beyond the impacts and events recorded in the Jefferson County Hazard Mitigation Plan. This is not a comprehensive summary of past incidents, as the hazard profiles collected in the main Mitigation Plan include other events that may have historically impacted the jurisdiction.

The following are past events noted by the HMPC.

March 2003 Blizzard

A very moist, intense, and slow-moving Pacific storm system made its way across the four corners area and into southeastern Colorado from March 17th to the 19th, allowing for a deep easterly upslope flow to form along the Front Range. Up to three feet of wet snow accumulated in Arvada. The heavy wet snow caused roofs of homes and businesses to collapse across the Urban Corridor. The snow also downed trees, branches, and power lines. Power outages struck homeowners for approximately 24 hours in some parts of the city. Some roads were impassable for up to 48 hours. The City of Arvada was given FEMA reimbursement for snow removal operations in the amount of \$81,022.48.

December 2006 Blizzards

Back-to-back blizzards struck the city a week apart in late December of 2006. The first blizzard, on December 20, struck as a result of a slow-moving low-pressure system that moved from the Desert Southwest into Southeastern Colorado. As a result, a deep upslope flow developed along the Front Range and Northeast Plains of Colorado. One to two feet of snow were recorded. On December 28, another slow-moving storm system moved from the Desert Southwest and into the Texas Panhandle. As it did, a deep easterly upslope flow occurred along the Front Range, with blizzard conditions developing over portions of the Northeast Plains of Colorado, mainly south of Interstate 76. The heaviest snow fell along east facing slopes of the Front Range with storm totals up to 2 1/2 feet in the North Central Mountains and Front Range Foothills. Some roads in Arvada were impassable for up to 48 hours. The City of Arvada was given FEMA reimbursement for snow removal operations in the amount of \$135,759.

May 8, 2017 Hailstorm

Hail the size of 2.75 inches fell in Arvada and the surrounding areas during rush hour. The hail event impacted the entire Denver metro area. In total for the metro area there were 50,000 homeowner claims and 150,000 auto insurance. The Rocky Mountain Insurance Information Association estimates the entire event resulted in \$1.4 Billion in property losses.

COVID-19 Pandemic

The COVID-19 or novel coronavirus pandemic began in December 2019 and was declared a pandemic in March of 2020. The City of Arvada declared a local state of emergency on March 13, 2020 and activated the Emergency Operations Center (EOC). As of January 28, 2021, 147 residents of Arvada have died from COVID-19. The business and economic impacts have been extensive. The City has operated a rent/mortgage relief programs as well as business grants and utility service assistance to residents to alleviate the economic impacts of the pandemic. In 2020, schools were closed and moved to remote learning for the remainder of the 2020 school year and into 2021. On March 27, 2021 Congress passed the Coronavirus Aid, Relief and Economic Security (CARES) Act which authorized the allocation of over \$2 trillion in economic relief for families, small businesses and state and local governments. The City of Arvada has received a total allocation of funding of \$9454,746 from both Counties it is part of (Jefferson County: \$9,211,753 allocated. Adams County: \$242,993 allocated).

A.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. Arvada's regulatory, administrative, and technical, and fiscal mitigation capabilities are summarized in Section 2.7 of the Base Plan. Additional details on specific capabilities are discussed below.

Preventive

Preventive activities keep problems from getting worse. The use and development of hazard-prone areas is limited through planning, land acquisition, or regulation. They are usually administered by building, zoning, planning, and/or code enforcement offices.

City of Arvada Comprehensive Plan 2014

The City's comprehensive plan is a guide to help the City make decisions and establish its future direction. The goals and policies contained within the plan cover a broad range of subjects related to services, issues, and geographic areas within Arvada. Combined, these elements serve to direct future policy decisions to preserve vital community attributes and service levels and manage growth.

The following excerpts are goals and related policies that are relevant to this hazard mitigation plan.

Land Use and Redevelopment

- Goal L-1: Coordinate Arvada's planning internally and with that of adjacent jurisdictions and the Denver Regional Council of Governments (DRCOG).
 - L-1.1: Coordination with regional planning. Arvada will coordinate with Denver Regional Council of Governments (DRCOG) in implementing its Metro Vision Plan and regional initiatives.

Community Character, Urban Design and Historic Preservation

- Goal CC-2: Establish and maintain Arvada's distinct qualities and small-town identity.
 - CC-2.2: The City will promote high quality architecture, site planning, landscaping, signage, and lighting for new residential and commercial developments.
 - CC-3.3: Transitions for stable rural development. Place open space, trails, riparian and wildlife corridors, view corridors, wetlands, or landscaped buffers between developments.
 - CC-4.1/4: Historic preservation programs. The City will expand outreach and promotion of its historic preservation efforts including the use of the Olde Town Design Guidelines.

Transportation

- Goal T-4: Develop the transportation system in a manner that maintains the quality of life for residents and visitors.
 - T-4.5: Air Quality. The City will consider the impacts that transportation decisions have on ozone-forming emissions and other pollutants in making transportation investments.

Neighborhoods and Housing

- Goal N-3: Maintain and improve the quality of the existing housing stock in Arvada and revitalize the physical and social fabric of neighborhoods that are in decline.
 - N-3.2: Improve Infrastructure in Older Neighborhoods. The City will analyze blighted conditions and invest in infrastructure, to the extent that funds are available.

Resource Conservation and Environment

- Goal R-1: Minimize the impact of new development on natural areas to allow continued cohabitation of people and wildlife.
 - R-1.1: Buffers and Setbacks. The City will require new developments to provide buffers for creeks, water bodies, existing wetlands, riparian areas, and wildlife corridors to retain water quality and environmental integrity.

- R-1.2: Land Use and Infrastructure Decisions. All decisions involving infrastructure and land use should be reviewed in light of a changing climate that may have different and more erratic precipitation trends.
- Goal R-2: Promote improved water quality in stream corridors.
 - R-2.1: Water Quality Features. The City will require water quality features in new developments to minimize degradation of stream water quality.
 - R-2.2: Water Quality Education. The City will educate the public about how they can assist in water quality efforts.
 - R-2.3: Best Management Practices for Stormwater Conveyance. The City will protect water quality through implementation of Best Management Practices in the design of stormwater conveyance and detention facilities.
- Goal R-3: Improve flood control.
 - R-3.1: Flood Control Program. The City will continue to improve the flood control and drainage program to remove properties from the 100 year floodplain.
- Goal R-5: Conserve water resources.
 - R-5.1: Water-Wise Landscaping Examine changes to the Land Development Code to further increase the use of water-wise landscaping and to ensure that plans were built and are operating to specifications.

Parks, Recreation and Open Space

- Goal P-1: Provide strategically placed parks, recreation centers, a well-connected trail system, and preserved open space to serve Arvada residents and visitors.
 - P-1.1: Parks and Open Space Master Plan. The Parks and Open Space Master Plan is part of the Comprehensive Plan. The City will continue to implement the Parks and Open Space Master Plan, as updated periodically.
- Goal P-3: Conserve and maintain important open space lands in and around Arvada to help define the character of the community.
 - P-3.1: Expanded and Maintained Open Space. The City will continue to expand and maintain the open space system. Open space will consist of park preserves, natural areas, and special resource areas as defined in the Open Space Master Plan.
- Goal P-4: Develop parks, trails, and outdoor recreational facilities in an environmentally sensitive manner to help protect and enhance the natural environment.
 - P-4.1: Include Natural Features in Parks. The City will develop new and existing parks and open space lands that include a wide range of natural features.
 - P-4.2: Natural and Drought-Tolerant Landscape. The City will promote and educate the public about the use of xeriscape and “water-wise” landscaping for new parks. The City will also use drought-tolerant landscape materials and convert non-drought tolerant landscape turf wherever possible.

Public Safety

- Goal PS-1: Provide police services and facilities to meet the needs of Arvada residents and the business community.
 - PS-1.3: Refine and Improve Service Delivery. Continue the move to decentralized service delivery to better connect public safety services with communities of interest.

Utilities and Public Facilities

- Goal U-2: Ensure that adequate public facilities and utilities are available at the time of development, or within a reasonable period, as stipulated by the City, to serve new growth.
 - U-2.1: Timing of Development Arvada will phase and locate future residential, commercial, and industrial growth in coordination with the City's ability to efficiently provide necessary services and utilities including but not limited to water and sewer, storm sewer, transportation, parks, and public safety.

Municipal Code

Article 4-1-2: Floodplain Regulations

This Section 6.13 is intended to provide the means and the guidelines to promote the public health, safety, and general welfare, to minimize public and private losses in areas subject to flood hazards, and to promote wise use of the Floodplain. This Section has been established with the following purposes intended:

- To reduce the hazards of flood to human life, health, and property;
- To protect floodplain occupants from a flood which is or may be caused by their own, or other land use;
- To protect the public from the burden of avoidable financial expenditures for flood control and relief
- To protect the storage capacity of floodplains and to assure retention of sufficient floodway areas;
- To protect the hydraulic characteristics of the small watercourses, including gulches, sloughs and artificial water channels used for conveying flood waters; and
- To protect individuals from purchasing floodplain lands for purposes which are not, in fact, suitable.

In order to accomplish its purposes, this Section includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to public life, health, or property due to flood waters or erosion hazards, or which result in damaging increases in erosion or in flood heights or velocities;
- Restricting uses which are particularly susceptible to flood damage;
- Requiring permitted floodplain uses, including public facilities which serve such uses, to be protected against floods by flood-proofing and providing general flood protection at the time of initial construction or reconstruction;
- Regulating the manner in which a structure, may be constructed in floodplain areas.
- Regulating the method of construction of water supply and sanitation systems so as to prevent disease, contamination, and unsanitary conditions;
- Delineating and describing areas that could be inundated by floods;
- Regulating the method of construction and pattern of development within all uses in the floodplain;
- Regulating the alteration of natural floodplains, stream channels and natural protective barriers which help accommodate or channel flood waters;
- Regulating or prohibiting filling, grading, development, dredging and unnecessary encroachments which may increase flood damage or prevent water carrying capacity;
- Encouraging uses such as greenbelt, open space, agricultural, recreation facilities and riding trails in floodplain areas.

Flood zone district regulations.

The Flood Zone District represents the area that is inundated in the 100-year flood that may serve as a temporary storage area for the flood waters and that lies landward of the floodway.

Special Provisions

1. No fill, structure, deposit, or other floodplain uses shall be permitted that adversely affects the efficiency of any channels or floodways of any tributaries to the mainstream or river; drainage ditches; or any other drainage facilities or systems.

2. If a property has been issued a Letter of Map Revision based on Fill (LOMR-F) from FEMA the property has been filled so as to remove it from the floodplain, no building permit shall be issued for a new structure to be constructed that would result in a finished floor elevation to be below the previously existing base flood elevation.
3. Residential Construction.
 - a. New construction and substantial improvement of any residential structure within or moved into the Flood Zone District, shall have the lowest floor (including basement), constructed at or above a point two (2) feet above the base flood elevation, or, if within Flood Zone AO, at or above a point three (3) feet above the depth number specified in feet on the Official Floodplain Maps (the depth number shall be at least two (2) feet if it is not specified on the maps). A residential structure shall be any structure which is designed for human habitation.
4. Nonresidential Construction. New construction and substantial improvements of any commercial, industrial, or other non-residential structure within or moved into the Flood Zone District shall either:
 - a. Have the lowest floor (including basement) constructed at or above the Flood Protection Elevation, or if within Flood Zone AO, at least one foot above the depth number specified in feet on the Official Floodplain Map (at least three feet if no depth number is specified); or
 - b. Together with attendant utility and sanitary facilities shall:
 - i. be flood-proofed to or above the Flood Protection Elevation; such that the structure is watertight with walls substantially impermeable to the passage of water;
 - ii. have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
 - iii. be certified by a Colorado registered professional engineer that the design and methods of construction are in accordance with accepted standards of practice for meeting the provisions of this paragraph. Such certifications shall be provided to the Floodplain Administrator as set forth in §2.5.2.D.1 (Obtain and Maintain Floodplain Information).
5. Critical Facilities. New construction and substantial improvements of any facility classified as a critical facility within or moved into the Flood Zone District shall have the lowest floor (including basement) constructed at or above a point two (2) feet above the base flood elevation.
6. Manufactured Homes.
 - a. Manufactured homes shall be anchored in accordance with §6.13.4.A (Anchoring)
7. All recreational vehicles shall either:
 - a. Be on the site for fewer than 180 consecutive days;
8. The storage or processing of materials that are buoyant, flammable, explosive, or in times of flooding, could be injurious to human, animal, or plant life, shall be at or above a point two (2) feet above the base flood elevation for a particular area, or adequately flood-proofed in accordance with provisions in this Section.
9. Building plans for any project or construction within the Flood Zone District must be submitted to the Floodplain Administrator, for approval, in accordance with [§3.16](#) (Floodplain Development Permit), to insure that said project or construction will not adversely affect the Flood Regulatory District.
10. Any structure permitted in the Flood Zone District pursuant to this Section shall be firmly anchored to prevent the structure or building from floating away thus threatening to further restrict bridge openings and other restricted sections of the stream or river.
 - a. Permitted Uses. Any uses permitted by the underlying Zoning District, in conformance with the preceding Special Provisions, may be permitted by the Floodplain Administrator, subject to the following conditions:

- i. If the Floodplain Administrator disallows a requested use through a Floodplain Development Permit, that is permitted in the underlying Zoning district, the applicant may follow the procedures outlined in § 3.21 (Floodplain Variance) or § 3.2.3 (Appeals).
- ii. The Floodplain Administrator may also require the applicant to follow procedure outlined in § 3.16 (Floodplain Development Permit) for certain uses in the Flood Zone District when said action appears to be in the public interest, and where the health, safety, and welfare of the public may be in question.

Other Regulations

- **Article 2-1-3 Parks and Open Space** and Residential Districts – This section addresses the character and design of those portions of the Standard Zoning Districts, PUD Zoning Districts, the CC Subdistricts, and the NC Subdistricts that are not occupied by platted lots or streets and that are reserved for parks, trails, landscaping, and open space uses. It does not address park and open space dedication requirements, which are described in detail in [§ 7.11](#) (Public Park and Trail Dedications). The requirements of this Section apply regardless of whether or not the land involved will be dedicated to Arvada, and regardless of whether or not such open space will be open to the public or to other residents of the development. For purposes of complying with the requirements of this Code, (a) driveways, sidewalks, parking areas, and designated outdoor storage areas shall not be counted as common open space, (b) land occupied by active recreational uses such as pools, playgrounds, tennis courts, jogging trails, and clubhouses used primarily for recreational purposes, may be counted as open space.
- **Article 4-1-3 Stormwater Drainage Control** – Requirements for stormwater drainage in this article shall apply to all land in the City, except lands on which an approved subdivision plat existed within the City prior to January 1, 1971, that are improved or can be improved without a development plan or plat required by this Code. Requirements for erosion control shall apply to all parcels within the City. At a minimum, reasonable efforts to prevent, mitigate, and control accelerated soil erosion shall include the design, installation, and implementation or temporary erosion control measures prior to any earth disturbance activities.
- **Article 4-1-4 Natural Hazards and Environmentally-Sensitive Areas** – This section applies to new construction. Specifies specific areas of a subdivision known as “Limits of Development” where development activity shall be contained in order to avoid areas due to natural or geologic hazards, soil conditions or floodplains. This section also defines significant natural features including areas that provide groundwater recharge, steep slopes, unstable slopes and other hazards include flooding “or other natural or man-made hazards”. This section also includes guidelines on ridgeline protection, which are identified through the development review process and may require residential dwellings to reduce in bulk or massing while also maintaining existing on-lot vegetation.
- **Article 4-1-6 Construction Activities** – This section of municipal code details the steps required to mitigate erosion, siltation, and dust during periods of construction. It also details how and what construction materials must be recycled.
- **Article 4-2 Subdivision Regulations and Improvements** - These regulations are enacted for the purposes of promoting the health, safety, convenience, order, prosperity, and welfare of the present and future inhabitants of the City of Arvada; for adequate and convenient open spaces for traffic, utilities, access of firefighting apparatus, recreation, light, air, and solar access; and for the avoidance of congestion of population, and other public requirements. Includes regulations on cluster subdivisions.

Natural Resource Protection

Natural protection activities preserve or restore natural areas or their natural functions. They are usually implemented by parks, recreation, or conservation agencies or organizations.

2016 Imagine Arvada Parks, Trails, and Open Space Master Plan (Master Plan)

The City never had a formal open space plan before the 2001 Master Plan. The 2016 update provides new recommendations to be completed over the next 10 years. The primary goals of the 2016 Master Plan update “is to ensure the City’s parks, trails and open space meet the needs of a growing community

and encourage outdoor recreation and wellness of Arvada residents. The Master Plan defines policies and projects for the next ten years. The Parks, Trails, and Open Space Master Plan is a functional plan that covers the entire City. Arvada has many trail systems and parks in flood hazard areas, which is an appropriate and wise use of floodplain land. Examples of this are the Ralston Creek and Van Bibber Creek bike trails and neighborhood parks located along these drainages.

2020-2025 City Council Strategic Plan

The following is identified in the City Council Strategic Plan as a priority: “Supports a resilient workforce and community that are able to withstand stresses and shocks, while maintaining essential functions and recovering quickly, effectively, and equitably.” This mandates the following strategic result: By December 2023, launch a citywide resilience collaborative sharing resources, building partnerships and ensuring community ownership of meeting identified resilience targets.

Emergency Services

Emergency services measures are taken during an emergency to minimize its impacts. These measures are the responsibility of city or county emergency management staff and the owners or operators of major or critical facilities.

Arvada Police Department Strategic Plan (Strategic Plan) (2003-2007)

The Arvada Police Department Strategic Plan assists the Police Department with accomplishing its mission, which is: “to provide high quality police service in an objective and professional manner.” The Strategic Plan is for police service for the entire Arvada community. It includes a vision statement and a series of goals and targets.

Arvada Fire Protection District Strategic Plan 2015-2020

The Arvada Fire Protection District Strategic Plan is developed to provide the guidance and vision for the current and future delivery of essential emergency services to the Fire District’s coverage area. Refer to the Arvada Fire Protection District’s Annex for additional information on the Strategic Plan.

Flood Protection Handbook 2010

This is a publicly available plan that helps Arvada residents with personal flood preparedness and management in case of emergency/flood event. It provides mitigation actions as well as adaptation suggestions along with information on flood assistance programs at the local and federal levels.

Post-Flood Recovery Assistance Plan

The City is in the process of updating this plan, which outlines short and long-term recovery roles and responsibilities in the event of a flood. The opportunities for pre and post-flood mitigation are also discussed.

Disaster Recovery Plan

The City’s Disaster Recovery Plan is a “living”, all-hazards plan that focuses on the whole community. The plan provides a framework for the City, its residents and stakeholders “to recover effectively and efficiently from a disaster”. The Recovery Plan is a guide for the City to use during recovery operations and recognizes no two disasters are alike and approached the development of the plan as a “single, comprehensive framework that is scalable, flexible and adaptable” (City of Arvada). The plan establishes the organization of recovery activities including the roles and responsibilities of different City staff involved in the recovery process.

Structural Projects

Structural projects keep hazards away from an area (e.g., levees, reservoirs, other flood control measures). They are usually designed by engineers and managed or maintained by public works staff.

- Van Bibber Flood Control Project
- Ralston Creek and Van Bibber Creek confluence flood control projects.
- Garrison Bridge and Ralston Creek and re-channelization.

The City has received approval to use funding from the Mile High Flood District to design and construct drainage improvements identified in the recent Leyden Creek Master Plan Update. This plan was completed after the 2013 flood to identify and prioritize capital drainage improvements on the Leyden Creek drainageway. The stakeholders have not secured funding for this project. Therefore, the improvements are still in the planning phase. A revised schedule will be developed when Arvada and the other stakeholders can secure a funding source.

2019- 2028 Capital Improvement Plan

The City's Capital Improvement Plan (CIP) is a comprehensive plan of long-term projects, "for the City's capital maintenance and capital investments for the next decade" (City of Arvada 2019). The CIP covers a variety of capital projects including transportation, facilities, parks, golf, hospitality, water, wastewater and stormwater. The following project highlights are listed under the water and stormwater sections and relate to drought, wildfire, and flood mitigation. Refer to the City of Arvada 2019-2028 Capital Improvement Plan for complete descriptions of each project.

Water

"The Water utility remains on the cusp of the most regionally transformational project to which the City is a party besides the G Line" (City of Arvada 2019).

- Gross Reservoir Expansion: Will substantially increase the availability of water for the City, ensuring stable and adequate supply for decades to come.
- Water System Replacement: Prioritize pipeline replacement based upon leak history, age and other known factors about condition of pipeline. Funding will be from water rates.
- Denver Water Moffat Project Participation: A financial partnership with Denver Water on the expansion of Denver Water's Moffat system. Will result in additional water supplies to meet the needs of the current and future residents. Funding will be from Water Tap Fee Revenues.
- Ralston Water Treatment Plant Pump Station: Water pump station will provide water to the northwest portion of Arvada. Funding will be from Water Tap Fee Revenues.
- Coal Creek 1.5 Million Gallon Water Tank and Pipeline: Installation of a potable water tank at the intersection of Hwy 93 and Hwy 72. This project will provide additional fire protection to the northwest section of Arvada including the Candelas and Leyden Rock subdivision. Funding will be from Water Tap Fee Revenues.

Stormwater

"Major plans include improvements along many points of Leyden Creek and various outfall improvements aimed at mitigating potential threats of flash flooding and property damage" (City of Arvada 2019).

- Flood Recovery: The September 2013 resulted in substantial damage to stream banks and other drainage infrastructure in the Ralston Creek, Leyden Creek, and Little Dry Creek drainageways. This project will fund repairs to banks and waterway infrastructure, studies conducted jointly with the Mile High Flood District and Jefferson County to determine how the stormwater flowed and what infrastructure improvements are needed. Funding will be from Stormwater Utilities Fee revenue.
- Bates Lake Watershed Drainage Improvements: Primary aim is to reduce property damage caused by flooding events. Multi-phased project to rebuild the outlet works for Bakes Lake Detention area, upsize an existing stormwater pipe and expand the stormwater conveyance system along Sheridan Boulevard from 62nd Ave. to Clear Creek.
- Yankee Doodle Outfall Systems – Pond Enlargement: Additional capacity will reduce the flood risk to the Fremont Elementary School, residences, and commercial businesses. Funding will be through Stormwater Fund Fee revenue. Financial participation with Mile High Flood District will be solicited.
- Leyden Creek Crossing at Croke Canal: During the 2013 Flood, the Croke Canal was purposely breached at this location to prevent flood water in the canal from over topping downstream and damaging properties. Will keep stormwater up to and including the 100-year flood flows on Leyden Creek from entering the Croke Canal and limits flows in the canal to its design capacity. Project is related to a recommendation in the Leyden Creek Drainageway Master Plan Update.
- Leyden Creek Crossing at W. 82nd Avenue aka Leyden Road: Replaces culverts to convey 100-year flood under W. 82nd Ave. Also includes upstream and downstream channel improvements. W. 82nd

Avenue closes when water crosses over it to prevent vehicles from being washed away. When closed, only allow in and out access for residents and emergency vehicles of Leyden Rock and Leyden Ranch West developments is through W. 80th Ave. and Indiana St. intersection.

- Ralston Creek at Croke Canal Crossing: Result of 2013 Flood flows that entered the Croke Canal. Will collect and direct flood flows in the Ralston Creek upstream of the Croke Canal to the existing 100-year crossing structure at Ralston Creek and the Croke Canal.
- Ralston Creek Improvements – Vance Street to Wadsworth By-Pass: Remove +/- 20 residential properties in the 100-year floodplain along Ralston Creek from upstream of Vance Street to Wadsworth By-Pass. Neighborhood is adjacent to Olde Town and with the opening of RTD's G Line, it will be difficult for those properties in the floodplain to reach their full redevelopment potential.
- Moon Gulch – Smith Property Detention Pond: Joint project with CDOT and Mile High Flood District. During the 2013 Flood the pond overflowed, and flood waters entered the Croke Canal. Will replace current drainage pipe under Indiana Street and Croke Canal.
- Tennyson Street Outfall: Outfall needs to be constructed to reduce flooding that occurs to commercial properties at W. 58th Ave. and Tennyson St. and south along Tennyson St.
- UDFCD (Mile High Flood District) Master Plan Studies and Joint Maintenance Projects
- Stormwater Master Plan: Fund an update to the Master Plan that was last updated in 1986.

Public Information

Public involvement includes a spectrum of activities, from informing residents, property owners, potential property owners, and visitors about hazards, ways to protect people and property, and the natural and beneficial functions of natural resources (e.g., local floodplains), to engaging the community to learn about new opportunities to mitigate risks and better understand knowledge gaps.

The City of Arvada's communications and engagement strategy is implemented by a cross section of City employees responsible for public information and engagement and is led by the City Manager's Office's Communications Team. The Chief Communications Manager leads that team, serves as the lead communications official for the City and is the interface between the City and all media sources (serving as City PIO). The position also directs Arvada's public television network, KATV Arvada (Channel 8) and oversees the posting of public information on the city's web site, www.arvada.org. The team also distributes hazard-related information across other digital communications channels, including social media and e-newsletters. The City's Police Department PIO is also a member of the Emergency Service Public Information Officers Colorado (ESPIOC).

Hazard awareness information is provided in the monthly Arvada Report, a printed publication that is mailed to every mailing address in Arvada. The City uses an online community engagement platform, called Speak Up Arvada, to periodically gather feedback from the community about hazard mitigation concerns.

Also, the city's Emergency Management Coordinator (EMC) provides public outreach to citizens with hazard awareness and preparedness information and presentations. Hazard awareness information is also posted on the City website and on social media. In addition, the City also acknowledges September as Emergency Preparedness Month and has a communication campaign for the entirety of that month.

Collectively, the City team provides ongoing public outreach through:

- Water bill flyers;
- City website (Arvada.org);
- Public education outreach on emergency planning, hazard awareness, and preparedness;
- Flood Protection Handbook for citizens;
- Employee safety training through Risk Management;
- Periodic messages on other digital channels, including social media and e-newsletters.

Additional Public Outreach Efforts include:

- **Sustain Arvada**
 - Arvada Air Quality –

- o Provide guides on steps residents can take to improve air quality in the City.
- Energy Conservation –
 - o All major remodels and new City facilities require LEED Silver certification;
 - o Traffic signals are being converted to LEDs;
 - o Solar panels have been installed at five locations;
 - o A 20-acre solar garden is planned with energy that can be sold to residents and businesses in the form of shares.
- Forestry –
 - o Parks Department Forestry Division tree assessment now digitized as part of Arvada's Forestry plan for its 13,000 + trees. The Forestry Plan includes strategies for tree diversification, preventative maintenance, spraying and injecting for pests and disease.
 - o Arvada has been named a Tree City USA for 30 consecutive years and has celebrated Arbor Day with Peck Elementary for 35 years planting 390 trees together over the years. The City also has a Plant-A-Tree program that allows for Citizens to purchase and plant trees in our Parks. The City has planted over 430 trees with Citizens over the years.
- Water Conservation –
 - o Water conservation was introduced as a City goal in the 2005 Comprehensive Plan. Goal reaffirmed in 2014 Plan.
 - o 100% of City parks have computerized irrigation systems to conserve water.
 - o A partnership with Resource Central
 - Garden in a Box
 - Waterwise Landscape Seminars

• **Resilient Neighborhoods – Resilience-building programs and resources for residents:**

In support of the City's strategic focus on maintaining a vibrant community and neighborhoods and consistent with its overall approach to communication and engagement the City operates the Neighbors Connected program. It is a neighborhood engagement platform designed to connect City of Arvada residents with resources and opportunities that will help them develop sustainable neighborhood groups and strengthen their own communities.

This program integrates with the Community Resilience Coordinator and the City's emergency preparedness and resiliency efforts through several related activities and recommendations to the community:

- Encouraging community members to meet with their Neighbors Connected group to identify a neighborhood emergency contact person and meeting point
- Promoting Severe Weather Spotter training
- Encouraging participation with the Arvada Community Emergency Response Team (Arvada CERT)
- Asking residents to create home preparedness plans and emergency kits with neighbors.
- Providing resources to help neighbors create a "talent bank" to inventory special skills, and asking questions like "Is someone in your neighborhood an EMT or nurse? Can someone speak multiple languages or use a HAM radio?"
- Encouraging neighborhood groups to apply for a Neighborhood Improvement Grant to build a local gathering place with your neighbors.
- Distributing a Flood Risk brochure for residents "What is my flood risk?"

Opportunities for Enhancement

Based on the capability assessment, Arvada has several existing mechanisms in place that already help to mitigate hazards. There are also opportunities for the City to expand or improve on these policies and programs to further protect the community. The HMPC identified exploring methods for partnering with Arvada Fire on community engagement and outreach efforts to help educate residents on their risk of wildfire hazards. Also, since experiencing the economic impacts of the 2020 COVID-19 pandemic, the

Arvada Economic Development Association is exploring recovery planning educational information for local businesses for the next disaster event so they can be better prepared. Table 2-15 in the Base Plan shows the potential financial benefits from increasing the City's Community Rating System class. Other future improvements may be the incorporation of risk and hazard information into future comprehensive plan updates, the next starting in 2023.

A.7 Plan Implementation and Maintenance

Arvada has developed a Plan Maintenance and Implementation Strategy outlining their method and schedule for keeping the plan current. The Implementation Strategy below also includes a discussion of how the City will continue public participation in the plan maintenance process.

A.7.1 Implementation and Maintenance of the 2016 Hazard Mitigation Plan

The City of Arvada recognizes and acknowledges the importance of hazard mitigation and has worked to integrate and incorporate hazard information into existing planning mechanisms. For example, the 2016 Hazard Mitigation Plan will be referenced in the City's 2021 Emergency Operations Plan. The floodplain regulations section of the Land Development Code was also updated and adopted in 2020.

A.7.2 Monitoring, Evaluation and Updating the Plan

The information contained within this plan, including results from the Vulnerability Assessment, and the Mitigation Strategy will be used by the City to help inform updates and the development of local plans, programs and policies, as described in Section 6 of the Base Plan.

Arvada Community Resilience Coordinator, City Manager's Office will be responsible for monitoring, evaluating, and updating this plan using the process outlined in Section 6 of the Base Plan. Arvada Community Resilience Coordinator, City Manager's Office will also be responsible for representing the City on future Jefferson County HMPC meetings, and for coordination with city staff and departments during plan updates. The City, Fire District and Police Department will meet at a minimum annually to discuss items that need to be updated and look at progress of action items. All items with budgetary requirements would need to be approved by the City Council.

The City of Arvada will also continue to involve the public in mitigation, as described in Section 6.4 of the Base Plan. This will include posting information on the website and utilize marketing and communications to get information to citizens and businesses.

A.8 Mitigation Strategy

The City of Arvada has adopted the hazard mitigation goals and objectives developed by the Planning Team and described in Section 6.2 of the Base Plan.

The City had six mitigation actions in the 2016 Plan, and has completed one of them:

- Multi-Jurisdictional Storm Ready Program Participation

The remaining actions have been carried over into the 2021 Plan, along with eleven new actions.

A.8.1 National Flood Insurance Program

Recognizing the importance of the National Flood Insurance Program (NFIP) in mitigating flood losses, the City of Arvada will place an emphasis on continued compliance with the NFIP. As an NFIP participant, the City has and will continue to make every effort to remain in good standing with NFIP. This includes continuing to comply with the NFIP's standards for updating and adopting floodplain maps and maintaining and updating the floodplain zoning ordinance as well as review of any potential development in special flood hazard areas.

A.8.2 Mitigation Actions

The local planning team identified and prioritized the following mitigation actions for the City of Arvada based on the risk assessment. Information on how each action will be implemented and administered, such as ideas for implementation, responsible agency, potential funding, estimated cost, and timeline also are included.

Many of these mitigation actions are intended to reduce impacts to existing development as well as future development. These actions include those that promote wise development and hazard avoidance, such as building code, mapping, and zoning improvements, and continued enforcement of floodplain development regulations. Actions that protect critical infrastructure note which lifeline category is protected using the following abbreviations:

COM: Communications

ENG: Energy

FWS: Food, Water, Sheltering

HAZ: Hazardous Waste

H&M: Health & Medical

S&S: Safety & Security

TRN: Transportation

DRAFT

Table A-29 City of Arvada Mitigation Action Plan

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Arvada 1	Leyden Creek Improvements. The 2013 flood inundated homes and private property along Leyden Creek. A drainage master plan has since been completed to identify strategies and drainage improvements to reduce the risk from future floods. Benefits include reduction in flood losses	Flood	2; FWS	City of Arvada Public Works	\$12,000,000 Jefferson County, MHFD, Farmers Reservoir and Irrigation Company, and Arvada	Medium	To be determined	Not Started. The stakeholders have not secured funding for this project. Therefore, the improvements are still in the planning phase. A revised schedule will be developed when Arvada and the other stakeholders can secure a funding source.
Arvada 2	MHFD Master Plan Implementation. In the early 1970s a drainage master plan was generated that identified drainage needs in the city not along the major creeks. Over the years numerous projects have been completed. This project would entail updating the Master Plan and continuing with implementing the master plan improvements.	Flood	2; FWS, H&M, S&S, TRN	City of Arvada Public Works	\$20,000,000 MHFD and City of Arvada	Medium	Anticipated completion in 2021	In Progress. The Storm Drainage Master Plan is currently underway and expected to be complete by Q2 of 2021. Arvada continues to work with the Mile High Flood District on updating Major Drainageway Master Plans and implementing their projects. On-schedule.
Arvada 3	Environmental damage protection. Areas in the northwest and western portions of Arvada are made up of open space, lakes and recreational attributes. These areas are exposed to high winds and blowing snow and precipitation. While wind shields and sandbags are deployed by Arvada Traffic and Transportation Division of Public Works-Maintenance during adverse weather to these key areas, engineered infrastructure investments are necessary for long term solutions. Without a permanent barrier solution to shield properties and roadways, Arvada and Jefferson County residents living	Erosion	2; FWS, H&M, S&S, TRN	City of Arvada – Traffic and Transportation Division of Public Works	The City would need an engineered study on potential alternatives with the highest benefit to cost ratio for consideration. To be determined.	Medium	To be determined and contingent on schedule	Not Started. Continuing to use short term solutions until a more permanent improvement can be funded.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	along this Front Range area as well as the traveling public, will continue to be affected by the rapidly changing weather conditions. This project mitigates impacts from windstorms and winter storms. Benefits include Reduction in soil erosion, transportation accidents, stranded travelers needing shelter during blizzard conditions and road closure, enhanced protection for railway transportation.							
Arvada 4	Road Weather Information System (RWIS). To reduce congestion and enhance roadway operational safety, the City of Arvada is interested in placing data stations on high volume arterials that are most vulnerable to adverse weather conditions and traffic collisions. Data Stations, similar to those operated by CDOT, will provide Street Maintenance and the Transportation Division with information pertaining to traffic flow, pavement condition, and weather temperatures to better manage City resources and communicate with roadway travelers. Each station will be equipped with the following elements: Traffic Cameras: will be used to visually verify traffic incidents, debris/blocked roadways, and pavement surface. Maintenance Decision Support System (MDSS): will be used to notify plow trucks of pavement conditions and determine amount of resources necessary to mitigate ice and snow. Traffic Data Collection Device: used to calculate volumes, speed, and lane occupancy that can be mapped and communicated to the traveling public. Communication Device: fiber or radio	Severe Winter Storms	2: TRN	City of Arvada – Traffic and Transportation Division of Public Works	\$50,000 X 5 (Stations: West 86th Pkwy, West 58th Ave, Kipling Pkwy, West 64th Avenue, and West 72nd Avenue corridors). To be determined	Low	To be determined	Not Started The mitigation project has been deferred until funding becomes available. However, the City team is seeking information to move forward on this project and recently visited Fort Collins to discuss their work.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	connection to TMC and Street Maintenance. Power: photovoltaic equipment and batteries, or metered electric power. Benefits include The City of Arvada manages 1,500 miles of pavement surface. The selected arterial corridors have an AADT higher than 9,000 vehicles and connect Arvada collector streets (neighborhoods) to State Highways in northwest metro area. The City can enhance roadway operations and improve regional trips by monitoring traffic and weather data to reduce the impact of incidents and weather related delays.							
Arvada 5	Continue to Implement Sound Floodplain Management Practices through Participation in the National Flood Insurance Program. The City of Arvada participates in the National Flood Insurance Program. The city also participates in the Community Rating System and is a CRS Class 5. This project restates the commitment of the City of Arvada to implement sound floodplain management practices, as stated in the floodplain ordinance. This includes ongoing activities such as enforcing local floodplain development regulations, including issuing permits for appropriate development in Special Flood Hazard Areas and ensuring that this development is elevated to or above the base flood elevation. This project also includes periodic reviews of the floodplain ordinance to ensure that it is clear and up to date. Floodplain managers will remain current on NFIP policies and are encouraged to attend appropriate	Flood	2; FWS, H&M, S&S, TRN	Engineering Division	Low Covered in existing budget	High	Continuing as an ongoing initiative	In Progress Continued as an ongoing initiative.

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
	training and consider achieving Certified Floodplain Manager (CFM) status. Currently three staff members have their CFM. Other activities that could be included in this effort are: Ensure that stop work orders and other means of compliance are being used as authorized by each ordinance; suggest changes to improve enforcement of and compliance with regulations and programs; participate in Flood Insurance Rate Map updates by adopting new maps or amendments to maps; utilize recently completed Digital Flood Insurance Rate maps in conjunction with GIS to improve floodplain management, such as improved risk assessment and tracking of floodplain permits; promote and disperse information on the benefits of flood insurance, with assistance from partners such as the County, Urban Drainage and Flood Control District, and Colorado Water Conservation Board; evaluate activities that will improve Community Rating System ratings that may further lower the cost of flood insurance for residents.							
Arvada 6	Hazard and Risk Mitigation Public Education and Awareness. City staff to reach out to residents and businesses about emergency preparedness and possible mitigation activities through awareness campaigns, events, public outreach, website, social media, and workshops.	Flood; Wildfire; Extreme Temps; Severe Winter Storms; Drought; Windstorm;	1; 3; S&S; COM;	City of Arvada Office of Emergency Management Arvada Police, Jeffcom 911	Covered in existing budget Covered in existing budget	Medium	Ongoing	New in 2021

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Arvada 7	Alert and Warning Public Education and Awareness (CodeRed). City staff to reach out to residents and businesses about alert and warning through awareness campaigns, events, public outreach, website, social media, and workshops.	Flood; Wildfire; Extreme Temps; Severe Winter Storms; Drought; Windstorm;	1; 3; S&S; COM;	City of Arvada Office of Emergency Management Arvada Police, Jeffcom 911	Covered in existing budget Covered in existing budget	Medium	Annual implementation.	New in 2021
Arvada 8	Partner with Arvada Economic Development Association (AEDA) to foster local business emergency preparedness and hazard mitigation. Engage with the Retention Committee on a regular basis to hear from local businesses. Develop local business preparedness and mitigation toolkit in collaboration with AEDA.	Dam Failure; Drought; Erosion and Deposition; Expansive Soils; Extreme Temps; Flood; Hailstorm; Severe Winter Storms; Wildfire; Windstorm;	1; 3; S&S; COM;	City of Arvada Office of Emergency Management Arvada Economic Development Association	Little to no cost Covered in existing budget	Medium	Annual implementation.	New in 2021
Arvada 9	Continue "Resilient Arvada" partnership. Partnership between staff at the City of Arvada Office of Emergency Management and Neighbors Connected Program to foster emergency preparedness at the neighborhood level (Talent Bank, neighborhood meeting places grants, and more).	Drought; Extreme Temps; Flood; Hailstorm; Severe Winter Storms; Wildfire; Windstorm;	1; 3; S&S; COM;	City of Arvada Office of Emergency Management City of Arvada Neighbors Connected Program	Covered in existing budget Covered in existing budget	Medium	Annual implementation.	New in 2021

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Arvada 10	Develop a CWPP in partnership with Arvada Fire. Both organizations have the goal of developing a CWPP for Arvada. This plan will identify the risks associated with development in the WUI/PUI and the projects that will mitigate the risk. Implementation of the projects is an interest of neighborhood-level groups like HOAs. Though Arvada does not have the highest risk in Jeffco for hazards typically identified in a CWPP, there is absolutely a benefit with understanding our specific risk better and working to minimize it as best we can as the City continues to grow in the PUI and toward the WUI.	Drought; Wildfire; Windstorm;	1; 2; 3; S&S; COM; TRN;	City of Arvada Office of Emergency Management Arvada Fire Protection District	Less than \$10,000 FEMA Hazard Mitigation Grant Programs	High	2026	New in 2021
Arvada 11	Ralston Creek Improvements - Vance Street to Wadsworth By-Pass. The purpose of this project is to remove approximately twenty residential properties in the 100-year floodway along Ralston Creek from just upstream of Vance Street to Wadsworth By-Pass. A detailed solution has not been identified, but it will probably be a combination of channels improvements and purchasing flood prone properties.	Flood;	2; S&S; COM; TRN;	City of Arvada Public Works Engineering Division UDFCD	More than \$10,000,000 MHFD, City of Arvada, Hazard Mitigation Assistance Grants	High	End of 2031	New in 2021
Arvada 12	City Wide Vegetation Management Program. The purpose of this program would be to proactively manage overgrown vegetation and dying trees along open channel drainageways within the City. This effort would restore the channel's roughness coefficients to a comparable value modeled in the Flood Insurance Studies. Additionally, this work would be complemented with tree mitigation efforts at strategic locations throughout the City.	Flood;	2; S&S; COM; TRN;	City of Arvada Public Works Engineering Division	More than \$1,000,000 UDFCD, City of Arvada, Hazard Mitigation Assistance Grants	Medium	End of 2031	New in 2021

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Arvada 13	Ralston Creek at Ward Rd. The purpose of this project is to replace the Ward Road bridge and increase channel capacity. This project was identified in the Ralston Creek US Army Corp Study of 2018 as part of the preferred alternative. The benefits of this project would reduce the floodplain footprint resulting in fewer structures within the regulatory floodplain. Additionally, the improvement would help protect critical water distribution pipes in the area.	Flood;	2; S&S; COM; TRN	City of Arvada Public Works Engineering Division	More than \$1,500,000 MHFD, City of Arvada, Hazard Mitigation Assistance Grants	Medium	2026	New in 2021
Arvada 14	Implement Multi-Year Training and Exercise Plan. The purpose of this project is to implement a multi-year training and exercise plan for the City of Arvada through the Office of Emergency Management. This will increase knowledge and training in disaster response and recovery for subject-matter experts and increase the organization and community's capability to be more resilient. This will include expanded ICS training for personnel as well as an annual tabletop exercise.	Dam Failure; Drought; Erosion and Deposition; Expansive Soils; Extreme Temps; Flood; Hailstorm; Landslides, Debris flows, Rockfalls; Lightning; Severe Winter Storms; Subsidence; Tornado; Wildfire; Windstorm; Cyber; Pandemic;	1; 2; 3; S&S; COM;	City of Arvada Office of Emergency Management Whole City Staff	Less than \$10,000 Covered in existing budget	Medium	Annual implementation.	New in 2021

Number	Title and Description	Hazards Mitigated	Related Goals & Lifelines	Lead Agency & Partners	Cost Estimate & Potential Funding	Priority	Timeline	Status & Implementation Notes
Arvada 15	Flood Hazard Public Outreach. The City will implement public information and education projects to increase the community's awareness of flood hazards and safety.	Flood;	1; COM; S&S;	City of Arvada Public Works Engineering Division City of Arvada Office of Emergency Management; City of Arvada Communications	Less than \$10,000 Department budget, FEMA Hazard Mitigation Assistance Grants	Medium	Annual implementation.	New in 2021
Arvada 16	Arvada Fire/City of Arvada Office of Emergency Management Collaboration. Continue partnership with Arvada Fire and other organizations to implement joint neighborhood-level resilience and community risk reduction work. Host workshops with neighborhood leaders to discuss their risks and the strategies for addressing those risks at the neighborhood level. Partner to communicate the importance of signing up for CodeRed emergency notifications. Visit HOA meetings together to discuss risk reduction and mitigation actions individuals and HOAs can take.	Windstorm; Wildfire; Drought;	1; 3; S&S; COM;	City of Arvada Office of Emergency Management Arvada Fire	Covered in existing budget Covered in existing budget	High	Annual implementation.	New in 2021



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
8.B.2.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-128 A Resolution Authorizing a Memorandum of Understanding Between the Colorado Attorney General and the City of Arvada for Distribution of Opioid Settlement Funds, Related Settlement Participation Forms, and a Colorado Subdivision Escrow Agreement with the Colorado Municipal League

Report in Brief

The Colorado Attorney General's Office has facilitated discussions associated with settlement conditions with defendants who engaged in the manufacture, marketing, promotion, distribution and/or dispensing of opioids which generated an epidemic. In order to proceed with finalizing the terms and conditions of the settlement, the Attorney General needs to determine the parties who will be included in the settlement. These parties will include the State of Colorado and participating local governments. The local governments that desire to be included in the settlement process must sign a Memorandum of Understanding (MOU) that states their intention to be a party to the settlement.

In order to formally approve the City of Arvada's participation in the settlement process, a resolution has been drafted that authorizes the Mayor or the Mayor Pro Tem to sign the MOU. Approval of the resolution will authorize the City to be a participating local government and remain engaged in the settlement process. The final settlement conditions will be determined through a regional collaborative process and defined in a future agreement that will include the State of Colorado and all of the participating local governments. By agreeing to be part of the settlement process and a party to the final settlement, Arvada and all participating local governments will have the ability to utilize resources on a local and regional level in order to address the negative impacts associated with the opioid epidemic.

The Arvada team recommends that the City Council approve R21-128, A Resolution Authorizing a Memorandum of Understanding Between the Colorado Attorney General And The City Of Arvada For Distribution Of Opioid Settlement Funds, Related Settlement Participation Forms, And A Colorado Subdivision Escrow Agreement With The Colorado Municipal League.

Financial Impact

The potential funding that could be awarded to the City of Arvada if up to 95% of Colorado local governments support the Memorandum of Understanding and potential Intergovernmental Agreement associated with the settlement conditions negotiated with the defendants described herein is estimated at \$980,000. These funds would be allocated over a period of 18 years.

Background

In September, opioid manufacturers and distributors agreed to settle claims and litigation with 42 states in association with the adverse impact of the opioid crisis. Colorado was among the 42 states that agreed to settle. Approximately \$26 billion will be allocated through the settlement with \$10.7 billion allocated to local governments within the participating states.

In addition to the state governments' pursuit of litigation, several Colorado local governments have also pursued litigation against various pharmaceutical companies for their role in causing the opioid epidemic in Colorado. That litigation recently

resulted in settlements with Purdue Pharma, McKinsey & Co., Johnson & Johnson, AmerisourceBergen, Cardinal Health, and McKesson, resulting in up to approximately \$400 million in settlement funds for both the State and Colorado local governments to abate the opioid crisis.

Following the announcement of the settlement, the Colorado Attorney General's Office facilitated a process to determine how the funds would be allocated to Colorado municipalities and counties. Elected officials representing regions within the state were asked to participate in negotiations to develop the framework for the equitable distribution of the settlement funds. Jefferson County was represented by Commissioner Lesley Dahlkemper and former Westminster Mayor Herb Atchison.

Through the diligence of the Attorney General's Office and the regional elected representatives, settlement conditions were developed which focused on regional collaboration and governance in order to allocate the payments to the state, counties and cities. Local governments within Colorado have been grouped into regions with governing boards composed of elected officials appointed from the cities and counties. Jefferson County is included within Region 10, which also includes Gilpin and Clear Creek counties. Each municipality within Region 10 will appoint a member to govern the distribution of the settlement funds.

Successful and equitable distribution of these funds will depend on maximum participation from all local government partners. The complex formula that formed the national and state settlements requires approximately 95% of the local governments to participate. By attracting a high percentage of local governments to join the settlement, the defendants believe that the number of remaining potential plaintiffs will be significantly reduced. Therefore, it is in the best interests of Colorado local governments to participate in the settlement process as the amount allocated to local governments could be adversely impacted by limited participation.

The settlement conditions will be presented to the local governments in two forms. The first form will be a Memorandum of Understanding (MOU) which must be approved by November 5. Following approval of the MOU, the State of Colorado and the local governments that have signed the MOU will work collaboratively through their regions to develop the Intergovernmental Agreement.

It is also important to note that the opioid settlement process described herein was discussed during the September 2 Commissioners and Municipalities meeting. Commissioner Dahlkemper and former Mayor Atchison provided a detailed explanation of the process and urged all elected officials who participated in the meeting to expedite approval of the MOU. The Arvada team received the MOU from the Attorney General on October 1 and scheduled the City Council's consideration of the document for the October 18 business meeting in order to meet the November 5 deadline.

Discussion

To maximize the settlement funds within Colorado, it is important that all Colorado counties and municipalities participate in these settlements and the distribution process by signing the following four documents:

- The MOU that lays out the allocation of opioid recoveries in the State of Colorado;
- The Subdivision Settlement Participation Form that releases subdivisions' legal claims against Johnson & Johnson;
- The Subdivision Settlement Participation Form that releases subdivisions' legal claims against AmerisourceBergen, Cardinal Health, and McKesson; and
- The Colorado Subdivision Escrow Agreement that ensures subdivisions' legal claims are released only when 95% participation by certain local governments has been reached. That 95% participation threshold is important because it triggers certain amounts of incentive payments under the settlements and signals to the settling pharmaceutical companies that the settlements have wide acceptance.

The City Attorney's Office has completed their legal review of the documents and drafted a resolution that would authorize the Mayor or Mayor Pro Tem to sign the document if approved by the Council.

As presented by Commissioner Dahlkemper and former Mayor Atchison during the September 2 Commissioners and

SUBJECT: R21-128 A Resolution Authorizing a Memorandum of Understanding Between the Colorado Attorney General and the City of Arvada for Distribution of Opioid Settlement Funds, Related Settlement Participation Forms, and a Colorado Subdivision Escrow Agreement with the Colorado Municipal League

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Municipalities meeting, Arvada and all participating local governments will receive significant funding that would be used to abate the impacts caused by the opioid crisis if the MOU and Intergovernmental Agreement are approved by the local boards and councils. The estimated allocation to Arvada based on the current settlements as described herein is approximately \$980,000 paid over 18 years. There may be additional payouts as other pharma and distribution companies join the current settlement in order to avoid additional litigation. These funds could be used, as an example, to help support homeless services, mental health programs, addiction therapy or other programs that would address the impacts of the opioid epidemic, either directly provided by the City or as part of a comprehensive and coordinated regional effort.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A.

Strategic Alignment

The recommended action aligns with the Organizational and Service Effectiveness Priority Area of the City Council Strategic Plan. The following Principle within this Priority Area closely aligns with the recommendation:

Provides a well-managed, fiscally responsible government that operates effectively and efficiently while identifying revenue requirements to sustain current service levels and achieve future requested les of service.

Alternative Courses of Action

N/A.

Recommendation for Action

The Arvada team recommends that the City Council approve R21-128, A Resolution Authorizing a Memorandum of Understanding Between the Colorado Attorney General And The City Of Arvada For Distribution Of Opioid Settlement Funds, Related Settlement Participation Forms, And A Colorado Subdivision Escrow Agreement With The Colorado Municipal League.

Suggested Motion:

I move that R21-128, A Resolution Authorizing a Memorandum of Understanding Between the Colorado Attorney General And The City Of Arvada For Distribution Of Opioid Settlement Funds, Related Settlement Participation Forms, And A Colorado Subdivision Escrow Agreement With The Colorado Municipal League, be (approved) (rejected).

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

SUBJECT: R21-128 A Resolution Authorizing a Memorandum of Understanding Between the Colorado Attorney General and the City of Arvada for Distribution of Opioid Settlement Funds, Related Settlement Participation Forms, and a Colorado Subdivision Escrow Agreement with the Colorado Municipal League

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ITEM: 8.B.2.

Gail Walker, Legal Specialist-Contracts 10/6/2021

Laura Hemler, Assistant City Attorney 10/6/2021

Rachel Morris, City Attorney 10/7/2021

Lorie Gillis, Deputy City Manager 10/7/2021

Mark Deven, City Manager 10/7/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-128

A RESOLUTION AUTHORIZING A MEMORANDUM OF UNDERSTANDING
BETWEEN THE COLORADO ATTORNEY GENERAL AND THE CITY OF ARVADA FOR
DISTRIBUTION OF OPIOID SETTLEMENT FUNDS, RELATED SETTLEMENT
PARTICIPATION FORMS, AND A COLORADO SUBDIVISION ESCROW AGREEMENT
WITH THE COLORADO MUNICIPAL LEAGUE

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The Mayor or Mayor Pro Tem is authorized to sign and the City Clerk to attest, in form approved by the City Attorney, the following documents:

- a) Memorandum of Understanding, which is in substantially the same form as that attached hereto, by and between the Colorado Attorney General and the City of Arvada for distribution of opioid settlement funds;
- b) Exhibit K: Settlement Participation Form relating to the Janssen Settlement;
- c) Exhibit K: Subdivision Settlement Participation Form relating to the Distributor Settlement; and
- d) Colorado Subdivision Escrow Agreement.

Section 2. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

**COLORADO OPIOIDS SETTLEMENT MEMORANDUM OF UNDERSTANDING
("MOU")**

Thursday, August 26, 2021

August 25, 2021 Attorney General version

A. Definitions

As used in this MOU:

1. "Approved Purpose(s)" shall mean forward-looking strategies, programming, and services to abate the opioid epidemic as identified by the terms of any Settlement. If a Settlement is silent on Approved Purpose(s), then Approved Purpose(s) shall mean those forward-looking strategies to abate the opioid epidemic identified in **Exhibit A** or any supplemental forward-looking abatement strategies added to **Exhibit A** by the Abatement Council. Consistent with the terms of any Settlement, "Approved Purposes" shall also include the reasonable administrative costs associated with overseeing and administering Opioid Funds from each of the four (4) Shares described in Section (B)(2). Reimbursement by the State or Local Governments for past expenses are not Approved Purpose(s). "Approved Purposes" shall include attorneys' fees and expenses incurred in the course of the opioid litigation that are paid through the process discussed below.
2. "County Area" shall mean a county in the State of Colorado plus the Local Governments, or portion of any Local Government, within that county.
3. "Effective Date" shall mean the date on which a court of competent jurisdiction, including any bankruptcy court, enters the first Settlement by order or consent decree. The Parties anticipate that more than one Settlement will be administered according to the terms of this MOU, but that the first entered Settlement will trigger the formation of the Abatement Council in Section (C) and the Regional Councils in Section (F)(5).¹
4. "General Abatement Fund Council," or "Abatement Council," shall have the meaning described in Section (C), below.

¹ For the avoidance of doubt, the McKinsey Settlement and any other Settlement that precedes the finalization of drafting this MOU are not considered a trigger for purposes of the calculation of "Effective Date."

5. “Local Government(s)” shall mean all counties in the State of Colorado and the municipalities, towns, and county and city municipal corporations that are listed in **Exhibit B**.
6. “National Opioid Settlement Administrative Fund” shall mean any fund identified by a Settlement for the national distribution of Opioid Funds.
7. “Opioid Funds” shall mean damage awards obtained through a Settlement.
8. “Opioid Settling Defendant” shall mean any person or entity, or its affiliates, that engages in or has engaged in the manufacture, marketing, promotion, distribution, or dispensing of licit opioids.
9. “Participating Local Government(s)” shall mean all Local Governments that sign this MOU, and if required under terms of a particular Settlement, who have executed a release of claims with the Opioid Settlement Defendant(s). For the avoidance of doubt, a Local Government must sign this MOU to become a “Participating Local Government.” Local Governments may designate the appropriate individual from their entity to sign the MOU.
10. “Party” or “Parties” shall mean the State and/or Participating Local Government(s).
11. “Qualified Settlement Fund Account,” or “QSF Account,” shall mean an account set up as a qualified settlement fund, 468b fund, as authorized by Treasury Regulations 1.468B-1(c) (26 CFR §1.468B-1).
12. “Regional Council” shall have the meaning described in Section (F)(5), below.
13. “Settlement” shall mean the negotiated resolution of legal or equitable claims against an Opioid Settling Defendant when that resolution has been jointly entered into by the State and the Participating Local Governments, or by any individual Party or collection of Parties that opt to subject their Settlement to this MOU. Unless otherwise directed by an order from a United States Bankruptcy Court, “Settlement” shall also include distributions from any liquidation under Chapter 7 of the United States Bankruptcy Code or confirmed plan under Chapter 11 of the United States Bankruptcy Code that treats the claims of the State and Local Governments against an Opioid Settling Defendant.
14. “The State” shall mean the State of Colorado acting through its Attorney General and the Colorado Department of Law.

B. Allocation of Settlement Proceeds

1. All Opioid Funds shall be held in accordance with the terms of any Settlement. If a Settlement allows Opioid Funds to be held in a National Opioid Settlement Administrative Fund, then Opioid Funds shall be held in such National Opioid Settlement Administrative Fund. If a Settlement does not allow for Opioid Funds

to be held in a National Opioid Settlement Administrative Fund, Opioid Funds shall be held in a Colorado-specific QSF Account or, under the following limited circumstances, in the State's Custodial Account: 1) if at the time of a Settlement, a Colorado-specific QSF Account is not yet established, although in such case, the Opioid Funds shall be transferred to the Colorado-specific QSF Account once it is established or 2) where the Abatement Fund Council determines Opioids Funds cannot be legally held in a Colorado-specific QSF Account. Regardless of whether Opioid Funds are held in a National Administrative Fund, a Colorado-specific QSF Account, or in the State's Custodial Account, the Abatement Council shall appoint one of its members to serve as the point of contact in accordance Section (C)(4)(b)(i), below.

2. All Opioid Funds, at the time of a Settlement or at the time designated in the Settlement documents, shall be divided and distributed as follows:²
 - a. **10%** directly to the State ("State Share") for Approved Purposes in accordance with Section (D), below;
 - b. **20%** directly to Participating Local Governments ("LG Share") for Approved Purposes in accordance with Section (E), below;
 - c. **60%** directly to Regions ("Regional Share") for Approved Purposes in accordance with Section (F), below; and
 - d. **10%** to specific abatement infrastructure projects ("Statewide Infrastructure Share") for Approved Purposes in accordance with Section (G), below.
3. Distribution of the Shares in Section B(2)(a) – (d) shall be direct, meaning that funds held in accordance with Section B(1) shall be disbursed directly to the State, Participating Local Governments, Regions, and the Statewide Infrastructure Share according to the terms of this MOU.
4. All Opioid Funds, regardless of allocation, shall be used for Approved Purposes.
5. Participating Local Governments may elect to share, pool, or collaborate with their respective allocation of the LG or Regional Shares in any manner they choose, so long as such sharing, pooling, or collaboration is used for Approved Purposes and complies with the terms of this MOU and any Settlement.

C. General Abatement Fund Council

1. A General Abatement Fund Council (the "Abatement Council"), consisting of representatives appointed by the State and Participating Local Governments, shall

² This MOU treats multi-county health departments as county health departments for purposes of allocation and distribution of abatement proceeds and therefore multi-county health departments shall not receive any Opioid Funds directly. Third-Party Payors ("TPPs") are not Parties to this MOU.

be created to ensure the distribution of Opioid Funds complies with the terms of any Settlement and to provide oversight of the Opioid Funds in accordance with the terms of this MOU.

2. **Membership:** The Abatement Council shall consist of the following thirteen (13) members, who shall serve in their official capacity only.

a. **State Members:** Seven (7) members shall be appointed by the State, as authorized volunteers of the State, as follows:

- (i) A Chair to serve as a non-voting member, except in the event of a tie;
- (ii) Two (2) members who are licensed professionals with significant experience in substance use disorders;
- (iii) Three (3) members who are professionals with significant experience in prevention, education, recovery, treatment, criminal justice, rural public health issues, or government administration related to substance use disorders; and
- (iv) One (1) member or family member affected directly by the opioid crisis.

b. **Local Government Members:** Six (6) members shall be appointed by the Participating Local Governments. Local Government Members shall be a County Commissioner, Mayor, City or Town Council Member, or a professional with significant experience in prevention, education, recovery, treatment, criminal justice, rural public health issues, or governmental administration related to substance use disorders. A Participating Local Government may determine which Local Government Members are eligible (or ineligible) to serve on the General Abatement Fund Council. County Commissioners, City or Town Council Members, and/or Mayors from the Regions identified in **Exhibit C** shall collaborate to appoint Local Government Members as follows:

- (i) Two (2) Members from Regions 1, 5, 13, 14, 15, 17, 18;
- (ii) Two (2) Members from Regions 2, 6, 7, 8, 9, 10, 11, 12, 16; and
- (iii) Two (2) Members from Regions 3, 4, 19.

c. **Terms:** The Abatement Council shall be established within ninety (90) days of the Effective Date. In order to do so, within sixty (60) days of the Effective Date, the State shall appoint the State Members in accordance with Section (C)(2)(a), and after conferral with the Local Governments, CCI and CML shall jointly appoint six (6) Local Government Members for an initial term not to exceed one year. Thereafter, Members shall be

appointed in accordance with this Section and Sections (C)(2)(a) and (b) and may serve no more than two (2) consecutive two-year terms, for a total of four (4) consecutive years. Except that, beginning in the second year only, two (2) State Members and two (2) Local Government members shall be appointed for a three-year term and may serve one consecutive two-year term thereafter. The Chair shall have no term but may be replaced at the State's discretion.

- (i) If a State or Local Government Member resigns or is otherwise removed from the Abatement Council prior to the expiration of their term, a replacement Member shall be appointed within sixty (60) days in accordance with Sections (C)(2)(a) and (b).
- (ii) If a Local Government Member vacancy exists for more than sixty (60) days, the State shall appoint a replacement Local Government Member to serve until the vacancy is filled in accordance with Section (C)(2)(b).

- 3. **Duties:** The Abatement Council is primarily responsible for ensuring that the distribution of Opioid Funds complies with the terms of this MOU. The Abatement Council is also responsible for oversight of Opioid Funds from the Regional Share in accordance with Section (F), below, and for developing processes and procedures for the distribution and oversight of Opioid Funds from the Statewide Infrastructure Share in accordance with Section (G) below.
- 4. **Governance:** The Abatement Council shall draft its own bylaws or other governing documents, which must include appropriate conflict of interest and dispute resolution provisions, in accordance with the terms of this MOU and the following principles:
 - a. **Authority:** The Abatement Council does not have rulemaking authority. The terms of this MOU and any Settlement, as entered by any court of competent jurisdiction, including any bankruptcy court, control the authority of the Abatement Council and the Abatement Council shall not stray outside the bounds of the authority and power vested by this MOU and any Settlement.
 - b. **Administration:** The Abatement Council shall be responsible for an accounting of all Opioid Funds. The Abatement Council shall be responsible for releasing Opioid Funds in accordance with Section (B)(1) for the Regional and Statewide Infrastructure Shares in Sections (B)(2)(c) and (d) and shall develop policies and procedures for the release and oversight of such funds in accordance with Sections (F) and (G). Should the Abatement Council require assistance with providing an accounting of Opioid Funds, it may seek assistance from the State.

- (i) The Abatement Council shall appoint one of its members to serve as a point of contact for the purpose of communicating with the entity holding Opioid Funds in accordance with Section (B)(1) and in that role shall only act as directed by the Abatement Council.
- c. **Transparency:** The Abatement Council shall operate with all reasonable transparency and operate in a manner consistent with all Colorado laws relating to open records and meetings regardless of whether the Abatement Council is otherwise obligated to comply with them.
 - (i) The Abatement Council shall develop a centralized public dashboard or other repository for the publication of expenditure data from any Party or Regional Council that receives Opioid Funds in accordance with Sections (D)-(G).
 - (ii) The Abatement Council may also require outcome related data from any Party or Regional Council that receives Opioid Funds in accordance with Sections (D)-(G) and may publish such outcome related data in the centralized public dashboard or other repository described above. In determining which outcome related data may be required, the Abatement Council shall work with all Parties and Regional Councils to identify appropriate data sets and develop reasonable procedures for collecting such data sets so that the administrative burden does not outweigh the benefit of producing such outcome related data.
 - (iii) For purposes of funding the centralized public dashboard or other repository described above, the Abatement Council shall make good faith efforts to seek funding from outside sources first, otherwise the State shall provide such funding.
- d. **Collaboration:** The Abatement Council shall facilitate collaboration between the State, Participating Local Governments, Regional Councils, and other stakeholders for the purposes of sharing data, outcomes, strategies, and other relevant information related to abating the opioid crisis in Colorado.
- e. **Decision Making:** The Abatement Council shall seek to make all decisions by consensus. In the event consensus cannot be achieved, unless otherwise required in this MOU, the Abatement Council shall make decisions by a majority vote of its Members. The Chair shall only vote in the event of a tie.
- f. **Due Process:** The Abatement Council shall develop the due process procedures required by Section (G)(3)(d) for Parties to dispute or challenge remedial actions taken by the Abatement Council for Opioid Funds from the Statewide Infrastructure Share. The Abatement Council

shall also abide by the due process principles required by Section (F)(12)-(13) for Regions to dispute or challenge remedial actions taken by the Abatement Council for Opioid Funds from the Regional Share.

- g. **Legal Status:** The Abatement Council shall not constitute a separate legal entity.
- h. **Legal Representation:** To the extent permitted by law, the State shall provide legal counsel to State Members for all legal issues arising from those State Members' work on the Abatement Council. At all times, Local Government Members of the Abatement Council are entitled to receive legal representation from their respective governmental entities. In the event of a conflict, the Abatement Council and its members may retain the services of other legal counsel.
- i. **Compensation:** No member of the Abatement Council shall be compensated for their work related to the Abatement Council.

D. State Share

- 1. In accordance with Sections (B)(1) and (B)(2)(a), and the terms of any Settlement, the State Share shall be paid directly to the State in accordance with the terms of this Section (D).
- 2. The State maintains full discretion over distribution of the State Share anywhere within the State of Colorado, however, the State Share shall be used for Approved Purposes only. The State will work to reduce administrative costs as much as practicable.
- 3. On an annual basis, as determined by the Abatement Council, the State shall provide all expenditure data, including administrative costs, from the State Share to the Abatement Council for purposes of maintaining transparency in accordance with Section (C)(4)(c)(i). The Abatement Council may require the State to provide additional outcome-related data in accordance with Section (C)(4)(c)(ii) and the State shall comply with such requirements.
- 4. If the State disputes the amount of Opioid Funds it receives from the State Share, the State shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. Failure to alert the Abatement Council within this time frame shall not constitute a waiver of the State's right to seek recoupment of any deficiency in its State Share.

E. LG Share

- 1. In accordance with Sections (B)(1) and (B)(2)(b), and the terms of any Settlement, the LG Share shall be paid directly to Participating Local Governments in accordance with the terms of this Section (E).

2. Allocations to Participating Local Governments from the LG Share shall first be determined using the percentages shown in **Exhibit D**.
3. The LG Share for each County Area shall then be allocated among the county and the other Participating Local Governments within it. **Exhibit E** reflects the default allocation that will apply unless the Participating Local Governments within a County Area enter into a written agreement providing for a different allocation. The Participating Local Governments may elect to modify the allocation for a County Area in **Exhibit E**, but such modification to the allocation in **Exhibit E** shall not change a County Area's total allocation under Section (E)(2).
4. A Local Government that chooses not to become a Participating Local Government will not receive a direct allocation from the LG Share. The portion of the LG Share that would have been allocated to a Local Government that is not a Participating Local Government will instead be re-allocated to the Regional Share for the Region where the Local Government is located, in accordance with Section (F), below.
5. In the event a Participating Local Government dissolves or ceases to exist during the term of any Settlement, the allocation for that Participating Local Government from the LG Share shall be re-allocated as directed by any Settlement, and if not specified, be re-allocated to the Regional Share for the Region in which the Participating Local Government was located, in accordance with Section (F). If a Participating Local Government merges with another Participating Local Government, the allocation for that Participating Local Government from the LG Share shall be re-allocated as directed by any Settlement, and if not specified, shall be re-allocated to the successor Participating Local Government's allocation of the LG Share. If a Participating Local Government merges with a Local Government that is not a Participating Local Government, the allocation for that Participating Local Government from the LG Share shall be re-allocated as directed by any Settlement, and if not specified, be re-allocated to the Region in which the merging Participating Local Government was located, in accordance with Section (F), below.
6. A Participating Local Government may forego its allocation of the LG Share and direct its allocation to the Regional Share for the Region where the Participating Local Government is located, in accordance with Section (F) below, by affirmatively notifying the Abatement Council on an annual basis of its decision to forego its allocation of the LG Share. A Participating Local Government's election to forego its allocation of the LG Share shall carry over to the following year unless the Participating Local Government notifies the Abatement Council otherwise. If a Participating Local Government elects to forego its allocation of the LG Share, the Participating Local Government shall be excused from the reporting requirements required by Section (E)(8).
7. Participating Local Governments maintain full discretion over the distribution of their allocation of the LG Share anywhere within the State of Colorado, however,

all Participating Local Governments shall use their allocation from the LG Share for Approved Purposes only. Reasonable administrative costs for a Participating Local Government to administer its allocation of the LG Share shall not exceed actual costs or 10% of the Participating Local Government's allocation of the LG Share, whichever is less.

8. On an annual basis, as determined by the Abatement Council, all Participating Local Governments shall provide all expenditure data, including administrative costs, from their allocation of the LG Share to the Abatement Council for purposes of maintaining transparency in accordance with Section (C)(4)(c)(i). The Abatement Council may require Participating Local Governments to provide additional outcome related data in accordance with Section (C)(4)(c)(ii) and all Participating Local Governments shall comply with such requirements.
9. If any Participating Local Government disputes the amount of Opioid Funds it receives from its allocation of the LG Share, the Participating Local Government shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. Failure to alert the Abatement Council within this time frame shall not constitute a waiver of the Participating Local Government's right to seek recoupment of any deficiency in its LG Share.

F. Regional Share

1. In accordance with Sections (B)(1) and (B)(2)(c), and the terms of any Settlement, the Regional Share shall be paid to the Regions in accordance with the terms of this Section (F).
2. Participating Local Governments shall organize themselves into the Regions depicted in **Exhibit C**. Municipalities located in multiple Regions may join all or some of the Regions in which they are located according to **Exhibit C**.
3. Allocations to Regions will be distributed according to **Exhibit F**. For multi-county Regions, each Region's share listed in **Exhibit F** is calculated by summing the individual percentage shares listed in **Exhibit D** for the counties within that Region. The percentages in **Exhibit F** are based on the assumption that every Local Government in each Region becomes a Participating Local Government.
4. In the event a city, town, or other municipality that is a Participating Local Government merges, dissolves, or ceases to exist during the term of any Settlement, the allocation of the Regional Share owed to the Region in which that Participating Local Government existed shall be re-allocated as directed by any Settlement, and if not specified, shall not be modified from **Exhibit F**. If a county that is a Participating Local Government merges with another county within its Region, the allocation of the Regional Share owed to the Region in which that county existed shall be re-allocated as directed by any Settlement, and if not specified, shall not be modified from **Exhibit F**. If a county that is a Participating Local Government merges with a county in a different Region during the term of

any Settlement, the allocation of the Regional Share owed to the Region in which that county existed shall be re-allocated as directed by any Settlement, and if not specified, shall be re-allocated to the Region in which that Participating Local Government merged in accordance with **Exhibit F**.

5. Each Region must create its own Regional Council while giving consideration to the regional governance models illustrated in **Exhibit G**. The Regional Council must be formed by the Participating Local Governments within the Region and each Regional Council shall designate a fiscal agent for the Region. Regional fiscal agents shall be county or municipal governments only. All funds from the Regional Share shall be distributed to the Regional Council's identified fiscal agent for the benefit of the entire Region.
 - a. Subject to this Section F(5), each Region may draft its own intra-regional agreements, bylaws, or other governing documents to determine how the Regional Council will operate. However, each voting member of a Regional Council shall be an employee or elected official of a Participating Local Government within the applicable Region. In the case of Denver, the voting members of its Regional Council shall be appointed by the Mayor. In the case of Broomfield, the voting members of its Regional Council shall be appointed by the Broomfield City and County Manager.
 - b. The Region shall not receive any Opioid Funds from the Regional Share until the Region certifies to the Abatement Council that its Regional Council has been formed and a fiscal agent has been designated. Such certification shall be in a simple form adopted by the Region and may be made via email, so long as it includes the names and affiliations of the Regional Council's members and the designated fiscal agent.
 - c. If a Region does not form and certify its Regional Council and designate its fiscal agent within one-hundred and eighty (180) days of the Effective Date, the Abatement Council shall appoint members to the Region's Regional Council. Regional Council members appointed by the Abatement Council shall serve until the Region certifies the formation of its Regional Council to the Abatement Council.
 - d. A Region shall submit a renewed certification required by Section (F)(5)(b), above, when its membership changes.
 - e. If a membership vacancy exists on a Regional Council for more than ninety (90) days and the Regional Council is unable to fill the vacancy by its regular procedures during that time, the Abatement Council shall appoint a replacement member to serve until the Region fills the vacancy.

6. A Local Government that chooses not to become a Participating Local Government shall not receive any Opioid Funds from the Regional Share or participate in the Regional Councils described in Section (F)(5) above.
7. Each Regional Council shall make requests to the Abatement Council for Opioid Funds from their allocation of the Regional Share. Each Regional Council's request for Opioid Funds from the Regional Share shall be accompanied by a 2-year plan identifying the Approved Purposes for which the requested funds will be used by the Region anywhere within the State of Colorado. A Regional Council's 2-year plan may be amended so long as such amendments comply with the terms of this MOU and any Settlement. Any Regional Council may seek assistance from the Abatement Council for purposes of developing its 2-year plan.
8. Reasonable administrative costs for a Regional Council to administer its Region's allocation of the Regional Share shall not exceed actual costs or 10% of the Region's allocation of the Regional Share, whichever is less.
9. The Abatement Council shall release funds requested by a Regional Council in accordance with Section (B)(1) if the Regional Council's 2-year plan complies with the Approved Purposes, the terms of this MOU, and the terms of any Settlement. The Abatement Council shall not deny any funding request from a Regional Council on the basis that the Abatement Council does not approve or agree with the Approved Purposes for which a Regional Council requests Opioid Funds from the Regional Share. Nor may the Abatement Council hold up, delay, or make unreasonable requests for additional or supporting information of the Regional Council prior to releasing the requested Opioid Funds. The purpose of this MOU is to facilitate Opioid Funds to their intended recipients quickly and efficiently with minimal administrative procedure.
10. On an annual basis, as determined by the Abatement Council, each Regional Council's fiscal agent shall provide to the Abatement Council the Regional Council's expenditure data, including administrative costs, from their allocation of the Regional Share and certify to the Abatement Council that the Regional Council's expenditures were for Approved Purposes and complied with its 2-year plan. The Regional Council shall subject itself to an accounting at the Abatement Council's discretion.
 - a. The Abatement Council shall review a Regional Council's expenditure data and certification to ensure compliance with the Regional Council's 2-year plan, the Approved Purposes, and the terms of this MOU and any Settlement.
 - b. The Abatement Council shall publish the Regional Council's expenditure data, including administrative costs, from the Regional Share in accordance with Section (C)(4)(c)(i). The Abatement Council may require Regional Councils to provide additional outcome related data in

accordance with Section (C)(4)(c)(ii) and all Regional Councils shall comply with such requirements.

11. If any Regional Council disputes the amount of Opioid Funds it receives from its allocation of the Regional Share, the Regional Council shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. Failure to alert the Abatement Council within this time frame shall not constitute a waiver of the Regional Council's right to seek recoupment of any deficiency in its Regional Share.
12. If the Abatement Council has reason to believe a Region's expenditure of its allocation of the Regional Share did not comply with the Region's 2-year Plan, the Approved Purposes, the terms of this MOU or any Settlement, as described in this Section (F), or that the Region otherwise misused its allocation of the Regional Share, the Abatement Council may take remedial action against the alleged offending Region. Such remedial action is left to the discretion of the Abatement Council and may include but not be limited to, withholding future Opioids Funds owed to the offending Region or requiring the offending Region to reimburse improperly expended Opioid Funds to the Regional Share.
13. Within one hundred and twenty (120) days of the Abatement Council being formed, in accordance with Section (C)(2)(c) above, the Abatement Council shall develop and publish due process procedures for allowing a Region to challenge or dispute any remedial action taken by the Abatement Council, including timelines during which the Region may engage in such a challenge or dispute. Such due process procedures shall reflect, at a minimum, the following principles:
 - a. Upon learning of any conduct that may warrant remedial action against a Region, the Abatement Council shall first provide notice to the Region of the conduct at issue, provide the Region an opportunity to respond, and, if appropriate, cure the alleged offending conduct. If after providing the Region such notice and opportunities to respond and cure, the Abatement Council continues to believe remedial action is warranted, the Abatement Council may take such remedial action.
 - b. If the Abatement Council decides to take remedial action against an alleged offending Region, such action may only occur by a two-thirds supermajority vote of the Abatement Council. Thus, an Abatement Council made up of twelve (12) voting members requires a vote of eight (8) Members prior to taking remedial action against an alleged offending Region.
 - c. Prior to taking any remedial action against an alleged offending Region, the Abatement Council shall first provide notice to the alleged offending Region of the remedial action to be taken and the facts underlying such remedial action. The Abatement Council shall then provide the alleged

offending Region an opportunity to challenge or dispute the remedial action in accordance with, at a minimum, the principles below:

- i. The alleged offending Region may request revisions or modifications to the proposed remedial action;
 - ii. The alleged offending Region may submit a written response to and/or request a hearing before the Abatement Council, or a third-party hearing officer,³ regarding the alleged offending conduct and proposed remedial action; and
 - iii. After such written responses are submitted and reviewed and/or a hearing is conducted, the alleged offending Region may submit an appeal to the Abatement Council of the decision to take remedial action.
- d. Remedial actions taken by the Abatement Council, in accordance with the due process principles detailed above, shall be considered final non-appealable orders and offending Regions may not seek judicial relief from remedial action taken by the Abatement Council, except as provided in Section (H), below.
- e. Subject to Section (H)(2), below, if any Party(ies) believes the Abatement Council violated the terms of this MOU, such Party(ies) may seek to enforce the terms of this MOU.

14. If the Abatement Council has reason to believe a Region's conduct, or the conduct of any Participating Local Government or individual in that Region, amounts to a violation of any criminal law, the Abatement Council shall refer such matters to the appropriate authorities and may consider such conduct in its determination of any remedial action to be taken.

15. If the Abatement Council has reason to believe that an individual involved in the receipt or administration of Opioid Funds from the Regional Share has violated any applicable ethics rules or codes, the Abatement Council shall not attempt to adjudicate such a violation. In such instances, the Abatement Council shall lodge a complaint with the appropriate forum for handling such ethical matters, such as a local home rule municipality's ethics board.

16. Costs associated with the Abatement Council's distribution and oversight of the Regional Share, as described above in this Section (F), including costs associated with any remedial action by the Abatement Council, shall be paid from the Statewide

³ Only an alleged offending Region may request the appointment of a third-party hearing officer to review any written responses and conduct any requested hearings. If an alleged offending Region makes such a request, the Abatement Council has sole discretion to appoint the third-party hearing officer and the alleged offending Region shall bear the cost of such review and/or hearing by the third-party hearing officer.

Infrastructure Share. The Abatement Council shall make all good faith efforts to limit such costs to the greatest extent possible.

G. Statewide Infrastructure Share

1. In accordance with Sections B(1) and (B)(2)(d), and the terms of any Settlement, the Statewide Infrastructure Share shall be paid to any Party or Regional Council in accordance with this Section (G).
2. The purpose of the Statewide Infrastructure Share is to promote capital improvements and provide operational assistance for developing or improving the infrastructure necessary to abate the opioid crisis anywhere within the State of Colorado. The Statewide Infrastructure Share is intended to supplement Opioid Funds received by any Party or Region.
3. Prior to distributing any Opioid Funds from the Statewide Infrastructure Share, the Abatement Council shall establish and publish policies and procedures for the distribution and oversight of the Statewide Infrastructure Share, including processes for Parties or Regions to apply for Opioid Funds from the Statewide Infrastructure Share. The Abatement Council's policies and procedures shall, at a minimum, reflect the following principles:
 - a. Opioid Funds from the Statewide Infrastructure Share shall be used for Approved Purposes only;
 - b. Opioid Funds from the Statewide Infrastructure Share shall be paid directly to the appropriate state agencies (including but not limited to the Colorado Department of Law), Regional fiscal agents, or Participating Local Governments only;
 - c. Distribution and oversight of the Statewide Infrastructure Share shall comply with the terms of this MOU and any Settlement;
 - d. Appropriate processes for remedial action will be taken against Parties or Regions that misuse Opioid Funds from the Statewide Infrastructure Share. Such processes shall include procedures for alleged offending Parties or Regions to challenge or dispute such remedial action; and
 - e. Limitations on administrative costs to be expended by recipients for administering Opioid Funds received from the Statewide Infrastructure Fund, not to exceed actual costs expended by the recipient or 10% of the amount received, whichever is less.
4. The distribution and oversight policies and procedures developed by the Abatement Council, in accordance with Section (G)(3), shall be non-appealable orders and no Party or Region may seek judicial relief related to the distribution and oversight of the Statewide Infrastructure Share.

5. On an annual basis, as determined by the Abatement Council, any Party or Regional Council that receives funds from the Statewide Infrastructure Share shall provide all expenditure data, including administrative costs, related to any Opioid Funds it received from the Statewide Infrastructure Share and subject itself to an accounting as required by the Abatement Council. The Abatement Council shall publish all expenditure data from the Statewide Infrastructure Share in accordance with Section (C)(4)(c)(i). The Abatement Council may require the Parties or Regional Councils that receive funds from the Statewide Infrastructure Share to provide additional outcome related data in accordance with Section (C)(4)(c)(ii) and the Parties or Regional Councils shall comply with such requirements.
6. Costs associated with the Abatement Council's distribution and oversight of the Statewide Infrastructure Share, as described in this Section (G), shall be paid for from the Statewide Infrastructure Share. The Abatement Council shall make all good faith efforts to limit such costs to the greatest extent possible.

H. General Terms

1. All Parties and Regional Councils shall maintain all records related to the receipt and expenditure of Opioid Funds for no less than five (5) years and shall make such records available for review by the Abatement Council, any other Party or Regional Council, or the public. Records requested by the public shall be produced in accordance with Colorado's open records laws. Records requested by the Abatement Council or another Party or a Regional Council shall be produced within twenty-one (21) days of the date the record request was received. This requirement does not supplant any Party or Regional Council's obligations under Colorado's open records laws.
2. If any Party(ies) believes the Abatement Council has violated the terms of this MOU, the alleging Party(ies) may seek to enforce the terms of this MOU, provided the alleging Party(ies) first provides notice to the Abatement Council of the alleged violation and a reasonable opportunity to cure the alleged violation. In such an enforcement action, the alleging Party(ies) may only seek to enforce the terms of the MOU against the State and the Participating Local Governments from which the Local Government Members of the Abatement Council were appointed and may only seek declaratory and/or injunctive relief. In defense of such an enforcement action, the State's Members of the Abatement Council shall be represented by the State and the Local Government Members shall be represented by the Participating Local Governments from which the Local Government Members were appointed. In the event of a conflict, the Abatement Council and its Members may seek outside representation to defend itself against such an enforcement action.
3. If any Party(ies) believes another Party(ies), not including the Abatement Council, violated the terms of this MOU, the alleging Party(ies) may seek to enforce the terms of this MOU in the court in which any applicable Settlement(s) was entered, provided the alleging Party(ies) first provide the alleged offending Party(ies)

notice of the alleged violation(s) and a reasonable opportunity to cure the alleged violation(s). In such an enforcement action, any alleging Party or alleged offending Party(ies) may be represented by their respective public entity in accordance with Colorado law.

4. Nothing in this MOU shall be interpreted to waive the right of any Party to seek judicial relief for conduct occurring outside the scope of this MOU that violates any Colorado law. In such an action, the alleged offending Party(ies), including the Abatement Council, may be represented by their respective public entities in accordance with Colorado law. In the event of a conflict, any Party, including the Abatement Council and its Members, may seek outside representation to defend itself against such an action.
5. If any Party(ies) believes another Party(ies), Region(s), or individual(s) involved in the receipt, distribution, or administration of Opioids Funds has violated any applicable ethics codes or rules, a complaint shall be lodged with the appropriate forum for handling such matters, such as a local home rule municipality's ethics board.
6. If any Party(ies) believes another Party(ies), Region(s), or individual(s) involved in the receipt, distribution, or administration of Opioid Funds violated any Colorado criminal law, such conduct shall be reported to the appropriate criminal authorities.
7. Venue for any legal action related to this MOU shall be in a court of competent jurisdiction where any applicable Settlement(s) is entered.
8. Because recovery under the terms of different Settlement(s) may vary depending on the number of Parties required to effectuate a Settlement, the Parties may conditionally agree to sign on to the MOU through a letter of intent, resolution or similar written statement, declaration or pronouncement declaring their intent to sign on to the MOU if the threshold for Party participation in a specific Settlement is achieved.⁴
9. This MOU may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. The Parties approve the use of electronic signatures for execution of this MOU. All use of electronic signatures shall be governed by the Uniform Electronic Transactions Act, C.R.S. §§ 24-71.3-101, *et seq.* The Parties agree not to deny the legal effect or enforceability of the MOU solely because it is in electronic form or

⁴ For instance, the July 21, 2021 "Distributor Settlement Agreement" includes a "Subdivision Settlement Agreement Form" that, once filled out and executed, is meant to indicate that Local Government's (or Subdivision's) election to participate in that Distributor Settlement and also, to require that Local Government to take steps to formally release any claim it may have against the Settling Distributors. With regard to the Distributor Settlement Agreement or any other Settlements that include a form similar to the Subdivision Settlement Agreement Form, the Parties may still conditionally agree to sign on to the MOU if, for instance, the threshold for Party participation in a specific Settlement is achieved.

because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the MOU in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

10. Each party represents that all procedures necessary to authorize such Party's execution of this MOU have been performed and that the person signing for such Party has been authorized to execute the MOU.

I. Payment of Counsel and Litigation Expenses Through a Back-Stop Fund

1. Some Settlements, including the McKesson Corporation, Cardinal Health, Inc., and AmerisourceBergen Corporation ("Distributor") and Johnson & Johnson/Janssen ("J&J") settlements, may provide for the payment of all or a portion of the fees and litigation expenses owed by Participating Local Governments to counsel specifically retained to file suit in the opioid litigation. If any Settlement is insufficient to cover the fee obligations of the Participating Local Governments (as discussed and modified by Judge Polster's Order of August 6 regarding fees for the Distributor and J&J settlements), the deficiencies will be covered as set forth in further detail below.
2. The Parties also recognize that, as in the Distributor and J&J settlements, certain Opioid Settling Defendants may offer premiums benefiting the entire state of Colorado when Participating Local Governments agree to the Settlement(s), thereby settling their claims in their on-going lawsuits. For example, below is the chart illustrating how Incentive Payment B (a 25% premium to the entire state) works in the Distributor Settlement at Section IV.F.2.b (p. 20):

Percentage of Litigating Subdivision Population that is Incentive B Eligible Subdivision Population⁵	Incentive Payment B Eligibility Percentage
Up to 85%	0%
85%+	30%
86+	40%
91+	50%
95+	60%
99%+	95%
100%	100%

3. If the court in *In Re: National Prescription Opiate Litigation*, MDL No. 2804 (N.D. Ohio), or if a Settlement establishes a common benefit fund or similar device to compensate attorneys for services rendered and expenses incurred that have benefited plaintiffs generally in the litigation (the "Common Benefit Fund"),

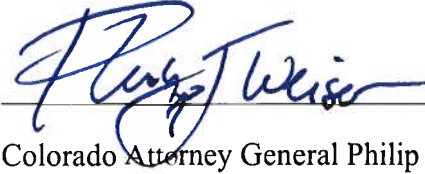
and/or requires certain governmental plaintiffs to pay a share of their recoveries from defendants into the Common Benefit Fund (“Court-Ordered Common Benefit Fund Assessment”), then the Participating Local Governments shall be required to first seek to have their attorneys’ fees and expenses paid through the Common Benefit Fund.

4. For the Distributor and J&J settlements only, counsel for Participating Local Governments shall have their expenses otherwise recoverable from Colorado Participating Local Governments compensated only through the Common Benefit Fund(s) established in those settlement(s). For the avoidance of doubt, counsel for Participating Local Governments may recover their attorneys’ fees through the Distributor and J&J settlements and through the other applicable provisions of this Section (I).
5. In addition, as a means of covering any deficiencies in paying counsel for Participating Local Governments, a supplemental Colorado Attorney Fee Back-Stop Fund shall be established. The Colorado Attorney Fee Back-Stop Fund is to be used to compensate counsel for Participating Local Governments that filed an initial complaint in the opioid litigation by September 1, 2020 (“Litigating Participating Local Governments”).
6. Payments out of the Colorado Attorney Fee Back-Stop Fund shall be determined by a committee (the “Opioid Fee and Expense Committee”). The Opioid Fee and Expense Committee shall consist of the following five (5) members:
 - a. One (1) member appointed by CCI from a litigating county or from a litigating county and city municipal corporation;
 - b. One (1) member appointed by CML from a litigating city;
 - c. One (1) member appointed jointly by CCI and CML from a non-litigating county or city;
 - d. One (1) member appointed by the Attorney General’s Office; and
 - e. One (1) neutral member jointly appointed by all of the other members listed above.
7. The Colorado Attorney Fee Back-Stop Fund shall be funded as follows from any Settlement, excluding settlements involving McKinsey and payments resulting from the Purdue or Mallinckrodt bankruptcy. For purposes only of calculating the funding of the Colorado Attorney Fee Back-Stop Fund, the Parties deem 58% of the total LG Share and Regional Share to be attributable to the Litigating Local Governments. The Colorado Attorney Fee Back-Stop Fund shall be funded by 8.7% of the total LG Share and 4.35% of the total Regional Share at the time such funds are actually received. No funds deposited into the Colorado Attorney Fee Back-Stop Fund will be taken from the Statewide Infrastructure Share or State Share.

8. Counsel for Litigating Participating Local Governments may apply to the Colorado Attorney Fee Back-Stop Fund only after applying to the Common Benefit Fund.
9. Counsel for Litigating Participating Local Governments may apply to the Colorado Attorney Fee Back-Stop Fund for only a shortfall – that is, the difference between what their fee agreements would entitle them to (as limited by this Section (I)) minus what they have already collected from the Common Benefit Fund (including both the “common benefit” and “contingency fee” calculations, if any). If they receive fees/costs for common benefit work in the national fee fund, these fees/costs will be allocated proportionately across all their local government opioid clients based on the allocation model used in the Negotiation Class website to allocate the appropriate portion to Colorado clients.
10. Counsel for Litigating Participating Local Governments are limited to being paid, at most, and assuming adequate funds are available in any Common Benefit Fund and Colorado Attorney Fee Back-Stop Fund, fees in an amount equal to 15% of the LG Share and 7.5% of the Regional Share attributable to their Colorado clients.
11. Any funds remaining in the Colorado Attorney Fee Back-Stop Fund in excess of the amounts needed to cover the fees and litigation expenses owed by Litigating Participating Local Governments to their respective counsel shall revert to the Participating Local Governments according to the allocations described in Sections (E) and (F). Every two years, the Opioid Fee and Expense Committee shall assess the amount remaining in the Colorado Attorney Fee Back-Stop Fund to determine if it is overfunded.
12. Despite the fact that a litigating entity bonus benefits the entire state, no portion of the State Share shall be used to fund the Colorado Attorney Fee Back-Stop Fund or in any other way to fund any Participating Local Government’s attorneys’ fees and expenses. Because the state did not hire outside counsel, any funds for attorneys fees that the state receives from the J&J and Distributor settlement will be deposited into the State Share.
13. To participate in the Colorado Attorney Fee Back-Stop Fund, counsel must follow the requirements of C.R.S. § 13-17-304.

This **Colorado Opioids Settlement Memorandum of Understanding** is signed

this 26 day of August, 2021 by:


Colorado Attorney General Philip J. Weiser

This **Colorado Opioids Settlement Memorandum of Understanding** is signed

this ____ day of _____, ____ by:

Name & Title_____

On behalf of _____

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

Exhibit A

POTENTIAL OPIOID ABATEMENT APPROVED PURPOSES

I. TREATMENT

A. TREATMENT OF OPIOID USE DISORDER AND ITS EFFECTS

1. Expand availability of treatment, including Medication-Assisted Treatment (MAT), for Opioid Use Disorder (OUD) and any co-occurring substance use or mental health issues.
2. Supportive housing, all forms of FDA-approved MAT, counseling, peer-support, recovery case management and residential treatment with access to medications for those who need it.
3. Treatment of mental health trauma issues that resulted from the traumatic experiences of the opioid user (e.g., violence, sexual assault, human trafficking) and for family members (e.g., surviving family members after an overdose or overdose fatality).
4. Expand telehealth to increase access to OUD treatment, including MAT, as well as counseling, psychiatric support, and other treatment and recovery support services.
5. Fellowships for addiction medicine specialists for direct patient care, instructors, and clinical research for treatments.
6. Scholarships for certified addiction counselors.
7. Clinicians to obtain training and a waiver under the federal Drug Addiction Treatment Act to prescribe MAT for OUD.
8. Training for health care providers, students, and other supporting professionals, such as peer recovery coaches/recovery outreach specialists, including but not limited to training relating to MAT and harm reduction.
9. Dissemination of accredited web-based training curricula, such as the American Academy of Addiction Psychiatry's Provider Clinical Support Service-Opioids web-based training curriculum and motivational interviewing.
10. Development and dissemination of new accredited curricula, such as the American Academy of Addiction Psychiatry's Provider Clinical Support Service Medication-Assisted Treatment.
11. Development of a multistate/nationally accessible database whereby health care providers can list currently available in-patient and out-patient OUD treatment services that are accessible on a real-time basis.

12. Support and reimburse services that include the full American Society of Addiction Medicine (ASAM) continuum of care for OUD.
13. Improve oversight of Opioid Treatment Programs (OTPs) to assure evidence-informed practices such as adequate methadone dosing.

B. INTERVENTION

1. Ensure that health care providers are screening for OUD and other risk factors and know how to appropriately counsel and treat (or refer, if necessary) a patient for OUD treatment.
2. Fund Screening, Brief Intervention and Referral to Treatment (SBIRT) programs to reduce the transition from use to disorder.
3. Training and long-term implementation of SBIRT in key systems (health, schools, colleges, criminal justice, and probation), with a focus on the late adolescence and young adulthood when transition from misuse to opioid disorder is most common.
4. Purchase automated versions of SBIRT and support ongoing costs of the technology.
5. Training for emergency room personnel treating opioid overdose patients on post-discharge planning, including community referrals for MAT, recovery case management and/or support services.
6. Support work of Emergency Medical Systems, including peer support specialists, to connect individuals to treatment or other appropriate services following an opioid overdose or other opioid-related adverse event.
7. Create school-based contacts whom parents can engage to seek immediate treatment services for their child.
8. Develop best practices on addressing OUD in the workplace.
9. Support assistance programs for health care providers with OUD.
10. Engage non-profits and faith community as a system to support outreach for treatment.

C. CRIMINAL-JUSTICE-INVOLVED PERSONS

1. Address the needs of persons involved in the criminal justice system who have OUD and any co-occurring substance use disorders or mental health (SUD/MH) issues.

2. Support pre-arrest diversion and deflection strategies for persons with OUD and any co-occurring SUD/MH issues, including established strategies such as:
 - a. Self-referral strategies such as Angel Programs or the Police Assisted Addiction Recovery Initiative (PAARI);
 - b. Active outreach strategies such as the Drug Abuse Response Team (DART) model;
 - c. “Naloxone Plus” strategies, which work to ensure that individuals who have received Naloxone to reverse the effects of an overdose are then linked to treatment programs;
 - d. Officer prevention strategies, such as the Law Enforcement Assisted Diversion (LEAD) model; or
 - e. Officer intervention strategies such as the Leon County, Florida Adult Civil Citation Network.
3. Support pre-trial services that connect individuals with OUD and any co-occurring SUD/MH issues to evidence-informed treatment, including MAT, and related services.
4. Support treatment and recovery courts for persons with OUD and any co-occurring SUD/MH issues, but only if they provide referrals to evidence-informed treatment, including MAT.
5. Provide evidence-informed treatment, including MAT, recovery support, harm reduction, or other appropriate services to individuals with OUD and any co-occurring SUD/MH issues who are incarcerated, on probation, or on parole.
6. Provide evidence-informed treatment, including MAT, recovery support, harm reduction, or other appropriate re-entry services to individuals with OUD and any co-occurring SUD/MH issues who are leaving jail or prison or who have recently left jail or prison.
7. Support critical time interventions (CTI), particularly for individuals living with dual-diagnosis OUD/serious mental illness, and services for individuals who face immediate risks and service needs and risks upon release from correctional settings.

D. WOMEN WHO ARE OR MAY BECOME PREGNANT

1. Evidence-informed treatment, including MAT, recovery, and prevention services for pregnant women or women who could become pregnant and have OUD.
2. Training for obstetricians and other healthcare personnel that work with pregnant women and their families regarding OUD treatment.

3. Other measures to address Neonatal Abstinence Syndrome, including prevention, care for addiction and education programs.
4. Child and family supports for parenting women with OUD.
5. Enhanced family supports and child care services for parents receiving treatment for OUD.

E. PEOPLE IN TREATMENT AND RECOVERY

1. The full continuum of care of recovery services for OUD and any co-occurring substance use or mental health issues, including supportive housing, residential treatment, medical detox services, peer support services and counseling, community navigators, case management, and connections to community-based services.
2. Identifying successful recovery programs such as physician, pilot, and college recovery programs, and providing support and technical assistance to increase the number and capacity of high-quality programs to help those in recovery.
3. Training and development of procedures for government staff to appropriately interact and provide social and other services to current and recovering opioid users, including reducing stigma.
4. Community-wide stigma reduction regarding treatment and support for persons with OUD, including reducing the stigma on effective treatment.
5. Engaging non-profits and faith community as a system to support family members in their efforts to help the opioid user in the family.

II. PREVENTION

F. PRESCRIBING PRACTICES

1. Training for health care providers regarding safe and responsible opioid prescribing, dosing, and tapering patients off opioids.
2. Academic counter-detailing.
3. Continuing Medical Education (CME) on prescribing of opioids.
4. Support for non-opioid pain treatment alternatives, including training providers to offer or refer to multi-modal, evidence-informed treatment of pain.
5. Fund development of a multistate/national prescription drug monitoring program (PDMP) that permits information sharing while providing appropriate safeguards on sharing of private information, including but not limited to:

- a. Integration of PDMP data with electronic health records, overdose episodes, and decision support tools for health care providers relating to OUD.
 - b. Ensuring PDMPs incorporate available overdose/naloxone deployment data, including the United States Department of Transportation's Emergency Medical Technician overdose database.
6. Educating dispensers on appropriate opioid dispensing.

G. MISUSE OF OPIOIDS

1. Corrective advertising/affirmative public education campaigns.
2. Public education relating to drug disposal.
3. Drug take-back disposal or destruction programs.
4. Fund community anti-drug coalitions that engage in drug-abuse prevention efforts.
5. School-based programs that have demonstrated effectiveness in preventing drug misuse and seem likely to be effective in preventing the uptake and use of opioids.
6. Support community coalitions in implementing evidence-informed prevention, such as reduced social access and physical access, stigma reduction – including staffing, educational campaigns, or training of coalitions in evidence-informed implementation.
7. School and community education programs and campaigns for students, families, school employees, school athletic programs, parent-teacher and student associations, and others.
8. Engaging non-profits and faith community as a system to support prevention.

H. OVERDOSE DEATHS AND OTHER HARMS

1. Increasing availability and distribution of naloxone and other drugs that treat overdoses to first responders, overdose patients, opioid users, families and friends of opioid users, schools, community navigators and outreach workers, drug offenders upon release from jail/prison, and other members of the general public.
2. Training and education regarding naloxone and other drugs that treat overdoses for first responders, overdose patients, patients taking opioids, families, schools, and other members of the general public.

3. Developing data tracking software and applications for overdoses/naloxone revivals.
4. Public education relating to emergency responses to overdoses.
5. Free naloxone for anyone in the community.
6. Public education relating to immunity and Good Samaritan laws.
7. Educating first responders regarding the existence and operation of immunity and Good Samaritan laws.
8. Syringe service programs, including supplies, staffing, space, peer support services, and the full range of harm reduction and treatment services provided by these programs.
9. Expand access to testing and treatment for infectious diseases such as HIV and Hepatitis C resulting from intravenous opioid use.

III. ADDITIONAL AREAS

I. SERVICES FOR CHILDREN

1. Support for children's services: Fund additional positions and services, including supportive housing and other residential services, relating to children being removed from the home and/or placed in foster care due to custodial opioid use.

J. FIRST RESPONDERS

1. Law enforcement expenditures relating to the opioid epidemic.
2. Educating first responders regarding appropriate practices and precautions when dealing with fentanyl or other drugs.
3. Increase electronic prescribing to prevent diversion and forgery.

K. COMMUNITY LEADERSHIP

1. Regional planning to identify goals for opioid reduction and support efforts or to identify areas and populations with the greatest needs for treatment intervention services.
2. Government dashboard to track key opioid-related indicators and supports as identified through collaborative community processes.

L. STAFFING AND TRAINING

1. Funding for programs and services regarding staff training and networking to improve staff capability to abate the opioid crisis.
2. Support infrastructure and staffing for collaborative cross-systems coordination to prevent opioid misuse, prevent overdoses, and treat those with OUD (e.g., health care, primary care, pharmacies, PDMPs, etc.).

M. RESEARCH

1. Funding opioid abatement research.
2. Research improved service delivery for modalities such as SBIRT that demonstrate promising but mixed results in populations vulnerable to OUD.
3. Support research for novel harm reduction and prevention efforts such as the provision of fentanyl test strips.
4. Support for innovative supply-side enforcement efforts such as improved detection of mail-based delivery of synthetic opioids.
5. Expanded research for swift/certain/fair models to reduce and deter opioid misuse within criminal justice populations that build upon promising approaches used to address other substances (e.g. Hawaii HOPE and Dakota 24/7).
6. Research expanded modalities such as prescription methadone that can expand access to MAT.

N. OTHER

1. Administrative costs for any of the approved purposes on this list.

Exhibit B

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Adams County	Adams	County	
Arvada	Adams	City	2 counties
Aurora	Adams	City	3 counties
Bennett	Adams	City	2 counties
Brighton	Adams	City	2 counties
Commerce City	Adams	City	
Federal Heights	Adams	City	
Lochbuie	Adams	City	2 counties
Northglenn	Adams	City	2 counties
Thornton	Adams	City	2 counties
Westminster	Adams	City	2 counties
Alamosa County	Alamosa	County	
Alamosa	Alamosa	City	
Hooper	Alamosa	City	
Arapahoe County	Arapahoe	County	
Aurora	Arapahoe	City	3 counties
Bennett	Arapahoe	City	2 counties
Bow Mar	Arapahoe	City	2 counties
Centennial	Arapahoe	City	
Cherry Hills Village	Arapahoe	City	
Columbine Valley	Arapahoe	City	
Deer Trail	Arapahoe	City	
Englewood	Arapahoe	City	
Foxfield	Arapahoe	City	
Glendale	Arapahoe	City	
Greenwood Village	Arapahoe	City	
Littleton	Arapahoe	City	3 counties
Sheridan	Arapahoe	City	
Archuleta County	Archuleta	County	
Pagosa Springs	Archuleta	City	
Baca County	Baca	County	
Campo	Baca	City	
Pritchett	Baca	City	
Springfield	Baca	City	
Two Buttes	Baca	City	
Vilas	Baca	City	
Walsh	Baca	City	
Bent County	Bent	County	
Las Animas	Bent	City	
Boulder County	Boulder	County	
Boulder	Boulder	City	
Erie	Boulder	City	2 counties
Jamestown	Boulder	City	
Lafayette	Boulder	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Longmont	Boulder	City	2 counties
Louisville	Boulder	City	
Lyons	Boulder	City	
Nederland	Boulder	City	
Superior	Boulder	City	2 counties
Ward	Boulder	City	
Broomfield	Broomfield	City/County	
Chaffee County	Chaffee	County	
Buena Vista	Chaffee	City	
Poncha Springs	Chaffee	City	
Salida	Chaffee	City	
Cheyenne County	Cheyenne	County	
Cheyenne Wells	Cheyenne	City	
Kit Carson	Cheyenne	City	
Clear Creek County	Clear Creek	County	
Central City	Clear Creek	City	2 counties
Empire	Clear Creek	City	
Georgetown	Clear Creek	City	
Idaho Springs	Clear Creek	City	
Silver Plume	Clear Creek	City	
Conejos County	Conejos	County	
Antonito	Conejos	City	
La Jara	Conejos	City	
Manassa	Conejos	City	
Romeo	Conejos	City	
Sanford	Conejos	City	
Costilla County	Costilla	County	
Blanca	Costilla	City	
San Luis	Costilla	City	
Crowley County	Crowley	County	
Crowley	Crowley	City	
Olney Springs	Crowley	City	
Ordway	Crowley	City	
Sugar City	Crowley	City	
Custer County	Custer	County	
Silver Cliff	Custer	City	
Westcliffe	Custer	City	
Delta County	Delta	County	
Cedaredge	Delta	City	
Crawford	Delta	City	
Delta	Delta	City	
Hotchkiss	Delta	City	
Orchard City	Delta	City	
Paonia	Delta	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Denver	Denver	City/County	
Dolores County	Dolores	County	
Dove Creek	Dolores	City	
Rico	Dolores	City	
Douglas County	Douglas	County	
Aurora	Douglas	City	3 counties
Castle Pines	Douglas	City	
Castle Rock	Douglas	City	
Larkspur	Douglas	City	
Littleton	Douglas	City	3 counties
Lone Tree	Douglas	City	
Parker	Douglas	City	
Eagle County	Eagle	County	
Avon	Eagle	City	
Basalt	Eagle	City	2 counties
Eagle	Eagle	City	
Gypsum	Eagle	City	
Minturn	Eagle	City	
Red Cliff	Eagle	City	
Vail	Eagle	City	
El Paso County	El Paso	County	
Calhan	El Paso	City	
Colorado Springs	El Paso	City	
Fountain	El Paso	City	
Green Mountain Falls	El Paso	City	2 counties
Manitou Springs	El Paso	City	
Monument	El Paso	City	
Palmer Lake	El Paso	City	
Ramah	El Paso	City	
Elbert County	Elbert	County	
Elizabeth	Elbert	City	
Kiowa	Elbert	City	
Simla	Elbert	City	
Fremont County	Fremont	County	
Brookside	Fremont	City	
Cañon City	Fremont	City	
Coal Creek	Fremont	City	
Florence	Fremont	City	
Rockvale	Fremont	City	
Williamsburg	Fremont	City	
Garfield County	Garfield	County	
Carbondale	Garfield	City	
Glenwood Springs	Garfield	City	
New Castle	Garfield	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Parachute	Garfield	City	
Rifle	Garfield	City	
Silt	Garfield	City	
Gilpin County	Gilpin	County	
Black Hawk	Gilpin	City	
Central City	Gilpin	City	2 counties
Grand County	Grand	County	
Fraser	Grand	City	
Granby	Grand	City	
Grand Lake	Grand	City	
Hot Sulphur Springs	Grand	City	
Kremmling	Grand	City	
Winter Park	Grand	City	
Gunnison County	Gunnison	County	
Crested Butte	Gunnison	City	
Gunnison	Gunnison	City	
Marble	Gunnison	City	
Mount Crested Butte	Gunnison	City	
Pitkin	Gunnison	City	
Hinsdale County	Hinsdale	County	
Lake City	Hinsdale	City	
Huerfano County	Huerfano	County	
La Veta	Huerfano	City	
Walsenburg	Huerfano	City	
Jackson County	Jackson	County	
Walden	Jackson	City	
Jefferson County	Jefferson	County	
Arvada	Jefferson	City	2 counties
Bow Mar	Jefferson	City	2 counties
Edgewater	Jefferson	City	
Golden	Jefferson	City	
Lakeside	Jefferson	City	
Lakewood	Jefferson	City	
Littleton	Jefferson	City	3 counties
Morrison	Jefferson	City	
Mountain View	Jefferson	City	
Superior	Jefferson	City	2 counties
Westminster	Jefferson	City	2 counties
Wheat Ridge	Jefferson	City	
Kiowa County	Kiowa	County	
Eads	Kiowa	City	
Haswell	Kiowa	City	
Sheridan Lake	Kiowa	City	
Kit Carson County	Kit Carson	County	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Bethune	Kit Carson	City	
Burlington	Kit Carson	City	
Flagler	Kit Carson	City	
Seibert	Kit Carson	City	
Stratton	Kit Carson	City	
Vona	Kit Carson	City	
La Plata County	La Plata	County	
Bayfield	La Plata	City	
Durango	La Plata	City	
Ignacio	La Plata	City	
Lake County	Lake	County	
Leadville	Lake	City	
Larimer County	Larimer	County	
Berthoud	Larimer	City	2 counties
Estes Park	Larimer	City	
Fort Collins	Larimer	City	
Johnstown	Larimer	City	2 counties
Loveland	Larimer	City	
Timnath	Larimer	City	2 counties
Wellington	Larimer	City	
Windsor	Larimer	City	2 counties
Las Animas County	Las Animas	County	
Aguilar	Las Animas	City	
Branson	Las Animas	City	
Cokedale	Las Animas	City	
Kim	Las Animas	City	
Starkville	Las Animas	City	
Trinidad	Las Animas	City	
Lincoln County	Lincoln	County	
Arriba	Lincoln	City	
Genoa	Lincoln	City	
Hugo	Lincoln	City	
Limon	Lincoln	City	
Logan County	Logan	County	
Crook	Logan	City	
Fleming	Logan	City	
Iliff	Logan	City	
Merino	Logan	City	
Peetz	Logan	City	
Sterling	Logan	City	
Mesa County	Mesa	County	
Collbran	Mesa	City	
De Beque	Mesa	City	
Fruita	Mesa	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Grand Junction	Mesa	City	
Palisade	Mesa	City	
Mineral County	Mineral	County	
City of Creede	Mineral	City	
Moffat County	Moffat	County	
Craig	Moffat	City	
Dinosaur	Moffat	City	
Montezuma County	Montezuma	County	
Cortez	Montezuma	City	
Dolores	Montezuma	City	
Mancos	Montezuma	City	
Montrose County	Montrose	County	
Montrose	Montrose	City	
Naturita	Montrose	City	
Nucla	Montrose	City	
Olathe	Montrose	City	
Morgan County	Morgan	County	
Brush	Morgan	City	
Fort Morgan	Morgan	City	
Hillrose	Morgan	City	
Log Lane Village	Morgan	City	
Wiggins	Morgan	City	
Otero County	Otero	County	
Cheraw	Otero	City	
Fowler	Otero	City	
La Junta	Otero	City	
Manzanola	Otero	City	
Rocky Ford	Otero	City	
Swink	Otero	City	
Ouray County	Ouray	County	
Ouray	Ouray	City	
Ridgway	Ouray	City	
Park County	Park	County	
Alma	Park	City	
Fairplay	Park	City	
Phillips County	Phillips	County	
Haxtun	Phillips	City	
Holyoke	Phillips	City	
Paoli	Phillips	City	
Pitkin County	Pitkin	County	
Aspen	Pitkin	City	
Basalt	Pitkin	City	2 counties
Snowmass Village	Pitkin	City	
Prowers County	Prowers	County	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Granada	Prowers	City	
Hartman	Prowers	City	
Holly	Prowers	City	
Lamar	Prowers	City	
Wiley	Prowers	City	
Pueblo County	Pueblo	County	
Boone	Pueblo	City	
Pueblo	Pueblo	City	
Rye	Pueblo	City	
Rio Blanco County	Rio Blanco	County	
Meeker	Rio Blanco	City	
Rangely	Rio Blanco	City	
Rio Grande County	Rio Grande	County	
Center	Rio Grande	City	2 counties
Del Norte	Rio Grande	City	
Monte Vista	Rio Grande	City	
South Fork	Rio Grande	City	
Routt County	Routt	County	
Hayden	Routt	City	
Oak Creek	Routt	City	
Steamboat Springs	Routt	City	
Yampa	Routt	City	
Saguache County	Saguache	County	
Bonanza	Saguache	City	
Center	Saguache	City	2 counties
Crestone	Saguache	City	
Moffat	Saguache	City	
Saguache	Saguache	City	
San Juan County	San Juan	County	
Silverton	San Juan	City	
San Miguel County	San Miguel	County	
Mountain Village	San Miguel	City	
Norwood	San Miguel	City	
Ophir	San Miguel	City	
Sawpit	San Miguel	City	
Telluride	San Miguel	City	
Sedgwick County	Sedgwick	County	
Julesburg	Sedgwick	City	
Ovid	Sedgwick	City	
Sedgwick	Sedgwick	City	
Summit County	Summit	County	
Blue River	Summit	City	
Breckenridge	Summit	City	
Dillon	Summit	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Frisco	Summit	City	
Montezuma	Summit	City	
Silverthorne	Summit	City	
Teller County	Teller	County	
Cripple Creek	Teller	City	
Green Mountain Falls	Teller	City	2 counties
Victor	Teller	City	
Woodland Park	Teller	City	
Washington County	Washington	County	
Akron	Washington	City	
Otis	Washington	City	
Weld County	Weld	County	
Ault	Weld	City	
Berthoud	Weld	City	2 counties
Brighton	Weld	City	2 counties
Dacono	Weld	City	
Eaton	Weld	City	
Erie	Weld	City	2 counties
Evans	Weld	City	
Firestone	Weld	City	
Fort Lupton	Weld	City	
Frederick	Weld	City	
Garden City	Weld	City	
Gilcrest	Weld	City	
Greeley	Weld	City	
Grover	Weld	City	
Hudson	Weld	City	
Johnstown	Weld	City	2 counties
Keenesburg	Weld	City	
Kersey	Weld	City	
La Salle	Weld	City	
Lochbuie	Weld	City	2 counties
Longmont	Weld	City	2 counties
Mead	Weld	City	
Milliken	Weld	City	
Northglenn	Weld	City	2 counties
Nunn	Weld	City	
Pierce	Weld	City	
Platteville	Weld	City	
Raymer (New Raymer)	Weld	City	
Severance	Weld	City	
Thornton	Weld	City	2 counties
Timnath	Weld	City	2 counties
Windsor	Weld	City	2 counties

Colorado Local Governments*

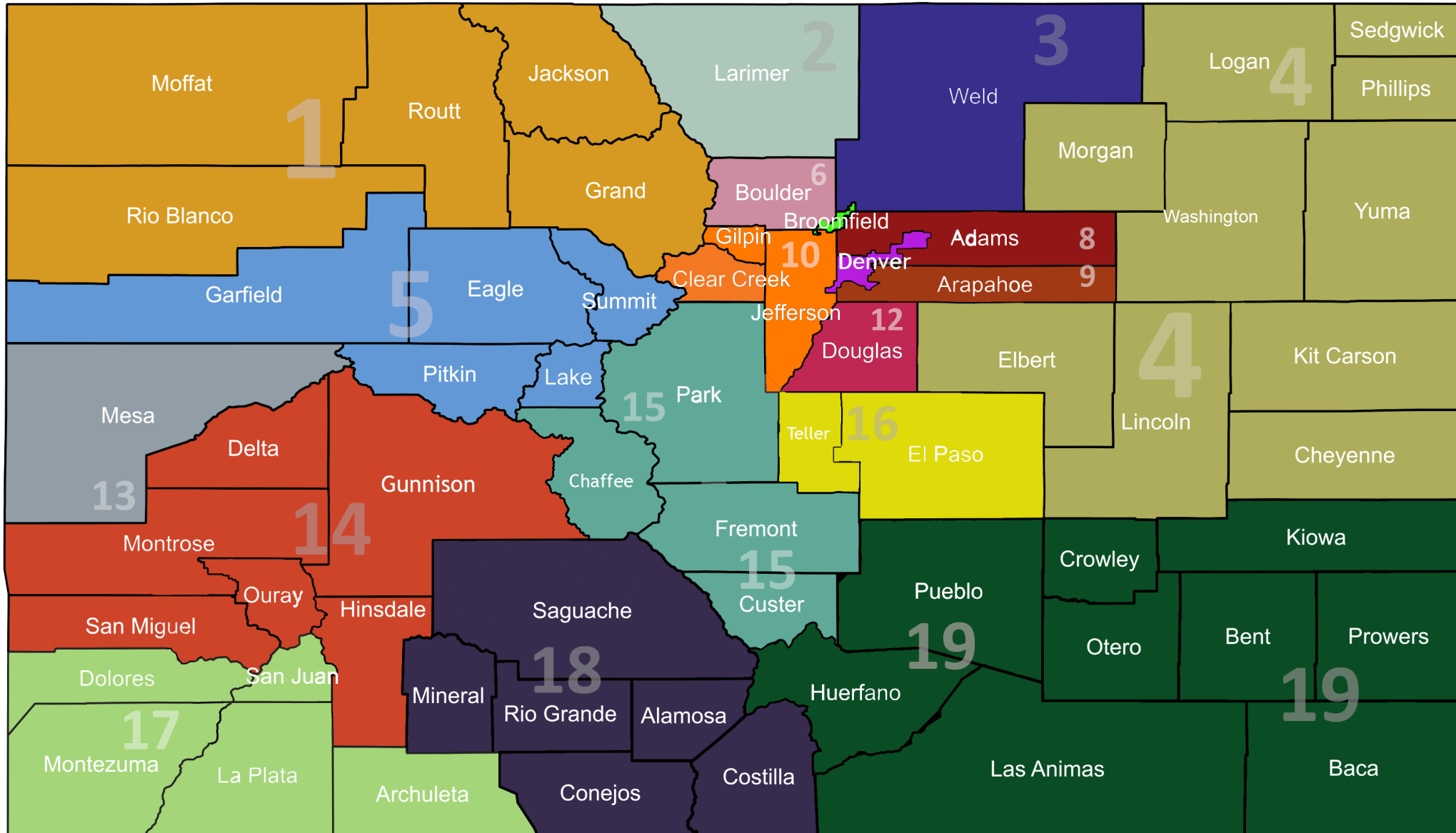
Government Name	County	Gov't Type	Multi-County
Yuma County	Yuma	County	
Eckley	Yuma	City	
Wray	Yuma	City	
Yuma	Yuma	City	

*This list includes all 64 Colorado counties and all 271 municipalities listed in the 2019 Census. Cities located in multiple counties are listed under each corresponding county subheading. City and County of Denver and City and County of Broomfield are counted in both the city and county totals. The City of Carbonate is not included in this list, as there was no population in the 2019 Census data.

This list will be reconciled as necessary to be consistent with the terms of Settlement(s) with Opioid Settling Defendant(s)

Exhibit C

Regions for the distribution of opioid settlement funds



Region 1	Region 5	Region 9	Region 13	Region 17
Region 2	Region 6	Region 10	Region 14	Region 18
Region 3	Region 7 (Broomfield)	Region 11 (Denver)	Region 15	Region 19
Region 4	Region 8	Region 12	Region 16	

Exhibit D

Exhibit D - Allocations to Colorado County Areas

County	Percentage of LG Share
Adams	9.4247%
Alamosa	0.5081%
Arapahoe	10.8071%
Archuleta	0.1370%
Baca	0.0592%
Bent	0.1133%
Boulder	5.7936%
Broomfield	1.0014%
Chaffee	0.3604%
Cheyenne	0.0159%
Clear Creek	0.1380%
Conejos	0.2108%
Costilla	0.0552%
Crowley	0.0934%
Custer	0.0412%
Delta	0.5440%
Denver	15.0042%
Dolores	0.0352%
Douglas	3.6696%
Eagle	0.6187%
El Paso	11.9897%
Elbert	0.2804%
Fremont	0.9937%
Garfield	0.8376%
Gilpin	0.0561%
Grand	0.2037%
Gunnison	0.1913%
Hinsdale	0.0112%
Huerfano	0.2505%
Jackson	0.0310%
Jefferson	10.5173%
Kiowa	0.0142%
Kit Carson	0.0940%
La Plata	0.8127%
Lake	0.0990%
Larimer	6.5211%
Las Animas	0.6304%
Lincoln	0.0819%
Logan	0.3815%
Mesa	2.8911%
Mineral	0.0039%
Moffat	0.2326%
Montezuma	0.4429%

Montrose	0.5695%
Morgan	0.4677%
Otero	0.4486%
Ouray	0.0535%
Park	0.1674%
Phillips	0.0714%
Pitkin	0.1747%
Prowers	0.1727%
Pueblo	5.6757%
Rio Blanco	0.1013%
Rio Grande	0.2526%
Routt	0.3837%
Saguache	0.0666%
San Juan	0.0097%
San Miguel	0.1005%
Sedgwick	0.0618%
Summit	0.3761%
Teller	0.6219%
Washington	0.0357%
Weld	3.8908%
Yuma	0.0992%
TOTAL	100.0000%

Exhibit E

Exhibit E - Intracounty Allocations^{1,2}

The below chart depicts the default percentage that each Local Government will receive from the LG Share amount attributed to its County Area, as described in Section (E)(3) of the MOU. The chart assumes full participation by all Local Governments

Government Name	Intracounty Share
Adams County	68.3372%
Arvada (2 Counties)	0.2632%
Aurora (3 Counties)	4.6336%
Bennett (2 Counties)	0.1670%
Brighton (2 Counties)	1.4527%
Commerce City	4.7314%
Federal Heights	1.1457%
Lochbuie (2 Counties)	0.0001%
Northglenn (2 Counties)	2.0913%
Thornton (2 Counties)	10.6435%
Westminster (2 Counties)	6.5342%

Alamosa County	85.3075%
Alamosa	14.6818%
Hooper	0.0108%

Arapahoe County	42.7003%
Aurora (3 Counties)	35.5997%
Bennett (2 Counties)	0.0324%
Bow Mar (2 Counties)	0.0159%
Centennial	0.4411%
Cherry Hills Village	0.6685%
Columbine Valley	0.1601%
Deer Trail	0.0003%
Englewood	5.5850%
Foxfield	0.0372%
Glendale	1.2289%
Greenwood Village	2.8305%
Littleton (3 Counties)	8.5654%
Sheridan	2.1347%

Archuleta County	90.0864%
Pagosa Springs	9.9136%

Baca County	85.9800%
Campo	2.4443%
Pritchett	1.5680%
Springfield	7.0100%

Government Name	Intracounty Share
Two Buttes	0.4766%
Vilas	0.9070%
Walsh	1.6141%

Bent County	80.9608%
Las Animas	19.0392%

Boulder County	47.6311%
Boulder	31.7629%
Erie (2 Counties)	0.3634%
Jamestown	0.0086%
Lafayette	3.3203%
Longmont (2 Counties)	14.6833%
Louisville	1.4455%
Lyons	0.5916%
Nederland	0.1646%
Superior (2 Counties)	0.0258%
Ward	0.0030%

Broomfield County/City	100.0000%
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Chaffee County	74.8440%
Buena Vista	5.8841%
Poncha Springs	4.2369%
Salida	15.0350%

Cheyenne County	66.8002%
Cheyenne Wells	0.8586%
Kit Carson	32.3412%

Clear Creek County	92.2164%
Central City (2 Counties)	0.0000%
Empire	0.3364%
Georgetown	1.9063%
Idaho Springs	4.7625%
Silver Plume	0.7784%

Conejos County	77.1204%
Antonito	4.6338%
La Jara	2.4313%
Manassa	1.0062%
Romeo	2.4270%
Sanford	12.3812%

Government Name	Intracounty Share
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Costilla County	97.3454%
Blanca	1.2036%
San Luis	1.4509%

Crowley County	80.7081%
Crowley	4.3597%
Olney Springs	8.3683%
Ordway	0.1853%
Sugar City	6.3786%

Custer County	96.6858%
Silver Cliff	0.7954%
Westcliffe	2.5188%

Delta County	76.3512%
Cedaredge	3.6221%
Crawford	0.4938%
Delta	16.2658%
Hotchkiss	1.0963%
Orchard City	0.1473%
Paonia	2.0236%

Denver County/City	100.0000%
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Dolores County	76.3307%
Dove Creek	17.3127%
Rico	6.3566%

Douglas County	71.8404%
Aurora (3 Counties)	0.2099%
Castle Pines	0.2007%
Castle Rock	13.5204%
Larkspur	0.0856%
Littleton (3 Counties)	0.0156%
Lone Tree	5.2786%
Parker	8.8487%

Eagle County	60.8236%
Avon	7.6631%
Basalt (2 Counties)	2.2311%
Eagle	3.1376%
Gypsum	1.7469%
Minturn	0.7771%

Government Name	Intracounty Share
Red Cliff	0.0957%
Vail	23.5250%

El Paso County	18.4181%
Calhan	0.0228%
Colorado Springs	80.1161%
Fountain	0.9892%
Green Mountain Falls (2 Counties)	0.0149%
Manitou Springs	0.2411%
Monument	0.1492%
Palmer Lake	0.0455%
Ramah	0.0033%

Elbert County	86.5840%
Elizabeth	10.2633%
Kiowa	1.5455%
Simla	1.6072%

Fremont County	60.7882%
Brookside	0.0348%
Cañon City	30.9017%
Coal Creek	0.0476%
Florence	8.0681%
Rockvale	0.0687%
Williamsburg	0.0907%

Garfield County	76.3371%
Carbondale	2.4698%
Glenwood Springs	11.8141%
New Castle	1.4295%
Parachute	1.0653%
Rifle	5.2733%
Silt	1.6110%

Gilpin County	46.8613%
Black Hawk	46.3909%
Central City (2 Counties)	6.7478%

Grand County	80.1046%
Fraser	2.4903%
Granby	5.4008%
Grand Lake	0.3174%
Hot Sulphur Springs	0.1431%
Kremmling	2.9284%

Government Name	Intracounty Share
Winter Park	8.6154%

Gunnison County	88.9185%
Crested Butte	2.3562%
Gunnison	5.9501%
Marble	0.1714%
Mount Crested Butte	2.5657%
Pitkin	0.0381%

Hinsdale County	76.0940%
Lake City	23.9060%

Huerfano County	68.2709%
La Veta	11.0719%
Walsenburg	20.6572%

Jackson County	61.5339%
Walden	38.4661%

Jefferson County	58.2140%
Arvada (2 Counties)	11.9733%
Bow Mar (2 Counties)	0.0087%
Edgewater	0.6604%
Golden	3.4815%
Lakeside	0.0030%
Lakewood	15.9399%
Littleton (3 Counties)	0.6176%
Morrison	0.2205%
Mountain View	0.1344%
Superior (2 Counties)	0.0000%
Westminster (2 Counties)	5.4779%
Wheat Ridge	3.2689%

Kiowa County	93.2138%
Eads	5.3777%
Haswell	0.6402%
Sheridan Lake	0.7682%

Kit Carson County	86.3178%
Bethune	0.1841%
Burlington	12.0640%
Flagler	0.4264%
Seibert	0.0291%
Stratton	0.9012%

Government Name	Intracounty Share
Vona	0.0775%

La Plata County	66.8874%
Bayfield	1.6292%
Durango	29.2985%
Ignacio	2.1849%

Lake County	73.4523%
Leadville	26.5477%

Larimer County	56.0589%
Berthoud (2 Counties)	0.4139%
Estes Park	0.3502%
Fort Collins	18.5702%
Johnstown (2 Counties)	0.0711%
Loveland	23.4493%
Timnath (2 Counties)	0.2964%
Wellington	0.3653%
Windsor (2 Counties)	0.4248%

Las Animas County	77.8076%
Aguilar	0.0751%
Branson	0.0101%
Cokedale	0.0188%
Kim	0.0101%
Starkville	0.0087%
Trinidad	22.0696%

Lincoln County	91.3222%
Arriba	0.3444%
Genoa	0.2222%
Hugo	1.4778%
Limon	6.6333%

Logan County	72.7982%
Crook	0.0931%
Fleming	0.3413%
Iliff	0.0095%
Merino	0.4702%
Peetz	0.2029%
Sterling	26.0848%

Mesa County	60.8549%
Collbran	0.0920%

Government Name	Intracounty Share
De Beque	0.0123%
Fruita	1.6696%
Grand Junction	37.1505%
Palisade	0.2208%

Mineral County	87.6744%
City of Creede	12.3256%

Moffat County	91.7981%
Craig	8.1862%
Dinosaur	0.0157%

Montezuma County	79.6682%
Cortez	18.6459%
Dolores	0.6106%
Mancos	1.0753%

Montrose County	92.8648%
Montrose	6.5980%
Naturita	0.1551%
Nucla	0.0703%
Olathe	0.3118%

Morgan County	61.6991%
Brush	8.5522%
Fort Morgan	27.8214%
Hillrose	0.1986%
Log Lane Village	0.6424%
Wiggins	1.0863%

Otero County	60.8168%
Cheraw	0.1888%
Fowler	1.0413%
La Junta	25.9225%
Manzanola	0.6983%
Rocky Ford	8.8215%
Swink	2.5109%

Ouray County	76.0810%
Ouray	17.6541%
Ridgway	6.2649%

Park County	96.3983%
Alma	0.7780%

Government Name	Intracounty Share
Fairplay	2.8237%

Phillips County	52.3463%
Haxtun	13.9505%
Holyoke	33.1803%
Paoli	0.5228%

Pitkin County	47.1379%
Aspen	42.0707%
Basalt (2 Counties)	1.1156%
Snowmass Village	9.6757%

Prowers County	70.4524%
Granada	0.9965%
Hartman	0.3164%
Holly	4.9826%
Lamar	21.5860%
Wiley	1.6661%

Pueblo County	54.6622%
Boone	0.0019%
Pueblo	45.3350%
Rye	0.0008%

Rio Blanco County	78.2831%
Meeker	9.1326%
Rangely	12.5843%

Rio Grande County	68.0724%
Center (2 Counties)	0.7713%
Del Norte	6.7762%
Monte Vista	20.4513%
South Fork	3.9288%

Routt County	58.5353%
Hayden	1.0679%
Oak Creek	0.6360%
Steamboat Springs	39.4499%
Yampa	0.3109%

Saguache County	92.8796%
Bonanza	0.1367%
Center (2 Counties)	6.3687%
Crestone	0.0137%

Government Name	Intracounty Share
Moffat	0.3553%
Saguache	0.2460%

San Juan County	87.0423%
Silverton	12.9577%

San Miguel County	48.7493%
Mountain Village	25.7930%
Norwood	0.4078%
Ophir	0.0816%
Sawpit	0.0272%
Telluride	24.9411%

Sedgwick County	98.7331%
Julesburg	0.3830%
Ovid	0.0295%
Sedgwick	0.8544%

Summit County	57.0567%
Blue River	0.5011%
Breckenridge	26.1112%
Dillon	4.1421%
Frisco	6.5096%
Montezuma	0.0169%
Silverthorne	5.6623%

Teller County	66.1557%
Cripple Creek	17.2992%
Green Mountain Falls (2 Counties)	0.0322%
Victor	3.1685%
Woodland Park	13.3445%

Washington County	99.1320%
Akron	0.7659%
Otis	0.1021%

Weld County	51.9387%
Ault	0.3202%
Berthoud (2 Counties)	0.0061%
Brighton (2 Counties)	0.0927%
Dacono	0.6104%
Eaton	0.4573%
Erie (2 Counties)	0.8591%
Evans	4.5121%

Government Name	Intracounty Share
Firestone	1.4648%
Fort Lupton	0.8502%
Frederick	1.2228%
Garden City	0.1514%
Gilcrest	0.1580%
Greeley	30.6922%
Grover	0.0852%
Hudson	0.0066%
Johnstown (2 Counties)	1.5416%
Keenesburg	0.0215%
Kersey	0.1378%
La Salle	0.4128%
Lochbuie (2 Counties)	0.4004%
Longmont (2 Counties)	0.0154%
Mead	0.0941%
Milliken	1.5373%
Northglenn (2 Counties)	0.0030%
Nunn	0.2558%
Pierce	0.0948%
Platteville	0.3712%
Raymer (New Raymer)	0.0597%
Severance	0.0403%
Thornton (2 Counties)	0.0000%
Timnath (2 Counties)	0.0000%
Windsor (2 Counties)	1.5865%

Yuma County	75.5598%
Eckley	2.5422%
Wray	10.2148%
Yuma	11.6832%

¹ These allocations are based on the allocation model used in the Negotiation Class website. The allocation model is the product of prolonged and intensive research, analysis, and discussion by and among members of the court-appointed Plaintiffs' Executive Committee and Settlement Committee and their retained public health and health economics experts, as well as a series of meetings with scores of cities, counties and subdivisions. Additional information about the allocation model is available on the Negotiation Class website.

The allocations in the Negotiation Class website use two different methodologies:

County-Level Allocation

The allocation model uses three factors, based on reliable, detailed, and objective data collected and reported by the federal government, to determine the share of a settlement fund that each county will receive. The three factors are: (1) the amount of opioids shipped to the county, (2) the number of opioid deaths in that county, and (3) the number of people who suffer opioid use disorder in that county.

County/Municipal-Level Allocation

The county/municipal-level allocation is a default allocation to be used if another agreement is not reached between the county and its constituent cities. The formula uses U.S. Census Bureau data on local government spending. This data covers cities and counties for 98% of the U.S. population. If a jurisdiction lacked this data, it was extrapolated based on available data.

² The municipalities of Bow Mar, Johnstown, and Timnath were not reflected as being in multiple counties in the Negotiation Class website. The estimated allocations to those cities are based on the same methodology used in the website, in consultation with the expert. For cities in multiple counties, please see each county in which that city lies.

Exhibit F

Regional Allocations		
Region Number	Region Description	Total State Share
1	Northwest	0.9522%
2	Larimer	6.5211%
3	Weld	3.8908%
4	Logan	1.5896%
5	North Central	2.1061%
6	Boulder	5.7936%
7	Broomfield	1.0014%
8	Adams	9.4247%
9	Arapahoe	10.8071%
10	Jefferson	10.7114%
11	Denver	15.0042%
12	Douglas	3.6696%
13	Mesa	2.8911%
14	Southwest	1.4700%
15	Central	1.5627%
16	El Paso/Teller	12.6116%
17	Southwest Corner	1.4375%
18	South Central	1.0973%
19	Southeast	7.4580%
Total		100.0000%

Exhibit G

Regional Governance Models

A. Membership Structure

Single-County Regions

1. Voting Members (Recommended List: Participating Local Governments to Decide)
 - 1 or 2 representatives appointed by the county (can be commissioners)
 - 1 representative appointed from the public health department
 - 1 representative from the county human services department
 - 1 representative appointed from law enforcement within region (sheriff, police, local city or town district attorney, etc.)
 - 1 representative appointed from a municipal or county court system within region
 - 1-3 representatives (total) appointed by the cities within the county (or other city or cities agreed upon) (can be councilmembers and mayors)
 - Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of funds)
2. Non-Voting Members (Optional but strongly encouraged)
 - Representatives from behavioral health providers
 - Representatives from health care providers
 - Recovery/treatment experts
 - Other county or city representatives
 - A representative from the Attorney General's Office
 - Community representative(s), preferably those with lived experience with the opioid crisis
 - Harm reduction experts

Multi-County Regions

1. Voting Members (Recommended List: Participating Local Governments to Decide)
 - 1 representative appointed by each county (can be commissioners)
 - 1 representative appointed by a rotating city within each county (or other city agreed upon) (can be councilmembers and mayors)
 - 1 representative from each public health department within the region
 - 1 representative from a county human services department
 - At least 1 representative appointed from law enforcement within region (sheriff, police, local city or town district attorney, etc.)
 - 1 representative from a municipal or county court system within region
 - Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of funds)
2. Non-Voting Members (Optional)
 - Representatives from behavioral health providers

- Representatives from health care providers
- Recovery/treatment experts
- Other county or city representatives
- A representative from the Attorney General's Office
- Community representative(s), preferably those with lived experience with the opioid crisis.
- Harm reduction experts

Single-County Single-City Regions (Denver & Broomfield)

1. Voting Members (Recommended List: Participating Local Government to Decide)¹

- 1 representative appointed by the city and county
- 1 representative appointed from the public health department
- 1 representative from the county human services department
- 1 representative appointed from law enforcement within region (sheriff, police, district attorney, etc.)
- 1 representative appointed from a municipal or county court system within region
- Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of funds)

2. Non-Voting Members (Optional)

- Representatives from behavioral health providers
- Representatives from health care providers
- Recovery/treatment experts
- Other county or city representatives
- A representative from the Attorney General's Office
- Community representative(s), preferably those with lived experience with the opioid crisis.
- Harm reduction experts

B. Member Terms

- Regions may establish terms of appointment for members. Appointment terms may be staggered.

C. Procedures

- Regions will be governed by an intergovernmental agreement ("IGA") or memorandum of understanding ("MOU").
- Regions may adopt the Model Colorado Regional Opioid Intergovernmental Agreement, attached here as Exhibit G-1, in its entirety or alter or amend it as they deem appropriate.

¹ In Denver, the Mayor shall make voting member appointments to the Regional Council. In Broomfield, the City and County Manager shall make voting member appointments to the Regional Council.

- Regions may establish their own procedures through adoption of bylaws (model bylaws to be made available).
- Meetings of regional board/committee shall be open to the public and comply with the Colorado Open Meetings Law (including requirement to keep minutes).

D. Financial Responsibility/Controls

- A local government entity shall nominate and designate a fiscal agent for the Region.
- A Regional fiscal agent must be appointed by the Regional Council on an annual basis. A Regional fiscal agent may serve as long as the Regional Council determines is appropriate, including the length of any Settlement that contemplates the distribution of Opioid Funds within Colorado. However, the Regional fiscal agent also can change over time.
- Regional fiscal agents must be a board of county commissioners or a city or town council or executive department, such as a department of finance.
- Yearly reporting by fiscal agent (using standard form) to the Abatement Council.
- All documents subject to CORA.

E. Conflicts of Interest

- Voting members shall abide by the conflict-of-interest rules applicable to local government officials under state law.

F. Ethics Laws

- Voting members shall abide by applicable state or local ethics laws, as appropriate.

G. Authority

- The Regional Council for each region shall have authority to decide how funds allocated to the region shall be distributed in accordance with the Colorado MOU and shall direct the fiscal agent accordingly.
- Any necessary contracts will be entered into by the fiscal agent, subject to approval by the Regional Council.

H. Legal Status

- The region shall not be considered a separate legal entity, unless the Participating Local Governments decide, through an IGA, to create a separate governmental entity.

Exhibit G-1

MODEL COLORADO REGIONAL OPIOID
INTERGOVERNMENTAL AGREEMENT²

THIS MODEL COLORADO REGIONAL OPIOID INTERGOVERNMENTAL AGREEMENT (the “Regional Agreement”) is made between _____, a Participating Local Government, as defined in the Colorado MOU, in the _____ Region (“_____”) and _____, a Participating Local Government in the _____ Region, (“_____”), individually herein a “Regional PLG” and collectively the “Regional PLGs.””

RECITALS

WHEREAS, the State of Colorado and Participating Local Governments executed the Colorado Opioids Summary Memorandum of Understanding on _____ 2021 (the “Colorado MOU”), establishing the manner in which Opioid Funds shall be divided and distributed within the State of Colorado;

WHEREAS, the Regional Agreement assumes and incorporates the definitions and provisions contained in the Colorado MOU, and the Regional Agreement shall be construed in conformity with the Colorado MOU³;

WHEREAS, all Opioid Funds, regardless of allocation, shall be used for Approved Purposes;

WHEREAS, Participating Local Governments shall organize themselves into Regions, as further depicted in **Exhibit E** to the Colorado MOU;

² This Model Regional Agreement is meant to serve as an example for the various Regions and to facilitate the flow of Opioid Funds to their intended purposes. Regions are free to adopt this Regional Agreement in its entirety or alter or amend it as they deem appropriate.

³ When drafting agreements like this Regional Agreement, Regional PLGs should be conscious of the definitions used therein so as not to confuse such definitions with those used in the Colorado MOU. The Definitions in the Colorado MOU shall supersede any definitions used by Regional PLGs in a Regional Agreement.

WHEREAS, Regions may consist of Single-County Regions, Multi-County Regions, or Single County-Single City Regions (Denver and Broomfield).

WHEREAS, there shall be a 60% direct allocation of Opioid Funds to Regions through a Regional Share;

WHEREAS, each Region shall be eligible to receive a Regional Share according to **Exhibit C** to the Colorado MOU;

WHEREAS, the Colorado MOU establishes the procedures by which each Region shall be entitled to Opioid Funds from the Abatement Council and administer its Regional Share allocation;

WHEREAS, the procedures established by the Colorado MOU include a requirement that each Region shall create its own Regional Council;

WHEREAS, all aspects of the creation, administration, and operation of the Regional Council shall proceed in accordance with the provisions of the Colorado MOU;

WHEREAS, each such Regional Council shall designate a fiscal agent from a county or municipal government within that Region;

WHEREAS, each such Regional Council shall submit a two-year plan to the Abatement Council that identifies the Approved Purposes for which the requested funds will be used, and the Regional Council's fiscal agent shall provide data and a certification to the Abatement Council regarding compliance with its two-year plan on an annual basis;

WHEREAS, the Regional Agreement pertains to the procedures for the Regional PLGs to establish a Regional Council, designate a fiscal agent, and request and administer Opioid Funds in a manner consistent with the Colorado MOU;

NOW, THEREFORE, in consideration of the mutual covenants and agreements hereinafter set forth and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Regional PLGs incorporate the recitals set forth above and agree as follows:

1. **DEFINITIONS**. The defined terms used in this Regional Agreement shall have the same meanings as in the Colorado MOU⁴. Capitalized terms used herein and not otherwise defined within the Regional Agreement or in the Colorado MOU shall have the meanings ascribed to them in the body of the Regional Agreement.
2. **OBLIGATIONS OF THE REGIONAL PLGS**. The Regional PLGs shall perform their respective obligations as set forth in the Regional Agreement, the Colorado MOU and the accompanying exhibits to the Colorado MOU and incorporated herein by reference.
3. **REGIONAL COUNCIL**.

3.1. Purpose: In accordance with the Colorado MOU, a Regional Council, consisting of representatives appointed by the Regional PLGs, shall be created to oversee the procedures by which a Region may request Opioid Funds from the Abatement Council and the procedures by which the allocation of its Region's Share of Opioid Funds are administered.

3.2. Membership: The Regional Council of a Multi-County or Single County Region shall consist of the following:

a. **Multi-County Region:**

- (i) **Voting Members.** Voting Members shall be appointed by the Regional PLGs. The Regional PLGs shall collaborate to appoint Regional Council members and to the extent practicable, Voting Members shall be selected from different counties and cities. No single county or city should dominate the make-up of the Regional Council. Voting Members shall be selected as follows:
 - (1) 1 representative appointed by each county (can be commissioners).
 - (2) 1 representative appointed from a rotating city within each county (or other city agreed upon) (can be councilmembers and mayors). A rotating city member shall be selected by majority vote of the cities within each county who do not have a Voting Member currently sitting on the Regional

⁴ See FN 2, *supra*.

Council.

- (3) 1 representative from each public health department within the region.
- (4) 1 representative from a county human services department.
- (5) At least 1 representative appointed from law enforcement within the region (sheriff, police, local city or town district attorney, etc.).
- (6) 1 representative from a municipal or county court system within the region.

b. Single-County Region:

- (i) **Voting Members.** Voting Members shall be appointed by the Regional PLGs. The Regional PLGs shall collaborate to appoint Regional Council members and to the extent practicable, Voting Members shall be selected from different cities within the region. No single city should dominate the make-up of the Regional Council. Voting Members shall be selected as follows:
 - (1) 1 or 2 representatives appointed by the county (can be commissioners)
 - (2) 1 representative appointed from the public health department
 - (3) 1 representative from the county human services department
 - (4) 1 representative appointed from law enforcement within region (sheriff, police, local city or town district attorney, etc.)
 - (5) 1 representative appointed from a municipal or county court system within region
 - (6) 1-3 representatives (total) appointed by rotating cities within the county (or other city or cities agreed upon) (can be councilmembers and mayors). Rotating city members shall be selected by majority vote of the cities who do not have a Voting Member currently sitting on the Regional Council.
 - (7) Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of

funds)

- c. **Non-Voting Members.** For both Multi-County and Single County Regions, Non-Voting Members are optional but are strongly encouraged. Non-voting members shall serve in an advisory capacity. Any Non-Voting Members shall be appointed by the Regional PLGs and may be comprised of all or some of the following, not to include potential recipients of funds:
 - (i) Representatives from behavioral health providers.
 - (ii) Representatives from health care providers.
 - (iii) Recovery/treatment experts.
 - (iv) Other county or city representatives.
 - (v) A representative from the Attorney General's Office.
 - (vi) Community representative(s), preferably those with lived experience with the opioid crisis.
 - (vii) Harm reduction experts.
- d. **Acting Chair:** The Voting Members for both Multi-County and Single-County Regions shall appoint one member to serve as Acting Chair of the Regional Council. The Acting Chair's primary responsibilities shall be to schedule periodic meetings and votes of the Regional Council as needed and to serve as the point of contact for disputes within the Region. The Acting Chair must be either a Member from a county within a Region, such as a county commissioner or their designee, or a Member from a city or town within a Region, such as a mayor or city or town council member or their designee.
- e. **Non-Participation:** A Local Government that chooses not to become a Participating Local Government in the Colorado MOU shall not receive any Opioid Funds from the Regional Share or participate in the Regional Council.
- f. **Terms:** The Regional Council shall be established within ninety (90) days of the first Settlement being entered by a court of competent jurisdiction, including any bankruptcy court. In order to do so, within sixty (60) days of the first Settlement being entered, CCI and CML shall jointly recommend six (6) Voting Members, and so long as such recommendations comply with the terms of Section 3.2 (a) or (b), the Regional Council shall consist of CCI/CML's recommended Members for

an initial term not to exceed one year.⁵ Thereafter, Voting Members shall be appointed in accordance with Section 3.2 (a) or (b) and shall serve two-year terms. Following the expiration of that two-year term, the Regional PLGs, working in concert, shall reappoint that Voting Member, or appoint a new Voting Member according to Section 3.2 (a) or (b).

- (i) If a Voting Member resigns or is otherwise removed from the Regional Council prior to the expiration of their term, a replacement Voting Member shall be appointed within sixty (60) days in accordance with Section 3.2 (a) or (b) to serve the remainder of the term. If the Regional PLGs are unable to fill a Voting Member vacancy within sixty (60) days, the existing Voting Members of the Regional Council at the time of the vacancy shall work collectively to appoint a replacement Voting Member in accordance with Section 3.2 (a) or (b). At the end of his or her term, the individual serving as that replacement Voting Member may be reappointed by the Regional PLGs to serve a full term consistent with this Section.
- (ii) The purpose of the two-year term is to allow Regional PLGs an increased opportunity to serve on the Regional Council. However, Regional Council members who have already served on the Regional Council may be appointed more than once and may serve consecutive terms if appointed to do so by the Regional Council.

3.3. Duties: The Regional Council is primarily responsible for engaging with the Abatement Council on behalf of its Region and following the procedures outlined in the Colorado MOU for requesting Opioid Funds from the Regional Share, which shall include developing 2-year plans, amending those plans as appropriate, and providing the Abatement Council with data through its fiscal agent regarding Opioid Fund expenditures. Upon request from the Abatement Council, the Regional Council may also be subject to an accounting from the Abatement Council.

3.4. Governance: A Regional Council may establish its own procedures through adoption of bylaws if needed. Any governing documents must be consistent with the other provisions in this section and the Colorado MOU.

3.5. Authority: The terms of the Colorado MOU control the authority of a Regional Council and a Regional Council shall not stray outside the bounds of the authority and power vested by the Colorado MOU. Should a Regional Council require legal assistance in determining its authority,

⁵ Local Governments within Multi-County or Single County Regions may decide to select initial Voting Members of the Regional Council between themselves and without CCI and CML involvement. However, the Regional Council must be established within ninety (90) days of the first Settlement being entered by a court of competent jurisdiction, including any bankruptcy court.

it may seek guidance from the legal counsel of the county or municipal government of the Regional Council's fiscal agent at the time the issue arises.

3.6. Collaboration: The Regional Council shall facilitate collaboration between the State, Participating Local Governments within its Region, the Abatement Council, and other stakeholders within its Region for the purposes of sharing data, outcomes, strategies, and other relevant information related to abating the opioid crisis in Colorado.

3.7. Transparency: The Regional Council shall operate with all reasonable transparency and abide by all Colorado laws relating to open records and meetings. To the extent the Abatement Council requests outcome-related data from the Regional Council, the Regional Council shall provide such data in an effort to determine best methods for abating the opioid crisis in Colorado.

3.8. Conflicts of Interest: Voting Members shall abide by the conflict-of-interest rules applicable to local government officials under state law.

3.9. Ethics Laws: Voting Members shall abide by their local ethics laws or, if no such ethics laws exist, by applicable state ethics laws.

3.10. Decision Making: The Regional Council shall seek to make all decisions by consensus. In the event consensus cannot be achieved, the Regional Council shall make decisions by a majority vote of its Members.

4. REGIONAL FISCAL AGENT

4.1. Purpose: According to the Colorado MOU, the Regional Council must designate a fiscal agent for the Region prior to the Region receiving any Opioid funds from the Regional Share. All funds from the Regional Share shall be distributed to the Regional Council's fiscal agent for the benefit of the entire Region.

4.2. Designation: The Regional Council shall nominate and designate a fiscal agent for the Region by majority vote. Regional fiscal agents must be a board of county commissioners or a city or town council or executive department, such as a department of finance.

4.3. Term: A Regional fiscal agent must be appointed by the Regional Council on an annual basis. A Regional fiscal agent may serve as long as the Regional Council determines is appropriate, including the length of any Settlement that contemplates the distribution of Opioid Funds within Colorado.

4.4. Duties: The Regional fiscal agent shall receive, deposit, and make available Opioid Funds distributed from the Abatement Council and provide expenditure reporting data to the

Abatement Council on an annual basis. In addition, the Regional fiscal agent shall perform certain recordkeeping duties outlined below.

- a. **Opioid Funds:** The Regional fiscal agent shall receive all Opioid Funds as distributed by the Abatement Council. Upon direction by the Regional Council, the Regional fiscal agent shall make any such Opioid Funds available to the Regional Council.
- b. **Reporting:** On an annual basis, as determined by the Abatement Council, the Regional fiscal agent shall provide to the Abatement Council the Regional Council's expenditure data from their allocation of the Regional Share and certify to the Abatement Council that the Regional Council's expenditures were for Approved Purposes and complied with its 2-year plan.
- c. **Recordkeeping:** The Regional fiscal agent shall maintain necessary records with regard the Regional Council's meetings, decisions, plans, and expenditure data.

4.5. Authority: The fiscal agent serves at the direction of the Regional Council and in service to the entire Region. The terms of the Colorado MOU control the authority of a Regional Council, and by extension, the Regional fiscal agent. A Regional fiscal agent shall not stray outside the bounds of the authority and power vested by the Colorado MOU.

5. REGIONAL TWO-YEAR PLAN

5.1. Purpose: According to the Colorado MOU, as part of a Regional Council's request to the Abatement Council for Opioid Funds from its Regional Share, the Regional Council must submit a 2-year plan identifying the Approved Purposes for which the requested funds will be used.

5.2 Development of 2-Year Plan: In developing a 2-year plan, the Regional Council shall solicit recommendations and information from all Regional PLGs and other stakeholders within its Region for the purposes of sharing data, outcomes, strategies, and other relevant information related to abating the opioid crisis in Colorado. At its discretion, a Regional Council may seek assistance from the Abatement Council for purposes of developing a 2-year plan.

5.3 Amendment: At any point, a Regional Council's 2-year plan may be amended so long as such amendments comply with the terms of the Colorado MOU and any Settlement.

6. DISPUTES WITHIN REGION. In the event that any Regional PLG disagrees with a decision of the Regional Council, or there is a dispute regarding the appointment of Voting or Non-Voting Members to the Regional Council, that Regional PLG shall inform the Acting Chair of its dispute at the earliest

possible opportunity. In Response, the Regional Council shall gather any information necessary to resolve the dispute. Within fourteen (14) days of the Regional PLG informing the Acting Chair of its dispute, the Regional Council shall issue a decision with respect to the dispute. In reaching its decision, the Regional Council may hold a vote of Voting Members, with the Acting Chair serving as the tie-breaker, or the Regional Council may devise its own dispute resolution process. However, in any disputes regarding the appointment of a Voting Member, that Voting Member will be recused from voting on the dispute. The decision of the Regional Council is a final decision.

7. **DISPUTES WITH ABATEMENT COUNCIL.** If the Regional Council disputes the amount of Opioid Funds it receives from its allocation of the Regional Share, the Regional Council shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. However, the failure to alert the Abatement Council within this time frame shall not constitute a waiver of the Regional Council's right to seek recoupment of any deficiency in its Regional Share.
8. **RECORDKEEPING.** The acting Regional fiscal agent shall be responsible for maintaining records consistent with the Regional Agreement.
9. **AUTHORIZED REPRESENTATIVES.** Each Regional PLGs' representative designated below shall be the point of contact to coordinate the obligations as provided herein. The Regional PLGs designate their authorized representatives under this Regional Agreement as follows:
 - 9.1. _____ designates the _____ of the _____ or their designee(s).
 - 9.2. _____ designates the _____ of the _____ or their designee(s).
10. **OBLIGATIONS OF THE REGIONAL PLGS.** The Regional PLGs shall perform their respective obligations as set forth in the Regional Agreement, the Colorado MOU and the accompanying exhibits to the Colorado MOU and incorporated herein by reference.
11. **TERM.** The Regional Agreement will commence on _____, and shall expire on the date the last action is taken by the Region, consistent with the terms of the Colorado MOU and any Settlement. (the "Term").
12. **INFORMATIONAL OBLIGATIONS.** Each Regional PLG hereto will meet its obligations as set forth in § 29-1-205, C.R.S., as amended, to include information about this Regional Agreement in a filing with the Colorado Division of Local Government; however, failure to do so shall in no way affect the validity of this Regional Agreement or any remedies available to the Regional PLGs hereunder.
13. **CONFIDENTIALITY.** The Regional PLGs, for themselves, their agents, employees and representatives, agree that they will not divulge any confidential or proprietary information they receive from another Regional PLG or otherwise have access to, except as may be required by law. Nothing in this Regional

Agreement shall in any way limit the ability of the Regional PLGs to comply with any laws or legal process concerning disclosures by public entities. The Regional PLGs understand that all materials exchanged under this Regional Agreement, including confidential information or proprietary information, may be subject to the Colorado Open Records Act., § 24-72-201, *et seq.*, C.R.S., (the “Act”). In the event of a request to a Regional PLG for disclosure of confidential materials, the Regional PLG shall advise the Regional PLGs of such request in order to give the Regional PLGs the opportunity to object to the disclosure of any of its materials which it marked as, or otherwise asserts is, proprietary or confidential. If a Regional PLG objects to disclosure of any of its material, the Regional PLG shall identify the legal basis under the Act for any right to withhold. In the event of any action or the filing of a lawsuit to compel disclosure, the Regional PLG agrees to intervene in such action or lawsuit to protect and assert its claims of privilege against disclosure of such material or waive the same. If the matter is not resolved, the Regional PLGs may tender all material to the court for judicial determination of the issue of disclosure.

14. GOVERNING LAW; VENUE. This Regional Agreement shall be governed by the laws of the State of Colorado. Venue for any legal action relating solely to this Regional Agreement will be in the applicable District Court of the State of Colorado for the county of the Region’s fiscal agent. Venue for any legal action relating to the Colorado MOU shall be in a court of competent jurisdiction where a Settlement or consent decree was entered, as those terms are described or defined in the Colorado MOU. If a legal action relates to both a Regional Agreement and the Colorado MOU, venue shall also be in a court of competent jurisdiction where a Settlement or consent decree was entered.

15. TERMINATION. The Regional PLGs enter into this Regional Agreement to serve the public interest. If this Regional Agreement ceases to further the public interest, a Regional PLG, in its discretion, may terminate their participation in the Regional Agreement, in whole or in part, upon written notice to the other Regional PLGs. Each Regional PLG also has the right to terminate the Regional Agreement with cause upon written notice effective immediately, and without cause upon thirty (30) days prior written notice to the other Regional PLGs. A Regional PLG’s decision to terminate this Regional Agreement, with or without cause, shall have no impact on the other Regional PLGs present or future administration of its Opioid Funds and the other procedures outlined in this Regional Agreement. Rather, a Regional PLG’s decision to terminate this Regional Agreement shall have the same effect as non-participation, as outlined in Section 3.2 (e).

16. NOTICES. “Key Notices” under this Regional Agreement are notices regarding default, disputes, or termination of the Regional Agreement. Key Notices shall be given in writing and shall be deemed

received if given by confirmed electronic transmission that creates a record that may be retained, retrieved and reviewed by a recipient thereof, and that may be directly reproduced in paper form by such a recipient through an automated process, but specifically excluding facsimile transmissions and texts when transmitted, if transmitted on a business day and during normal business hours of the recipient, and otherwise on the next business day following transmission; certified mail, return receipt requested, postage prepaid, three business days after being deposited in the United States mail; or overnight carrier service or personal delivery, when received. For Key Notices, the Regional PLGs will follow up any electronic transmission with a hard copy of the communication by the means described above. All other communications or notices between the Regional PLGs that are not Key Notices may be done via electronic transmission. The Regional PLGs agree that any notice or communication transmitted by electronic transmission shall be treated in all manner and respects as an original written document; any such notice or communication shall be considered to have the same binding and legal effect as an original document. All Key Notices shall include a reference to the Regional Agreement, and Key Notices shall be given to the Regional PLGs at the following addresses:

17. GENERAL TERMS AND CONDITIONS

- 17.1. Independent Entities.** The Regional PLGs enter into this Regional Agreement as separate, independent governmental entities and shall maintain such status throughout.
- 17.2. Assignment.** This Regional Agreement shall not be assigned by any Regional PLG without the prior written consent of all Regional PLGs. Any assignment or subcontracting without such consent will be ineffective and void and will be cause for termination of this Regional Agreement.
- 17.3. Integration and Amendment.** This Regional Agreement represents the entire agreement between the Regional PLGs and terminates any oral or collateral agreement or understandings. This Regional Agreement may be amended only by a writing signed by the Regional PLGs. If any provision of this Regional Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and the remaining provision of this Regional Agreement shall continue in full force and effect.

- 17.4. No Construction Against Drafting Party.** The Regional PLGs and their respective counsel have had the opportunity to review the Regional Agreement, and the Regional Agreement will not be construed against any Regional PLG merely because any provisions of the Regional Agreement were prepared by a particular Regional PLG.
- 17.5. Captions and References.** The captions and headings in this Regional Agreement are for convenience of reference only and shall not be used to interpret, define, or limit its provisions. All references in this Regional Agreement to sections (whether spelled out or using the § symbol), subsections, exhibits or other attachments, are references to sections, subsections, exhibits or other attachments contained herein or incorporated as a part hereof, unless otherwise noted.
- 17.6. Statutes, Regulations, and Other Authority.** Any reference in this Regional Agreement to a statute, regulation, policy or other authority shall be interpreted to refer to such authority then current, as may have been changed or amended since the execution of this Regional Agreement.
- 17.7. Conflict of Interest.** No Regional PLG shall knowingly perform any act that would conflict in any manner with said Regional PLG's obligations hereunder. Each Regional PLG certifies that it is not engaged in any current project or business transaction, directly or indirectly, nor has it any interest, direct or indirect, with any person or business that might result in a conflict of interest in the performance of its obligations hereunder. No elected or employed member of any Regional PLG shall be paid or receive, directly or indirectly, any share or part of this Regional Agreement or any benefit that may arise therefrom.
- 17.8. Inurement.** The rights and obligations of the Regional PLGs to the Regional Agreement inure to the benefit of and shall be binding upon the Regional PLGs and their respective successors and assigns, provided assignments are consented to in accordance with the terms of the Regional Agreement.
- 17.9. Survival.** Notwithstanding anything to the contrary, the Regional PLGs understand and agree that all terms and conditions of this Regional Agreement and any exhibits that require continued performance or compliance beyond the termination or expiration of this Regional Agreement shall survive such termination or expiration and shall be enforceable against a Regional PLG if such Regional PLG fails to perform or comply with such term or condition.
- 17.10. Waiver of Rights and Remedies.** This Regional Agreement or any of its provisions may not be waived except in writing by a Regional PLG's authorized representative. The failure of a

Regional PLG to enforce any right arising under this Regional Agreement on one or more occasions will not operate as a waiver of that or any other right on that or any other occasion.

17.11. No Third-Party Beneficiaries. Enforcement of the terms of the Regional Agreement and all rights of action relating to enforcement are strictly reserved to the Regional PLGs. Nothing contained in the Regional Agreement gives or allows any claim or right of action to any third person or entity. Any person or entity other than the Regional PLGs receiving services or benefits pursuant to the Regional Agreement is an incidental beneficiary only.

17.12. Records Retention. The Regional PLGs shall maintain all records, including working papers, notes, and financial records in accordance with their applicable record retention schedules and policies. Copies of such records shall be furnished to the Parties request.

17.13. Execution by Counterparts; Electronic Signatures and Records. This Regional Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. The Regional PLGs approve the use of electronic signatures for execution of this Regional Agreement. All use of electronic signatures shall be governed by the Uniform Electronic Transactions Act, C.R.S. §§ 24-71.3-101, *et seq.* The Regional PLGs agree not to deny the legal effect or enforceability of the Regional Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Regional PLGs agree not to object to the admissibility of the Regional Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

17.14. Authority to Execute. Each Regional PLG represents that all procedures necessary to authorize such Regional PLG's execution of this Regional Agreement have been performed and that the person signing for such Regional PLG has been authorized to execute the Regional Agreement.

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EXHIBIT K
COLORADO OPIOIDS SETTLEMENT MEMORANDUM
OF UNDERSTANDING

Settlement Participation Form

EXHIBIT K

Settlement Participation Form

Governmental Entity: City of Arvada	State: Colorado
Authorized Official: Mayor of Arvada, Marc Williams	
Address 1: 8101 Ralston Road	
Address 2:	
City, State, Zip: Arvada, CO 80002	
Phone: (720) 898-7000	
Email: mwilliams@arvada.org	

The governmental entity identified above (“Governmental Entity”), in order to obtain and in consideration for the benefits provided to the Governmental Entity pursuant to the Settlement Agreement dated July 21, 2021 (“Janssen Settlement”), and acting through the undersigned authorized official, hereby elects to participate in the Janssen Settlement, release all Released Claims against all Released Entities, and agrees as follows.

1. The Governmental Entity is aware of and has reviewed the Janssen Settlement, understands that all terms in this Election and Release have the meanings defined therein, and agrees that by this Election, the Governmental Entity elects to participate in the Janssen Settlement and become a Participating Subdivision as provided therein.
2. The Governmental Entity shall, within 14 days of the Reference Date and prior to the filing of the Consent Judgment, dismiss with prejudice any Released Claims that it has filed.
3. The Governmental Entity agrees to the terms of the Janssen Settlement pertaining to Subdivisions as defined therein.
4. By agreeing to the terms of the Janssen Settlement and becoming a Releasor, the Governmental Entity is entitled to the benefits provided therein, including, if applicable, monetary payments beginning after the Effective Date.
5. The Governmental Entity agrees to use any monies it receives through the Janssen Settlement solely for the purposes provided therein.
6. The Governmental Entity submits to the jurisdiction of the court in the Governmental Entity’s state where the Consent Judgment is filed for purposes limited to that court’s role as provided in, and for resolving disputes to the extent provided in, the Janssen Settlement.
7. The Governmental Entity has the right to enforce the Janssen Settlement as provided therein.

8. The Governmental Entity, as a Participating Subdivision, hereby becomes a Releasor for all purposes in the Janssen Settlement, including but not limited to all provisions of Section IV (Release), and along with all departments, agencies, divisions, boards, commissions, districts, instrumentalities of any kind and attorneys, and any person in their official capacity elected or appointed to serve any of the foregoing and any agency, person, or other entity claiming by or through any of the foregoing, and any other entity identified in the definition of Releasor, provides for a release to the fullest extent of its authority. As a Releasor, the Governmental Entity hereby absolutely, unconditionally, and irrevocably covenants not to bring, file, or claim, or to cause, assist or permit to be brought, filed, or claimed, or to otherwise seek to establish liability for any Released Claims against any Released Entity in any forum whatsoever. The releases provided for in the Janssen Settlement are intended by the Parties to be broad and shall be interpreted so as to give the Released Entities the broadest possible bar against any liability relating in any way to Released Claims and extend to the full extent of the power of the Governmental Entity to release claims. The Janssen Settlement shall be a complete bar to any Released Claim.
9. In connection with the releases provided for in the Janssen Settlement, each Governmental Entity expressly waives, releases, and forever discharges any and all provisions, rights, and benefits conferred by any law of any state or territory of the United States or other jurisdiction, or principle of common law, which is similar, comparable, or equivalent to § 1542 of the California Civil Code, which reads:

General Release; extent. A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release that, if known by him or her, would have materially affected his or her settlement with the debtor or released party.

A Releasor may hereafter discover facts other than or different from those which it knows, believes, or assumes to be true with respect to the Released Claims, but each Governmental Entity hereby expressly waives and fully, finally, and forever settles, releases and discharges, upon the Effective Date, any and all Released Claims that may exist as of such date but which Releasors do not know or suspect to exist, whether through ignorance, oversight, error, negligence or through no fault whatsoever, and which, if known, would materially affect the Governmental Entities' decision to participate in the Janssen Settlement.

10. Nothing herein is intended to modify in any way the terms of the Janssen Settlement, to which Governmental Entity hereby agrees. To the extent this Election and Release is interpreted differently from the Janssen Settlement in any respect, the Janssen Settlement controls.

I have all necessary power and authorization to execute this Election and Release on behalf of the Governmental Entity.

Signature: _____

Name: _____

Title: _____

Date: _____

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

EXHIBIT K
COLORADO OPIOIDS SETTLEMENT MEMORANDUM
OF UNDERSTANDING

Settlement Participation Form

EXHIBIT K

Subdivision Settlement Participation Form

Governmental Entity: <u>City of Arvada</u>	State: <u>Colorado</u>
Authorized Official: <u>Mayor of Arvada Marc Williams</u>	
Address 1: <u>8101 Ralston Road</u>	
Address 2:	
City, State, Zip: <u>Arvada, CO 80002</u>	
Phone: <u>(720) 898-7000</u>	
Email: <u>mwilliams@arvada.org</u>	

The governmental entity identified above ("*Governmental Entity*"), in order to obtain and in consideration for the benefits provided to the Governmental Entity pursuant to the Settlement Agreement dated July 21, 2021 ("*Distributor Settlement*"), and acting through the undersigned authorized official, hereby elects to participate in the Distributor Settlement, release all Released Claims against all Released Entities, and agrees as follows.

1. The Governmental Entity is aware of and has reviewed the Distributor Settlement, understands that all terms in this Participation Form have the meanings defined therein, and agrees that by signing this Participation Form, the Governmental Entity elects to participate in the Distributor Settlement and become a Participating Subdivision as provided therein.
2. The Governmental Entity shall, within 14 days of the Reference Date and prior to the filing of the Consent Judgment, secure the dismissal with prejudice of any Released Claims that it has filed.
3. The Governmental Entity agrees to the terms of the Distributor Settlement pertaining to Subdivisions as defined therein.
4. By agreeing to the terms of the Distributor Settlement and becoming a Releasor, the Governmental Entity is entitled to the benefits provided therein, including, if applicable, monetary payments beginning after the Effective Date.
5. The Governmental Entity agrees to use any monies it receives through the Distributor Settlement solely for the purposes provided therein.
6. The Governmental Entity submits to the jurisdiction of the court in the Governmental Entity's state where the Consent Judgment is filed for purposes limited to that court's role as provided in, and for resolving disputes to the extent provided in, the Distributor Settlement. The Governmental Entity likewise agrees to arbitrate before the National Arbitration Panel as provided in, and for resolving disputes to the extent otherwise provided in, the Distributor Settlement.

7. The Governmental Entity has the right to enforce the Distributor Settlement as provided therein.
8. The Governmental Entity, as a Participating Subdivision, hereby becomes a Releasor for all purposes in the Distributor Settlement, including, but not limited to, all provisions of Part XI, and along with all departments, agencies, divisions, boards, commissions, districts, instrumentalities of any kind and attorneys, and any person in their official capacity elected or appointed to serve any of the foregoing and any agency, person, or other entity claiming by or through any of the foregoing, and any other entity identified in the definition of Releasor, provides for a release to the fullest extent of its authority. As a Releasor, the Governmental Entity hereby absolutely, unconditionally, and irrevocably covenants not to bring, file, or claim, or to cause, assist or permit to be brought, filed, or claimed, or to otherwise seek to establish liability for any Released Claims against any Released Entity in any forum whatsoever. The releases provided for in the Distributor Settlement are intended by the Parties to be broad and shall be interpreted so as to give the Released Entities the broadest possible bar against any liability relating in any way to Released Claims and extend to the full extent of the power of the Governmental Entity to release claims. The Distributor Settlement shall be a complete bar to any Released Claim.
9. The Governmental Entity hereby takes on all rights and obligations of a Participating Subdivision as set forth in the Distributor Settlement.
10. In connection with the releases provided for in the Distributor Settlement, each Governmental Entity expressly waives, releases, and forever discharges any and all provisions, rights, and benefits conferred by any law of any state or territory of the United States or other jurisdiction, or principle of common law, which is similar, comparable, or equivalent to § 1542 of the California Civil Code, which reads:

General Release; extent. A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release, and that if known by him or her would have materially affected his or her settlement with the debtor or released party.

A Releasor may hereafter discover facts other than or different from those which it knows, believes, or assumes to be true with respect to the Released Claims, but each Governmental Entity hereby expressly waives and fully, finally, and forever settles, releases and discharges, upon the Effective Date, any and all Released Claims that may exist as of such date but which Releasors do not know or suspect to exist, whether through ignorance, oversight, error, negligence or through no fault whatsoever, and which, if known, would materially affect the Governmental Entities' decision to participate in the Distributor Settlement.

11. Nothing herein is intended to modify in any way the terms of the Distributor Settlement, to which Governmental Entity hereby agrees. To the extent this Participation Form is interpreted differently from the Distributor Settlement in any respect, the Distributor Settlement controls.

I have all necessary power and authorization to execute this Participation Form on behalf of the Governmental Entity.

Signature: _____

Name: _____

Title: _____

Date: _____

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

Colorado Subdivision Escrow Agreement

Governmental Entity: City of Arvada	State: CO
Authorized Official: Mayor of Arvada Marc Williams	
Address 1: 8101 Ralston Road	
Address 2:	
City, State, Zip: Arvada, CO 80002	
Phone: (720) 898-7000	
Email: mwilliams@arvada.org	

The governmental entity identified above (“*Governmental Entity*”) hereby provides Colorado Counties, Inc. (for counties) or the Colorado Municipal League (for municipalities) (“*Escrow Agent*”) the enclosed copies of the Governmental Entity’s endorsed Subdivision Settlement Participation Forms and the Colorado Opioids Settlement Memorandum of Understanding (“Colorado MOU”), to be held in escrow. The Subdivision Settlement Participation Forms apply respectively to (1) the National Settlement Agreement with McKesson Corporation, Cardinal Health, Inc., and AmerisourceBergen Corporation, dated July 21, 2021 (“*Distributor Settlement*”); and (2) the National Settlement Agreement with Janssen Pharmaceuticals, Inc., and its parent company Johnson & Johnson, dated July 21, 2021 (“*J&J Settlement*”). Pursuant to this Agreement, the Subdivision Settlement Participation Forms and the Colorado MOU will be released only if there is 95% participation by local governments in Colorado as further explained below.

Purpose of this Agreement

By endorsing a Subdivision Settlement Participation Form in the Distributor Settlement and the J&J Settlement, a governmental entity agrees to participate in those settlements and release any legal claims it has or may have against those settling pharmaceutical companies. This Colorado Subdivision Escrow Agreement is meant to ensure that the legal claims of governmental entities in Colorado will be released only when 95% participation by certain governmental entities has been reached. That 95% participation threshold is important because it signals to the settling pharmaceutical companies that the settlement has wide acceptance which will then secure significant incentive payments under these settlement agreements.

Escrow

The Escrow Agent shall promptly report the receipt of any Governmental Entity’s endorsed Subdivision Settlement Participation Forms and Colorado MOUs to the Colorado Attorney General’s Office and to the law firm of Keller Rohrback L.L.P. These documents shall be released by the Escrow Agent to the Colorado Attorney General’s Office if and when the Escrow Agent is notified by the Attorney General’s Office and Keller Rohrback that that the threshold 95% participation levels have been reached for both the Distributor Settlement and the J&J Settlement, as further described below. If by December 29, 2021, the Escrow Agent has not received notification that the threshold 95% levels have been reached for both the Distributor Settlement and the J&J Settlements, then the documents being escrowed shall be returned to the Governmental Entities and all copies shall be destroyed.

Distributor Settlement

The Attorney General’s Office and Keller Rohrback shall jointly submit a written notification to the Escrow Agent when it has been determined that the percentages of populations eligible for Incentives B and C, as described in Sections IV.F.2 and IV.F.3 of the Distributor Settlement, are each 95% or more. For purposes of this Escrow Agreement, the percentages of populations eligible for Incentives B and C under the Distributor Settlement will include governmental entities that sign a Subdivision Settlement Participation Form subject to an escrow agreement and governmental entities that sign a Subdivision Settlement Participation Form that is not subject to an escrow agreement.

J&J Settlement

The Attorney General’s Office and Keller Rohrback shall jointly submit a written notification to the Escrow Agent when it has been determined that the Participation or Case-Specific Resolution Levels for Incentives B and C, as described in Sections V.E.5 and V.E.6 of the J&J Settlement, are each 95% or more. For purposes of this Escrow Agreement, the percentages or populations eligible for Incentives B and C under the J&J Settlement will include governmental entities that sign a Subdivision Settlement Participation Form subject to an escrow agreement and governmental entities that sign a Subdivision Settlement Participation Form that is not subject to an escrow agreement.

Colorado Subdivision Name _____

Authorized Signature

Date

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____



REPORT TO CITY COUNCIL ORDINANCE FIRST READING

AGENDA ITEM
8.C.1.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-037 An Ordinance Amending Various Sections of Chapter 102, Utilities, of the Arvada City Code Pertaining to Water Users Rates and Bimonthly Service Charges (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

Report in Brief

The Utilities Department is proposing to increase in-city water rates by 4.4% and single family bimonthly service fees by \$4 for 2022. This will increase the average in-city single family water bill by \$41.93 per year (\$3.49/month).

The Arvada team recommends that the City Council approve CB21-037, An Ordinance Amending Various Sections of Chapter 102, Utilities, of the Arvada City Code Pertaining to Water Users Rates (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

Financial Impact

The proposed 4.4% in-city rate increase, \$4 single family in-city bimonthly service fee increase, and indexed rate and fee increases, will generate approximately \$2,276,000 annually in new revenue for the Water Fund.

Background

The 2022 budget for Operations & Maintenance includes an increase of 8% in Denver Water rates, increasing personnel costs, infrastructure reinvestment, and vendor services and supplies. It also includes costs for new engineering positions and equipment. Overall operational costs are expected to increase by \$2,276,000 in 2022 as shown in the table below.

2021 Operations Budget	\$27,867,000
Salaries & Benefits Changes	\$50,000
Denver Water Rate Increase	\$472,000
City Support Services	\$205,000
General Vendor Price Increases	\$130,000
Equipment	\$180,000
New/Upgraded Positions	\$381,000
Capital Reinvestment Projects	\$858,000
Subtotal	\$2,276,000
2022 Operating Budget	\$30,143,000

Discussion

The average in-city water rate increase over the last five years was 3.2%. The bimonthly service fee was last adjusted in 2009. A primary cost driver for the Water Operating Budget is Denver Water, which provides the majority of the City's raw

water supply. At this time, we understand that Denver Water has proposed an 8% rate increase for raw water customers in 2022. It is likely future years will see more high rate increases from Denver Water due to the extensive capital and operating costs required for them to operate their raw water system. Arvada is a beneficiary of their efforts to ensure reliability of water supply on a regional basis. With forecasts of more severe drought and impacts on water supplies from wildfires, the costs associated with Denver Water's system are escalating. Of the 4.4% rate increase recommended, almost 2% of that is the pass-through from the higher cost of purchasing raw water from Denver Water.

The other major factor contributing to this year's rate and service fee recommendations is the urgency to reinvest in aging water infrastructure, especially the City's two water treatment facilities. The City team has developed a master plan for water infrastructure, including recommendations for capital projects in the 10-year Financial Model for the Water Enterprise Fund. Looking ahead, service fees will be an important source of funding for reinvestment projects identified in the master plan process.

An increase in funding for new equipment and engineering positions has also been requested this year.

The City team is recommending an in-city rate increase of 4.4% and a single family bimonthly service charge increase of \$4. If approved, this rate and fee change will result in an additional \$41.93 per year (\$3.49 per month) to the average in-city single family owner.

In accordance with past practice, the in-city rate and fee increases are used as an index to calculate all other customer categories. The complete updated rate schedule is in the proposed ordinance.

Rates and fees are two sources of revenue for the Water Enterprise Fund. The Water Utility also receives funding from tap fees. The City typically adjusts rates each year to allow for smooth, steady increases over time. This is the first time since 2009 that an increase in bimonthly fees is being recommended. The City team will also be evaluating the schedule of tap fees in the year ahead.

Public Contact

Posting of the City Council agenda. In addition, workshops regarding utility rates and fees were presented to the City Council on August 23 and September 20.

Commission Recommendation

N/A

Strategic Alignment

Adjusting water rates is consistent with the Infrastructure work system priority area to provide safe, reliable, high-quality, and cost-effective water supply and systems.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve CB21-037, An Ordinance Amending Various Sections of Chapter 102, Utilities, of the Arvada City Code Pertaining to Water Users Rates and set the Public Hearing for November 15, 2021 at 6:15 p.m.

Suggested Motion:

SUBJECT: CB21-037 An Ordinance Amending Various Sections of Chapter 102, Utilities, of the Arvada City Code Pertaining to Water Users Rates and Bimonthly Service Charges (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

PAGE: 3
ITEM: 8.C.1.

I move that CB21-037, An Ordinance Amending Various Sections of Chapter 102, Utilities, of the Arvada City Code Pertaining to Water Users Rates and Bimonthly Services Charges, be (approved on first reading, ordered published in full, and a public hearing set for November 15, 2021, at 6:15 p.m.) (rejected).

Prepared by:
Sharon Israel, Director of Utilities

Reviewed by:

Approved by:

Sharon Israel, Director of Utilities	10/6/2021
Bryan Archer, Director of Finance	10/6/2021
Erika Pierce, Litigation Paralegal	10/6/2021
Jessica Morales, Assistant City Attorney	10/6/2021
Rachel Morris, City Attorney	10/7/2021
Lorie Gillis, Deputy City Manager	10/7/2021
Mark Deven, City Manager	10/7/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-037
ORDINANCE NO. _____

AN ORDINANCE AMENDING VARIOUS SECTIONS OF CHAPTER 102, UTILITIES, OF
THE ARVADA CITY CODE PERTAINING TO WATER USERS RATES AND BIMONTHLY
SERVICE CHARGES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Sec. 102-170. Residential user charges -- Within city, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-170. Residential user charges—Within city.

Bimonthly user charges for residential class of service within the city shall be based upon the following service charges and usage rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

- (1) Single-family or other individually connected units:
 - a. The bimonthly service charge is..... \$9.83
 - b. Plus, a bimonthly usage charge as follows:
 1. 0—30,000 gallons, per 1,000..... \$4.48
 2. from 30,001 to 60,000 gallons, per 1,000.....\$5.60
 3. from 60,001 to 90,000 gallons, per 1,000.....\$6.73
 4. All above 90,000 gallons, per 1,000.....\$8.97
- (2) Duplex, multifamily, townhouse, or other units that are interconnected:
 - a. The total bimonthly service charge regardless of usage is as follows:

<i>Number of Units</i>	<i>Service Charge</i>
2—6	\$15.43
7—18	\$26.98
19—60	\$36.62
61—144	\$82.87
Over 144	\$140.69

- b. Plus, a bimonthly usage charge as follows:
 1. 0—30,000 gallons for the first unit plus 13,000 gallons for each additional unit at the rate of \$4.48 per 1,000 gallons.
 2. 30,001—60,000 gallons for the first unit plus 26,000 gallons for each additional unit at the rate of \$5.60 per 1,000 gallons.
 3. 60,001—90,000 gallons for the first unit plus 39,000 gallons for each additional unit at the rate of \$6.73 per 1,000 gallons.
 4. All remaining usage at the rate of \$8.97 per 1,000 gallons.

Section 2. Sec. 102-171. Outside city, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-171. Outside city.

Bimonthly user charges for residential service outside the city shall be based upon the following service charges and user rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

(1) Single-family or other individually connected units:

- a. The bimonthly service charge is.....\$19.66
- b. Plus, a bimonthly usage charge as follows:
 - 1. 0—30,000 gallons per 1,000.....\$8.96
 - 2. from 30,001 to 60,000 gallons, per 1,000.....\$11.19
 - 3. from 60,001 to 90,000 gallons, per 1,000.....\$13.47
 - 4. All over 90,000 gallons, per 1,000.....\$17.94

(2) Duplex, multifamily, townhouse, or other units that are interconnected:

- a. The total bimonthly service charge regardless of usage is as follows:

<i>Number of Units</i>	<i>Service Charge</i>
2—6	\$30.86
7—18	\$53.96
19—60	\$73.24
61—144	\$165.74
Over 144	\$281.38

- b. Plus, a bimonthly usage charge as follows:
 - 1. 0—30,000 gallons for the first unit plus 13,000 gallons for each additional unit at the rate of \$8.96 per 1,000 gallons.
 - 2. 30,001—60,000 gallons for the first unit plus 26,000 gallons for each additional unit at the rate of \$11.19 per 1,000 gallons.
 - 3. 60,001—90,000 gallons for the first unit plus 39,000 gallons for each additional unit at the rate of \$13.47 per 1,000 gallons.
 - 4. All remaining usage at the rate of \$17.94 per 1,000 gallons.

Section 3. Sec. 102-172. Nonresidential user charges--Within city, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-172. Nonresidential user charges—Within city.

Bimonthly user charges for nonresidential class of service within the city is based upon the following service charges and user rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

<i>Meter Size</i>	<i>Service Charge</i>
$\frac{5}{8}$ " $\times$ $\frac{3}{4}$ "	\$9.83
$\frac{3}{4}$ "	\$11.72
1"	\$15.43
1 $\frac{1}{2}$ "	\$26.98
2"	\$36.62
3"	\$82.87
4"	\$140.69

<i>Meter Size</i>	<i>Quantity (in 1,000 gallons) at a rate of \$4.48 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$5.60 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$6.73 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$8.97 per 1,000 gallons</i>
$\frac{5}{8}$ " $\times$ $\frac{3}{4}$ "	0 to 170	170 to 340	340 to 510	All over 510
$\frac{3}{4}$ "	0 to 170	170 to 340	340 to 510	All over 510
1"	0 to 280	280 to 560	560 to 840	All over 840
1 $\frac{1}{2}$ "	0 to 600	600 to 1,200	1,200 to 1,800	All over 1,800
2"	0 to 900	900 to 1,800	1,800 to 2,700	All over 2,700
3"	0 to 2,000	2,000 to 4,000	4,000 to 6,000	All over 6,000
4"	0 to 3,400	3,400 to 6,800	6,800 to 10,200	All over 10,200

Section 4. Sec. 102-173. Same--Outside city, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-173. Same—outside city.

Bimonthly user charges for nonresidential class of service outside the city is based upon the following service charges and user rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

<i>Meter Size</i>	<i>Service Charge</i>
$\frac{5}{8}$ " $\times$ $\frac{3}{4}$ "	\$19.66
$\frac{3}{4}$ "	\$23.44
1"	\$30.86
1 $\frac{1}{2}$ "	\$53.96
2"	\$73.24
3"	\$165.74
4"	\$281.38

Meter Size	<i>Quantity (in 1,000 gallons) at a rate of \$8.96 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$11.19 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$13.47 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$17.94 per 1,000 gallons</i>
$\frac{5}{8}" \times \frac{3}{4}"$	0 to 170	170 to 340	340 to 510	All over 510
$\frac{3}{4}"$	0 to 170	170 to 340	340 to 510	All over 510
1"	0 to 280	280 to 560	560 to 840	All over 840
1 $\frac{1}{2}"$	0 to 600	600 to 1,200	1,200 to 1,800	All over 1,800
2"	0 to 900	900 to 1,800	1,800 to 2,700	All over 2,700
3"	0 to 2,000	2,000 to 4,000	4,000 to 6,000	All over 6,000
4"	0 to 3,400	3,400 to 6,800	6,800 to 10,200	All over 10,200

Section 5. Sec. 102-174. Distributor and institution user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-174. Distributor and institution user rates.

The following water user rates are applicable to contractual service in or out of the city accountable through master meter or meters to user-owned and user-maintained distribution systems:

- (1) First 500,000 gallons per month, per 1,000 gallons.....\$4.59
- (2) Excess of 500,000 gallons per month, per 1,000 gallons.....\$4.42

Section 6. Section 102-175. Fill Station user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-175. Fill station user rates.

The water user rate applicable for fill station usage will be charged at \$6.73 per 1,000 gallons.

Section 7. Sec. 102-176. Fire hydrant metered water user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-176. Fire hydrant metered water user rates.

- (a) The water user rate applicable to permitted users of fire hydrant meters for measuring water supplied from a city fire hydrant is \$6.73 per 1,000 gallons, plus a service charge as

follows:

- | | |
|-----------------------|----------------------------------|
| (1) 1 to 90 days: | \$1.00 per day, minimum of 1 day |
| (2) 91 to 180 days: | \$2.00 per day |
| (3) 181 days or more: | \$3.00 per day |

A damage deposit of \$1,250.00 will be collected at the time of issuance of the fire hydrant permit. Upon return of the fire hydrant meter in condition acceptable to the city, the damage deposit will be returned.

- (b) Tampering with, or in any manner altering the operation of the meter such that the register usage is less than the actual usage will result in an additional fee of \$5.00 per day being charged retroactive to the date the hydrant meter permit was issued and ending on the date the meter is returned. The charges provided in this paragraph shall be in addition to the charges provided in paragraph (a) of this section.
- (c) If the city cannot furnish a fire hydrant meter, the customer may use the customer's own meter upon obtaining a permit under provisions of this section. The customer may be required to submit written proof that the meter has been calibrated and reads accurately.

Section 8. Sec. 102-177. Municipal park rate, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-177. Municipal park rate.

- (a) Monthly user rate for the municipal park class is based upon the rate of \$2.55 per 1,000 gallons.
- (b) This service is interruptible to the extent the city may limit the times of irrigation and the amount of water used. The city and the Apex Park and Recreation District-owned properties, which have occupied structures located thereon, are excluded from this class of water service.

Section 9. Sec. 102-178. Unmetered standby fire protection service charge, of the Arvada City Code, is hereby amended and shall read as follows:

Bimonthly charges for unmetered standby fire protection service is as follows:

	In City	Out of City
a. Fire hydrants, each	\$6.73	\$10.10
b. Automatic sprinkler system:		
$\frac{5}{8}$ "— $\frac{3}{4}$ " service line	\$6.73	\$10.10
1" service line	\$6.73	\$10.10
1 $\frac{1}{4}$ " service line	\$13.47	\$20.20
1 $\frac{1}{2}$ " service line	\$13.47	\$20.20

2" service line	\$20.18	\$30.27
3" service line	\$26.88	\$40.32
4" service line	\$40.37	\$60.56
6" service line	\$53.82	\$80.73
8" service line	\$63.68	\$95.53

Section 10. Sec. 102-179. Lost water rate, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-179. Lost water rate.

Unmetered water lost or used due to activities such as, but not limited to, excavation, demolition, landscaping, or intentional acts of vandalism or theft will be billed to the responsible party at the rate of \$6.73 per 1,000 gallons. The estimated volume of unmetered lost water will be based on main size, break size, water pressure, flow time, or other available data.

Section 11. Sec. 102-180. Special service fees and user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-180. Special service fees and user rates.

Prior to use of the fire hydrant as a source of water for special short-term community activities, the applicant will obtain a hydrant permit and water meter from the utilities department at least 24 hours prior to the time of use. Charges for the service and the water used will be based only on the water user rate of \$4.48 per 1,000 gallons.

Section 12. The rates set forth herein shall take effect on January 1, 2022.

Section 13. This ordinance shall be effective five days after publication following final passage.

INTRODUCED, READ AND ORDERED PUBLISHED this 18th day of October, 2021.

PASSED, ADOPTED AND APPROVED this _____ day of _____, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

Publication Dates: October 21, 2021

REDLINE/STRIKETHROUGH VERSION

FOR INFORMATION ONLY – NOT PART OF THE ORDINANCE

Underlined indicates new material
~~Strikethrough~~ indicated deleted material

Section 1. Sec. 102-170. Residential user charges -- Within city, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-170. Residential user charges—Within city.

Bimonthly user charges for residential class of service within the city shall be based upon the following service charges and usage rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

- (1) Single-family or other individually connected units:
- a. The bimonthly service charge is..... ~~\$5.83~~
9.83
- b. Plus, a bimonthly usage charge as follows:
1. 0—30,000 gallons, per 1,000.....\$4.~~29~~ 48
2. from 30,001 to 60,000 gallons, per 1,000.....\$5.~~36~~ 60
3. from 60,001 to 90,000 gallons, per 1,000.....\$6.~~45~~ 73
4. All above 90,000 gallons, per 1,000.....\$8.~~59~~ 97
- (2) Duplex, multifamily, townhouse, or other units that are interconnected:
- a. The total bimonthly service charge regardless of usage is as follows:

<i>Number of Units</i>	<i>Service Charge</i>
2—6	\$9.15 <u>\$15.43</u>
7—18	\$16.00 <u>26.98</u>
19—60	\$21.72 <u>36.62</u>
61—144	\$49.15 <u>82.87</u>
Over 144	\$83.44 <u>140.69</u>

- b. Plus, a bimonthly usage charge as follows:
1. 0—30,000 gallons for the first unit plus 13,000 gallons for each additional unit at the rate of \$~~4.29~~ 4.48 per 1,000 gallons.
2. 30,001—60,000 gallons for the first unit plus 26,000 gallons for each additional unit at the rate of \$~~5.36~~ 5.60 per 1,000 gallons.
3. 60,001—90,000 gallons for the first unit plus 39,000 gallons for each additional unit at the rate of \$~~6.45~~ 6.73 per 1,000 gallons.
4. All remaining usage at the rate of \$~~8.59~~ 8.97 per 1,000 gallons.

Section 2. Sec. 102-171. Outside city, of the Arvada City Code, is hereby amended and shall

read as follows:

Sec. 102-171. Outside city.

Bimonthly user charges for residential service outside the city shall be based upon the following service charges and user rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

- (1) Single-family or other individually connected units:
 - a. The bimonthly service charge is.....\$~~11.66~~ 19.66
 - b. Plus, a bimonthly usage charge as follows:
 1. 0—30,000 gallons per 1,000.....\$8.~~59~~96
 2. from 30,001 to 60,000 gallons, per 1,000.....\$~~10.73~~ 11.19
 3. from 60,001 to 90,000 gallons, per 1,000.....\$~~12.90~~ 13.47
 4. All over 90,000 gallons, per 1,000.....\$17.~~48~~ 94
- (2) Duplex, multifamily, townhouse, or other units that are interconnected:
 - a. The total bimonthly service charge regardless of usage is as follows:

<i>Number of Units</i>	<i>Service Charge</i>
2—6	\$ 18.29 <u>30.86</u>
7—18	\$ 32.01 <u>53.96</u>
19—60	\$ 43.43 <u>73.24</u>
61—144	\$ 98.31 <u>165.74</u>
Over 144	\$ 166.88 <u>281.38</u>

- b. Plus, a bimonthly usage charge as follows:
 1. 0—30,000 gallons for the first unit plus 13,000 gallons for each additional unit at the rate of \$8.~~59~~96 per 1,000 gallons.
 2. 30,001—60,000 gallons for the first unit plus 26,000 gallons for each additional unit at the rate of \$~~10.73~~ 11.19 per 1,000 gallons.
 3. 60,001—90,000 gallons for the first unit plus 39,000 gallons for each additional unit at the rate of \$~~12.90~~ 13.47 per 1,000 gallons.
 4. All remaining usage at the rate of \$17. ~~48~~ 94 per 1,000 gallons.

Section 3. Sec. 102-172. Nonresidential user charges--Within city, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-172. Nonresidential user charges—Within city.

Bimonthly user charges for nonresidential class of service within the city is based upon the following service charges and user rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

<i>Meter Size</i>	<i>Service Charge</i>
$\frac{5}{8}" \times \frac{3}{4}"$	\$5.83 <u>9.83</u>
$\frac{3}{4}"$	\$6.95 <u>11.72</u>
1"	\$9.15 <u>15.43</u>
1 $\frac{1}{2}"$	\$16.00 <u>26.98</u>
2"	\$21.72 <u>36.62</u>
3"	\$49.15 <u>82.87</u>
4"	\$83.44 <u>140.69</u>

<i>Meter Size</i>	<i>Quantity (in 1,000 gallons) at a rate of \$4.48 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$5.60 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$6.73 per 1,000 gallons</i>	<i>Quantity (in 1,000 gallons) at a rate of \$8.97 per 1,000 gallons</i>
$\frac{5}{8}" \times \frac{3}{4}"$	0 to 170	170 to 340	340 to 510	All over 510
$\frac{3}{4}"$	0 to 170	170 to 340	340 to 510	All over 510
1"	0 to 280	280 to 560	560 to 840	All over 840
1 $\frac{1}{2}"$	0 to 600	600 to 1,200	1,200 to 1,800	All over 1,800
2"	0 to 900	900 to 1,800	1,800 to 2,700	All over 2,700
3"	0 to 2,000	2,000 to 4,000	4,000 to 6,000	All over 6,000
4"	0 to 3,400	3,400 to 6,800	6,800 to 10,200	All over 10,200

Section 4. Sec. 102-173. Same--Outside city, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-173. Same—outside city.

Bimonthly user charges for nonresidential class of service outside the city is based upon the following service charges and user rates; provided, however, there will be a bimonthly service charge regardless of usage as set forth in this section:

<i>Meter Size</i>	<i>Service Charge</i>
$\frac{5}{8}" \times \frac{3}{4}"$	\$11.66 <u>19.66</u>
$\frac{3}{4}"$	\$13.91 <u>23.44</u>
1"	\$18.29 <u>30.86</u>
1 $\frac{1}{2}"$	\$32.01 <u>53.96</u>
2"	\$43.43 <u>73.24</u>
3"	\$98.31 <u>165.74</u>
4"	\$166.88 <u>281.38</u>

<i>Meter Size</i>	<i>Quantity (in 1,000 gallons) at a rate</i>	<i>Quantity (in 1,000 gallons) at a rate</i>	<i>Quantity (in 1,000 gallons) at a rate</i>	<i>Quantity (in 1,000 gallons) at a rate</i>
-------------------	--	--	--	--

	<i>of \$8. 59 <u>96</u> per 1,000 gallons</i>	<i>of \$10.73 <u>11.19</u> per 1,000 gallons</i>	<i>of \$12.90 <u>13.47</u> per 1,000 gallons</i>	<i>of \$17. 18 <u>94</u> per 1,000 gallons</i>
$\frac{5}{8}" \times \frac{3}{4}"$	0 to 170	170 to 340	340 to 510	All over 510
$\frac{3}{4}"$	0 to 170	170 to 340	340 to 510	All over 510
1"	0 to 280	280 to 560	560 to 840	All over 840
1 $\frac{1}{2}"$	0 to 600	600 to 1,200	1,200 to 1,800	All over 1,800
2"	0 to 900	900 to 1,800	1,800 to 2,700	All over 2,700
3"	0 to 2,000	2,000 to 4,000	4,000 to 6,000	All over 6,000
4"	0 to 3,400	3,400 to 6,800	6,800 to 10,200	All over 10,200

Section 5. Sec. 102-174. Distributor and institution user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-174. Distributor and institution user rates.

The following water user rates are applicable to contractual service in or out of the city accountable through master meter or meters to user-owned and user-maintained distribution systems:

- (1) First 500,000 gallons per month, per 1,000 gallons.....\$4. ~~40~~ 59
- (2) Excess of 500,000 gallons per month, per 1,000 gallons.....\$4. ~~23~~ 42

Section 6. Section 102-175. Fill Station user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-175. Fill station user rates.

The water user rate applicable for fill station usage will be charged at \$6. ~~45~~ 73 per 1,000 gallons.

Section 7. Sec. 102-176. Fire hydrant metered water user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-176. Fire hydrant metered water user rates.

- (a) The water user rate applicable to permitted users of fire hydrant meters for measuring water supplied from a city fire hydrant is \$6. ~~45~~ 73 per 1,000 gallons, plus a service charge as follows:

- (1) 1 to 90 days: \$1.00 per day, minimum of 1 day
- (2) 91 to 180 days: \$2.00 per day
- (3) 181 days or more: \$3.00 per day

A damage deposit of \$1,250.00 will be collected at the time of issuance of the fire hydrant

permit. Upon return of the fire hydrant meter in condition acceptable to the city, the damage deposit will be returned.

- (b) Tampering with, or in any manner altering the operation of the meter such that the register usage is less than the actual usage will result in an additional fee of \$5.00 per day being charged retroactive to the date the hydrant meter permit was issued and ending on the date the meter is returned. The charges provided in this paragraph shall be in addition to the charges provided in paragraph (a) of this section.
- (c) If the city cannot furnish a fire hydrant meter, the customer may use the customer's own meter upon obtaining a permit under provisions of this section. The customer may be required to submit written proof that the meter has been calibrated and reads accurately.

Section 8. Sec. 102-177. Municipal park rate, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-177. Municipal park rate.

- (a) Monthly user rate for the municipal park class is based upon the rate of \$2.~~44~~55 per 1,000 gallons.
- (b) This service is interruptible to the extent the city may limit the times of irrigation and the amount of water used. The city and the Apex Park and Recreation District-owned properties, which have occupied structures located thereon, are excluded from this class of water service.

Section 9. Sec. 102-178. Unmetered standby fire protection service charge, of the Arvada City Code, is hereby amended and shall read as follows:

Bimonthly charges for unmetered standby fire protection service is as follows:

	In City	Out of City
a. Fire hydrants, each	\$6. 45 <u>73</u>	\$9.67 <u>10.10</u>
b. Automatic sprinkler system:		
5/8"—3/4" service line	\$6. 45 <u>73</u>	\$9.67 <u>10.10</u>
1" service line	\$6. 45 <u>73</u>	\$9.67 <u>10.10</u>
1 1/4" service line	\$12.90 <u>13.47</u>	\$19.35 <u>20.20</u>
1 1/2" service line	\$12.90 <u>13.47</u>	\$19.35 <u>20.20</u>
2" service line	\$19.33 <u>20.18</u>	\$29.00 <u>30.27</u>
3" service line	\$25.75 <u>26.88</u>	\$38.60 <u>40.32</u>
4" service line	\$38.67 <u>40.37</u>	\$58.00 <u>60.56</u>
6" service line	\$51.55 <u>53.82</u>	\$77.30 <u>80.73</u>
8" service line	\$61.00 <u>63.68</u>	\$91.50 <u>95.53</u>

Section 10. Sec. 102-179. Lost water rate, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-179. Lost water rate.

Unmetered water lost or used due to activities such as, but not limited to, excavation, demolition, landscaping, or intentional acts of vandalism or theft will be billed to the responsible party at the rate of \$6. ~~45-73~~ per 1,000 gallons. The estimated volume of unmetered lost water will be based on main size, break size, water pressure, flow time, or other available data.

Section 11. Sec. 102-180. Special service fees and user rates, of the Arvada City Code, is hereby amended and shall read as follows:

Sec. 102-180. Special service fees and user rates.

Prior to use of the fire hydrant as a source of water for special short-term community activities, the applicant will obtain a hydrant permit and water meter from the utilities department at least 24 hours prior to the time of use. Charges for the service and the water used will be based only on the water user rate of \$4. ~~2948~~ per 1,000 gallons.



REPORT TO CITY COUNCIL ORDINANCE FIRST READING

AGENDA ITEM
8.C.2.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-038 An Ordinance Amending Section 102-206 of Chapter 102, Utilities, of the Arvada City Code Pertaining to Wastewater Users Rates and Bimonthly Service Charges (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

Report in Brief

The Utilities Department is proposing to increase wastewater user rates by 2.6% and bimonthly service fees by \$2 for 2022. This will increase costs by \$18.45 per year (\$1.54 per month) for a typical single family account.

The Arvada team recommends that the City Council approve CB21-038, An Ordinance Amending Section 102-206 of Chapter 102, Utilities, of the Arvada City Code Pertaining to Wastewater Users Rates (Public Hearing to be set for November 15, 2021 at 6:15 p.m.).

Financial Impact

The proposed 2.6% rate increase and \$2 bimonthly service charge increase will generate approximately \$929,000 annually in new revenue for the Wastewater Fund.

Background

The proposed Wastewater Fund budget for 2022 is \$15,677,000. The Operations & Maintenance portion includes increases in personnel costs, higher costs from vendors, new equipment, and a 3% increase in the rate charged to the City by Metro Water Recovery (formerly named the Metro Wastewater Reclamation District). The proposed budget includes funding a study of the Collection System and excess loading charges passed through to Metro Water Recovery. A new engineering position has been added. Overall operational costs are expected to increase by \$929,000 from 2021 as shown in the table below.

2021 Operations Budget	\$14,748,000
Salaries & Benefits Changes	\$27,000
Metro Rate Increase	\$220,000
City Support Services	\$38,000
General Vendor Price Increases	\$32,000
Equipment	\$74,000
New/Upgraded Positions	\$109,000
Collection System Analysis	\$200,000
Excess Metro Loading Charges	\$229,000
Subtotal	\$929,000
2022 Operating Budget	\$15,677,000

Discussion

The average wastewater rate increase over the last five years was 2.4%. The bimonthly service fee was last adjusted in 2009. A primary cost driver for the Wastewater Operating Budget is Metro Water Recovery (formerly named the Metro Wastewater Reclamation District), which provides for the treatment and disposal of sewage generated by our customers. The Metro District adopted a 3% rate increase in 2022. In recent years, more of the City's charges have been coming from loadings than flows, which has resulted in overall charges increasing at a rate higher than 3%.

An increase in funding for new equipment, an engineering position, and a study of the City's collection system are also requested this year.

The City team is recommending a rate increase of 2.6% and a bimonthly service charge increase of \$2. If approved, this rate and fee change will result in an additional \$18.45 per year (\$1.54 per month) for the average single family owner.

Rates and fees are two sources of revenue for the Wastewater Enterprise Fund. The Wastewater Utility also receives funding from tap fees. The City typically adjusts rates each year to allow for smooth, steady increases over time. This is the first time since 2009 that an increase in bimonthly fees is being recommended. A Wastewater Master Plan is in development, as directed by the City Council Strategic Plan. Looking ahead, service fees will be an important source of funding for reinvestment projects identified in the master plan process. The City team will also be evaluating the schedule of tap fees in the year ahead.

Public Contact

Posting of the City Council agenda. In addition, the City Council received a presentation on Sewer Infrastructure Funding during the August 23 Workshop.

Commission Recommendation

N/A

Strategic Alignment

Adjusting sewer rates is consistent with the Infrastructure Priority Area of the City Council Strategic Plan and aligns with the following Principle:

Provides the community with a safe, reliable, high-quality water supply, drainage system, and wastewater disposal services for full city build-out, as defined by the Comprehensive Plan. This includes maintaining utility rates at the lowest practical levels with accurate billing that supports the replacement of aging infrastructure in order to maintain robust utility systems.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve CB21-038, An Ordinance Amending Section 102-206 of Chapter 102, Utilities, of the Arvada City Code Pertaining to Wastewater Users Rates and Bimonthly Services Charges be (approved on first reading, ordered published in full and a Public Hearing date be set for November 15, 2021 at 6:15 p.m.) (rejected)

Suggested Motion:

I move that CB21-038, An Ordinance Amending Section 102-206 of Chapter 102, Utilities, of the Arvada City Code Pertaining to Wastewater Users Rates and Bimonthly Service Charges, be (approved on first reading, ordered published in full, and a public hearing set for November 15, 2021, at 6:15 p.m.) (rejected).

SUBJECT: CB21-038 An Ordinance Amending Section 102-206 of Chapter 102, Utilities, of the Arvada City Code Pertaining to Wastewater Users Rates and Bimonthly Service Charges (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

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ITEM: 8.C.2.

Prepared by:
Sharon Israel, Director of Utilities

Reviewed by:

Approved by:

Sharon Israel, Director of Utilities	10/6/2021
Bryan Archer, Director of Finance	10/6/2021
Erika Pierce, Litigation Paralegal	10/6/2021
Jessica Morales, Assistant City Attorney	10/6/2021
Rachel Morris, City Attorney	10/7/2021
Lorie Gillis, Deputy City Manager	10/7/2021
Mark Deven, City Manager	10/7/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-038
ORDINANCE NO. _____

AN ORDINANCE AMENDING SECTION 102-206 OF CHAPTER 102, UTILITIES, OF THE
ARVADA CITY CODE PERTAINING TO WASTEWATER USERS RATES AND
BIMONTHLY SERVICES CHARGES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Section 102-206. User charges, of the Arvada City Code, is hereby amended
and shall read as follows:

Sec. 102-206. User charges.

Each connected property owner or user of the city sewer system is required to pay to the city a
user charge based upon the following rate schedule according to the classified strength of
sewage:

(1) Normal strength charges:

Bi-monthly usage (gallons)	Rate
a. Service charge, regardless of usage	\$4.44
b. All usage, per 1,000 gallons	\$5.30

(2) Plus, extra strength charges as follows:

	Per Pound
a. BOD in excess of 300 mg/l	\$0.55
b. SS in excess of 330 mg/l	\$0.58
c. TKN in excess of 35 mg/l	\$1.13

Section 2. The rates set forth herein shall take effect on January 1, 2022.

Section 3. This ordinance shall be effective five days after publication following final
passage.

INTRODUCED, READ AND ORDERED PUBLISHED this 18th day of October, 2021.

PASSED, ADOPTED AND APPROVED this _____ day of _____, 2021

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

Publication Dates: October 21, 2021

REDLINE/STRIKETHROUGH VERSION

FOR INFORMATION ONLY – NOT PART OF THE ORDINANCE

Underlined indicates new material
~~Strikethrough~~ indicated deleted material

Section 1. Sec. 102-206. User charges, of the Arvada City Code is hereby amended and shall read as follows:

Sec. 102-206. User charges.

Each connected property owner or user of the city sewer system is required to pay to the city a user charge based upon the following rate schedule according to the classified strength of sewage:

(1) Normal strength charges:

Bi-monthly usage (gallons)	Rate
a. Service charge, regardless of usage	\$ <u>4.44</u> 2.44
b. All usage, per 1,000 gallons	\$ <u>5.30</u> 17

(2) Plus, extra strength charges as follows:

	Per Pound
a. BOD in excess of 300 mg/l	\$0. <u>55</u> 40
b. SS in excess of 330 mg/l	\$0. <u>58</u> 68
c. TKN in excess of 35 mg/l	\$1. <u>13</u> 00



REPORT TO CITY COUNCIL ORDINANCE FIRST READING

**AGENDA ITEM
8.C.3.**

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-039 An Ordinance Rezoning Certain Land Within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005 (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

Report in Brief

Select Building Group and Linda Chassman Craddock and Jeffrey Craddock are requesting approval of a rezoning and PUD Development Plan in order to expand the existing business (Animal Assisted Therapy Programs of Colorado). Animal Assisted Therapy Programs of Colorado is a non-profit organization that offers specialized therapy utilizing animals to treat patients with mental, developmental, and behavioral disadvantages.

The property is approximately 3.29 acres in size and contains a 3,640 square-foot primary building, three additional accessory buildings, and various mini-structures. The primary building contains office spaces for administrative staff as well as therapy rooms. The various accessory buildings contain additional therapy rooms as well as barns for animals. Additionally, a stable located on the west-side of the property is used to house various large animals, including horses. In addition to horses, other animals including alpacas, donkeys, goats, dogs, cats, rabbits, guinea pigs, and rats are also on-site and are kept either in secure barns or in the building. One full-time caretaker for the animals lives on-site in an accessory dwelling unit.

The intent of the PUD zoning and PUD Development Plan is to allow a unique use to be established specifically for a site and operate while ensuring that the City can maintain strict control over any changes in use and expansions in the future. This specific PUD will establish a more agricultural/commercial use, allowing for employees and customers while at the same time allowing large and small animals to be kept on the property as well as a care-taker. The PUD intends to preserve the more rural and agricultural character by keeping the design of the existing building as a single-family form, allowing the parking lot to remain unpaved, allowing various barns, stables, and accessory buildings to remain, and keeping the visual connections between the existing neighborhood to the north.

The Arvada team recommends that the City Council approve CB21-039, An Ordinance Rezoning certain land within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005.

Financial Impact

The approval of the recommended action will have no financial impact.

Background

The subject property is located at 7275 Kipling Street and is currently operating as Animal Assisted Therapy Programs of Colorado.

The subject property was annexed into the City of Arvada in 1979 with the Parcel A Unilateral Annexation and is currently

SUBJECT: CB21-039 An Ordinance Rezoning Certain Land Within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005 (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

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ITEM: 8.C.3.

unplatted land. The property has historically operated as an agricultural/commercial property with previous uses including a kennel with care-takers living in the main building as well as other large animals living on the property.

Discussion

It is the responsibility of the applicant to justify the requested land use application. The City Council must reach a decision based on its findings regarding the approval criteria shown in the table below and upon testimony heard during the public hearing as it applied to the criteria.

The Community and Economic Development team performed an analysis of the proposal, based on the approval criteria listed in Division 8-3-4, Zoning and Rezoning, and presents the following findings:

Approval Criteria from Staff Report Pages 7, 8 & 9.

Div. 8-3-4 Zoning and Rezoning Approval Criteria	Finding	Rationale
1. The rezoning is consistent with the Arvada Comprehensive Plan, or an adopted sub-area plan, corridor plan, or urban renewal plan, or reflects conditions that have changed since the adoption of the Comprehensive Plan.	Complies	The rezoning is consistent with the Low-Density Residential designation in the Comprehensive Plan as demonstrated in the report.
2. The intended land use is consistent with the stated intent of the proposed zoning district.	Complies	The intended land use is consistent with intent of the PUD zone district. The PUD zone district will allow a unique use to operate with standards that are specific to this site.
3. Facilities and services (including sewage and waste disposal, water, gas, electricity, police and fire protection, and roads and transportation, as applicable) will, prior to development, be available to serve the subject property while maintaining adequate levels of service to existing development.	Complies	Facilities and services necessary to serve the property are available. A new fire hydrant will also be installed to service this property and others nearby.
4. The intended land use for which the rezoning is sought will not result in significant adverse impacts upon the natural environment, including air, water, noise, stormwater management, wildlife, and vegetation, or such impacts will be substantially mitigated.	Complies	The intended land use will not result in significant adverse impacts.
5. The rezoning is consistent with the character of existing or planned development on adjacent properties and in the surrounding area or neighborhood, or measures will be taken to substantially buffer or otherwise substantially mitigate any negative impacts.	Complies	The rezoning is consistent with the character of the existing area. The agricultural character of the property will be preserved while allowing expansion of the commercial use.

Public Contact

SUBJECT: CB21-039 An Ordinance Rezoning Certain Land Within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005 (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

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ITEM: 8.C.3.

The required neighborhood meeting for this project took place on August 26, 2020. The applicant, team members, and two neighbors were in attendance.

The neighbors raised concerns related to the height and scale of the new addition, noise, animals, and well water impacts.

Written notice was sent 15 days prior to the meeting, a published notice was posted in the newspaper 15 days prior to the meeting, and a public hearing sign was posted 15 days prior to the meeting. In addition, the City Council agenda was posted.

Commission Recommendation

The Planning Commission voted 6 to 0 in favor of the Council's approval on October 5, 2021.

Strategic Alignment

The project is consistent with the principles stated within the Community and Economic Development Priority Area of the City Council Strategic Plan.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve CB21-039, An Ordinance Rezoning Certain Land Within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005, be approved on first reading, ordered published in full, and a public hearing set for November 15, 2021 at 6:15 p.m.

Suggested Motion:

I move that CB21-039, An Ordinance Rezoning Certain Land Within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005, be (approved on first reading, ordered published in full, and a public hearing set for November 15, 2021 at 6:15 p.m.) (rejected).

Prepared by:
Abigail Ogg, Administrative Specialist

Reviewed by:

Approved by:

Jeremiah Bebo, Planner II	10/1/2021
Josie Suk, Development Systems and Administrative Manager	10/1/2021
Robert Smetana, Manager of City Planning and Development	10/1/2021

SUBJECT: CB21-039 An Ordinance Rezoning Certain Land Within the City of Arvada, from City of Arvada RA (Residential/Agricultural) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, located at 7275 Kipling Street, Unit A and Unit B, Arvada, Colorado 80005 (Public Hearing to be set for November 15, 2021 at 6:15 p.m.)

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ITEM: 8.C.3.

Ryan Stachelski, Director of Community and Economic Development	10/1/2021
Gail Walker, Legal Specialist-Contracts	10/1/2021
Emily Grogg, Senior Assistant City Attorney	10/4/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/7/2021
Mark Deven, City Manager	10/7/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-039
ORDINANCE NO.

AN ORDINANCE REZONING CERTAIN LAND WITHIN THE CITY OF ARVADA,
FROM CITY OF ARVADA RA (RESIDENTIAL/AGRICULTURAL) TO CITY OF
ARVADA PUD (PLANNED UNIT DEVELOPMENT) AND AMENDING THE
OFFICIAL ZONING MAPS OF THE CITY OF ARVADA, COLORADO, LOCATED AT
7275 KIPLING STREET, UNIT A AND UNIT B, ARVADA, COLORADO 80005

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA,
COLORADO:

Section 1. The following described property is hereby rezoned from City of Arvada RA
(Residential/Agricultural) to City of Arvada PUD (Planned Unit Development).

A PARCEL OF LAND DESCRIBED ON THE ATTACHED EXHIBIT A.

Section 2. The Official Zoning Maps of the City of Arvada are hereby amended in
accordance herewith.

Section 3. This ordinance shall be effective fifteen days after publication following final
passage.

INTRODUCED, READ, AND ORDERED PUBLISHED this 18th day of October, 2021.

PASSED, ADOPTED, AND APPROVED this _____ day of _____, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

Publication Dates: October 21, 2021

LEGAL DESCRIPTION

THE SOUTH 1/2 OF TRACT 2, STAR ACRES, RECORDED UNDER RECEPTION NO. 49465618 TOGETHER WITH A TRACT OF LAND LYING WITHIN THE SOUTHEAST QUARTER OF SECTION 33, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

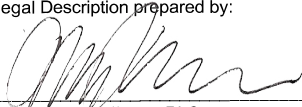
COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 33, FROM WHENCE THE EAST 1/4 CORNER OF SAID SECTION BEARS N01°14'59"W A DISTANCE OF 2696.69 FEET (BASIS FOR ALL SUBSEQUENT BEARINGS); THENCE N01°14'59"W ALONG THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 33 A DISTANCE OF 549.70 FEET TO THE POINT OF BEGINNING; THENCE S88°45'01"W A DISTANCE OF 50.00 FEET TO A POINT ON THE WESTERLY RIGHT OF WAY LINE OF KIPLING STREET AND ON THE NORTHERLY RIGHT OF WAY OF THE ARAPAHOE DITCH (A.K.A. FARMER'S HIGHLINE CANAL); THENCE ALONG SAID NORTHERLY RIGHT OF WAY OF THE ARAPAHOE DITCH THE FOLLOWING FIVE (5) COURSES:

1. N79°10'38"W A DISTANCE OF 67.25 FEET;
2. N74°36'46"W A DISTANCE OF 417.40 FEET TO A POINT OF CURVATURE;
3. ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 686.71 FEET AND AN ARC LENGTH OF 122.27 FEET, THROUGH A CENTRAL ANGLE OF 10°12'07" (CHORD BEARS N79°42'49"W A DISTANCE OF 122.11 FEET);
4. N84°48'53"W A DISTANCE OF 253.78 FEET TO A POINT OF CURVATURE;
5. ALONG A CURVE TO THE RIGHT HAVING A RADIUS OF 136.56 FEET AND AN ARC LENGTH OF 125.82 FEET, THROUGH A CENTRAL ANGLE OF 52°47'26" (CHORD BEARS N58°25'10"W A DISTANCE OF 121.42 FEET);

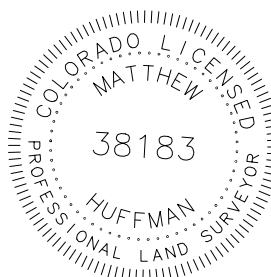
THENCE, DEPARTING FROM THE NORTHERLY RIGHT OF WAY OF THE ARAPAHOE DITCH AND TRAVELING N89°51'22"E ALONG THE SOUTH LINE OF STAR ACRES A DISTANCE OF 749.71 FEET TO THE SOUTHWEST CORNER OF TRACT 2, STAR ACRES; THENCE N00°43'05"W A DISTANCE OF 148.54 FEET; THENCE S87°48'50"E A DISTANCE OF 188.93 FEET TO A POINT ON THE WESTERLY RIGHT OF WAY LINE OF KIPLING STREET; THENCE N88°45'01"E A DISTANCE OF 50.00 FEET TO A POINT ON THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 33; THENCE S01°14'59"E ALONG THE EAST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 33, A DISTANCE OF 375.00 FEET TO THE POINT OF BEGINNING; LESS AND EXCEPT THE EASTERLY 50 FEET THEREOF;

CONTAINING 143,593 SQ.FT. (3.296 ACRES), MORE OR LESS.

Legal Description prepared by:


Matthew L. Huffman, PLS
Licensed Professional Land Surveyor,
State of Colorado, No. 38183

August 31, 2021
(date)



HUFFMAN SURVEYING
PO BOX 12293
DENVER, CO 80212
(303) 421-5263
www.huffmansurveying.com

City of Arvada
Community and Economic Development Department
PUBLIC HEARING STAFF REPORT

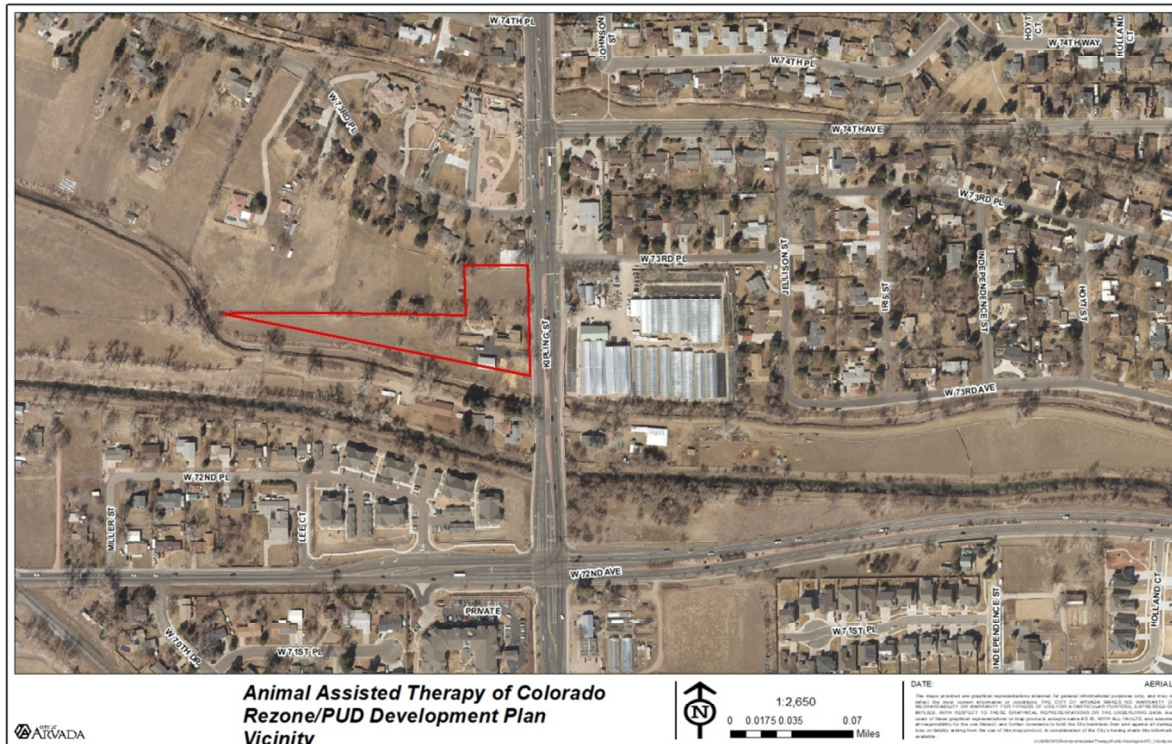
Animal Assisted Therapy Programs of Colorado
Rezoning/PUD Development Plan
DA2020-0143

NATURE OF REQUEST

Select Building Group and Linda Chassman Craddock and Jeffrey Craddock are requesting approval of a rezoning and PUD Development Plan in order to expand the existing business (Animal Assisted Therapy Programs of Colorado). Animal Assisted Therapy Programs of Colorado is a non-profit organization that offers specialized therapy utilizing animals to treat patients with mental, developmental, and behavioral disadvantages.

The property is approximately 3.29 acres in size and contains a 3,640 square-foot primary building, three additional accessory buildings, and various mini-structures. The primary building contains office spaces for administrative staff as well as therapy rooms. The various accessory buildings contain additional therapy rooms as well as barns for animals. Additionally, a stable located on the west-side of the property is used to house various large animals including horses. In addition to horses other various animals including alpacas, donkeys, goats, dogs, cats, rabbits, guinea pigs, and rats are also on-site and are kept either in secure barns or in the building. One full-time caretaker for the animals lives on-site in an accessory dwelling unit.

The intent of the PUD zoning and PUD Development Plan is to allow a unique use to be established specifically for a site and operate while ensuring that the City can maintain strict control over any changes in use and expansions in the future. This specific PUD will establish a more agricultural/commercial use allowing for employees and customers while at the same time allowing large and small animals to be kept on the property as well as a care-taker. The PUD intends to preserve the more rural and agricultural character by keeping the design of the existing building as a single-family form, allowing the parking lot to remain unpaved, allowing various barns, stables, and accessory buildings to remain, and keeping the visual connections between the existing neighborhood to the north.



LOCATION AND HISTORY

The subject property is located at 7275 Kipling Street and is currently operating as Animal Assisted Therapy Programs of Colorado.

The subject property was annexed into the City of Arvada in 1979 with the Parcel A Unilateral Annexation and is currently unplatted land. The property has historically operated as an agricultural/commercial property with previous uses including a kennel with care-takers living in the main building as well as other large animals living on the property.

NEIGHBORHOOD MEETING

Division 8-2-2 of the Land Development Code requires that at least one neighborhood meeting be held for projects that require public hearings before the Planning Commission and City Council.

The required neighborhood meeting for this project took place on August 26, 2020. The applicant, staff, and two neighbors were in attendance.

The neighbors raised concerns related to the height and scale of the new addition, noise, animals, and well water impacts.

The applicant prepared a summary of the meeting, which is attached.

PUBLIC NOTIFICATION

Division 8-2-4 of the Land Development Code requires public notification for all public hearings as follows:

Written Notice: At least 15 days prior to all public hearings, written notice must be mailed to all property owners within 500 feet of the subject property and to all homeowners associations and neighborhood associations with a known interest in the subject property. The applicant will provide an affidavit of mailing verifying this requirement has been met prior to the public hearing.

Posted Notice: At least 15 days prior to all public hearings, signs notifying the public of the hearing must be posted on the subject property. The applicant will provide a posting log verifying that this requirement has been met prior to the public hearing.

Published Notice: At least 15 days prior to all public hearings, notice of the hearing must be published in a newspaper of general circulation in the City. The required notice has been published.

SEVERED MINERAL RIGHTS

At least 30 days prior to the public hearing, written notice of the application must be mailed to any owner of mineral rights associated with the subject property. The applicant has provided the required Certification of Notice pursuant to Colorado Revised Statute 24-65.5-103.

DEVELOPMENT REVIEW TIMELINE

The applicant submitted their development application on December 29, 2020 and were placed on the standard track. The applicant explored changing the scope of the project throughout the review process and therefor did not resubmit during the standard timeframe which pushed their process out longer. The review was completed in 31 weeks.

ALIGNMENT WITH CITY COUNCIL STRATEGIC PLAN

The project is consistent with the City Council Strategic Plan principles for the Community and Economic Development work system.

ZONING AND LAND USE

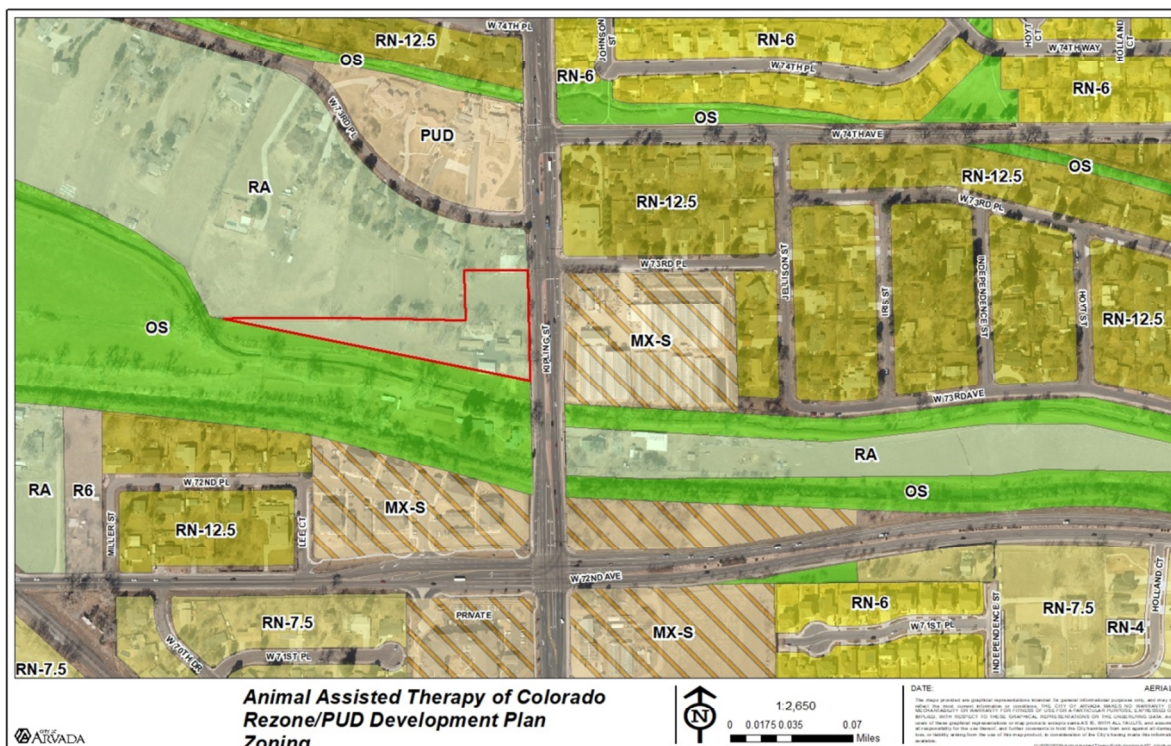
The subject property is currently zoned RA (Residential/Agricultural) and is approximately 3.29 in size.

Surrounding properties are zoned and utilized as follows:

Direction	Zoning	Actual Use
North	RA	Single-family home
South	OS (Open Space)	Farmers Highline Canal
East (across Kipling Street)	MX-S (Mixed Use – Suburban)	Greenhouses
West	RA	Single-family homes

The applicant is proposing to rezone the property from RA to PUD (Planned Unit Development). The intent of the rezoning is to legally establish the use which is not specifically defined in the LDC. The purpose of the PUD zone district is to: 1) provide for procedures by which a subject property can be uniquely zoned and developed to meet the needs of the City, property owners, residents, and developers and 2) to allow for flexibility that results in innovative or exceptional project and site design or for unique and imaginative uses or combinations of uses, where no other zoning district set out in this Land Development Code would allow for a product that is substantially similar to the proposed development, and where the proposed development would result in a net benefit to the community.

The PUD zoning would allow the business expansion and building addition, the ability to keep animals already allowed in the RA zone district on site, and allow an on-site caretaker to live on the property.



PROJECT ANALYSIS

Compliance with the Comprehensive Plan

The property is designated as Low-Density Residential on the Comprehensive Plan Future Land Use map. The intention of the Low Density Residential designation is to allow for residential densities lower than typically found in suburban residential areas and encourage more rural characteristics. Both residential and agricultural uses are allowed under this designation. The proposed development is consistent with the Low Density Residential designation as well as the following Comprehensive Plan Goals & Policies:

GOAL ED-1: Expand and diversify the City's economic base to create primary jobs to increase the City's fiscal capacity to meet the needs of its citizens.

POLICY ED-1.2: Existing Business Retention

The City will work with its strategic public and private partners to grow and otherwise assist existing businesses throughout the City to increase existing business retention, especially for primary employers and small, locally-owned businesses.

Goal CC-1: Plan Arvada as a City of different development character districts.

Policy CC-1.1: Variety of Development Types

The City will include a variety of development types including rural areas, suburban residential neighborhoods, historic districts, redevelopment areas, and mixed-use communities that contain services, employment, and higher density housing.

Goal CC-2: Establish and maintain Arvada's distinct qualities and small-town identity.

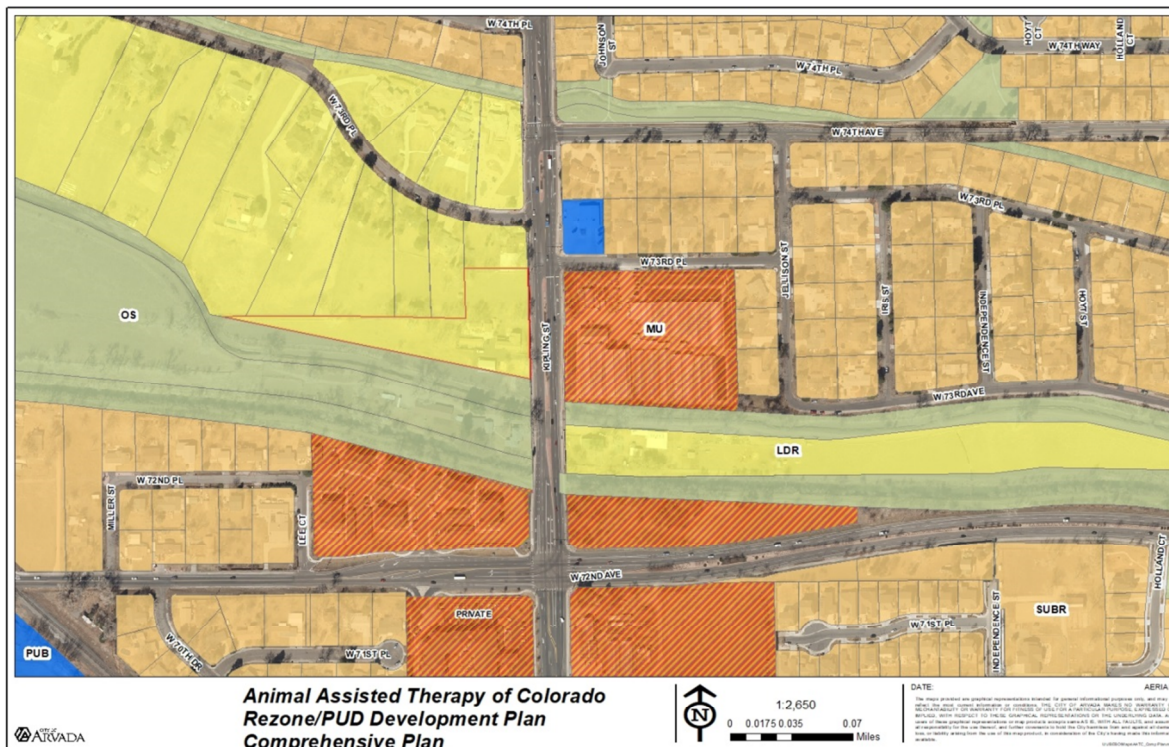
Policy CC-2.2: High Quality Private Development

The City will promote high quality architecture, site planning, landscaping, signage, and lighting for new residential and commercial developments.

GOAL CC-3: Identify places and assets that are unique and important to the community and work to preserve them.

Policy CC-3.4: Low Density Areas

Development within designated Low Density areas should have an open feel and incorporate characteristics found in rural areas such as significant open space, existing vegetation, more natural landscaping, open fencing, view corridors from public places, and non-suburban road design



Setbacks

The setbacks established for this PUD are as follows:

Principal & Accessory Buildings:	Barns and Stables
Front: 27.3'	Front: 30'
Side: 15'	Side: 25'
Rear: 15'	Rear: 25'

Building Height

A maximum height of 35 feet is allowed in the RA zone district and will be established in the PUD. As shown in the plans, the maximum height of the new addition would be 20.4 feet.

Open Space

A maximum lot coverage of 20 percent is established in the PUD zone district. As shown in the plans, only 2.3 percent of the site will be covered in building.

Landscaping, Buffering and Fencing

No new landscaping is being proposed with the project. The site currently contains many mature trees along Kipling Street as well as between this site and various single-family properties to the north. No fencing or buffering is provided nor required.

Building Design

The design of the building addition is intended to compliment and tie into the existing building utilizing primarily stucco and a pitched roof. Additionally, a new deck leading from the second floor addition with stairs to the ground will be provided on the north elevation. The intent of the

PUD is to maintain the single-family character of the building even though it contains a commercial use.

Circulation and Connectivity

One existing point of access to the site is provided off of southbound Kipling Street. Access is median restricted to right-in right-out movement only.

Grading and Drainage

The site generally slopes from the north to the south. No major changes to grading or drainage are proposed. No water quality or detention is required with this proposal.

Parking and Loading

Staff recommended a parking ratio of 3 spaces per 1,000 GFA of building which is the minimum parking ratio required for medical office uses and would require 17 parking spaces. The applicant has determined that a parking ratio of 4.9 spaces per 1,000 GFA resulting in 25 parking spaces is needed to accommodate their business.

Utility Services

The property currently receives City water and sanitary sewer service.

Police and Fire Protection

The property is serviced by both Arvada Police and the Arvada Fire and Protection District. As a part of their approval, the applicant will be required to construct a new fire hydrant in the right-of-way along Kipling Street as there is currently no nearby hydrant to service the property in the event of an emergency. The City and AFD are currently reviewing those plans.

LAND DEVELOPMENT CODE APPROVAL CRITERIA

It is the responsibility of the applicant to justify the requested land use application. The Planning Commission should make a recommendation to the City Council based on its findings regarding the approval criteria shown in the table(s) below and upon testimony heard during the public hearing as it applied to the criteria.

Staff performed an analysis of the proposal, based on the approval criteria listed in Chapter 8 of the Land Development Code, and presents the following findings:

Div. 8-3-4 Zoning and Rezoning Approval Criteria	Finding	Rationale
1. The rezoning is consistent with the Arvada Comprehensive Plan, or an adopted sub-area plan, corridor plan, or urban renewal plan, or reflects conditions that have changed since the adoption of the Comprehensive Plan.	Complies	The rezoning is consistent with the Low-Density Residential designation in the Comprehensive Plan as demonstrated in the report.
2. The intended land use is consistent with the stated intent of the proposed zoning district.	Complies	The intended land use is consistent with intent of the PUD zone district. The PUD zone district will allow a

		unique use to operate with standards that are specific to this site.
3. Facilities and services (including sewage and waste disposal, water, gas, electricity, police and fire protection, and roads and transportation, as applicable) will, prior to development, be available to serve the subject property while maintaining adequate levels of service to existing development.	Complies	Facilities and services necessary to serve the property are available. A new fire hydrant will also be installed to service this property and others nearby.
4. The intended land use for which the rezoning is sought will not result in significant adverse impacts upon the natural environment, including air, water, noise, stormwater management, wildlife, and vegetation, or such impacts will be substantially mitigated.	Complies	The intended land use will not result in significant adverse impacts.
5. The rezoning is consistent with the character of existing or planned development on adjacent properties and in the surrounding area or neighborhood, or measures will be taken to substantially buffer or otherwise substantially mitigate any negative impacts.	Complies	The rezoning is consistent with the character of the existing area. The agricultural character of the property will be preserved while allowing expansion of the commercial use.

Div. 8-3-10 PUD Development Plan Approval Criteria	Finding	Rationale
1. The plan is consistent with the Comprehensive Plan or reflects conditions that have changed since the adoption of the Comprehensive Plan	Complies	The plan is consistent with the Low-Density Residential designation in the Comprehensive Plan.
2. The plan is consistent with and implements and previously approved Outline Development Plan in effect for the subject property, per Section 8-3-10-7, PUDs Approved Prior to Effective Date.	NA	
3. The plan represents a development that will address a unique situation, confer a substantial benefit to the City, or incorporate creative site design such that it achieves the purposes set out in Section 8-3-10-1, Purpose of Planned Development Zone, and represents an improvement in quality over what could have been accomplished through application of the otherwise applicable zoning district or development standards.	Complies	The plan addresses a unique situation to accommodate a unique use that could not have been accomplished otherwise in another zone district. The use of the property currently exists and the expansion will maintain an agricultural character to the property.
4. The plan generally complies with the intent of the use, development and design standards set forth in the LDC.	Complies	The plan complies with the intent of the PUD zone district and the LDC.
5. To the extent reasonably feasible, the plan provides for integration and connection with	Complies	The plan maintains existing connections to the public right-of-

adjoining development through street connections, sidewalks, trails, and similar features; unless due to the nature of the uses that are allowable in the plan such connections are not desirable.		way. No additional connections are proposed.
6. Sufficient public safety, transportation, and utility facilities and services will, prior to development, be available to serve the subject property, while maintaining sufficient levels of service to existing development.	Complies	Facilities and services necessary to serve the property are available. A new fire hydrant will also be installed to service this property and others nearby.
7. The proposed uses (or group of uses) are appropriately located and designed, both within the boundaries of the plan and in relation to adjacent uses, such that the foreseeable, material adverse impacts that may be created by the scale, design, and operating characteristics (e.g., hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts) of the uses are avoided or mitigated.	Complies	The intended land use will not result in significant adverse impacts that cannot be mitigated. The use is currently existing and the expansion will not result in any additional significant adverse impacts.
8. If the application for plan approval is accompanied by an application for rezoning to the PUD zoning district, the rezoning application is concurrently approved.	Complies	A PUD rezoning application is being processed concurrently.

STAFF RECOMMENDATION

Based upon project analysis and review of the Land Development Code approval criteria, staff recommends approval of the project.

If the Planning Commission finds that a recommendation to approve the Rezoning and PUD Development Plan are supported by the approval criteria, then staff recommends that the following conditions be made part of the approval:

1. All remaining comments from the review of the PUD Development Plan shall be addressed in the PUD Final Development Plan.

The Planning Commission may recommend denial of the request(s) if it cannot make affirmative findings of the approval criteria stated above.



REPORT TO CITY COUNCIL

AGENDA ITEM
9.A.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: Motion to Cancel November 1 and November 22, 2021 City Council Meetings

Report in Brief

*****Provide a 3-4 sentence paragraph that summarizes the key critical points associated with the issue that the City Council will consider. The information needs to be framed in a policy context and include references to other Council, Council Committee, Commission or citizen committee action.

This section must conclude with a separate one sentence paragraph that clearly states the recommended action. The statement needs to read: The Arvada team recommends that the City Council approve CB21-____, An Ordinance

OR

R21-____, A Resolution _____.

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Lorie Gillis, Deputy City Manager 10/7/2021

Mark Deven, City Manager 10/7/2021

Enclosure, exhibits & attachments required to support the report



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
10.A.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-129 A Resolution Setting Forth Certain Findings of Fact and Conclusions as to the Annexation of Certain Land into the City of Arvada, Colorado, Northeast corner of Indiana Street and West 82nd Avenue, Also known as 8200 Indiana Street

Report in Brief

Ralston Valley Land Partners, LLC is requesting approval of applications for Annexation, Zoning, Major Subdivision Preliminary Plat, and PUD Development Plan (PDP) of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation and Zoning applications also include the right-of-way (ROW) of West 82nd Ave. between Indiana St. and Alkire St. containing 5.9 acres of land.

The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Ave via an existing ROW adjacent to the west property line of Ralston Valley High School.

If the City Council approves the applications for Annexation, the applications for Zoning, Major Subdivision Preliminary Plat, and PDP will then be required for a Final Development Plan (FDP) and Final Plat, which will be reviewed administratively.

The Arvada team recommends that the City Council approve R21-129, A Resolution Setting Forth Certain Findings of Fact and Conclusions As To The Annexation of Cerain Land Into The City of Arvada, Colorado, Northeast Corner Of Indiana Street And West 82nd Avenue, Also Known As 8200 Indiana Street.

Financial Impact

There is no financial impact associated with the proposed action.

Background

Ralston Valley Land Partners, LLC is requesting approval of applications for Annexation, Zoning, Major Subdivision Preliminary Plat, and PUD Development Plan (PDP) of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation and Zoning applications also include the right-of-way (ROW) of West 82nd Ave. between Indiana St. and Alkire St. containing 5.9 acres of land.

The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Ave via an existing ROW adjacent to the west property line of Ralston Valley High School.

Discussion

The applicant is petitioning to annex 31.4 acres of land into the City in order to access City water and sanitary sewer service. Annexation into the City requires conformance with section 30 of Article II of the state constitution and Colorado Revised Statutes §31-12-101, et seq.

The land proposed to be annexed includes the 25.5 acre subject property and 5.9 acres of W 82nd Ave. ROW between Indiana St. and Alkire St. W 82nd Ave. is currently under the jurisdiction of Jefferson County. Since the City has existing water mains within that ROW and a new sanitary sewer main will be constructed on the ROW, the City requested that W 82nd Avenue be annexed into Arvada in conjunction with the subject property. Jefferson County does not have any objections to the request, but did provide several comments related to W 82nd Ave. The County noted that W 82nd Ave. had recently been downgraded to a local street with a speed limit of 25 mph and the adjacent residents had partially funded the installation of speed humps along W 82nd Ave. City staff supports these measures previously taken by Jefferson County and will continue to work with residents of the area to ensure traffic speeds remain safe.

Our team has reviewed the annexation application and finds it to be in accordance with the constitution and laws of the State of Colorado currently in effect. The annexation application has also been processed in accordance with LDC Division 8-3-3. If the City Council approves the applications for Annexation, the applications for Zoning, Major Subdivision Preliminary Plat, and PDP will then be required for a Final Development Plan (FDP) and Final Plat, which will be reviewed administratively.

Public Contact

The required neighborhood meeting for this project took place virtually on October 7, 2020. The applicant, team members, and 34 neighbors were in attendance. The primary concerns of neighbors were about whether anyone located in Unincorporated Jefferson County would be required to annex into the City and whether the new development would negatively impact the soil or water in the area, since all of the property owners along this section of West 82nd Avenue have septic systems. City team members informed the neighbors that the City does not have a policy of unilateral or forced annexation. The developer addressed concerns about the potential environmental impact and stated that any impacts would be required to be mitigated. The applicant has prepared a summary of the meeting, which is attached.

A written notice was sent 15 days prior to the meeting, a published notice was posted in the newspaper 15 days prior to the meeting, and a public hearing sign was posted 15 days prior to the meeting. In addition, the City Council agenda was posted.

Commission Recommendation

The Planning Commission voted 6 to 0 in favor of the Council's approval on September 7, 2021.

Strategic Alignment

This project aligns with the Community and Economic Development Priority Area of the City Council Strategic Plan.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that Council approve R21-129, A Resolution Setting Forth Certain Findings Of Fact and Conclusions As To The Annexation Of Certain Land Into The City of Arvada, Colorado, Northeast Corner Of Indiana Street And West 82nd Avenue, Also Known As 8200 Indiana Street.

Suggested Motion:

SUBJECT: R21-129 A Resolution Setting Forth Certain Findings of Fact and Conclusions as to the Annexation of Certain Land into the City of Arvada, Colorado, Northeast corner of Indiana Street and West 82nd Avenue, Also known as 8200 Indiana Street

PAGE: 3
ITEM: 10.A.

I move that R21-129, A Resolution Setting Forth Certain Findings of Fact and Conclusions As To The Annexation Of Certain Land Into The City Of Arvada, Colorado, Northeast Corner Of Indiana Street And West 82nd Avenue, Also Known As 8200 Indiana Street, be (approved) (rejected).

Prepared by:

Abigail Ogg, Administrative Specialist

Reviewed by:

Approved by:

Josie Suk, Development Systems and Administrative Manager	9/23/2021
Jonathan Moore, Planner I	9/27/2021
Robert Smetana, Manager of City Planning and Development	9/29/2021
Ryan Stachelski, Director of Community and Economic Development	9/30/2021
Gail Walker, Legal Specialist-Contracts	9/30/2021
Emily Grogg, Senior Assistant City Attorney	10/4/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-129

A RESOLUTION SETTING FORTH CERTAIN FINDINGS OF FACT AND CONCLUSIONS
AS TO THE ANNEXATION OF CERTAIN LAND INTO THE CITY OF ARVADA,
COLORADO, NORTHEAST CORNER OF INDIANA STREET AND WEST 82ND AVENUE,
ALSO KNOWN AS 8200 INDIANA STREET

WHEREAS, the City Council of Arvada, Colorado has found a petition for the annexation of the hereinafter described parcel of land to be in substantial compliance with the requirements of §31-12-107(1) C.R.S.; and

WHEREAS, the City Clerk has provided notice of public hearing on the proposed annexation by publication once per week for four successive weeks and by registered mail to the Clerk of the Board of County Commissioners, the county Attorney, the school district, and to any special district having territory in the area to be annexed; and

WHEREAS, the City Council has completed a public hearing to determine if the proposed annexation complies with Article II, Section 30 of the Colorado Constitution and §§31-12-104 and 31-12-105 C.R.S., to establish eligibility for annexation.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The City Council of the City of Arvada, State of Colorado, having examined the filings and the Petition for Annexation for certain real property, the northeast corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street, Arvada, Colorado, more fully described in said Petition and having held a public hearing thereon, make the following findings pursuant to Colorado State law:

1. That not less than one-sixth of the perimeter of the area proposed to be annexed is contiguous with the existing boundaries of the City; and therefore, because of such contiguity, a community interest exists between the territory proposed to be annexed and the City.
2. That the area proposed to be annexed is urban or will be urbanized in the near future.
3. That the area proposed to be annexed is integrated or is capable of being integrated in the City.
4. That no land held in identical ownership has been divided or included without written consent of the owner thereof.
5. That no annexation proceedings have been commenced by another municipality.
6. That the annexation will not result in the detachment of area from a school district.

7. That the annexation will not result in the extension of a municipal boundary more than three miles.
8. That the City has in place a plan for said three mile area.
9. That in establishing the boundaries of the area to be annexed the entire width of any street or alley is included within the area annexed.
10. That an election is not required under §31-12-107(2) C.R.S.
11. That no additional terms or conditions are imposed which require an election under §31-12-107(2) C.R.S.

Section 2. The City Council of the City of Arvada, State of Colorado, having examined the filings and the Petition for Annexation for certain real property, the northeast corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street, Arvada, Colorado, more fully described in said Petition and having held a public hearing thereon, make the additional following findings pursuant to Arvada's Land Development Code:

1. That the annexation is in accord with the Comprehensive Plan and the best interest of the City would be served by annexation of the subject property.
2. That the subject property is capable of being integrated into the City and developed in compliance with all applicable provisions of this Code, the Arvada City Code, and the terms of an annexation agreement.
3. That at the time any development of the subject property is completed, there will be capacity to adequately serve residents of such area with all necessary utilities, facilities, and public services.

Section 3. This resolution shall be effective upon its approval by the City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____



REPORT TO CITY COUNCIL PUBLIC HEARING

AGENDA ITEM
10.B.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-032 An Ordinance Annexing Certain Land into the City of Arvada, at the Northeast Corner of Indiana Street and West 82nd Avenue, Approximately Located at 8200 Indiana Street in the County of Jefferson and State of Colorado (Ordinance No. 4779)

Report in Brief

Ralston Valley Land Partners, LLC is petitioning for Annexation of a 25.5-acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation also includes the right-of-way (ROW) of West 82nd Avenue between Indiana Street and Alkire Street containing 5.9 acres of land.

Applications for Zoning, a Major Subdivision Preliminary Plat, and a PUD Development Plan (PDP) are being considered concurrently with the annexation. The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Avenue via an existing ROW adjacent to the west property line of Ralston Valley High School.

If the City Council approves the applications for Annexation, the applications for Zoning, Major Subdivision Preliminary Plat, and PDP will then be required for a Final Development Plan (FDP) and Final Plat, which will be reviewed administratively.

The Arvada team recommends that the City Council approve CB21-032, An Ordinance Annexing Certain Land into the City of Arvada, at the Northeast Corner of Indiana Street and West 82nd Avenue, Approximately Located at 8200 Indiana Street in the County of Jefferson and State of Colorado, on final reading, numbered 4779 and ordered published by title only.

Financial Impact

The approval of this ordinance will have no financial impact.

Background

The subject property is located in Unincorporated Jefferson County at the northeast corner of Indiana Street and West 82nd Avenue and is currently vacant. The property abuts the Union Pacific Railroad (UPRR) to the north, Indiana Street to the west, and West 82nd Avenue to the south. The property has significant grade changes throughout, with the railroad being the highpoint and the remaining property sloping generally south. The Tucker Irrigation Ditch runs generally west to east across the site. The section of Indiana Street adjacent to the site is part of State Highway 72 under the Colorado Department of Transportation's (CDOT's) jurisdiction.

The subject property does not have any development history. The prior owners of the property have previously contacted the City team for pre-application meetings regarding annexation; however, the current annexation application is the first formal application that has been submitted to the City.

Discussion

It is the responsibility of the applicant to justify the requested land use application. The City Council must reach a decision based on its findings regarding the approval criteria shown in the table below and upon testimony heard during the public hearing as it applied to the criteria.

The Community and Economic Development team performed an analysis of the proposal, based on the approval criteria listed in Division 8-3-3, Annexation and Disconnection, and presents the following findings:

Div. 8-3-3 Annexation and Disconnection Approval Criteria	Finding	Rationale
1. The annexation is in accord with the Comprehensive Plan and the best interests of the City would be served by annexation of such property.	Complies	The annexation complies with the Low Density Residential designation and will improve surrounding infrastructure.
2. The property is capable of being integrated into the City and developed in compliance with all applicable provisions of this Code and the Arvada City Code.	Complies	The proposed development complies with all applicable provisions of this Code and the Arvada City Code.
3. At the time any development of the area proposed to be annexed is completed, there will be capacity to adequately serve residents of such area with all necessary utilities, facilities and public services.	Complies	With the extension of water and sanitary sewer mains as part of this proposal, there will be capacity and infrastructure to adequately serve residents.

Public Contact

The required neighborhood meeting for this project took place virtually on October 7, 2020. The applicant, Arvada team members, and 34 neighbors were in attendance. The primary concerns of neighbors were about whether anyone located in Unincorporated Jefferson County would be required to annex into the City and whether the new development would negatively impact the soil or water in the area, since all of the property owners along this section of West 82nd Avenue have septic systems. City team members informed the neighbors that the City does not have a policy of unilateral or forced annexation. The developer addressed concerns about the potential environmental impact and stated that any impacts would be required to be mitigated. The applicant has prepared a summary of the meeting, which is attached.

At the Planning Commission hearing held on September 7, 2021, approximately 10 neighbors were in attendance. One member of the public spoke to voice some concerns relating to traffic and impacts to adjacent properties from construction.

A written notice was sent 15 days prior to the meeting, a published notice was posted in the newspaper 15 days prior to the meeting, and a public hearing sign was posted 15 days prior to the meeting.

Commission Recommendation

The Planning Commission voted 6 to 0 in favor of the Council's approval on September 7, 2021.

Strategic Alignment

The project is consistent with the following principle within the Community and Economic Development Priority Area of the City Council Strategic Plan:

Uses the Comprehensive Plan to guide planning, land use code decisions, development management, and informational and resource services that are delivered to residents, businesses, the development community, decision-making bodies, and neighborhood partners to achieve a well-planned, aligned, sustainable, and livable community for current and future generations.

Alternative Courses of Action

NA

Recommendation for Action

The Arvada Team recommends that the City Council approve CB21-032, An Ordinance Annexing Certain Land into the City of Arvada, at the Northeast Corner of Indiana Street and West 82nd Avenue, Approximately Located at 8200 Indiana Street in the County of Jefferson and State of Colorado, on final reading, numbered 4779 and ordered published by title only.

Suggested Motion:

I move that CB21-032, An Ordinance Annexing Certain Land into the City of Arvada, at the Northeast Corner of Indiana Street and West 82nd Avenue, Approximately Located at 8200 Indiana Street in the County of Jefferson and State of Colorado, be (approved on final reading, numbered 4779 and ordered published by title only) (rejected).

Prepared by:
Abigail Ogg, Administrative Specialist

Reviewed by:

Approved by:

Jonathan Moore, Planner I	9/27/2021
Josie Suk, Development Systems and Administrative Manager	9/28/2021
Robert Smetana, Manager of City Planning and Development	9/29/2021
Ryan Stachelski, Director of Community and Economic Development	9/30/2021
Gail Walker, Legal Specialist-Contracts	9/30/2021
Emily Grogg, Senior Assistant City Attorney	10/4/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-032
ORDINANCE NO. 4779

AN ORDINANCE ANNEXING CERTAIN LAND INTO THE CITY OF ARVADA, AT
THE NORTHEAST CORNER OF INDIANA STREET AND WEST 82ND AVENUE,
APPROXIMATELY LOCATED AT 8200 INDIANA STREET IN THE COUNTY OF
JEFFERSON AND STATE OF COLORADO

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA,
COLORADO:

Section 1. The City Council of the City of Arvada, State of Colorado, having examined the filings and the annexation map for certain real property more fully described in said map finds as follows:

1. That a petition for annexation, together with four copies of the annexation map as required by law, was filed with the City by the owners of over fifty percent of the area of the territory hereinafter described, exclusive of public streets and alleys, and comprising more than fifty percent of the landowners of the property to be annexed.
2. That the City, by resolution at a properly noticed meeting accepted said petition and found and determined that the applicable parts of the Municipal Annexation Act of 1965, as amended, and Section 30 of Article II of the Colorado Constitution have been met and further determined that an election was not required under the Act and that no additional terms and conditions were imposed upon said annexation.
3. That the area proposed to be annexed meets the applicable requirements of Sections 31-12-104 and 31-12-105, C.R.S., and is therefore eligible for annexation to the City of Arvada.

Section 2. The following described real property, situated in the County of Jefferson, State of Colorado, be and the same hereby is annexed to the City of Arvada, to wit:

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION
30, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN

More particularly described in attached Exhibit A.

Section 3. The Mayor is hereby authorized to execute, the City Clerk to attest, in form approved by the City Attorney, an Annexation Agreement pertaining to the property owned by the Petitioners.

Section 4. The Clerk of the City shall perform all statutory duties to complete said annexation.

Section 5. This Ordinance shall be effective five days after publication following final passage.

INTRODUCED, READ, AND ORDERED PUBLISHED this 4th day of October, 2021.

PASSED, ADOPTED, AND APPROVED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

Publication Dates: October 7, 2021
 October 21, 2021

EXHIBIT A
LEGAL DESCRIPTION

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF JEFFERSON, STATE OF COLORADO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 30 BEING ASSUMED TO BEAR NORTH 88°26'57" EAST, A DISTANCE OF 2524.92 FEET BETWEEN THE FOLLOWING DESCRIBED MONUMENTS:

-THE 60' WITNESS CORNER TO THE CENTER QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 IN RANGE BOX MATCHING MONUMENT RECORD FILED 3/29/04.

-THE WEST QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 MATCHING MONUMENT RECORD FILED 4/28/07

COMMENCING AT THE SOUTHWEST CORNER OF SECTION 30 FROM WHENCE THE WEST QUARTER CORNER OF SECTION 30 BEARS NORTH 00°28'43" WEST, A DISTANCE OF 2644.86 FEET;

THENCE ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER OF SECTION 30 NORTH 00°28'43" WEST, A DISTANCE OF 1,344.41 FEET;

THENCE NORTH 89°23'08" EAST, A DISTANCE OF 50.00 FEET TO THE EASTERLY RIGHT-OF-WAY OF INDIANA STREET AND THE EASTERLY LINE OF ORDINANCE #4325 BEING ALSO THE POINT OF BEGINNING;

THENCE ALONG SAID EASTERLY LINES AND ALSO THE EAST LINE OF ORDINANCE #4324 NORTH 00°28'43" WEST, A DISTANCE OF 678.69 FEET TO THE SOUTHERLY RIGHT-OF-WAY, BOOK 727, PAGE 474;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY SOUTH 84°45'14" EAST, A DISTANCE OF 2,238.36 FEET TO THE NORTHWEST CORNER OF THAT PARCEL DESCRIBED AT RECEPTION NO. 2010042014;

THENCE ALONG THE WEST LINE OF SAID PARCEL SOUTH 00°29'57" EAST, A DISTANCE OF 385.15 FEET TO THE SOUTHWEST CORNER THEREOF BEING ALSO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF WEST 82ND AVENUE;

THENCE ALONG SAID NORTHERLY RIGHT—OF—WAY THE FOLLOWING EIGHT (8) COURSES AND DISTANCES;

1. THENCE NORTH 89°05'34" EAST, A DISTANCE OF 190.31 FEET;

2. THENCE NORTH 89°34'35" EAST, A DISTANCE OF 224.19 FEET;
3. THENCE NORTH 89°34'09" EAST, A DISTANCE OF 199.19 FEET;
4. THENCE NORTH 89°33'28" EAST, A DISTANCE OF 300.47 FEET;
5. THENCE NORTH 89°23'13" EAST, A DISTANCE OF 399.57 FEET;
6. THENCE NORTH 89°33'20" EAST, A DISTANCE OF 500.03 FEET;
7. THENCE NORTH 89°20'31" EAST, A DISTANCE OF 577.43 FEET;
8. THENCE NORTH 89°20'54" EAST, A DISTANCE OF 300.91 FEET TO THE EASTERLY LINE OF SAID SOUTHWEST QUARTER OF SECTION 30;

THENCE ALONG SAID EASTERLY LINE SOUTH 00°58'07" EAST, A DISTANCE OF 49.43 FEET TO THE NORTHERLY LINE OF ORDINANCE #3582 AND THE SOUTHERLY RIGHT-OF-WAY OF SAID 82ND/ AVENUE;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY AND THE NORTHERLY LINES OF ORDINANCE #3582, #3583 AND 3584 SOUTH 88°58'40" WEST, A DISTANCE OF 1,799.00 FEET TO THE EASTERLY LINE OF THAT PARCEL DESCRIBED AT RECEPTION NO. 85074569;

THENCE ALONG SAID EASTERLY LINE, BEING ALSO THE RIGHT-OF-WAY OF SAID 82ND/ AVENUE NORTH 00°57'54" WEST, A DISTANCE OF 13.15 FEET;

THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING NINE (9) COURSES AND DISTANCES;

1. THENCE SOUTH 89°33'00" WEST, A DISTANCE OF 106.38 FEET;
2. THENCE SOUTH 89°34'12" WEST, A DISTANCE OF 596.64 FEET;
3. THENCE SOUTH 89°09'08" WEST, A DISTANCE OF 607.45 FEET;
4. THENCE SOUTH 89°52'03" WEST, A DISTANCE OF 299.55 FEET;
5. THENCE SOUTH 89°17'42" WEST, A DISTANCE OF 599.53 FEET;
6. THENCE SOUTH 89°21'13" WEST, A DISTANCE OF 149.73 FEET;
7. THENCE SOUTH 89°19'33" WEST, A DISTANCE OF 149.99 FEET;
8. THENCE SOUTH 89°23'59" WEST, A DISTANCE OF 596.61 FEET;
9. THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 15.00 FEET,

A CENTRAL ANGLE OF 89°51'01", WHOSE CHORD BEARS SOUTH 44°26'47" WEST A DISTANCE OF 21.19 FEET, FOR AN ARC DISTANCE OF 23.52 FEET TO THE POINT OF BEGINNING.

CONTAINING 1,369,062 SQUARE FEET OR 31.429 ACRES, MORE OR LESS.

RESOLUTION NO. R21-111

A RESOLUTION ACCEPTING AN ANNEXATION PETITION CONCERNING THE NORTHEAST CORNER OF INDIANA STREET AND W 82ND AVENUE, ALSO KNOWN AS 8200 INDIANA STREET, FINDING SAID PETITION SUBSTANTIALLY COMPLIANT WITH C.R.S. 31-12-107(1), AND SETTING A PUBLIC HEARING FOR OCTOBER 18, 2021, 6:15 P.M. FOR CITY COUNCIL TO DETERMINE WHETHER THE AREA MEETS THE REQUIREMENTS OF C.R.S. 31-12-104 AND 105, AND IS CONSIDERED ELIGIBLE FOR ANNEXATION

WHEREAS, the owner of certain property located in Jefferson County, Colorado, filed a petition for annexation with the City Clerk of the City of Arvada, Colorado (the “City”), for annexation of property more particularly described below (the “subject property”), into the City limits;

WHEREAS, having received the petition for annexation, the City Council of the City of Arvada is required under the Municipal Annexation Act of 1965, as amended, to determine whether said petition is in substantial compliance with C.R.S. Sections 31-12-107 (1), 31-12-105, 31-12-104, and if so, to follow the procedure set forth in C.R.S. Sections 31-12-108 through 111;

WHEREAS, the City Council of the City of Arvada, having examined the filings and the petition for annexation of the subject property, and being duly advised by the City planning team, finds as follows:

1. On its face, the annexation petition is in substantial compliance with C.R.S. §31-12-107(1), as the petition contains the following:
 - a. An allegation that it is desirable and necessary that the area be annexed to the City of Arvada;
 - b. An allegation that the requirements of §§ 31-12-104 and 31-12-105 C.R.S. exist or are met.
 - c. An allegation that the signer of the petition comprises the landowners of more than 50 percent of the territory included in the area and own more than fifty percent of the area proposed to be annexed, exclusive of streets and alleys and any land owned by the annexing municipality.
 - d. A request that the City of Arvada approve the annexation of the area proposed to be annexed.

- e. The signature of such landowner.
 - f. The mailing address of such signer.
 - g. The legal description of the land owned by such signer.
 - h. The date of signing of each signature.
 - i. The affidavit of the circulator of the petition stating that each signature therein is the signature of the person whose name it purports to be.
2. That the annexation petition was filed with an annexation map containing the following information, and is in substantial compliance with the Municipal Annexation Act:
- a. A written legal description of the boundaries of the area proposed to be annexed;
 - b. A map showing the boundary of the area proposed to be annexed;
 - c. Within the annexation boundary map, a showing of the location of each ownership tract in unplatted land and, if part or all of the area is platted, the boundaries and the plat numbers of plots or of lots and blocks;
 - d. Next to the boundary of the area proposed to be annexed is drawn the contiguous boundary of the City of Arvada, and that the dimensions of the contiguous boundary are shown on the map.
3. That no signature on the petition is dated more than 180 days prior to the date of filing of the Petition for Annexation with the City Clerk of the City of Arvada, State of Colorado.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1 That the City Council hereby makes and adopts the determinations and findings contained in the recitals set forth above, and finds that the annexation petition on its face is in substantial compliance with the requirements of C.R.S. §31-12-107(1).

Section 2. That the City Council hereby accepts the annexation petition for the following described unincorporated territory, situated in the County of Jefferson and State of Colorado, to wit:

See Exhibit A

Section 3. That a public hearing shall be held on the 18th day of October, 2021 at 6:15 p.m. at the Arvada City Hall and/or virtually for the purpose of determining and finding whether the areas proposed to be annexed meet the applicable requirements of §§31-12-104 and 31-12-105 C.R.S. and are considered eligible for annexation.

Section 4. This resolution shall be effective five days after its approval by the City Council.

APPROVED AND ADOPTED this 13th day of September, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

Publication Dates: September 16, 2021
 September 23, 2021
 September 30, 2021
 October 7, 2021

EXHIBIT A
LEGAL DESCRIPTION

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF JEFFERSON, STATE OF COLORADO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 30 BEING ASSUMED TO BEAR NORTH 88°26'57" EAST, A DISTANCE OF 2524.92 FEET BETWEEN THE FOLLOWING DESCRIBED MONUMENTS:

-THE 60' WITNESS CORNER TO THE CENTER QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 IN RANGE BOX MATCHING MONUMENT RECORD FILED 3/29/04.

-THE WEST QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 MATCHING MONUMENT RECORD FILED 4/28/07

COMMENCING AT THE SOUTHWEST CORNER OF SECTION 30 FROM WHENCE THE WEST QUARTER CORNER OF SECTION 30 BEARS NORTH 00°28'43" WEST, A DISTANCE OF 2644.86 FEET;

THENCE ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER OF SECTION 30 NORTH 00°28'43" WEST, A DISTANCE OF 1,344.41 FEET;

THENCE NORTH 89°23'08" EAST, A DISTANCE OF 50.00 FEET TO THE EASTERLY RIGHT-OF-WAY OF INDIANA STREET AND THE EASTERLY LINE OF ORDINANCE #4325 BEING ALSO THE POINT OF BEGINNING;

THENCE ALONG SAID EASTERLY LINES AND ALSO THE EAST LINE OF ORDINANCE #4324 NORTH 00°28'43" WEST, A DISTANCE OF 678.69 FEET TO THE SOUTHERLY RIGHT-OF-WAY, BOOK 727, PAGE 474;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY SOUTH 84°45'14" EAST, A DISTANCE OF 2,238.36 FEET TO THE NORTHWEST CORNER OF THAT PARCEL DESCRIBED AT RECEPTION NO. 2010042014;

THENCE ALONG THE WEST LINE OF SAID PARCEL SOUTH 00°29'57" EAST, A DISTANCE OF 385.15 FEET TO THE SOUTHWEST CORNER THEREOF BEING ALSO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF WEST 82ND AVENUE;

THENCE ALONG SAID NORTHERLY RIGHT—OF—WAY THE FOLLOWING EIGHT (8) COURSES AND DISTANCES;

1. THENCE NORTH 89°05'34" EAST, A DISTANCE OF 190.31 FEET;

2. THENCE NORTH 89°34'35" EAST, A DISTANCE OF 224.19 FEET;
3. THENCE NORTH 89°34'09" EAST, A DISTANCE OF 199.19 FEET;
4. THENCE NORTH 89°33'28" EAST, A DISTANCE OF 300.47 FEET;
5. THENCE NORTH 89°23'13" EAST, A DISTANCE OF 399.57 FEET;
6. THENCE NORTH 89°33'20" EAST, A DISTANCE OF 500.03 FEET;
7. THENCE NORTH 89°20'31" EAST, A DISTANCE OF 577.43 FEET;
8. THENCE NORTH 89°20'54" EAST, A DISTANCE OF 300.91 FEET TO THE
EASTERLY LINE OF SAID SOUTHWEST QUARTER OF SECTION 30;

THENCE ALONG SAID EASTERLY LINE SOUTH 00°58'07" EAST, A DISTANCE OF 49.43 FEET
TO THE NORTHERLY LINE OF ORDINANCE #3582 AND THE SOUTHERLY RIGHT-OF-WAY OF
SAID 82ND/ AVENUE;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY AND THE NORTHERLY LINES OF
ORDINANCE #3582, #3583 AND 3584 SOUTH 88°58'40" WEST, A DISTANCE OF 1,799.00 FEET
TO THE EASTERLY LINE OF THAT PARCEL DESCRIBED AT RECEPTION NO. 85074569;

THENCE ALONG SAID EASTERLY LINE, BEING ALSO THE RIGHT-OF-WAY OF SAID 82ND/
AVENUE NORTH 00°57'54" WEST, A DISTANCE OF 13.15 FEET;

THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING NINE
(9) COURSES AND DISTANCES;

1. THENCE SOUTH 89°33'00" WEST, A DISTANCE OF 106.38 FEET;
2. THENCE SOUTH 89°34'12" WEST, A DISTANCE OF 596.64 FEET;
3. THENCE SOUTH 89°09'08" WEST, A DISTANCE OF 607.45 FEET;
4. THENCE SOUTH 89°52'03" WEST, A DISTANCE OF 299.55 FEET;
5. THENCE SOUTH 89°17'42" WEST, A DISTANCE OF 599.53 FEET;
6. THENCE SOUTH 89°21'13" WEST, A DISTANCE OF 149.73 FEET;
7. THENCE SOUTH 89°19'33" WEST, A DISTANCE OF 149.99 FEET;
8. THENCE SOUTH 89°23'59" WEST, A DISTANCE OF 596.61 FEET;
9. THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 15.00 FEET,

A CENTRAL ANGLE OF 89°51'01", WHOSE CHORD BEARS SOUTH 44°26'47" WEST A
DISTANCE OF 21.19 FEET, FOR AN ARC DISTANCE OF 23.52 FEET TO THE POINT OF
BEGINNING.

CONTAINING 1,369,062 SQUARE FEET OR 31.429 ACRES, MORE OR LESS.

NAME OF ANNEXATION: **Whitewing at Ralston Summit**

APPROXIMATE LOCATION: **W 82nd Avenue and Indiana Street**

**PETITION FOR ANNEXATION OF UNINCORPORATED TERRITORY
IN THE COUNTY OF JEFFERSON, STATE OF COLORADO,
TO THE CITY OF ARVADA, STATE OF COLORADO**

TO THE MAYOR AND THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

The undersigned in accordance with the Municipal Annexation Act of 1965, Chapter 31, Article 12, C.R.S. 1973, as amended, hereby petitions the City Council of the City of Arvada for annexation to the City of Arvada of the following described unincorporated territory located in the County of Jefferson, State of Colorado, to wit:

LEGAL DESCRIPTION

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF JEFFERSON, STATE OF COLORADO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 30 BEING ASSUMED TO BEAR NORTH 88°26'57" EAST, A DISTANCE OF 2524.92 FEET BETWEEN THE FOLLOWING DESCRIBED MONUMENTS:

-THE 60' WITNESS CORNER TO THE CENTER QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 IN RANGE BOX MATCHING MONUMENT RECORD FILED 3/29/04.

-THE WEST QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 MATCHING MONUMENT RECORD FILED 4/28/07

COMMENCING AT THE SOUTHWEST CORNER OF SECTION 30 FROM WHENCE THE WEST QUARTER CORNER OF SECTION 30 BEARS NORTH 00°28'43" WEST, A DISTANCE OF 2644.86 FEET;

THENCE ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER OF SECTION 30 NORTH 00°28'43" WEST, A DISTANCE OF 1,344.41 FEET;

THENCE NORTH 89°23'08" EAST, A DISTANCE OF 50.00 FEET TO THE EASTERLY RIGHT-OF-WAY OF INDIANA STREET AND THE EASTERLY LINE OF ORDINANCE #4325 BEING ALSO THE POINT OF BEGINNING;

THENCE ALONG SAID EASTERLY LINES AND ALSO THE EAST LINE OF ORDINANCE #4324 NORTH 00°28'43" WEST, A DISTANCE OF 678.69 FEET TO THE SOUTHERLY RIGHT-OF-WAY, BOOK 727, PAGE 474;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY SOUTH 84°45'14" EAST, A DISTANCE OF 2,238.36 FEET TO THE NORTHWEST CORNER OF THAT PARCEL DESCRIBED AT RECEPTION NO. 2010042014;

THENCE ALONG THE WEST LINE OF SAID PARCEL SOUTH 00°29'57" EAST, A DISTANCE OF 385.15 FEET TO THE SOUTHWEST CORNER THEREOF BEING ALSO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF WEST 82ND AVENUE;

THENCE ALONG SAID NORTHERLY RIGHT-OF-WAY THE FOLLOWING EIGHT (8) COURSES AND DISTANCES;

1. THENCE NORTH 89°05'34" EAST, A DISTANCE OF 190.31 FEET;
2. THENCE NORTH 89°34'35" EAST, A DISTANCE OF 224.19 FEET;
3. THENCE NORTH 89°34'09" EAST, A DISTANCE OF 199.19 FEET;
4. THENCE NORTH 89°33'28" EAST, A DISTANCE OF 300.47 FEET;
5. THENCE NORTH 89°23'13" EAST, A DISTANCE OF 399.57 FEET;
6. THENCE NORTH 89°33'20" EAST, A DISTANCE OF 500.03 FEET;
7. THENCE NORTH 89°20'31" EAST, A DISTANCE OF 577.43 FEET;
8. THENCE NORTH 89°20'54" EAST, A DISTANCE OF 300.91 FEET TO THE EASTERLY LINE OF SAID SOUTHWEST QUARTER OF SECTION 30;

THENCE ALONG SAID EASTERLY LINE SOUTH 00°58'07" EAST, A DISTANCE OF 49.43 FEET TO THE NORTHERLY LINE OF ORDINANCE #3582 AND THE SOUTHERLY RIGHT-OF-WAY OF SAID 82ND/ AVENUE;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY AND THE NORTHERLY LINES OF ORDINANCE #3582, #3583 AND 3584 SOUTH 88°58'40" WEST, A DISTANCE OF 1,799.00 FEET TO THE EASTERLY LINE OF THAT PARCEL DESCRIBED AT RECEPTION NO. 85074569;

THENCE ALONG SAID EASTERLY LINE, BEING ALSO THE RIGHT-OF-WAY OF SAID 82ND/ AVENUE NORTH 00°57'54" WEST, A DISTANCE OF 13.15 FEET;

THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING NINE (9) COURSES AND DISTANCES;

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2. THENCE SOUTH 89°34'12" WEST, A DISTANCE OF 596.64 FEET;
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CONTAINING 1,369,062 SQUARE FEET OR 31.429 ACRES, MORE OR LESS.

In support of the said Petition, your Petitioner alleges that:

1. It is desirable and necessary that the above-described territory be annexed to the City of Arvada.
2. No less than one-sixth of the perimeter of the area proposed to be annexed is contiguous with the City of Arvada.
3. A community of interest exists between the territory proposed to be annexed and the City of Arvada.
4. The territory proposed to be annexed is urban or will be urbanized in the future.
5. The territory proposed to be annexed is integrated or is capable of being integrated with the City of Arvada.
6. No land held in identical ownership, whether consisting of one tract or parcel of real estate or two or more contiguous tracts or parcels of real estate:
 - a. is divided into separate parts or parcels without the written consent of the landowner or landowners thereof.
 - b. comprising twenty acres or more which, together with the buildings and improvements situated thereon, has an assessed value in excess of two-hundred thousand dollars for an ad valorem tax purpose for the year preceding the annexation is included within the territory proposed to be annexed, without the written consent of the landowner or landowners thereof.
7. No annexation proceedings have been commenced by another municipality for the annexation of part or all of the area proposed herein to be annexed to Arvada.
8. Annexation of the territory proposed to be annexed will not result in detachment of area from any school district and the attachment of the same to another school district.
9. Annexation of the area proposed to be annexed will not have the effect of extending the City of Arvada's municipal boundary more than three miles in any direction from any point of such municipal boundary in any one year.
10. No portion of a platted street or alley lies within the boundaries of the area proposed to be annexed, unless the entire width of said street or alley has been included within the boundaries of the area to be annexed.
11. The Signer(s) of the Petition comprise(s) the landowner(s) of one hundred percent of the territory included in the area proposed to be annexed, exclusive of streets and alleys and any land owned by the annexing municipality.
12. All other requirements of Section 31-12-104 and 31-12-105, C.R.S., exist or have been met.
13. The mailing address of the Signer, the legal description of the land owned by such signer, and the date of signing of such signature are all shown on this Petition.
14. Attached to this Petition is the Affidavit of Circulator of this Petition that the signature hereon is the signature of the person whose name it purports to be.

Your Petitioner(s) further request(s) that the City of Arvada approve the annexation of the area proposed to be annexed.

Legal Owner's Printed Name

Christian Dinsdale

Legal Owner's Signature

[Signature]

Title

Manager (of Ralston Valley Land Partners, LLC)

Address Street Number/Name

1660 17th St.

City/State/Zip Code

Denver, CO, 80202

Date Signed

8/24/2021

AFFIDAVIT OF CIRCULATOR

STATE OF COLORADO)

COUNTY OF Jefferson) ss.

Joseph A. John

, being duly sworn, upon oath, deposes and states:

1. That the affiant circulated the Petition for Annexation for the purpose of obtaining the signature(s) of the above Petitioner(s).
2. That each signature thereon is the signature of the person whose name it purports to be.

[Signature]
Circulator

NOTARY CERTIFICATE

STATE OF COLORADO)

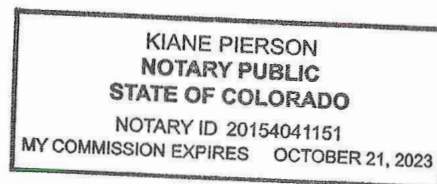
COUNTY OF Jefferson) ss.

Subscribed and sworn to before me this 24th day of August, 2021.

(SEAL)

Witness my hand and seal: Kiane Pierson

My commission expires: 10/21/2023



WHITEWING ANNEXATION MAP
A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30,
TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
COUNTY OF JEFFERSON, STATE OF COLORADO
SHEET 1 OF 2

LEGAL DESCRIPTION

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF JEFFERSON, STATE OF COLORADO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

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–THE WEST QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5” ALUMINUM CAP PLS 28286 MATCHING MONUMENT RECORD FILED 4/28/07

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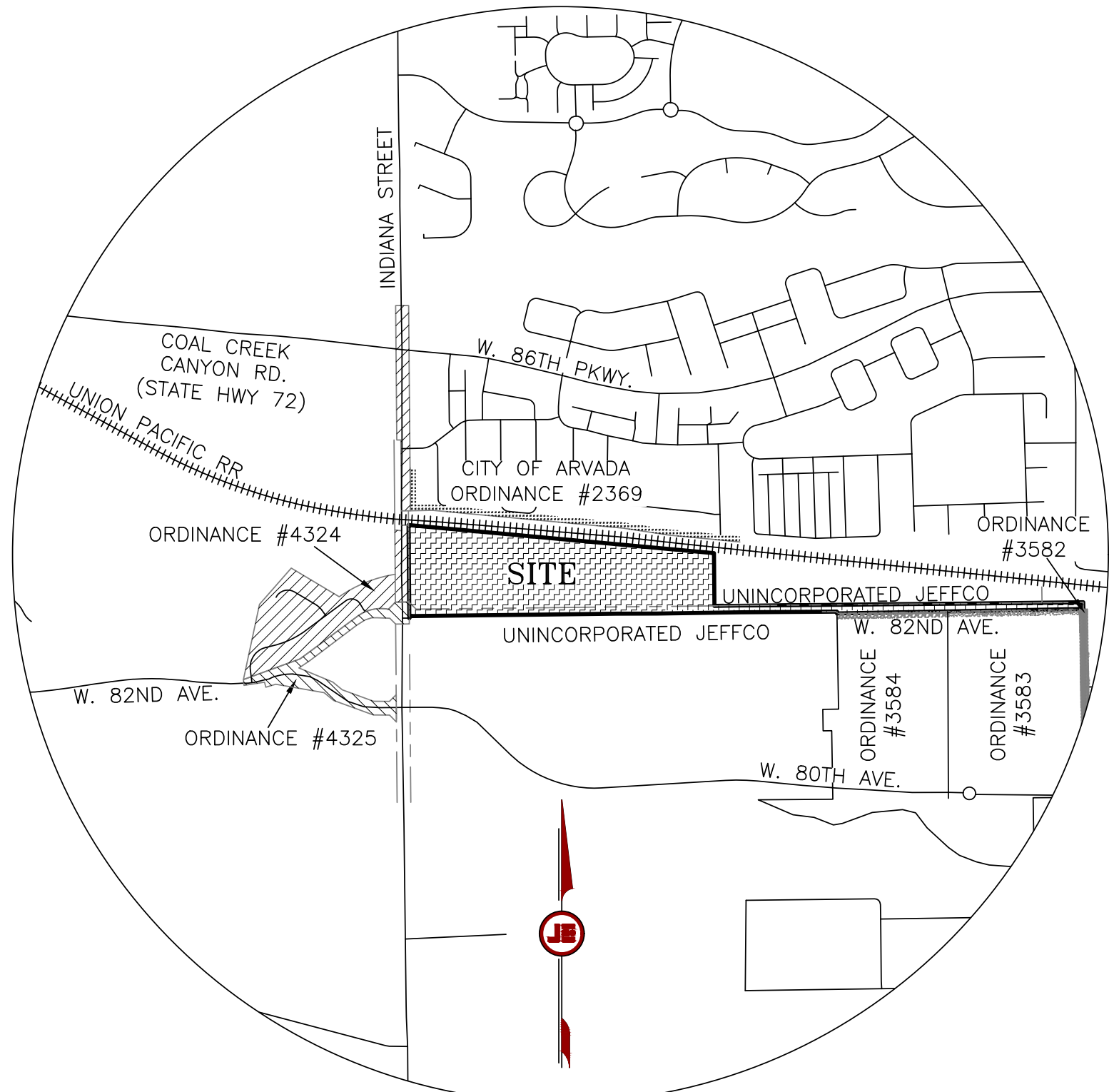
NOTES

1. BASIS OF BEARINGS: BEARINGS ARE BASED ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SECTION 30 BEING ASSUMED TO BEAR NORTH 88°26'57" EAST BETWEEN MONUMENTS AS SHOWN WITHIN THIS MAP.

2. ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF CERTIFICATION SHOWN HEREON.

3. THIS MAP IS NOT A MONUMENTED LAND SURVEY PLAT OR IMPROVEMENT SURVEY PLAT AS DEFINED IN C.R.S. 38–51–106. THE PURPOSE OF THIS MAP IS TO SHOW THE AREA TO BE ANNEXED INTO THE CITY OF ARVADA.

4. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY JEHN ENGINEERING TO DETERMINE OWNERSHIP OF EASEMENTS OF RECORD. FOR ALL INFORMATION REGARDING EASEMENTS, RIGHTS–OF–WAY AND TITLE OF RECORD, JEHN ENGINEERING RELIED UPON COMMITMENT FOR TITLE INSURANCE, POLICY NO. CO–FWCO–IMP–72306–1–21–C2054638, ISSUED BY CHICAGO TITLE OF COLORADO AND HAVING AN EFFECTIVE DATE OF AUGUST 17, 2021 AT 11:29 A.M.



VICINITY MAP
1"=1000'

CONTIGUITY STATEMENT

TOTAL PERIMETER OF AREA CONSIDERED FOR ANNEXATION=10,985.27 LF

ONE–SIXTH OF TOTAL PERIMETER=1,830.87 LF (16.67%)

PERIMETER OF THE AREA CONTIGUOUS WITH EXISTING CITY LIMITS=4,716.05 LF (42.93%)

ANNEXATION EXCEEDS THE ONE–SIXTH PERIMETER REQUIREMENT.

SURVEYOR’S CERTIFICATE

I ROBERT J. HENNESSY, A PROFESSIONAL LAND SURVEYOR LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS WHITEWING ANNEXATION MAP WAS MADE BY ME OR DIRECTLY UNDER MY SUPERVISION, AND THAT IT IS A TRUE AND CORRECT REPRESENTATION OF THE AREA TO BE ANNEXED TO THE CITY OF ARVADA, COLORADO. THE ABOVE DESCRIBED LAND IS CONTIGUOUS TO THE CITY OF ARVADA AND MEETS THE REQUIREMENTS SET FORTH IN COLORADO REVISED STATUTES 1973, 31–12–104–(1) (A) THAT ONE–SIXTH OR MORE OF THE PERIMETER TO BE ANNEXED IS CONTIGUOUS WITH THE ANNEXING MUNICIPALITY. THE SURVEY IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

ROBERT J. HENNESSY, P.L.S. 34580, LICENSED COLORADO LAND SURVEYOR
FOR AND ON BEHALF OF JEHN ENGINEERING, INC.

APPROVAL CERTIFICATE

APPROVED FOR FILING BY THE CITY OF ARVADA THIS _____ DAY OF _____, 20____.

MAYOR _____ ATTEST: _____
CITY CLERK

ORDINANCE NUMBER _____

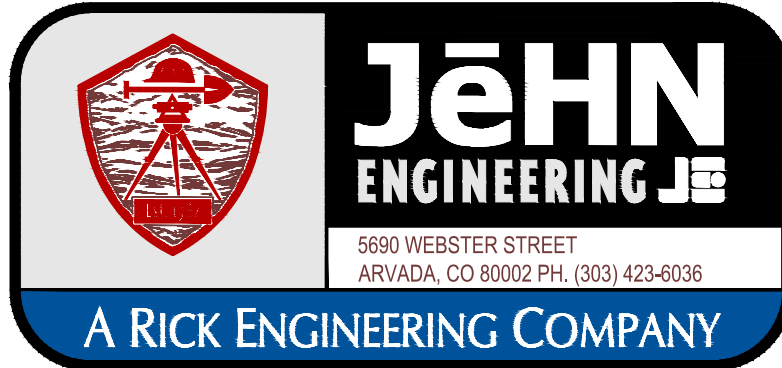
CLERK AND RECORDER’S CERTIFICATE

RECEPTION NUMBER _____

ACCEPTED FOR FILING IN THE OFFICE OF THE CLERK AND RECORDER OF JEFFERSON COUNTY, AT GOLDEN COLORADO ON THIS _____ DAY OF _____, 20____ AT _____ O’CLOCK.

JEFFERSON COUNTY CLERK AND RECORDER

BY: DEPUTY CLERK



WHITEWING ANNEXATION MAP

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30,
TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
COUNTY OF JEFFERSON, STATE OF COLORADO
SHEET 2 OF 2

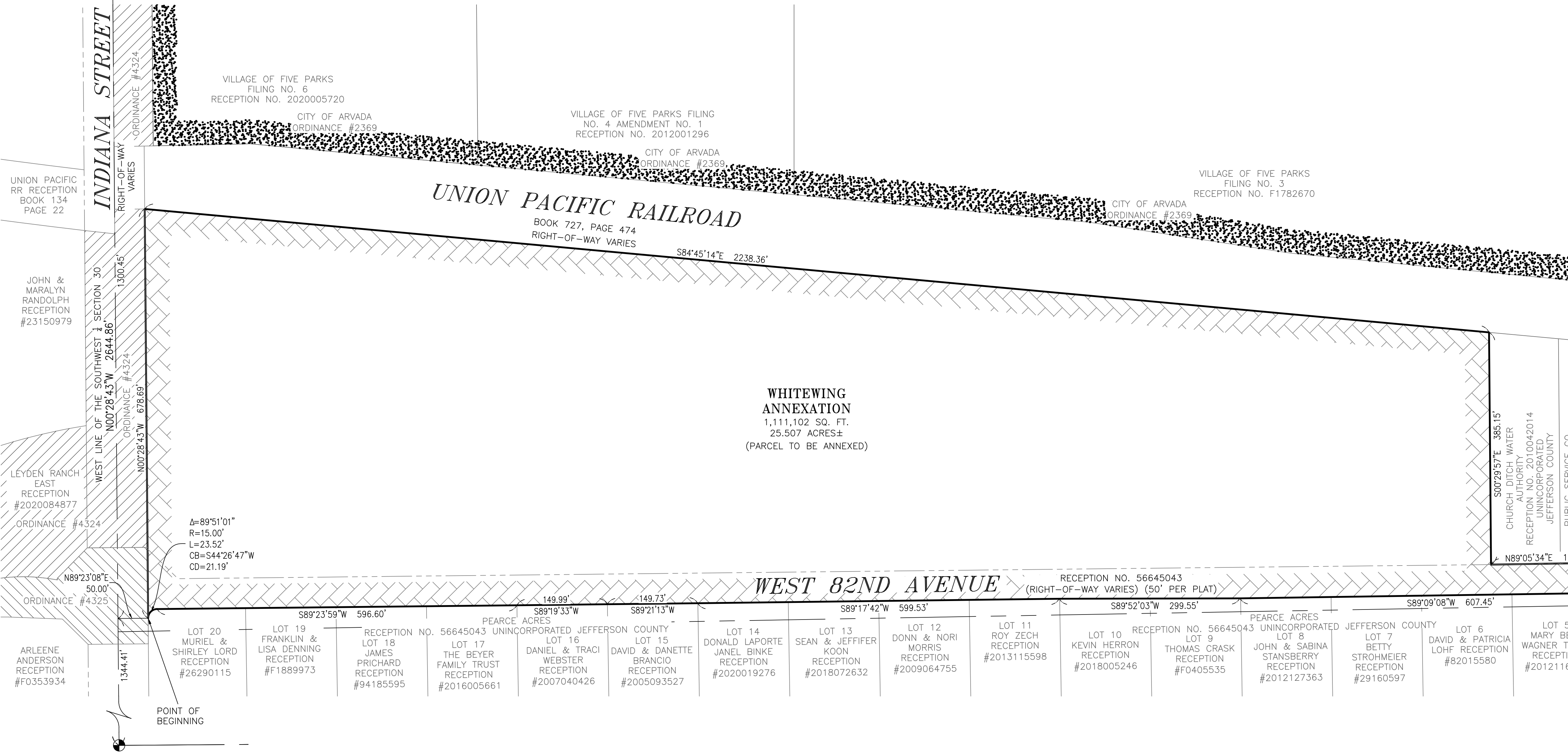
WEST 1/4 CORNER OF SECTION
30 FOUND #6 REBAR & 2.5"
ALUMINUM CAP PLS 28286 IN
RANGE BOX MATCHING
MONUMENT RECORD FILED
4/28/07

N88°26'57"E 2524.92'

N. LINE OF THE SW 1/4 SECTION 30
BASIS OF BEARINGS

60' WITNESS CORNER TO THE
CENTER 1/4 CORNER OF
SECTION 30 FOUND #6 REBAR
& 2.5" ALUMINUM CAP PLS
28286 IN RANGE BOX
MATCHING MONUMENT RECORD
FILED 3/29/04

CENTER 1/4 CORNER SECTION 30



LEGEND

ALIQUOT CORNER

SECTION LINE

ADJACENT LOT LINE

RIGHT-OF-WAY

ANNEX BOUNDARY

ARVADA CITY LIMITS

ANNEXATION ORDINANCE NO. 4324

ANNEXATION ORDINANCE NO. 4325

ANNEXATION ORDINANCE NO. 2369

ANNEXATION ORDINANCE NO. 3582

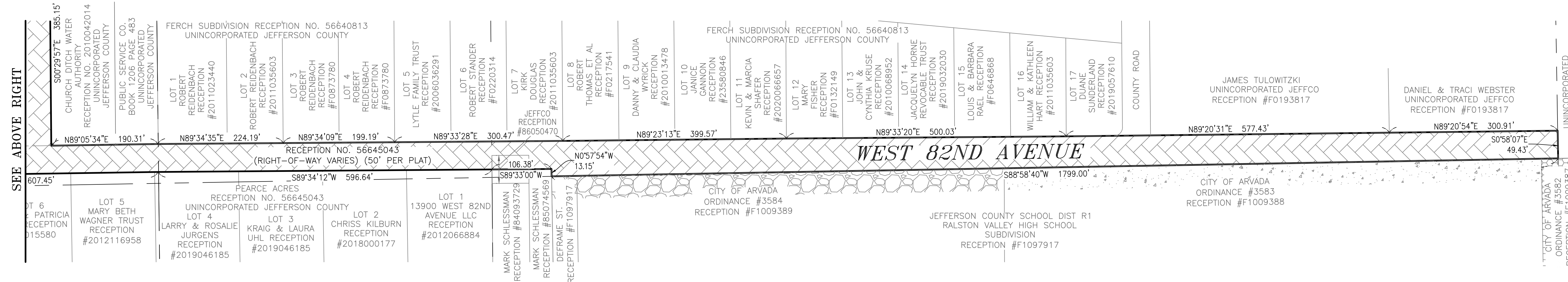
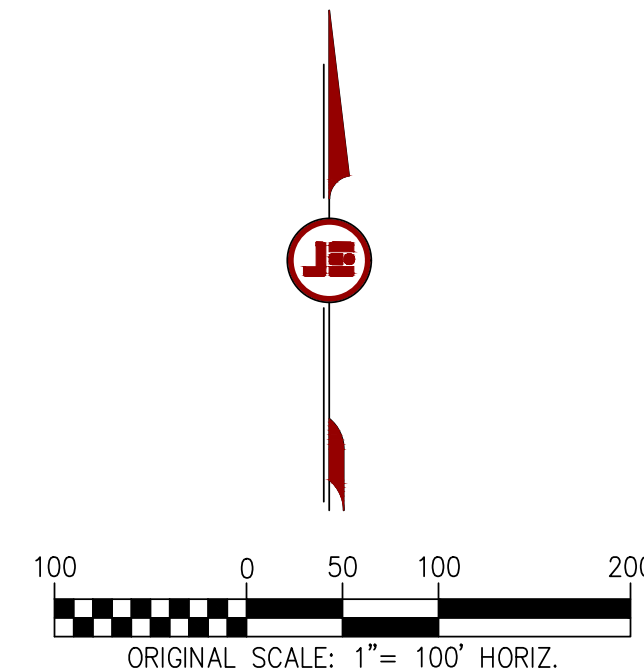
ANNEXATION ORDINANCE NO. 3583

ANNEXATION ORDINANCE NO. 3584

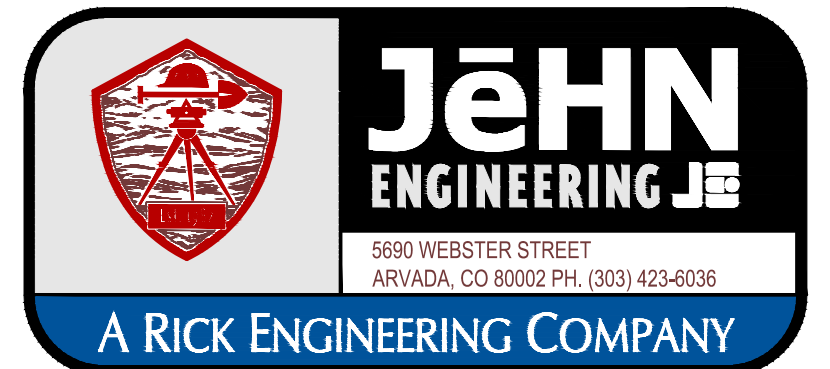
ANNEXATION ORDINANCE NO. 3584

WHITEWING ANNEXATION

SEE BELOW LEFT



ALBIRE STREET



City of Arvada Community and Economic Development Department **PUBLIC HEARING STAFF REPORT**

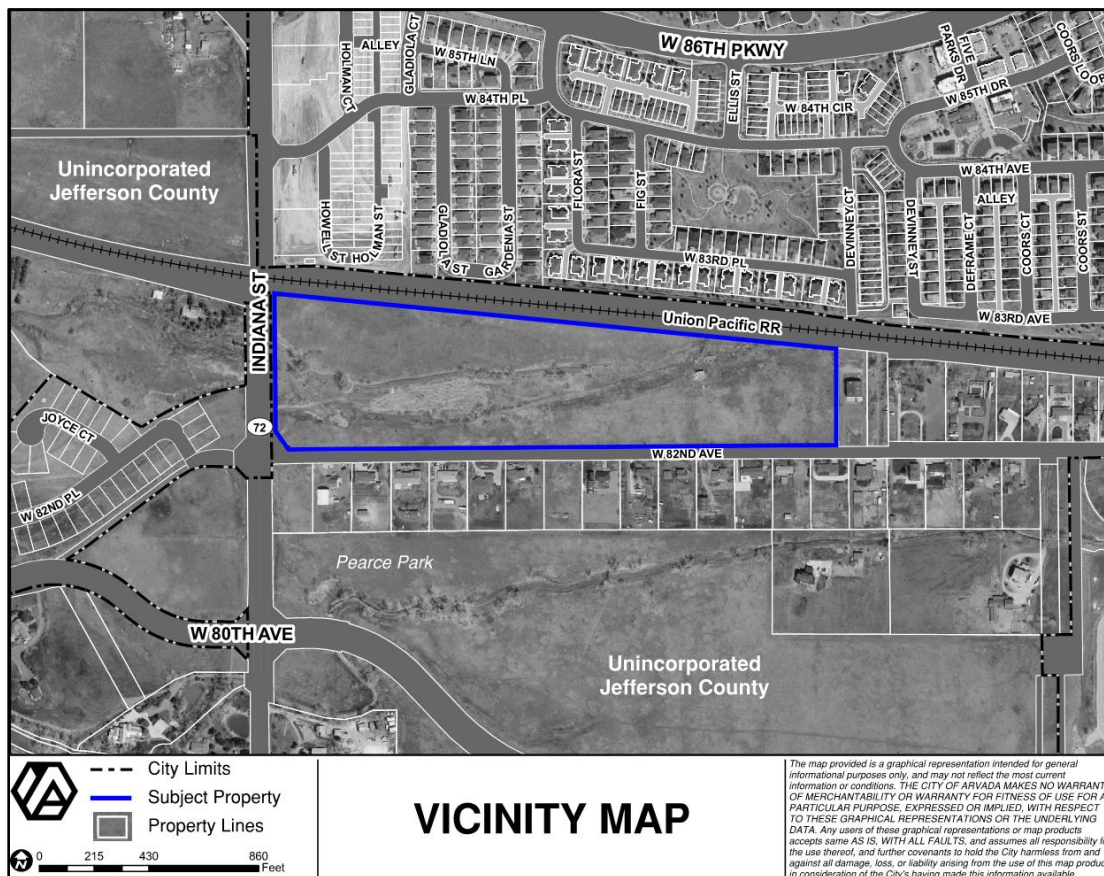
Whitewing at Ralston Summit Annexation, Zoning, PUD Development Plan, Major Subdivision Preliminary Plat DA2021-0006

NATURE OF REQUEST

Ralston Valley Land Partners, LLC is requesting approval of applications for Annexation, Zoning, PUD Development Plan (PDP), and Major Subdivision Preliminary Plat of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation and Zoning applications also include the right-of-way (ROW) of W 82nd Ave. between Indiana St. and Alkire St. containing 5.9 acres of land.

The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom construction on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Ave via existing ROW adjacent to the west property line of Ralston Valley High School.

If the City Council approves the applications for Annexation, Zoning, PDP, and Major Subdivision Preliminary Plat, applications will then be required for a Final Development Plan (FDP) and Final Plat, which will be reviewed administratively.



LOCATION AND HISTORY

The subject property is located in Unincorporated Jefferson County at the northeast corner of Indiana Street and W 82nd Avenue and is currently vacant. The property abuts the Union Pacific Railroad (UPRR) to the north, Indiana Street to the west, and W 82nd Avenue to the south. The property has significant grade change throughout with the railroad being the highpoint and the remaining property sloping generally south. The Tucker Irrigation Ditch runs generally west to east across the site. The section of Indiana Street adjacent to the site is part of State Highway 72 under the Colorado Department of Transportation's (CDOT's) jurisdiction.

The subject property does not have any development history. The prior owners of the property have previously contacted City staff for pre-application meetings regarding annexation, but the current annexation application is the first formal application that has been submitted to the City.

NEIGHBORHOOD MEETING

Division 8-2-2 of the Land Development Code (LDC) requires that at least one neighborhood meeting be held for projects that require public hearings before the Planning Commission and City Council.

The required neighborhood meeting for this project took place virtually on October 7, 2020. The applicant, staff, and 34 neighbors were in attendance. The primary concerns of neighbors were about whether anyone located in Unincorporated Jefferson County would be required to annex into the City and whether the new development would negatively impact the soil or water in the area since all of the property owners along this section of W 82nd Ave. have septic systems. City staff informed the neighbors that the City does not have a policy of unilateral or forced annexation. The developer addressed concerns about the potential environmental impact and stated that any impacts would be required to be mitigated. The applicant has prepared a summary of the meeting, which is attached.

PUBLIC NOTIFICATION

Division 8-2-4 of the Land Development Code requires public notification for all public hearings as follows:

Written Notice: At least 15 days prior to all public hearings, written notice must be mailed to all property owners within 500 feet of the subject property and to all homeowners associations and neighborhood associations with a known interest in the subject property. The applicant will provide an affidavit of mailing verifying this requirement has been met prior to the public hearing.

Posted Notice: At least 15 days prior to all public hearings, signs notifying the public of the hearing must be posted on the subject property. The applicant will provide a posting log verifying that this requirement has been met prior to the public hearing.

Published Notice: At least 15 days prior to all public hearings, notice of the hearing must be published in a newspaper of general circulation in the City. The required notice has been published.

SEVERED MINERAL RIGHTS

At least 30 days prior to the public hearing, written notice of the application must be mailed to any owner of mineral rights associated with the subject property. The applicant has provided the required Certification of Notice pursuant to Colorado Revised Statute 24-65.5-103.

DEVELOPMENT REVIEW TIMELINE

The application was accepted by the City for review on January 24, 2021. The standard review timeline allows for three reviews within a 20 week timeframe to hold a Planning Commission public hearing. This application required three reviews. The first and second City reviews were completed in six and seven weeks respectively when the typical review period is four weeks. These reviews took longer than typical due to the development caseload at the time and the complexity of the project. City staff also held several meetings with the applicant's development team between submittals. The applicant submitted the project for the third review after seven weeks, when the typical resubmittal period is three weeks. The third staff review was completed in four weeks. In total, the case will be heard 32 weeks after the application was submitted.

ALIGNMENT WITH CITY COUNCIL STRATEGIC PLAN

The project is consistent with the City Council Strategic Plan principles for the Community and Economic Development work system.

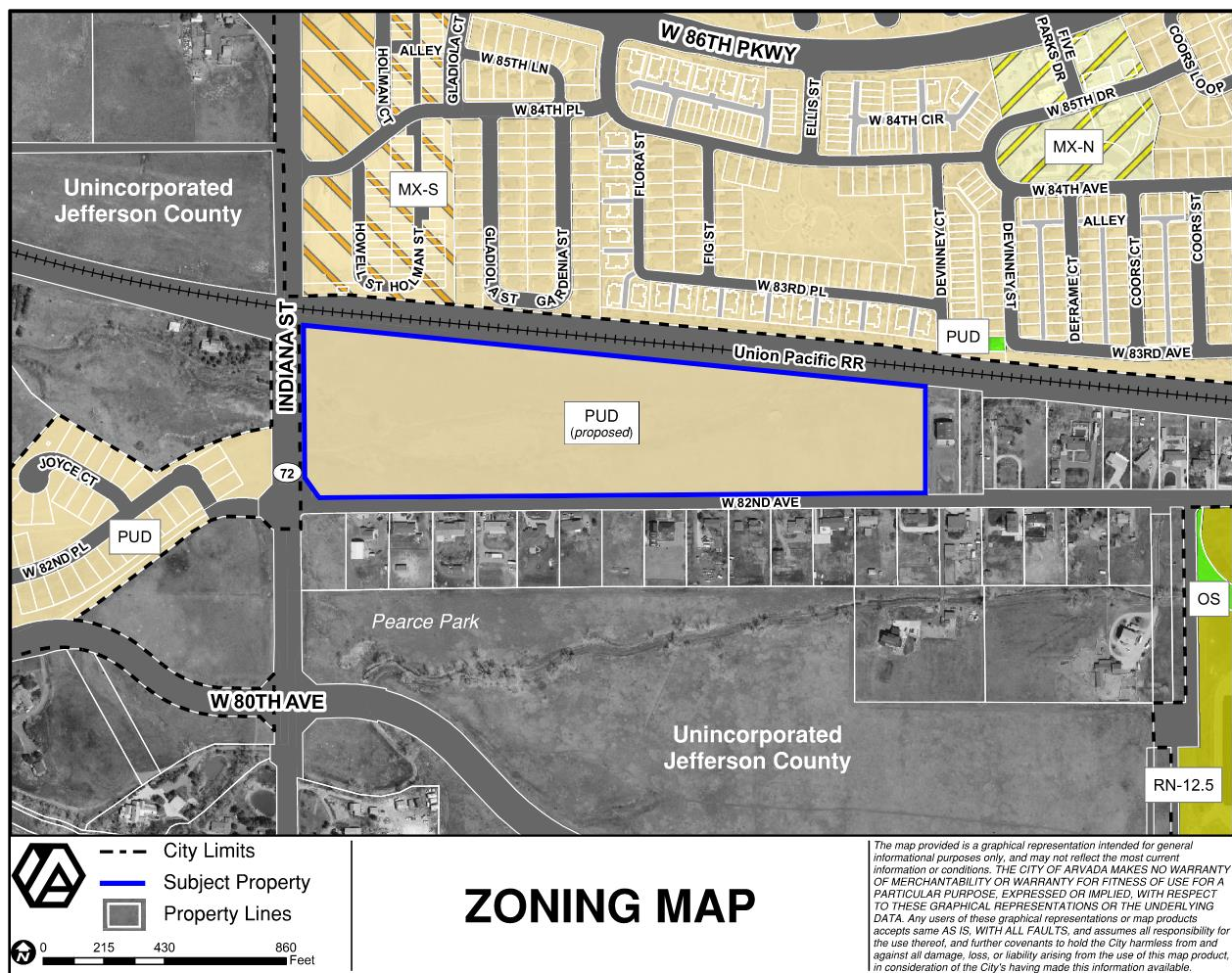
ZONING AND LAND USE

The subject property is currently zoned Jefferson County Agricultural-Two and contains approximately 25.5 acres of land. The applicant is proposing to zone the property as Planned Unit Development (PUD). Surrounding properties are zoned and utilized as follows:

Direction	Zoning	Actual Use
North (across railroad)	MX-S and PUD (Mixed Use – Suburban) and (Planned Unit Development – Residential 3.75 du/ac)	Commercial, Duplex homes, and Single-Family homes
South (across W 82nd Ave)	Jefferson County A-2 (Agricultural - Two)	Single-Family homes
East	Jefferson County A-2 (Agricultural - Two)	Church Ditch Water Authority Utility Building
West (across Indiana St)	Jefferson County A-2 and Arvada PUD (Agricultural - Two) and (Planned Unit Development – Residential 3.2 du/ac)	Single-Family homes

The Comprehensive Plan Future Land Use Designation for the subject property is Low Density Residential, which allows for a zoning of Residential Agricultural (RA) or PUD with a gross density up to 1.5 du/ac.

The overall intention of the proposal is to develop a high-end large-lot single-family residential product with a rural feel. While the concept could apply to the RA zone district, it would be practically infeasible for an RA zoned development to meet all of the standard requirements due to the challenging grade change on the site, existing gas and fiber utility locations, and the Tucker Irrigation Ditch located on site. Given that reality, the applicant is proposing PUD zoning while using the development standards of the RN-32.5 and RN-12.5 Residential Neighborhood zone districts as guidance.



The purpose of the PUD zoning district is to accommodate innovative site planning for a development that includes significant public benefits. In order that the public health, safety, integrity, and general welfare may be furthered in an era where innovation and responsiveness in real estate development is often needed to meet shifting market demands, the PUD zone is established to provide project variety and diversity through the establishment of project-specific standards in the alternative to those otherwise set out in this LDC, so that maximum long-range neighborhood and community benefits can be gained.

The proposed development standards for the site are generally consistent with either the RN-32.5 or RN-12.5 Residential Neighborhood zone district standards. The standards of those districts are generally appropriate as a metrics due to their similarity in lot sizes. The minimum lot size of the proposed Whitewing PUD is 19,500 square feet while the minimum lot size of the RN-12.5 zone district is 12,500 square feet and the minimum lot size of the RN-32.5 zone district is 32,500 square feet. Specific development standards will be discussed in greater detail below. The proposal meets the intention and purpose of the PUD zone district.

PROJECT ANALYSIS

Annexation

The applicant is petitioning to annex 31.4 acres of land into the City in order to access City water and sanitary sewer service. Annexation into the City requires conformance with section 30 of article II of the state constitution and Colorado Revised Statutes §31-12-101, et seq.

The land proposed to be annexed includes the 25.5 acre subject property and 5.9 acres of W 82nd Ave. ROW between Indiana St. and Alkire St. W 82nd Ave. is currently under the jurisdiction of Jefferson County. Since the City has existing water mains within that ROW and a new sanitary sewer main will be constructed in the ROW, the City requested that W 82nd Ave. be annexed into Arvada in conjunction with the subject property. Jefferson County does not have any objections to the request, but did provide several comments related to W 82nd Ave. The County noted that W 82nd Ave. had recently been downgraded to a local street with a speed limit of 25 mph and the adjacent residents had partially funded the installation of speed humps along W 82nd Ave. City staff supports these measures previously taken by Jefferson County and will continue to work with residents of the area to ensure traffic speeds remain safe.

Staff has reviewed the annexation application and finds it to be in accordance with the constitution and laws of the State of Colorado currently in effect. The annexation application has also been processed in accordance with LDC Division 8-3-3. Staff has provided a bulleted summary of relevant Colorado Revised Statutes:

- §31-12-104(1)(a) – at least one-sixth of the perimeter of the area proposed to be annexed is contiguous with the City of Arvada
- §31-12-105 – the annexation application does not present any conflicts with the limitations imposed by this section
- §31-12-107(1) – a petition has been submitted to the City in accordance with section 30(1)(b) of article II of the state constitution

Compliance with the Comprehensive Plan

The Comprehensive Plan Future Land Use Designation for the subject property is Low Density Residential. The intention of the Low Density Residential designation is to allow for residential densities lower than typically found in suburban residential areas and encourage more rural characteristics. It is generally found in the western part of Arvada where topography is more varied. The proposed development is consistent with the Low Density Residential designation as well as the following Comprehensive Plan Goals & Policies:

Goal L-2: Plan for a balanced mix of commercial and residential land uses in Arvada.

Policy L-2.2: Allow Appropriate Expansion of City Boundaries

The City will consider the annexation of land that includes land uses that are consistent with the Comprehensive Plan goals, the long-term needs of the community and the City's service capacity.

Goal CC-1: Plan Arvada as a City of different development character districts.

Policy CC-1.1: Variety of Development Types

The City will include a variety of development types including rural areas, suburban residential neighborhoods, historic districts, redevelopment areas, and mixed-use communities that contain services, employment, and higher density housing.

Goal CC-2: Establish and maintain Arvada's distinct qualities and small-town identity.

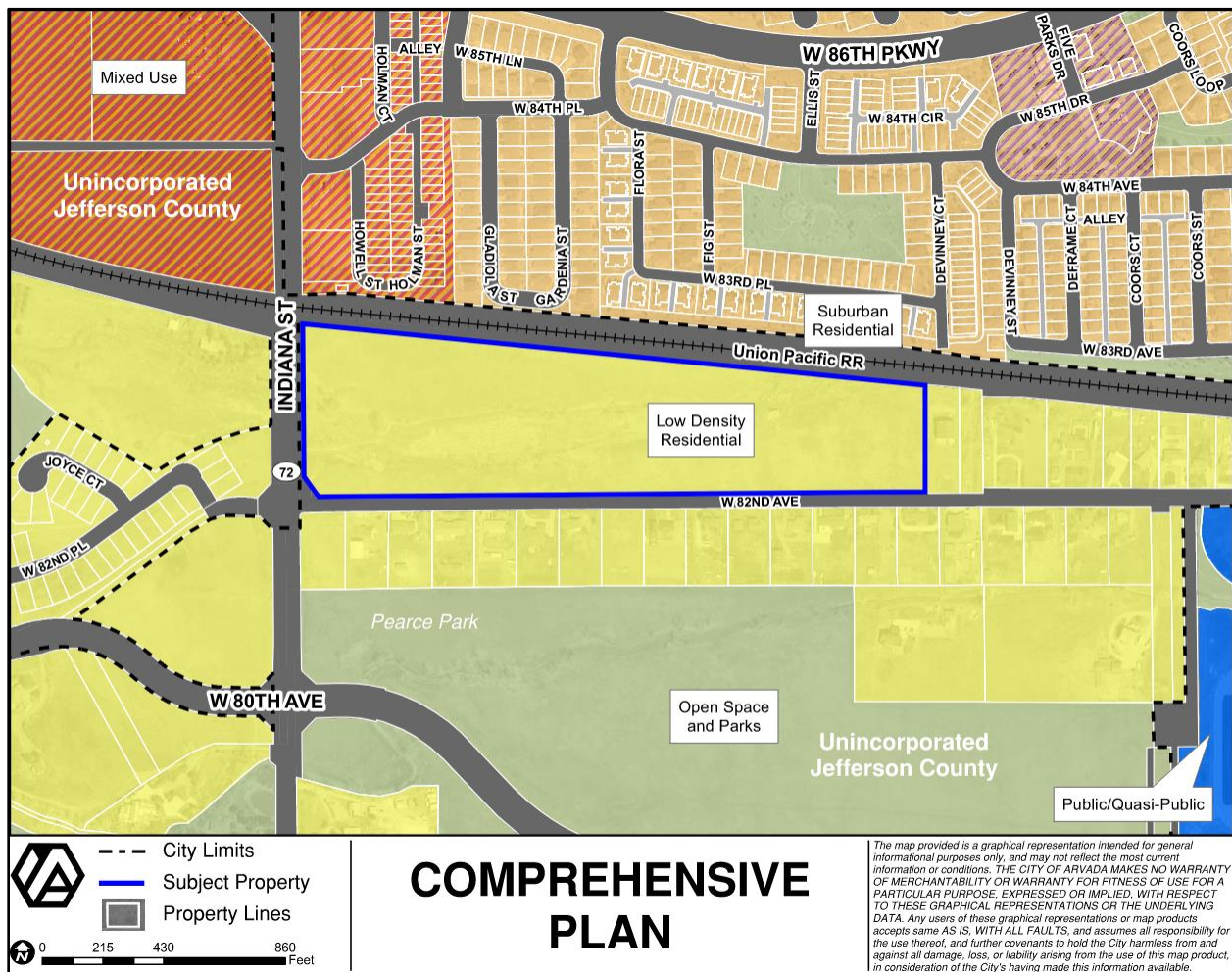
Policy CC-2.2: High Quality Private Development

The City will promote high quality architecture, site planning, landscaping, signage, and lighting for new residential and commercial developments.

GOAL CC-3: Identify places and assets that are unique and important to the community and work to preserve them.

Policy CC-3.4: Low Density Areas

Development within designated Low Density areas should have an open feel and incorporate characteristics found in rural areas such as significant open space, existing vegetation, more natural landscaping, open fencing, view corridors from public places, and non-suburban road design



Infrastructure Improvements to Indiana Street

The ROW of Indiana St. adjacent to the subject property does not currently meet City standards and is not constructed to the ultimate build out of State Highway 72 as designated by CDOT. Typically, all new development in the City is required to dedicate and construct ROW meeting City standards or improve existing ROW to meet City standards at the time of development in accordance with Arvada City Code Sec. 74-93. - Development of streets.

However, in this instance, the proximate location of the Union Pacific Railroad (UPRR) overpass prevents the full design of improvements to Indiana St. as the bridge would need to be replaced in order to accommodate the ultimate design to widen Indiana St. The City is actively working with CDOT and UPRR to secure funding for design and construction of a new railroad bridge.

Due to this circumstance, the applicant will provide designs for the necessary improvements to Indiana St. along the property frontage except for the northernmost 150 feet. The northernmost 150 feet along the property frontage would be the likely location of a temporary shoofly rail bridge to allow continuous UPRR operations while the existing bridge is replaced. As such, the future condition of that area is unknown until the bridge replacement is designed. The applicant will pay fees-in-lieu of construction to the City for all of the improvements that would typically be required. When the railroad bridge is replaced and Indiana St. is widened, the City would install the required improvements using the fees-in-lieu. The associated construction costs will be determined prior to approval of the FDP and final plat.

Setbacks

The proposed setbacks mostly align with the setbacks of the RN-12.5 zone district.

Setback Standards	Proposed	RN-12.5
Min. Front	30 ft	30 ft
Min. Street Side	25 ft	25 ft
Min. Interior Side	10 ft / 20 ft	10 ft
Min. Rear	15 ft	15 ft
Min. Arterial Setback	100 ft	100 ft

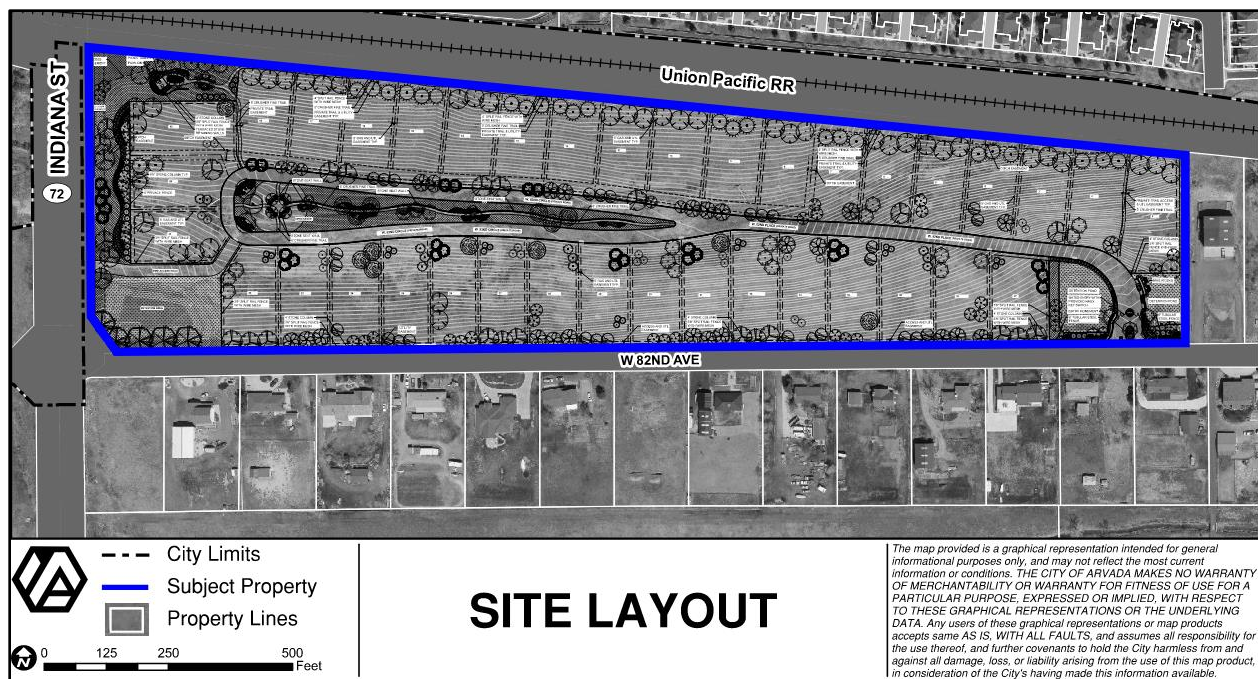
There is one deviation from the Min. Interior Side Setback standard. The proposed interior side setback is intended to be larger on one side of each lot to preserve the open character of the neighborhood while allowing room for side-loaded garages on the opposite side of the lot.

Building Height

The maximum proposed principal building height is 35 feet. The maximum proposed accessory building height is 20 feet. These standards are consistent with the RN-32.5 zone district.

Open Space

The proposal contains approximately six acres of open space accounting for 24% of the site. The focal point of the open space is the 51,000 square foot neighborhood park in the center of the site with seating areas and paths connecting the area. There is also a large HOA tract along the west and south perimeter that offers landscaped amenities and there is a shared trail that runs along the northern property boundary.



Landscaping, Buffering, and Fencing

The PDP is meeting landscaping, buffering, and fencing standards of the LDC. However, it should be noted that the landscaping directly adjacent to Indiana St. would likely not be installed until the final street section of Indiana St. is constructed. Additionally, a modification will be necessary to the typical tree lawn of the W 82nd Ave. street section. Due to the location of an existing gas line and fiber optic line combined with the grade of the site and drainage requirements, the typical eight-foot tree lawn cannot be provided. A four-foot lawn is provided as a buffer between the sidewalk and the street instead. The street trees that would typically be planted in the tree lawn will be located within an adjacent HOA tract to be irrigated and maintained by the HOA.

Parks

The development will be required to pay the standard Park Development Fees as well as fees-in-lieu of park land dedication, which will be determined prior to approval of the Final Plat.

Building Design

The applicant is proposing to construct high-end custom homes and to establish strong architectural guidelines. As the building design will be customized to future homeowners preferences, there are not any 'typical' architectural drawings associated with the project. All buildings will be required to meet the standard LDC residential building design standards.

Site Access

The applicant is requesting a modification to LDC §4-4-3-4(J) – *Private Streets* as part of the PDP to allow gated access to the site. LDC §4-4-3-4(J) states: "The use of private streets is discouraged. Where allowed by the Director, private streets shall comply with all standards for the design of public streets of the same function adopted by the City."

Gated access would not comply with a stated purpose and intent of the LDC to “promote the creation of safe, unique, interesting, inclusive, and economically vibrant places throughout the City.” A gated access is exclusive by nature and function, which is why the City has historically not approved any requests for gated access to residential communities. In addition to being exclusive, gated access creates logistical issues for first responders and can increase response time. For these reasons, staff has included a provision in the conditions of approval stating that gated access to the development would not be permitted.

Circulation and Connectivity

The proposed development is located at the corner of Indiana St. and W 82nd Ave. Access to the development will be from W 82nd Ave. and there will not be any direct access to Indiana St. The development will be served by a private road to be owned and maintained by the HOA. The applicant will improve W 82nd Ave. along the subject property frontage to Arvada standards for local streets including constructing a sidewalk. A modification to the tree lawn width for the Arvada local street section will be necessary, which was discussed above.

Current access to Indiana St. from W 82nd Ave. is limited to a right-in-right-out movement. A median is anticipated to be constructed on Indiana St. in this area when Indiana St. is widened and final improvements are made. In order for residents of the development to head south, they would need to take W 82nd Ave. to Alkire St. Due to this traffic pattern, the applicant will be required to contribute funding to upgrade the traffic signal at Alkire St. and W 80th Ave. based on their proportionate share of traffic.

Grading and Drainage

There is an approximate 85-foot existing grade change between the highest point on the site in the northwest corner to the lowest point on the site in the southeast corner. The preliminary grading plan has been reviewed and it appears to comply with all applicable standards. The development is required to control drainage on-site and release collected stormwater at historic flow rates. This will be achieved through swales and stormwater detention infrastructure located along the perimeter of the development in HOA tracts. The infrastructure will be owned and maintained by the HOA. The final grading and drainage plans will be reviewed with the FDP.

Parking and Loading

The proposed development is required to provide two-off street parking spaces for each single-family home. This will be achieved through two-car garages. If a property owner constructs an accessory dwelling unit (ADU), and additional off-street parking space would be required. This could be achieved by using a driveway space or constructing a garage as part of the ADU. On-street parking on the private road serving the development will not be permitted due to the International Fire Code (IFC) access requirements.

Utility Services

Water and sanitary sewer service will both be provided by the City of Arvada, which will be able to adequately serve the proposed development. There is an existing water main east of the subject property within the W 82nd Ave. ROW that will be extended through the site and looped into the existing water main in Indiana St. The closest sanitary sewer main to the site is a quarter mile south in the W 80th Ave. ROW. The applicant is proposing to extend the sanitary sewer main along the west property line of Ralston Valley High School where there is existing ROW dedicated to Arvada. The main will then be extended west along W 82nd Ave. to serve the

proposed development. The extension of the sewer main may also be a future benefit to the current residents along that section of W 82nd Ave.

Police and Fire Protection

The proposed development is currently served by the Arvada Police Department and the Arvada Fire Protection District (AFPD), who have reviewed the proposed development. Due to the number of units proposed and grade challenges for a potential secondary access road, the fire code requires that all homes within the development have automatic sprinkler systems installed that meet the adopted IFC standards. The AFPD has confirmed that the proposed secondary emergency vehicle access is too steep for their equipment to use.

School District

The residential development will be required to pay the standard school fee-in-lieu of land dedication, which will be determined prior to approval of the Final Plat. Children living in this development would attend Van Arsdale Elementary School, Oberon Middle School, and Ralston Valley High School. The Jefferson County School District has reviewed the proposal and has indicated that capacity for Van Arsdale Elementary & Oberon Middle is sufficient to house students from this development; however, Ralston Valley High will be overenrolled. Ralston Valley HS is receiving an addition to increase capacity in the current bond that will accommodate these students. This development will be further evaluated as a part of the Jefferson County School's overall review of the north area development picture.

LAND DEVELOPMENT CODE APPROVAL CRITERIA

It is the responsibility of the applicant to justify the requested land use application. The Planning Commission should make a recommendation to the City Council based on its findings regarding the approval criteria shown in the tables below and upon testimony heard during the public hearing as it applied to the criteria. Staff performed an analysis of the proposal, based on the approval criteria listed in Chapter 8 of the Land Development Code, and presents the following findings:

Div. 8-3-3 Annexation and Disconnection Approval Criteria	Finding	Rationale
1. The annexation is in accord with the Comprehensive Plan and the best interests of the City would be served by annexation of such property.	Complies	The annexation complies with the Low Density Residential designation and will improve surrounding infrastructure.
2. The property is capable of being integrated into the City and developed in compliance with all applicable provisions of this Code and the Arvada City Code.	Complies	The proposed development complies with all applicable provisions of this Code and the Arvada City Code.
3. At the time any development of the area proposed to be annexed is completed, there will be capacity to adequately serve residents of such area with all necessary utilities, facilities and public services.	Complies	With the extension of water and sanitary sewer mains as part of this proposal, there will be capacity and infrastructure to adequately serve residents.

Div. 8-3-4 Zoning and Rezoning Approval Criteria	Finding	Rationale
1. The rezoning is consistent with the Arvada Comprehensive Plan, or an adopted sub-area plan, corridor plan, or urban renewal plan, or reflects conditions that have changed since the adoption of the Comprehensive Plan.	Complies	The PUD zoning and PDP to develop single-family homes with a max. density of 1.5 du/ac complies with the Comprehensive Plan Low Density Residential designation.
2. The intended land use is consistent with the stated intent of the proposed zoning district.	Complies	Single-family residential units are allowed in the PUD zone district.
3. Facilities and services (including sewage and waste disposal, water, gas, electricity, police and fire protection, and roads and transportation, as applicable) will, prior to development, be available to serve the subject property while maintaining adequate levels of service to existing development.	Complies	With the extension of water and sanitary sewer mains as part of this proposal, there will be capacity and infrastructure to adequately serve residents while maintaining adequate levels of service to existing development. As noted in the analysis above, AFPD will require all homes within the development to install automatic sprinkler systems meeting the adopted IFC standards.
4. The intended land use for which the rezoning is sought will not result in significant adverse impacts upon the natural environment, including air, water, noise, stormwater management, wildlife, and vegetation, or such impacts will be substantially mitigated.	Complies	The development will not have a significant impact on the natural environment. The development will comply with all required stormwater management standards and mitigate off-site impacts.
5. The rezoning is consistent with the character of existing or planned development on adjacent properties and in the surrounding area or neighborhood, or measures will be taken to substantially buffer or otherwise substantially mitigate any negative impacts.	Complies	The immediately adjacent properties located in Unincorporated Jefferson County are large lot rural/agricultural properties. The nearby residential properties at the Village of Five Parks are a mix of housing types and lot sizes with high-quality construction. The proposed development is compatible with and fills a niche in between the two nearby neighborhoods with large lot high quality housing.

Div. 8-3-8 Major Subdivision Preliminary Plat Approval Criteria	Finding	Rationale
1. The proposed subdivision is consistent with the Comprehensive Plan.	Complies	The proposal to create large single-family home lots with a max. density of 1.5 du/ac complies with the Comprehensive Plan Low Density Residential designation.
2. The proposed subdivision is consistent with, and implements, the intent of the zoning district in which it is located. If the subject property is in a PUD zoning district, the subdivision is consistent with any previously approved PUD Outline Development Plan, PUD Development Plan, and/or PUD Final Development Plan.	Complies	There is not a previously approved PUD Outline Development Plan, PUD Development Plan, and/or PUD Final Development Plan. The proposed subdivision is consistent with the PUD Development Plan that is being analyzed concurrently.

3. Adequate and sufficient public safety, transportation, utility facilities and services, recreation facilities, parks, and schools will, prior to development, be available to serve the subject property, while maintaining sufficient levels of service to existing development.	Complies	With the extension of water and sanitary sewer mains as part of this proposal, there will be capacity and infrastructure to adequately serve residents while maintaining adequate levels of service to existing development.
4. The proposed subdivision will not result in significant adverse impacts on the natural environment or the use and enjoyment of adjoining property, including changes in air quality, water quality, noise levels, stormwater runoff, wildlife habitat, and/or natural vegetation, in that such impacts will be substantially avoided or mitigated by design.	Complies	The development will not have a significant impact on the natural environment. The development will comply with all required stormwater management standards and mitigate off-site impacts.
5. The proposed subdivision complies with all applicable regulations, standards, requirements, or plans of the federal or state governments and other general or special-purpose governmental entities with jurisdiction, involving (but not limited to) such matters as wetlands, water quality, erosion control, potable water, fire safety, or wastewater regulations.	Complies	The proposed subdivision is anticipated to meet all applicable regulations, standards, requirements, or plans. As noted in the analysis above, AFPD will require all homes within the development to install automatic sprinkler systems meeting the adopted IFC standards.
6. The proposed subdivision complies with all applicable use, development, and design standards set forth in Chapter 2, Zoning Districts Chapter 4, Environmental and Site Design, and other applicable provisions of this Code, except to the extent the same are modified as may be provided in this LDC. Applicants shall avoid creating lots or patterns of lots in the subdivision that will make future compliance with such development and design standards difficult or infeasible.	Complies	The proposed subdivision is meeting all applicable use, development, and design standards.
7. The general layout of lots, roads, driveways, utilities, drainage facilities, and other services within the proposed subdivision is designed in a way that minimizes the amount of land disturbance, maximizes the amount of open space in the development, preserves existing trees/vegetation and riparian areas, protects critical wildlife habitat, and otherwise accomplishes the purposes and intent of this LDC.	Complies	The general layout of lots, roads, driveways, utilities, drainage facilities, and other services within the proposed subdivision comply with all applicable requirements in the City's Engineering Code of Standards and Specifications along with all applicable standards in the LDC that are not otherwise modified.

Div. 8-3-10 PUD Development Plan Approval Criteria	Finding	Rationale
1. The plan is consistent with the Comprehensive Plan or reflects conditions that have changed since the adoption of the Comprehensive Plan	Complies	The PDP to develop single-family homes with a max. density of 1.5 du/ac complies with the Comprehensive Plan Low Density Residential designation.
2. The plan is consistent with and implements and previously approved Outline Development Plan in	N/A	There is not a previously approved

effect for the subject property, per Section 8-3-10-7, PUDs Approved Prior to Effective Date.		Outline Development Plan.
3. The plan represents a development that will address a unique situation, confer a substantial benefit to the City, or incorporate creative site design such that it achieves the purposes set out in Section 8-3-10-1, Purpose of Planned Development Zone, and represents an improvement in quality over what could have been accomplished through application of the otherwise applicable zoning district or development standards.	Complies	The plan will confer a substantial benefit to the City through extension of water and sewer main lines, infrastructure improvements, and fees-in-lieu of improvements. The plan addresses the unique situation presented by the significant grades on the site by creating large lot standards not found in established zone districts.
4. The plan generally complies with the intent of the use, development and design standards set forth in the LDC.	Mostly Complies	The PDP complies with almost all applicable development and design standards set forth in the LDC with the exception of the requested modification to allow gated access to the private road serving the development. Staff does not support the requested modification.
5. To the extent reasonably feasible, the plan provides for integration and connection with adjoining development through street connections, sidewalks, trails, and similar features; unless due to the nature of the uses that are allowable in the plan such connections are not desirable.	Mostly Complies	The development will improve W 82 nd Ave. to Arvada local street standards including constructing a sidewalk along the property frontage. The applicant will also pay fees-in-lieu of constructing improvements to Indiana St., which include a sidewalk/trail that will ultimately connect to existing sidewalk/trail to the north. The requested modification to allow gated access to the private road serving the development does not provide for integration and connection and staff does not support the request.
6. Sufficient public safety, transportation, and utility facilities and services will, prior to development, be available to serve the subject property, while maintaining sufficient levels of service to existing development.	Complies	With the extension of water and sanitary sewer mains as well as roadway improvements to W 82 nd Ave and fees-in-lieu for improvements to Indiana St. as part of this proposal, there will be capacity and infrastructure to adequately serve residents while maintaining adequate levels of service to existing development. As noted in the analysis above, AFD will require all homes within the development to install automatic sprinkler systems meeting the adopted IFC standards.
7. The proposed uses (or group of uses) are appropriately located and designed, both within the boundaries of the plan and in relation to adjacent uses, such that the foreseeable, material adverse impacts that may be created by the scale, design, and operating characteristics (e.g., hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts) of the uses are avoided or mitigated.	Complies	The proposed use will not have a significant impact to adjacent uses. The development will provide landscaping along W 82 nd Ave. offering a larger than typical buffer from existing homes and the proposed setbacks are in line with the existing neighborhood.

8. If the application for plan approval is accompanied by an application for rezoning to the PUD zoning district, the rezoning application is concurrently approved.	Complies	The zoning application and PDP are being considered concurrently.
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STAFF RECOMMENDATION

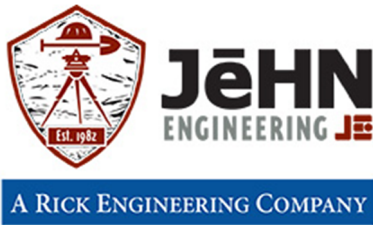
Based upon project analysis and review of the Land Development Code approval criteria, staff recommends approval of the following applications:

1. Annexation
2. Zoning
3. Major Subdivision Preliminary Plat
4. PUD Development Plan (PDP)

If the Planning Commission finds that a recommendation to approve the PUD Development Plan (PDP) application is supported by the approval criteria, then staff recommends that the following conditions be made part of the approval:

1. The applicant shall address all of the remaining technical issues identified by staff on the PDP as part of the first FDP submittal.
2. A Development Agreement for this site must be signed by the applicant prior to approval of the FDP and final plat to ensure completion of all public improvements and any other necessary requirements. The agreement shall contain the total amount of fees-in-lieu required to construct improvements for the ultimate buildout of Indiana St. along the subject property frontage.
3. As part of the first FDP submittal for this development, the applicant shall submit roadway design plans for the portion of Indiana St. along the subject property frontage, excepting that 150 foot portion of the northernmost roadway. The design shall be approved concurrently with the FDP.
4. As part of FDP approval, the applicant shall submit funds for the necessary capacity improvements associated with the development to the traffic signal at the intersection of W 80th Ave. and Alkire St. The exact amount of this cost shall be determined through the FDP process.
5. Gated access to the private road serving the development shall not be permitted.

The Planning Commission may recommend denial of the request(s) if it cannot make affirmative findings of the approval criteria stated above.



October 8, 2020

Jonathan Moore, Planning Department
City of Arvada
8101 Ralston Road
Arvada, Colorado 80002

RE: Whitewing at Ralston Summit Neighborhood Meeting

Meeting was held on October 7, 2020 at 6pm via zoom format

Attendance was by: Debbie Klisis, Jehn Engineering
Joseph A. Jehn, Jehn Engineering
Jerome Magsino, Jehn Engineering
Sandra Moore, Jehn Engineering
Greg Bamford, Bamford Company
David Bamford, Bamford Company
Jonathan Moore, Planner City of Arvada
Jake Sawaya, City of Arvada Planning
Rob Smetana, City of Arvada Planning

24 people RSVP to attend the meeting
34 people were generally present at the meeting
1 person RSVP but was unable to attend

Debbie Klisis opened the meeting by introducing the Jehn Engineering representatives, City of Arvada representatives in attendance, and Bamford Company representatives to showcase their conceptual community development plan for this project.

After the presentation was shown, Greg Bamford talked about his lengthy history as a developer and how he would like to bring his knowledge and product to the Arvada area. He also reassured everyone that his company would be present until the last home was built and someone from his company would be on the HOA to insure that a quality product would be shown.

The adjacent property owner's concerns were as follows:

- With this development would this ruin the residents wells and septic systems.
RESPONSE: There will be no adverse effect to the wells and the septic system because of development of this project.
- Would the residents be forced into being annexed into the city of Arvada?
RESPONSE: No one will be asked to be annexed into the city. That is done only by a request to be annexed.
- They were afraid they would have to rely on city water and sewer and to have to pay the tap fees.
RESPONSE: The property owners will not be subjected to using city water and the sewer system.
- They asked where the water and sewer line come from. Would it come from 80th or farther up Indiana.
RESPONSE: Still working out the location but probably be connected to the utilities in 82nd Sewer extends east on 82nd and south to 80th; water connects in 82nd on east and west side. ..
- Was a soils study to be done because of the expansive soils in the area? It was also mentioned that numerous homes in the area were showing stress due to the bentonite in the soil, and sliding which some of the residents were worried about their homes below this project.
RESPONSE: A Geotechnical Engineer has been hired to do a soil analysis and they will provide their recommendations and findings.
- Was there going to be a height limit to the houses so the people in Five Parks would not lose their views?
RESPONSE: The City of Arvada already has height limitations in place which is 35 feet.
- Would there be parks and open spaces in the community?
RESPONSE: Yes there will be.
- What would happen to the ditch water, would it be piped?
RESPONSE: We are working with the ditch companies and discussing piping the ditch water.
- Would there be trails through the community for adjacent property owners?
RESPONSE: The trails would be for the residences of the community.
- Would this community be gated?
RESPONSE: There is a discuss with the City concerning this concept.

- What type of illumination would be used so you would not have light pollution?
RESPONSE: This is still being discussed with the City to avoid any light pollution. A photometric plan will be prepared, and will meet city standards, which does not allow light spilling beyond the property.
- Could the entrance be at an angle so the car light would not shine into surrounding residences homes?
RESPONSE: This is still being discussed with the city to avoid any light pollution. Entrance relocated to align with adjacent lot line o avoid lights in houses.
- Will the soils be tested for plutonium, when the soils are done. What will happen once the soils are disturbed?
RESPONSE: A Geotechnical Engineer has been hired to do a soil analysis and they will provide their recommendations and finding.
- When construction starts what will be done to keep the dust down?
RESPONSE: When construction starts the contractors will be following the City of Arvada protocol of dust mitigation.
- How would the construction traffic get to the site?
RESPONSE: City of Arvada wants to minimize the construction traffic issues but it is still very early in this process. Traffic will access off 82nd.
- Traffic issues was a major problem because of the right in and out only on Indiana Street. Where would the access to the community be? Would there be an access onto Indiana Street?
RESPONSE: A traffic study will be prepared, nothing has been finalized this early.
- Would there be an environmental study done to protect the wet lands in the area?
RESPONSE: Yes and will be completed.
- Would they pave the road by the railway for a trail? That would not be done because the railroad owns that property.
RESPONSE: Nothing has been determined to date.
- A lot of discussion about Indiana Street possibly widening and the intersection at Alkire and Indiana Street. What the future would hold for these roads for easier access.
RESPONSE: Indiana will eventually be widened but there is no final development plans at this time. There will be interim widening with this development.

- What type of custom homes would be built and was there a minimum size to the house? Some of the lots were set for accessory building such as a casita, outer office, rv storage, larger storage units.

RESPONSE: The buyer will bring in their own custom architectural plans to be approved by the HOA. The developer has standards and guides to the type of home allowed in this community. Nothing has been determined at this time.

- Would the developer be pushed away from this project? Other developers walked away from this site and they liked this concept.

RESPONSE: Bamford Company will stay its course and push forward to develop this site. Mr. Bamford assured people that someone would be available from the HOA on site until the last home has been built.

- People did like the idea presented to them as there would be quality design and a constant presence of the owner/developer.

Summary:

We have addressed the neighbors' concerns. Any concerns not addressed will be worked through during the design process.



CED Boards and Commission <cedboardsandcommission@arvada.org>

Whitewing at Ralston Summit

Thu, Aug 26, 2021 at 3:36 PM

To: cedbordsandcommission@arvada.org

To Whom it may concern: I believe it is disingenuous to ask for feedback regarding the building of this development as I believe it's a done deal. I drive north on Indiana frequently as I live at The Village of Five Parks and there is a sign on the road stating that people can get further information regarding buying into this development.

My reason for not wanting this development to move forward is due to traffic issues. There are currently MANY times during the day when Indiana is very congested. There is no way to widen that part of Indiana due to the railroad trestle. So, we will be adding more and more cars to this road with no way to ease the congestion.

Please do not move forward with this development.

Sincerely,

Kathy Frank

Arvada resident of The Village of Five Parks



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CED Boards and Commission <cedboardsandcommission@arvada.org>

Comments: Whitewing at Ralston Summit, case number DA2021-0006

Michael Reim

Tue, Aug 31, 2021 at 11:33 AM

To: "CEDBOARDSANDCOMMISSION@ARVADA.ORG" <CEDBOARDSANDCOMMISSION@arvada.org>

Community and Economic Development Department

CEDBOARDSANDCOMMISSION@ARVADA.ORG

Mr. Jonathan Moore, Staff Contact, Arvada, CO

I submit comments for the record concerning the project "Whitewing at Ralston Summit," case number DA2021-0006.

I appreciate the opportunity to provide these comments and hope that they will offer some guidance to the City of Arvada in deciding whether or not to annex this land for residential development and to provide some direction for proper development requirements at this location. I present discussion of selected issues that particularly stood out to me as needing additional review and consideration.

Summary: As it currently stands, the Planning Commission must reject the annexation of this project. Critical issues have not been addressed and Arvada should not be in receivership of annexed lands required for this project. The key to this rejection is that the principle of "Infrastructure First" has not been precisely or comprehensively addressed and there appear to be inadequacies of site modifications for residential use of this land.

Land Stability and Grading: It would be important to review the grading of this property to make sure no stability reduction occurs on the slope of the embankment for the train track. The railroad should be contacted for input specific to this concern.

Slope of the lots: Drainage is greatly impacted by the topography and soil type. Here, the slope on many lots is 12 to over 20 percent. In addition, the soil types are clay-loams that typically have very low infiltration rates. The footprint of the structures to be built is stated to be on the order of 35 percent of the lot size and additional structures are indicated to be allowed on the lots. That could initially approach a 50 percent impermeable footprint and with the high slopes of the lots, it would be best to consider as a caution the entire surface of the development as an impermeable surface. Therefore, the adequacy of draining designs must be reevaluated. That would require reconsideration of the adequacy of 18-inch storm pipe and perhaps requiring a significantly larger diameter. Also, the adequacy of detention ponds as designed may not be sufficient as they are proximal to the drainage area. There do not appear to be any drainage pipes under these ponds. Drainage considerations must be adjusted accordingly.

Traffic inadequacy: The traffic study accompanying this proposal does not adequately address the future loads on Indiana Street. Indiana St. is already overburdened because of the residential developments of Candelas and Leyden Ranch and with the continued increase in commercial developments to serve those communities. The northbound rush hour traffic at the W 86th Parkway intersection with Indiana Street is frequently backed up in the northbound lane to well south of the W 82nd Ave intersection. It would be prudent to plan for that intersection at this time to consider future traffic loads, such as not allowing south bound (left hand) turns onto Indiana from 82nd Ave. If such future considerations are not constructed at this time, there will have to be more expensive and traffic disruptive reconfiguration in the future. This is why the Infrastructure First tenet must be applied as forward looking.

Proximity to the trestle reduces north-looking vision, and that would require, for safety, the need for a traffic signal for any south-bound egress onto Indiana Street at this location. Naturally, that in itself indicates poor design when traffic signals are required at close intervals. To reemphasize, no left turn from W 82nd Avenue onto Indiana Street should be permitted. Traffic can and should be directed to W 80th Avenue where there is already a traffic signal.

Open space designations: I fail to comprehend the argument that larger lots means less open space is required. The city has requirements for community open space for a reason and a homeowner lot size exemption does not fit into this concept of community. In addition, what is labeled as open space is, in part, simply a road divider and borders with retention ponds. A path down the middle of the divider strip is hardly a trail as it goes from no place to no where. Is it suitable to walk your pet? Maybe a site for a community playground? A wildlife habitat, perhaps? There is, in effect, no viable open space and concerns about minimizing costs to the Homeowners Association seem somewhat specious.

Noise: I noticed one comment on earlier review was that homes would be proximal to the Union Pacific railroad tracks and design should include extra sound-proofing. That should be a requirement and not just a suggestion. It is known by City Council members and the City Manager from recent complaints that Union Pacific is now using the siding at this location as a train storage yard. That function has engines and compressors running at that location for days at time with its concomitant noise and engine exhaust pollution. Because the train companies have so far rejected neighborhood considerations to reduce the risks to health and safety of nearby residents, buyers of homes at this location must be informed of that condition.

No reasonable benefit to Arvada: It would be prudent to have a cost-benefit analysis for Arvada to see if this development is a cost trap for the City. While it superficially may seem inviting to increase the tax base with the addition of 37 luxury homes, the up-front and continuing monies will be a drain on all taxpayers. It should be the responsibility of the developer to provide adequate road and other infrastructure compatible for future development in this area and not just bandaid® approach for current conditions. Indiana Street is already over capacity with its current structure and the Union Pacific track trestle adjacent to this property. With the current plans for this development there is an increased hazard to travelers of Indiana Street. It also imposes an impediment or burden to any future development.

Thank you in advance for considering my comments.

Michael Reimer



Haskin Park

Arvada, CO 80005

9/1/2021



CED Boards and Commission <cedboardsandcommission@arvada.org>

Whitewing at Ralston Summit

Tom Cras [REDACTED]
To: cedboardsandcommission@arvada.org

Thu, Aug 26, 2021 at 10:33 AM

To whom it may concern,

I wish to make the following comments in regard to the proposed development on West 82nd Ave.

Concern number one:

Presently on West 82nd Avenue between Alkire Street to Indiana Street there is no street lighting. The neighbors in this area would like this to continue. Not having lights on this street makes us feel as if we are still living in the country. In addition we are constantly reminded of global warming. While LED lights might decrease some of the energy needed they still need electricity. This will add to the existing problem of global warming. With even more lights this will add to the light pollution. You can barely see the stars in the sky presently instead of the billion that are in the sky. I feel that if this development is approved there should be no street lights installed at all.

Concern number two:

With 37 new homes being built and going by old data each home would have an average of two vehicles which when all of the homes are built which would add another 74 vehicles onto this street. Add in all of the school traffic that uses this street there is a potential of 150 vehicles traveling twice a day on a street that is only a mile long and the traffic is supposed to only turn right which happens most of the time. Add to that there is no sidewalks on this stretch is has become unsafe to walk during the time of school. The speed limit is posted at 25 miles per hour with four speed bumps however that has not slowed down most of the traffic. Then factor in the condition of this street which is badly cracked and falling off in place, what would be the plan to ensure that this section is given some consideration for enforcement for the traffic laws and whose jurisdiction would this fall under since the North side of the street would fall under the City of Arvada and the rest is still unincorporated Jefferson County?

Concern number three:

What time would construction begin on the site? Many of the residents in this area are retired and sleep until around 7:00 am. I believe that most construction sites begin around 5:00 am or earlier. What is the plan to keep the noise down so as not to interrupt the existing residents? We know there will be a lot of noise with the earth movers and the constant beeping however we should not have to suffer outside of normal hours.

Thank you for your time.

Tom Crask



SUMMARY MINUTES OF PLANNING COMMISSION ACTION HELD
SEPTEMBER 7, 2021

Planning Commission meeting minutes are not an exact transcript and represent key points and the basis of discussion.

1. **CALLED MEETING TO ORDER**– By T. O. Owens at 5:34 P.M.
2. **PLEDGE OF ALLEGIANCE**
3. **ROLL CALL OF MEMBERS**

Those present: T.O Owens, Michael P. Griffith, Patricia Connell, Steve Hannan, Doug Magee, Tim Knapp

THOSE ABSENT

Andrew Gay

Mr. Owens moved to excuse Andrew Gay from the meeting.

The following votes were cast on the motion:

Those voting Yes: Owens, Griffith, Connell, Hannan, Magee, Knapp

Those voting No: None

Those absent: Gay

The motion carried 6-0.

ALSO PRESENT: Ryan Stachelski, Director of Community and Economic Development; Rob Smetana, Manager of City Planning and Development; Emily Grogg, Sr. Ass't. City Attorney; Josie Suk, Systems and Administrative Manager; Abigail Ogg, Recording Secretary/Administrative Specialist; Jonathan Moore, City Planner; Jake Sawaya, Civil Engineer, Carol Ibanez, Senior Planner; Shane Greenburg, City Planner II.

4. **APPROVAL OF MINUTES**

June 22, 2021.

Mr. Magee proposed a grammatical correction on page five. The sentence should read “the facility is not intended to operate with semi-truck deliveries” instead of “the facility is not intended to operate without semi-truck deliveries.”

The minutes stand approved as corrected.

5. **GENERAL BUSINESS**

None

6. **REPORTS**

None

7. **PUBLIC COMMENT**

There being no one wishing to speak. Public Comment was closed.

Three attendees were sworn in for Public Comment.

8. **PUBLIC HEARINGS**

Annexing certain land into the City of Arvada, Rezoning from Jefferson County A-2 to City of Arvada PUD, a Major Subdivision Preliminary Plan and a PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre Parcel of land approximately located at the Northeast corner of Indiana Street and W. 82nd Avenue also known as 8200 Indiana Street.

Mr. Owens opened the public hearing, and asked Staff if the required documents were in order.

Mr. Moore stated that three forms of notice are required. Staff published notice in the paper and the mailing affidavits and posting log are both in order. There were no additions or corrections added to staff report.

Mr. Owens entered into the record the staff report dated September 7, 2021, affidavit of mailing, posting log, and the public comment that was received.

Mr. Moore gave a brief overview of the project. Staff recommended approval and noted the conditions of approval for the PUD Development plan on page 14 of the staff report.

Mr. Owens asked for the applicant to present their project.

Greg Bamford, on behalf of Ralston Valley Land Partners, LLC, applicant and Joe Jehn, project engineer, explained the site, the zoning, the surrounding area, and the reason for the requests. They stated that they are proposing plans to have a gated community.

Mr. Bamford explained his experience with growth in the past and the desire to find the best designated area for the proposed site plan. He explained that the lots will be sold separately to single families or other developers to be able to build custom homes.

Mr. Owens opened the hearing for comments from the public.

PUBLIC COMMENT

IN FAVOR

None

IN OPPOSITION

Mr. Tom Crask introduced himself and gave a warning about high school kids that frequent the proposed site. He stated concerns about the development access points affecting the traffic along Indiana and 82nd Avenue. He asked which direction the sewer would be built. Mr. Crask asked how to have access to comments from the city and the developer.

APPLICANT REBUTTAL

Mr. Jehn stated that they are not allowed to have access along a State Highway, per the State Highway Code. They will have one access point on the far east side of the site to try and reduce traffic from Highway 72 and Indiana Street. He expressed that they are going to do interim grading to meet requirements of future improvements, along with the fees in lieu of improvements. Mr. Jehn stated the sanitary sewer will be going all the way to western edge of the High School Football field to connect with an interceptor sewer that was previously built for access capacity.

Mr. Owens closed public comment.

QUESTIONS FROM THE COMMISSION

Mr. Hannan asked the applicant if the annexation was contiguous to Arvada due to the location of railroad

Mr. Jehn explained that state law regarding annexations allows annexations to jump railroad right-of-way when considering contiguity requirements.

Mr. Hannan asked the applicant how we the City can assess a fee-in-lieu of a railroad bridge without the final cost of the construction.

Mr. Jehn explained that the fee-in-lieu of is not for the railroad bridge and it is simply a cost estimate for the preliminary design roadway improvements from 82nd Avenue to north of the railroad.

Mr. Hannan asked the applicant about the note of a shared trail on the North side of the development, but did not see it in the plans.

Mr. Jehn explained that they are in the preliminary stage still and the shared trail is planned to go on the North side of the site adjacent to the railroad and connect into the 82nd Avenue trail. He expressed that the shared trail is for the community and is a private system.

Mr. Hannan asked the applicant if Arvada has a gated community.

Mr. Jehn stated there are no gated communities in the City of Arvada.

Mr. Hannan asked the staff and applicant if the stormwater historic rate referred to post development or current conditions.

Mr. Jehn explained the requirements on flow restriction and where their detention ponds are placed.

Mr. Hannan asked staff if on-street parking is not permitted because it is a private road.

Mr. Moore explained since it is a private road and is not being built to city standards.

Mr. Hannan asked staff about the current bond for Ralston Valley High School was in fact current and not for future use.

Mr. Moore confirmed the bond is current.

Mr. Magee asked the applicant if there was a minimum size requirement for the homes.

Mr. Jehn explained that they have dictated a maximum lot coverage ratio of 35% and on average, the homes are expected to be 4,000 to 5,000 square feet.

Mr. Magee asked the applicant if the proposed home was too small, would it be rejected.

Mr. Jehn confirmed that they will be rejected if they are not in balance with the development.

Mr. Magee asked the applicant for a sense on the size of the retaining walls.

Mr. Jehn stated that they are trying to limit the height to 4 feet tall tiered walls in backyards. There will be nothing on the front side of the home. He stated that some of the homes will have walk-outs.

Mr. Magee asked the applicant if the property had water rights in the Tucker Ditch.

Mr. Jehn explained that there are no water rights associated with this property and they are working with the ditch company to pipe the ditch and make it accessible.

Mr. Magee suggested the applicant look into the option to purchase water rights and use the ditch water for irrigation in the open space and drainage areas.

Mr. Jehn agreed and explained that it would be difficult to purchase the water rights without a storage right, which they don't have. He stated the City of Arvada has a significant interest in the Tucker Ditch.

Mr. Magee commented on the landscape plan and how impressed he was with the thought process that was involved.

Mr. Knapp asked staff about classification of 82nd Avenue and how the city traffic department proposed to treat the road and address the concerns of the neighbors.

Mr. Moore explained that the traffic department agreed with the local road classification and the City will keep the lowered speed limit and speed humps. He explained that traffic issues need to be dealt with by enforcement.

Mr. Knapp asked staff if the draining surface water would become an overflow issue for the residents south of 82nd Avenue.

Mr. Sawaya confirmed that there will be no overflow across 82nd Avenue and the drainage will continue to go in the culvert under the intersection of 82nd Avenue and Indiana Street.

Mr. Knapp asked staff if the fire department had specific comments on the gated community and access.

Mr. Moore stated that the fire department didn't have any comments specific to the gated community and that this community is required to meet the International Fire Code 2018 with

Amendments, adopted by City Council. He stated that the gate will need to have a Knox box for emergency responders.

Mr. Knapp asked the staff if the homes in the development would be required to have sprinkler systems installed.

Mr. Moore explained that the final development plan will need to meet the requirements under the IFC, by either proving access can be easily attained by the fire department or by installing sprinkler systems in the home.

Mr. Knapp confirmed that it will be dependent on what the fire department requests.

Mr. Jehn agreed and stated that the fire department will be the ultimate decider, dependent on the fire code.

Mr. Knapp asked the applicant if there is a sufficient amount of land to be able to provide for vehicle stacking 82nd Avenue.

Mr. Jehn stated that the gate will be offset enough to have a cut through for anyone that cannot gain access and will not have to back up onto 82nd Avenue.

Mr. Knapp asked staff about the status with the Union Pacific railroad bridge.

Mr. Moore explained that the City has been working with CDOT and the railroad to identify funding sources for the railroad bridge. He stated that there isn't a time-frame at the moment.

Mr. Griffith asked the applicant if there was going to be an HOA.

Mr. Jehn explained that there are very strong HOA's active in these types of developments.

Mr. Griffith asked the applicant how the HOA will monitor landscape requirements, pertaining to water use.

Mr. Bamford stated that they will be stressing low water use and the use of native seeds. He explained that these are customized homes and everyone will want something different; however the landscaping will be on equal footing with the architecture.

Mr. Griffith asked the applicant if there would be a minimum requirement for landscape.

Mr. Bamford stated that they will not have a minimum requirement for landscape to review building plans. He explained that they will have a list of approved plants.

Mr. Griffith asked the applicant about the extra space needed for guest cars if street parking is not allowed.

Mr. Jehn explained that the driveways are long and will be able to fit. He stated that on-street parking is prohibited in this community.

Mr. Bamford explained that there will be isolated incidents for on-street parking but it is a rarity, he ultimately agreed that on-street parking will be prohibited. He stated that it has worked in other developments.

Mr. Griffith asked the applicant if the cost estimate for the roadway improvements has been completed or if it is to be completed at a later date.

Mr. Jehn stated that once they have an approved plan from staff they would be able to create a final public improvement cost estimate.

Mr. Griffith asked the applicant who would be on the Design Review Board for the new builds.

Mr. Jehn stated that the Design Review Board will be Mr. Bamford, (applicant), David Bamford and a registered architect.

Mr. Griffith asked if residents would be allowed on the Design Review Board as the community grew.

Mr. Bamford explained that as the community grows and gets built out, residents would be welcome to join the board.

Mr. Griffith asked staff if it is viable that people will still want to buy a premium, custom product so close to a rail road and if any considerations need to be made for noise levels created by the railroad.

Mr. Moore explained the typical setback requirements from railroads and stated that staff would examine the need for noise barriers with the final development plan. He explained that staff does not have any serious concerns about the noise levels at this time due to the proposed location of the homes, but it could be addressed with the final development plan.

Mr. Griffith asked the applicant how the general public would know the access point off of Indiana Street was for emergency responders only. He expressed concerns of people parking there and blocking access.

Mr. Jehn explained that it will be a 20ft wide paved roadway for emergency access.

Mr. Moore added there would be a gate at the access point blocking off the area, allowing only emergency responders to be able to pull in.

Mr. Griffith asked the staff about construction standards for dust and how the applicant proposed to mitigate it.

Mr. Moore explained the permit process for construction and inspection stages. He stated there are control measures the applicant must show to prove they are controlling dust from construction.

Mr. Jehn stated that contractors have to meet City and State permit requirements.

Mr. Griffith asked staff if there was an environmental study done for toxic or hazardous material underneath the surface.

Mr. Moore stated that the City requires all annexations to complete a phase one environmental site assessment report. The report completed for this project did not indicate any environmental concerns to warrant a phase two report. He also mentioned that the question was likely related to the former Rocky Flats Plant and stated that federal and state authorities released a statement after the site had been cleaned indication that future developments in Arvada would not be impacted by hazardous or toxic materials from the former plant.

Mr. Griffith asked the staff how this development will impact peak traffic hours taking into consideration the nearby schools.

Mr. Sawaya stated that the morning peak hour provided 32 trips and the afternoon provided 41 trips and that it is a very limited percentage of the traffic going on in the area.

Ms. Connell asked the applicant what kind of impact this would have to the surrounding school system.

Mr. Jehn explained that they anticipate paying a school impact fee.

Mr. Owens asked if there were any further comments, no more comments were made. Mr. Owens asked for a motion.

MOTION:

It was moved by Mr. Magee, Annexation of certain land into the City of Arvada for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street, be recommended to City Council for approval. This motion is based on the findings of fact and approval criteria on Page 11 of the staff report.

DISCUSSION OF MOTION

Mr. Hannan explained the three approval criteria for annexations and how this development meets those.

Mr. Magee stated that this is a reasonable project for the size of the land. He explained that the City will need to work with CDOT and the applicant to minimize traffic impacts and lighting impacts for neighboring residents.

Ms. Grogg corrected Mr. Magee's motion to say Page 10 of the staff report, not page 11.

Mr. Griffith stated that some pieces of the public infrastructure are greatly needed by the City and this development will be able to provide for them and he will be supporting it.

Ms. Connell stated she is supporting due to the innovative ideas.

Mr. Knapp stated the water line will benefit the residents south of 82nd Ave and he will be approving.

Those voting Yes: Owens, Griffith, Connell, Hannan, Magee, Knapp

Those voting No:

Those absent: Gay

The motion carried 6-0

MOTION:

It was moved by Mr. Magee, that Zoning certain land into the City of Arvada for Whitewing at Ralston Summit, a 25.5 acre parcel of land from Jefferson County A-2 to City of Arvada PUD, Planned Unit Development and amending the official zoning map of City of Arvada Colorado, approximately located at the Northeast corner of Indiana Street and W 82nd

Avenue also known as 8200 Indiana Street be recommended to City Council for approval. This motion is based on the findings of fact and approval criteria on Page 11 of the staff report.

DISCUSSION OF MOTION

None

Those voting Yes: Owens, Griffith, Connell, Hannan, Magee, Knapp

Those voting No:

Those absent: Gay

The motion carried 6-0

MOTION:

It was moved by Mr. Magee, that a Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street, be recommended to City Council for approval. This motion is based on the findings of fact and approval criteria on Pages 11-12 of the staff report.

DISCUSSION OF MOTION

None.

Those voting Yes: Owens, Griffith, Connell, Hannan, Magee, Knapp

Those voting No:

Those absent: Gay

The motion carried 6-0

MOTION:

It was moved by Mr. Magee, that a PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street, be recommended to City Council for approval subject to the conditions stated in the staff report, Items 1-5 Page 14. This motion is based on the findings of fact and approval criteria on Pages 12 - 14 of the staff report.

DISCUSSION OF MOTION

Mr. Owens asked for discussion on the gate.

Mr. Knapp made a formal amendment to strike condition five of the staff report.

Mr. Owens stated that he would support the request to allow gate due to the uniqueness and safety of a gated community.

Mr. Hannan supported the amendment.

Mr. Griffith stated that he would be supporting the amendment and it would be a positive addition.

Voting on the amendment to remove condition 5, which would have the effect of allowing the gate.

Those voting Yes: Owens, Griffith, Connell, Hannan, Magee, Knapp
Those voting No:
Those absent: Gay
The amendment carried 6-0

Mr. Owens stated that he approved of the larger lot sizes and diverse homes. He will be supporting the development.

Those voting Yes: Owens, Griffith, Connell, Hannan, Magee, Knapp
Those voting No:
Those absent: Gay
The motion carried with the amendment. 6-0

8. **OTHER ITEMS**

Mr. Owens moved to cancel the September 21, 2021 meeting.

Those voting Yes: Owens, Griffith, Connell, Hannan, Magee, Knapp
Those voting No:
Those absent: Gay
The motion carried 6-0

Next meeting will be October 5, 2021.

City staff asked the commissioner if they are okay with future meetings being held in-person. The commissioners agreed that they will continue with in-person meetings.

9. **ADJOURNED** at 7:52 P.M.

T.O. Owens, Chair

Patricia Connell, Secretary

Abigail Ogg, Recording Secretary



REPORT TO CITY COUNCIL PUBLIC HEARING

AGENDA ITEM
10.C.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-033 An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street (Ordinance No. 4780)

Report in Brief

Ralston Valley Land Partners, LLC is requesting approval of an application for Zoning of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Zoning application also includes the right-of-way (ROW) of W 82nd Avenue between Indiana Street and Alkire Street containing 5.9 acres of land.

Applications for Annexation, a Major Subdivision Preliminary Plat, and a PUD Development Plan (PDP) are being considered concurrently with the zoning request. The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Avenue via an existing ROW adjacent to the west property line of Ralston Valley High School.

If the City Council approves the applications for Annexation, the applications for Zoning, Major Subdivision Preliminary Plat, and PDP will then be required for a Final Development Plan (FDP) and Final Plat, which will be reviewed administratively.

The Arvada team recommends that the City Council approve CB21-033, An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street, be approved on final reading, numbered 4780 and ordered published by title only.

Financial Impact

The approval of this property will have no financial impact.

Background

The subject property is located in Unincorporated Jefferson County at the northeast corner of Indiana Street and W 82nd Avenue and is currently vacant. The property abuts the Union Pacific Railroad (UPRR) to the north, Indiana Street to the west, and W 82nd Avenue to the south. The property has significant grade changes throughout, with the railroad being the highpoint and the remaining property sloping generally south. The Tucker Irrigation Ditch runs generally west to east across the site. The section of Indiana Street adjacent to the site is part of State Highway 72 under the Colorado Department of Transportation's (CDOT's) jurisdiction.

The subject property does not have any development history. The prior owners of the property have previously contacted City team members for pre-application meetings regarding annexation; however, the current annexation application is the first formal application that has been submitted to the City.

SUBJECT: CB21-033 An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street (Ordinance No. 4780)

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Discussion

It is the responsibility of the applicant to justify the requested land use application. The City Council must reach a decision based on its findings regarding the approval criteria shown in the table below and upon testimony heard during the public hearing as it applied to the criteria.

The Community and Economic Development team performed an analysis of the proposal, based on the approval criteria listed in Division 8-3-4, Zoning and Rezoning, and presents the following findings:

Div. 8-3-4 Zoning and Rezoning Approval Criteria	Finding	Rationale
1. The rezoning is consistent with the Arvada Comprehensive Plan, or an adopted sub-area plan, corridor plan, or urban renewal plan, or reflects conditions that have changed since the adoption of the Comprehensive Plan.	Complies	The PUD zoning and PDP to develop single-family homes with a max. density of 1.5 du/ac complies with the Comprehensive Plan Low Density Residential designation.
2. The intended land use is consistent with the stated intent of the proposed zoning district.	Complies	Single-family residential units are allowed in the PUD zone district.
3. Facilities and services (including sewage and waste disposal, water, gas, electricity, police and fire protection, and roads and transportation, as applicable) will, prior to development, be available to serve the subject property while maintaining adequate levels of service to existing development.	Complies	With the extension of water and sanitary sewer mains as part of this proposal, there will be capacity and infrastructure to adequately serve residents while maintaining adequate levels of service to existing development. The AFPD will require all homes within the development to install automatic sprinkler systems meeting the adopted IFC standards.
4. The intended land use for which the rezoning is sought will not result in significant adverse impacts upon the natural environment, including air, water, noise, stormwater management, wildlife, and vegetation, or such impacts will be substantially mitigated.	Complies	The development will not have a significant impact on the natural environment. The development will comply with all required stormwater management standards and mitigate off-site impacts.
5. The rezoning is consistent with the character of existing or planned development on adjacent properties and in the surrounding area or neighborhood, or measures will be taken to substantially buffer or otherwise substantially mitigate any negative impacts.	Complies	The immediately adjacent properties located in Unincorporated Jefferson County are large lot rural/agricultural properties. The nearby residential properties at the Village of Five Parks are a mix of housing types and lot sizes with high-quality construction. The proposed development is compatible with and fills a niche in between the two nearby neighborhoods with large lot high quality housing.

Public Contact

The required neighborhood meeting for this project took place virtually on October 7, 2020. The applicant, staff, and 34 neighbors were in attendance. The primary concerns of neighbors were about whether anyone located in Unincorporated Jefferson County would be required to annex into the City and whether the new development would negatively impact the soil or water in the area, since all of the property owners along this section of W 82nd Ave. have septic systems. City team members informed the neighbors that the City does not have a policy of unilateral or forced annexation. The developer

SUBJECT: CB21-033 An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street (Ordinance No. 4780)

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ITEM: 10.C.

addressed concerns about the potential environmental impact and stated that any impacts would be required to be mitigated. The applicant has prepared a summary of the meeting, which is attached.

At the Planning Commission hearing held on September 7, 2021, approximately 10 neighbors were in attendance. One member of the public spoke to voice some concerns relating to traffic and impacts to adjacent properties from construction.

A written notice was sent 15 days prior to the meeting, a published notice was posted in the newspaper 15 days prior to the meeting, and a public hearing sign was posted 15 days prior to the meeting.

Commission Recommendation

The Planning Commission voted 6 to 0 in favor of the Council's approval on September 7, 2021.

Strategic Alignment

The project is consistent with the following principle within the Community and Economic Development Priority Area of the City Council Strategic Plan:

Uses the Comprehensive Plan to guide planning, land use code decisions, development management, and informational and resource services that are delivered to residents, businesses, the development community, decision-making bodies, and neighborhood partners to achieve a well-planned, aligned, sustainable, and livable community for current and future generations.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve CB21-033, An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street, be approved on final reading, numbered 4780 and ordered published by title only.

Suggested Motion:

I move that CB21-033, An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street, be (approved on final reading, numbered 4780 and ordered published by title only) (rejected).

Prepared by:
Abigail Ogg, Administrative Specialist

Reviewed by:

SUBJECT: CB21-033 An Ordinance Rezoning Certain Land Within the City of Arvada, from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development) and Amending the Official Zoning Maps of the City of Arvada, Colorado, Located at the Northeast Corner of Indiana Street and West 82nd Avenue, also known as 8200 Indiana Street (Ordinance No. 4780)

PAGE: 4
ITEM: 10.C.

Approved by:

Jonathan Moore, Planner I	9/27/2021
Josie Suk, Development Systems and Administrative Manager	9/28/2021
Robert Smetana, Manager of City Planning and Development	9/29/2021
Ryan Stachelski, Director of Community and Economic Development	9/30/2021
Gail Walker, Legal Specialist-Contracts	9/30/2021
Emily Grogg, Senior Assistant City Attorney	10/4/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-033
ORDINANCE NO. 4780

AN ORDINANCE REZONING CERTAIN LAND WITHIN THE CITY OF ARVADA, FROM JEFFERSON COUNTY A-2 (AGRICULTURAL-TWO) TO CITY OF ARVADA PUD (PLANNED UNIT DEVELOPMENT) AND AMENDING THE OFFICIAL ZONING MAPS OF THE CITY OF ARVADA, COLORADO, LOCATED AT THE NORTHEAST CORNER OF INDIANA STREET AND WEST 82ND AVENUE, ALSO KNOWN AS 8200 INDIANA STREET.

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. The following described property is hereby rezoned from Jefferson County A-2 (Agricultural-Two) to City of Arvada PUD (Planned Unit Development).

A PARCEL OF LAND DESCRIBED ON THE ATTACHED EXHIBIT A.

Section 2. The Official Zoning Maps of the City of Arvada are hereby amended in accordance herewith.

Section 3. This ordinance shall be effective fifteen days after publication following final passage.

INTRODUCED, READ, AND ORDERED PUBLISHED this 4th day of October, 2021.

PASSED, ADOPTED, AND APPROVED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, City Attorney

By: _____

Publication Dates: October 7, 2021
 October 21, 2021

EXHIBIT A
LEGAL DESCRIPTION

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF JEFFERSON, STATE OF COLORADO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 30 BEING ASSUMED TO BEAR NORTH 88°26'57" EAST, A DISTANCE OF 2524.92 FEET BETWEEN THE FOLLOWING DESCRIBED MONUMENTS:

-THE 60' WITNESS CORNER TO THE CENTER QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 IN RANGE BOX MATCHING MONUMENT RECORD FILED 3/29/04.

-THE WEST QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 MATCHING MONUMENT RECORD FILED 4/28/07

COMMENCING AT THE SOUTHWEST CORNER OF SECTION 30 FROM WHENCE THE WEST QUARTER CORNER OF SECTION 30 BEARS NORTH 00°28'43" WEST, A DISTANCE OF 2644.86 FEET;

THENCE ALONG THE WEST LINE OF SAID SOUTHWEST QUARTER OF SECTION 30 NORTH 00°28'43" WEST, A DISTANCE OF 1,344.41 FEET;

THENCE NORTH 89°23'08" EAST, A DISTANCE OF 50.00 FEET TO THE EASTERLY RIGHT-OF-WAY OF INDIANA STREET AND THE EASTERLY LINE OF ORDINANCE #4325 BEING ALSO THE POINT OF BEGINNING;

THENCE ALONG SAID EASTERLY LINES AND ALSO THE EAST LINE OF ORDINANCE #4324 NORTH 00°28'43" WEST, A DISTANCE OF 678.69 FEET TO THE SOUTHERLY RIGHT-OF-WAY, BOOK 727, PAGE 474;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY SOUTH 84°45'14" EAST, A DISTANCE OF 2,238.36 FEET TO THE NORTHWEST CORNER OF THAT PARCEL DESCRIBED AT RECEPTION NO. 2010042014;

THENCE ALONG THE WEST LINE OF SAID PARCEL SOUTH 00°29'57" EAST, A DISTANCE OF 385.15 FEET TO THE SOUTHWEST CORNER THEREOF BEING ALSO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF WEST 82ND AVENUE;

THENCE ALONG SAID NORTHERLY RIGHT—OF—WAY THE FOLLOWING EIGHT (8) COURSES AND DISTANCES;

1. THENCE NORTH 89°05'34" EAST, A DISTANCE OF 190.31 FEET;

2. THENCE NORTH 89°34'35" EAST, A DISTANCE OF 224.19 FEET;
3. THENCE NORTH 89°34'09" EAST, A DISTANCE OF 199.19 FEET;
4. THENCE NORTH 89°33'28" EAST, A DISTANCE OF 300.47 FEET;
5. THENCE NORTH 89°23'13" EAST, A DISTANCE OF 399.57 FEET;
6. THENCE NORTH 89°33'20" EAST, A DISTANCE OF 500.03 FEET;
7. THENCE NORTH 89°20'31" EAST, A DISTANCE OF 577.43 FEET;
8. THENCE NORTH 89°20'54" EAST, A DISTANCE OF 300.91 FEET TO THE
EASTERLY LINE OF SAID SOUTHWEST QUARTER OF SECTION 30;

THENCE ALONG SAID EASTERLY LINE SOUTH 00°58'07" EAST, A DISTANCE OF 49.43 FEET
TO THE NORTHERLY LINE OF ORDINANCE #3582 AND THE SOUTHERLY RIGHT-OF-WAY OF
SAID 82ND/ AVENUE;

THENCE ALONG SAID SOUTHERLY RIGHT-OF-WAY AND THE NORTHERLY LINES OF
ORDINANCE #3582, #3583 AND 3584 SOUTH 88°58'40" WEST, A DISTANCE OF 1,799.00 FEET
TO THE EASTERLY LINE OF THAT PARCEL DESCRIBED AT RECEPTION NO. 85074569;

THENCE ALONG SAID EASTERLY LINE, BEING ALSO THE RIGHT-OF-WAY OF SAID 82ND/
AVENUE NORTH 00°57'54" WEST, A DISTANCE OF 13.15 FEET;

THENCE CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY THE FOLLOWING NINE
(9) COURSES AND DISTANCES;

1. THENCE SOUTH 89°33'00" WEST, A DISTANCE OF 106.38 FEET;
2. THENCE SOUTH 89°34'12" WEST, A DISTANCE OF 596.64 FEET;
3. THENCE SOUTH 89°09'08" WEST, A DISTANCE OF 607.45 FEET;
4. THENCE SOUTH 89°52'03" WEST, A DISTANCE OF 299.55 FEET;
5. THENCE SOUTH 89°17'42" WEST, A DISTANCE OF 599.53 FEET;
6. THENCE SOUTH 89°21'13" WEST, A DISTANCE OF 149.73 FEET;
7. THENCE SOUTH 89°19'33" WEST, A DISTANCE OF 149.99 FEET;
8. THENCE SOUTH 89°23'59" WEST, A DISTANCE OF 596.61 FEET;
9. THENCE ALONG A CURVE TO THE LEFT HAVING A RADIUS OF 15.00 FEET,

A CENTRAL ANGLE OF 89°51'01", WHOSE CHORD BEARS SOUTH 44°26'47" WEST A
DISTANCE OF 21.19 FEET, FOR AN ARC DISTANCE OF 23.52 FEET TO THE POINT OF
BEGINNING.

CONTAINING 1,369,062 SQUARE FEET OR 31.429 ACRES, MORE OR LESS.



REPORT TO CITY COUNCIL PUBLIC HEARING

AGENDA ITEM
10.D.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street

Report in Brief

Ralston Valley Land Partners, LLC is requesting approval of applications for Annexation, Zoning, PUD Development Plan (PDP), and Major Subdivision Preliminary Plat of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation and Zoning applications also include the right-of-way (ROW) of W 82nd Ave. between Indiana St. and Alkire St. containing 5.9 acres of land.

The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Ave via an existing ROW adjacent to the west property line of Ralston Valley High School.

If the City Council approves the applications for Annexation, the applications for Zoning, Major Subdivision Preliminary Plat, and PDP will then be required for a Final Development Plan (FDP) and Final Plat, which will be reviewed administratively.

The Arvada team recommends that the City Council approve the Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue, also known as 8200 Indiana Street.

Financial Impact

The approval of this property will have no financial impact.

Background

Ralston Valley Land Partners, LLC is requesting approval of applications for Annexation, Zoning, PUD Development Plan (PDP), and Major Subdivision Preliminary Plat of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation and Zoning applications also include the right-of-way (ROW) of W 82nd Ave. between Indiana St. and Alkire St. containing 5.9 acres of land.

The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Ave via an existing ROW adjacent to the west property line of Ralston Valley High School.

Discussion

It is the responsibility of the applicant to justify the requested land use application. The City Council must reach a decision based on its findings regarding the approval criteria shown in the table below and upon testimony heard during the public hearing as it applied to the criteria.

The Community and Economic Development team performed an analysis of the proposal, based on the approval criteria listed in Division 8-3-8, Major Subdivision Preliminary Plat, and presents the following findings:

Div. 8-3-8 Major Subdivision Preliminary Plat Approval Criteria	Finding	Rationale
1. The proposed subdivision is consistent with the Comprehensive Plan.	Complies	The proposal to create large single-family home lots with a max. density of 1.5 du/ac complies with the Comprehensive Plan Low Density Residential designation.
2. The proposed subdivision is consistent with, and implements, the intent of the zoning district in which it is located. If the subject property is in a PUD zoning district, the subdivision is consistent with any previously approved PUD Outline Development Plan, PUD Development Plan, and/or PUD Final Development Plan.	Complies	There is not a previously approved PUD Outline Development Plan, PUD Development Plan, and/or PUD Final Development Plan. The proposed subdivision is consistent with the PUD Development Plan that is being analyzed concurrently.
3. Adequate and sufficient public safety, transportation, utility facilities and services, recreation facilities, parks, and schools will, prior to development, be available to serve the subject property, while maintaining sufficient levels of service to existing development.	Complies	With the extension of water and sanitary sewer mains as part of this proposal, there will be capacity and infrastructure to adequately serve residents while maintaining adequate levels of service to existing development.
4. The proposed subdivision will not result in significant adverse impacts on the natural environment or the use and enjoyment of adjoining property, including changes in air quality, water quality, noise levels, stormwater runoff, wildlife habitat, and/or natural vegetation, in that such impacts will be substantially avoided or mitigated by design.	Complies	The development will not have a significant impact on the natural environment. The development will comply with all required stormwater management standards and mitigate off-site impacts.
5. The proposed subdivision complies with all applicable regulations, standards, requirements, or plans of the federal or state governments and other general or special-purpose governmental entities with jurisdiction, involving (but not limited to) such matters as wetlands, water quality, erosion control, potable water, fire safety, or wastewater regulations.	Complies	The proposed subdivision is anticipated to meet all applicable regulations, standards, requirements, or plans. As noted in the analysis above, AFD will require all homes within the development to install automatic sprinkler systems meeting the adopted IFC standards.
6. The proposed subdivision complies with all applicable use, development, and design standards set forth in Chapter 2, Zoning Districts Chapter 4, Environmental and Site Design, and other applicable provisions of this Code, except to the extent the same are modified as may be provided in this LDC. Applicants shall avoid creating lots or patterns of lots in the subdivision that will make future compliance with such development and design standards difficult or infeasible.	Complies	The proposed subdivision is meeting all applicable use, development, and design standards.
7. The general layout of lots, roads, driveways, utilities, drainage facilities, and other services within the proposed subdivision is designed in a way that minimizes the amount of	Complies	The general layout of lots, roads, driveways, utilities, drainage facilities, and other services within the proposed subdivision

SUBJECT: Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street

PAGE: 3
ITEM: 10.D.

land disturbance, maximizes the amount of open space in the development, preserves existing trees/vegetation and riparian areas, protects critical wildlife habitat, and otherwise accomplishes the purposes and intent of this LDC.

comply with all applicable requirements in the City's Engineering Code of Standards and Specifications along with all applicable standards in the LDC that are not otherwise modified.

Public Contact

The required neighborhood meeting for this project took place virtually on October 7, 2020. The applicant, team members, and 34 neighbors were in attendance. The primary concerns of neighbors were about whether anyone located in Unincorporated Jefferson County would be required to annex into the City and whether the new development would negatively impact the soil or water in the area, since all of the property owners along this section of W 82nd Ave. have septic systems. City staff informed the neighbors that the City does not have a policy of unilateral or forced annexation. The developer addressed concerns about the potential environmental impact and stated that any impacts would be required to be mitigated. The applicant has prepared a summary of the meeting, which is attached.

A written notice was sent 15 days prior to the meeting, a published notice was posted in the newspaper 15 days prior to the meeting, and a public hearing sign was posted 15 days prior to the meeting. In addition, the City Council agenda was posted.

Commission Recommendation

The Planning Commission voted 6 to 0 in favor of the Council's approval on September 7, 2021.

Strategic Alignment

The project is consistent with the principles stated within the Community and Economic Development Priority Area of the City Council Strategic Plan.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that Council approve the Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street.

Suggested Motion:

I move that the Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street be (approved) (rejected).

Prepared by:
Abigail Ogg, Administrative Specialist

Reviewed by:

SUBJECT: Major Subdivision Preliminary Plat for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street

PAGE: 4
ITEM: 10.D.

Approved by:

Jonathan Moore, Planner I	9/29/2021
Josie Suk, Development Systems and Administrative Manager	9/29/2021
Robert Smetana, Manager of City Planning and Development	9/29/2021
Ryan Stachelski, Director of Community and Economic Development	9/30/2021
Gail Walker, Legal Specialist-Contracts	9/30/2021
Emily Grogg, Senior Assistant City Attorney	10/4/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

PRELIMINARY PLAT
WHITEWING AT RALSTON SUMMIT
A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30,
TOWNSHIP 2 SOUTH, RANGE 69 WEST 6TH P.M.
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO

SHEET 1 OF 3

TRACT SUMMARY TABLE

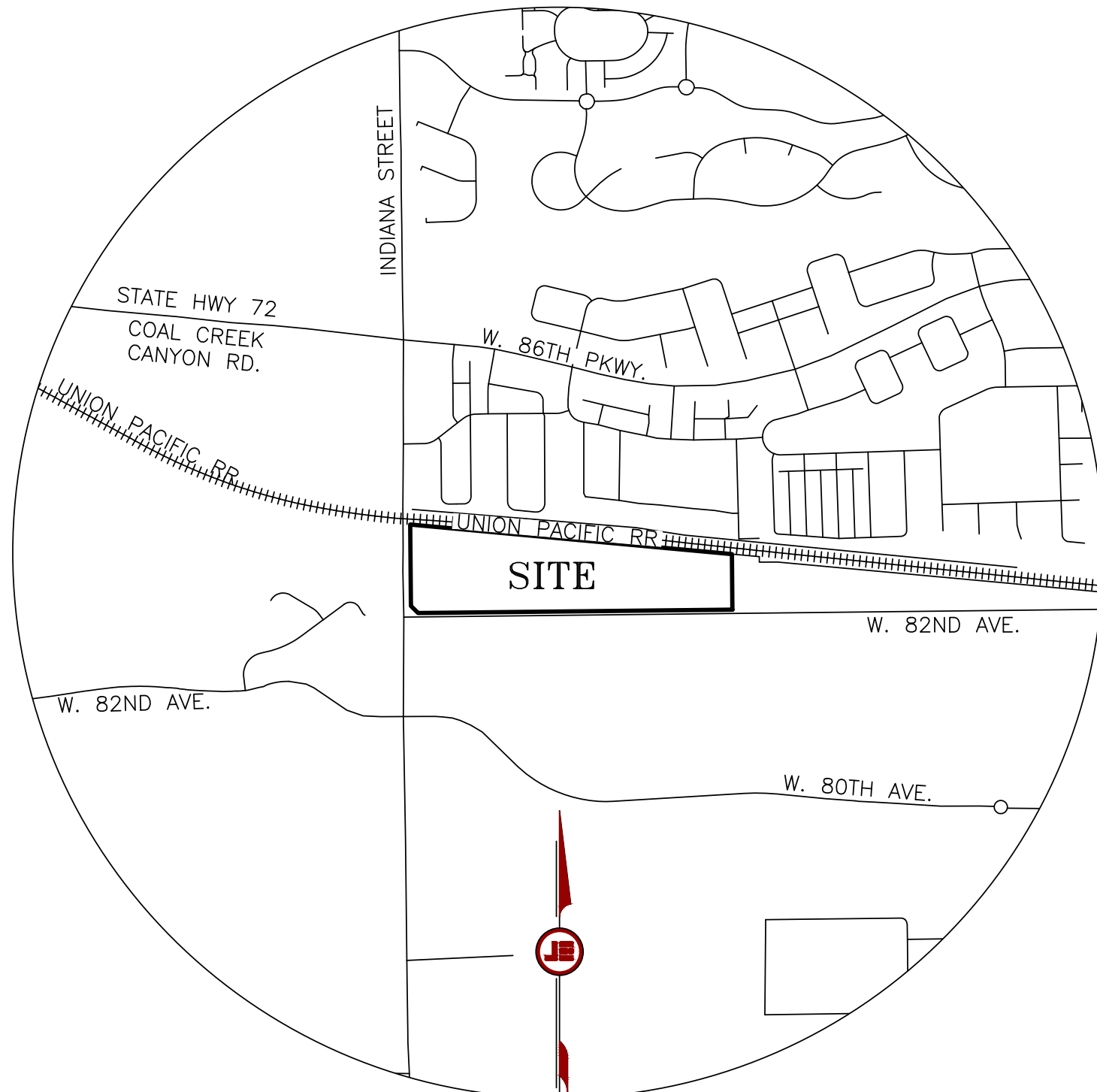
TRACT	PURPOSE	OWNERSHIP/MAINTAINANCE	ACREAGE
A	ACCESS, OPEN SPACE, UTILITY	H.O.A	3.245±
B	OPEN SPACE, DRAINAGE, UTILITY, SIGHT TRIANGLE	H.O.A.	3.411±
C	DRAINAGE, UTILITY, MAIL KIOSK	H.O.A.	0.260±

GENERAL NOTES

- 1.) THE LINEAL UNITS USED ON THIS PLAT ARE IN U.S. SURVEY FEET. A U.S. SURVEY FOOT IS DEFINED AS EXACTLY 1200/3937 METERS. ALL BEARINGS SHOWN HEREON ARE IN DEGREES-MINUTES-SECONDS.
- 2.) ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT, LAND SURVEY BOUNDARY MONUMENT OR ACCESSORY COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUTE 18-4-508, C.R.S.
- 3.) NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF CERTIFICATION SHOWN HEREON.
- 4.) CHICAGO TITLE OF COLORADO. POLICY NUMBER CO-FWCO-IMP-72306-1-21-C2054638, EFFECTIVE DATED AUGUST 17, 2021 AT 11:29 A.M. WAS ENTIRELY RELIED UPON FOR RECORDED RIGHTS-OF-WAY, EASEMENTS AND ENCUMBRANCES IN THE PREPARATION OF THIS SURVEY.
- 5.) JEHN ENGINEERING, INC. HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR RECORDED/UNRECORDED EASEMENTS, ENCUMBRANCES, RESTRICTIVE COVENANTS, OWNERSHIP TITLE EVIDENCE OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.
- 6.) ALL LOT CORNER MONUMENTS SHALL BE SET PER COLORADO STATE STATUTE 38-51-105.
- 7.) BASIS OF BEARINGS: BEARINGS ARE BASED ON THE NORTH LINE OF THE SOUTHWEST QUARTER OF SECTION 30 BEING ASSUMED TO BEAR NORTH 88°26'57" EAST BETWEEN MONUMENTS AS SHOWN WITHIN THIS PLAT.
- 8.) NO BUILDING OR STRUCTURE SHALL BE CONSTRUCTED WITHIN THE STORM WATER DETENTION AREA AND NO CHANGES OR ALTERATIONS AFFECTING THE HYDRAULIC CHARACTERISTICS OF THE DETENTION AREA WILL BE MADE WITHOUT THE APPROVAL OF THE CITY OF ARVADA.
- 9.) FENCES ON THIS PLAT ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. THEY ARE NOT PRECISELY LOCATED AND WERE NOT RELIED UPON FOR THE DETERMINATION OF ANY BOUNDARY BY THIS SURVEYOR.

EASEMENT NOTES

UTILITY EASEMENTS ARE HEREBY GRANTED AS FIVE (5) FEET WIDE ALONG THE SIDE OF LOTS, AND EIGHT (8) FEET WIDE AS SHOWN HEREON. UTILITY MEANS SEWER, WATER, ELECTRICITY, TELEPHONE, CABLE AND OTHER TELECOMMUNICATIONS FACILITIES. ALL SIDE AND REAR LOT LINE EASEMENTS ARE FOR UTILITY AND DRAINAGE PURPOSES. NO TREES SHRUBS OR OTHER PLANTS MAY BE PLANTED, NOR SHALL ANY BUILDING, FENCE, STRUCTURE OR IMPROVEMENTS BE CONSTRUCTED OR INSTALLED WITHIN OR OVER ANY EASEMENT OR RIGHT-OF-WAY SO AS TO PREVENT OR UNREASONABLY INTERFERE WITH ANY PURPOSE FOR WHICH THE EASEMENT OR RIGHT-OF-WAY IS GRANTED, PROVIDED THAT WINDOW WELLS NOT EXCEEDING FIFTEEN (15) SQUARE FEET AND NOT ENCROACHING MORE THAN TWO (2) FEET INTO A SIDE LOT EASEMENT AND EAVES ARE ALLOWED UNLESS OTHERWISE PROHIBITED BY CODE PROVISION, BUILDING REGULATION, OR OTHER LAW. CONSTRUCTION EASEMENT IS HEREBY GRANTED FOR USE BY THE CITY OF ARVADA IN ASSOCIATION WITH CONSTRUCTION RELATED TO THE UNION PACIFIC RAILROAD OVERPASS. NO STRUCTURES NOR LANDSCAPING SHALL BE INSTALLED WITHIN THE EASEMENT. AT SUCH A TIME AS THE EASEMENT IS NOT NECESSARY FOR CONSTRUCTION ACTIVITIES, IT MAY BE VACATED.



VICINITY MAP

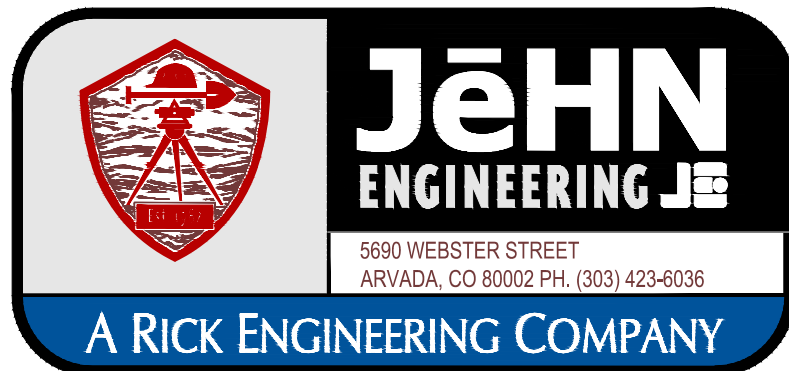
1"=1000'

SHEET 1-COVER
SHEET 2-WEST PORTION OF SUBDIVISION
SHEET 3-EAST PORTION OF SUBDIVISION
AND LINE/CURVE TABLES

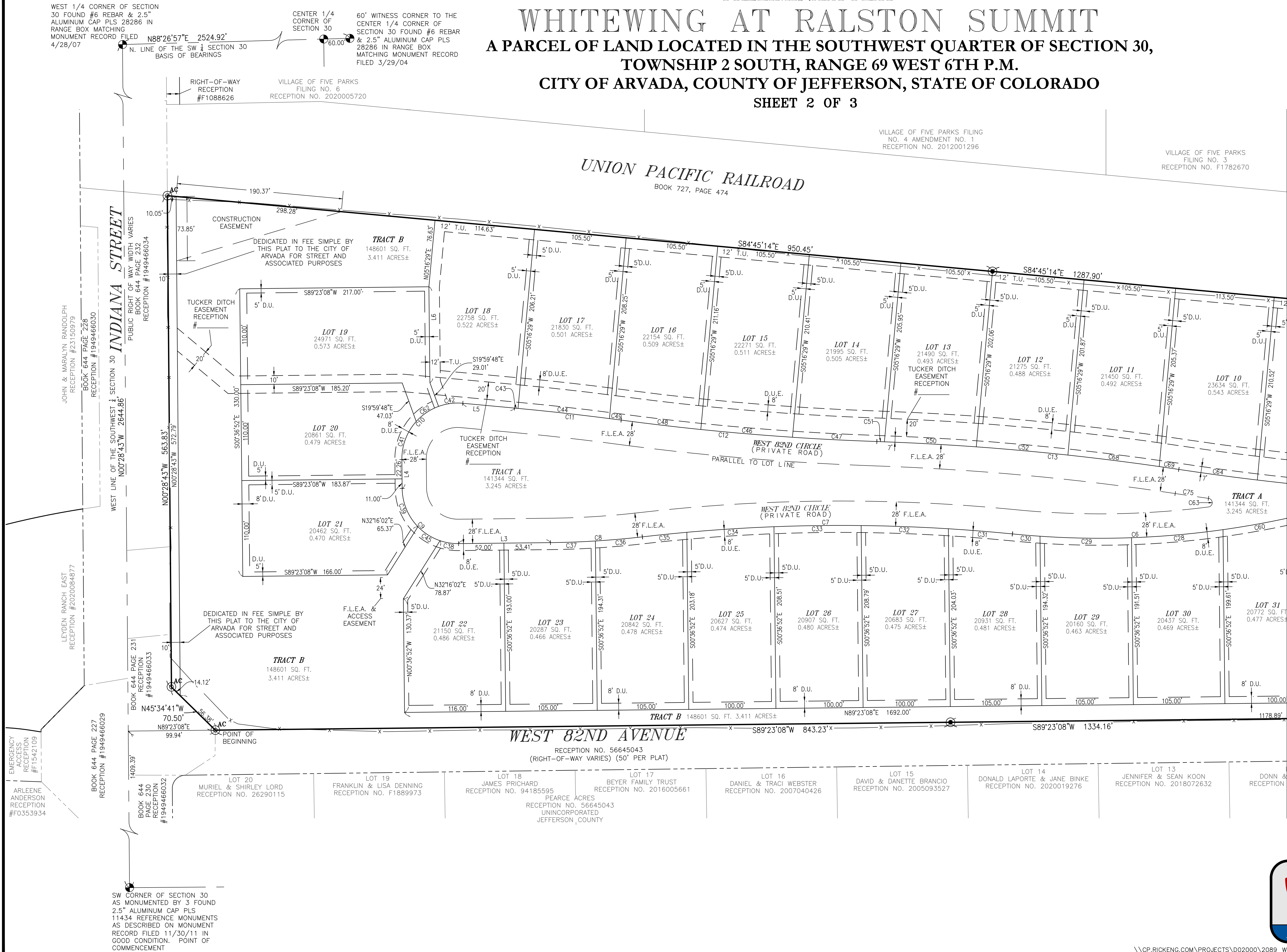
SURVEYOR'S CERTIFICATE

I ROBERT J. HENNESSY, A PROFESSIONAL LAND SURVEYOR LICENSED TO PRACTICE LAND SURVEYING IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THE SURVEY OF WHITEWING AT RALSTON SUMMIT WAS MADE BY ME OR DIRECTLY UNDER MY SUPERVISION ON OR ABOUT THE 22ND DAY OF OCTOBER, 2020, AND THAT THE SURVEY IS BASED UPON MY KNOWLEDGE, INFORMATION AND BELIEF, IT HAS BEEN PREPARED IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE, THE SURVEY IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED, AND THE ACCOMPANYING PLAT ACCURATELY AND PROPERLY SHOWS SAID SUBDIVISION AND THE SURVEY THEREOF.

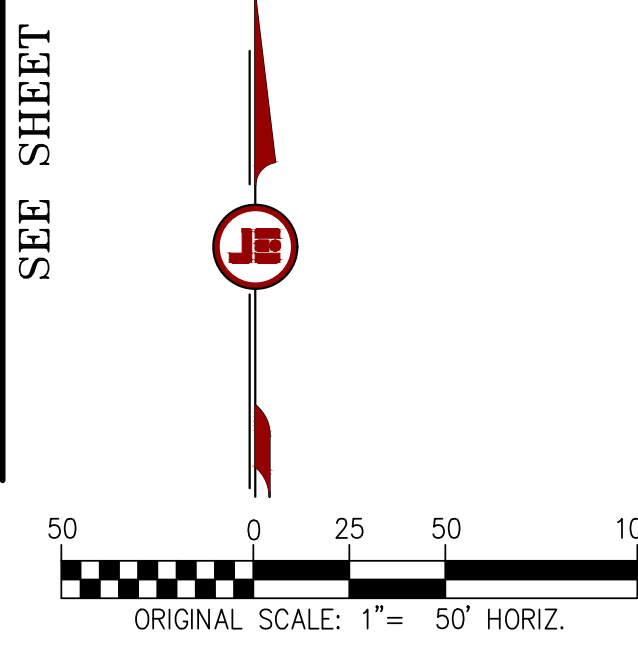
ROBERT J. HENNESSY, P.L.S. 34580, LICENSED COLORADO LAND SURVEYOR
FOR AND ON BEHALF OF JEHN ENGINEERING, INC.



PRELIMINARY PLAT
WHITEWING AT RALSTON SUMMIT
A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30,
TOWNSHIP 2 SOUTH, RANGE 69 WEST 6TH P.M.
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
SHEET 2 OF 3



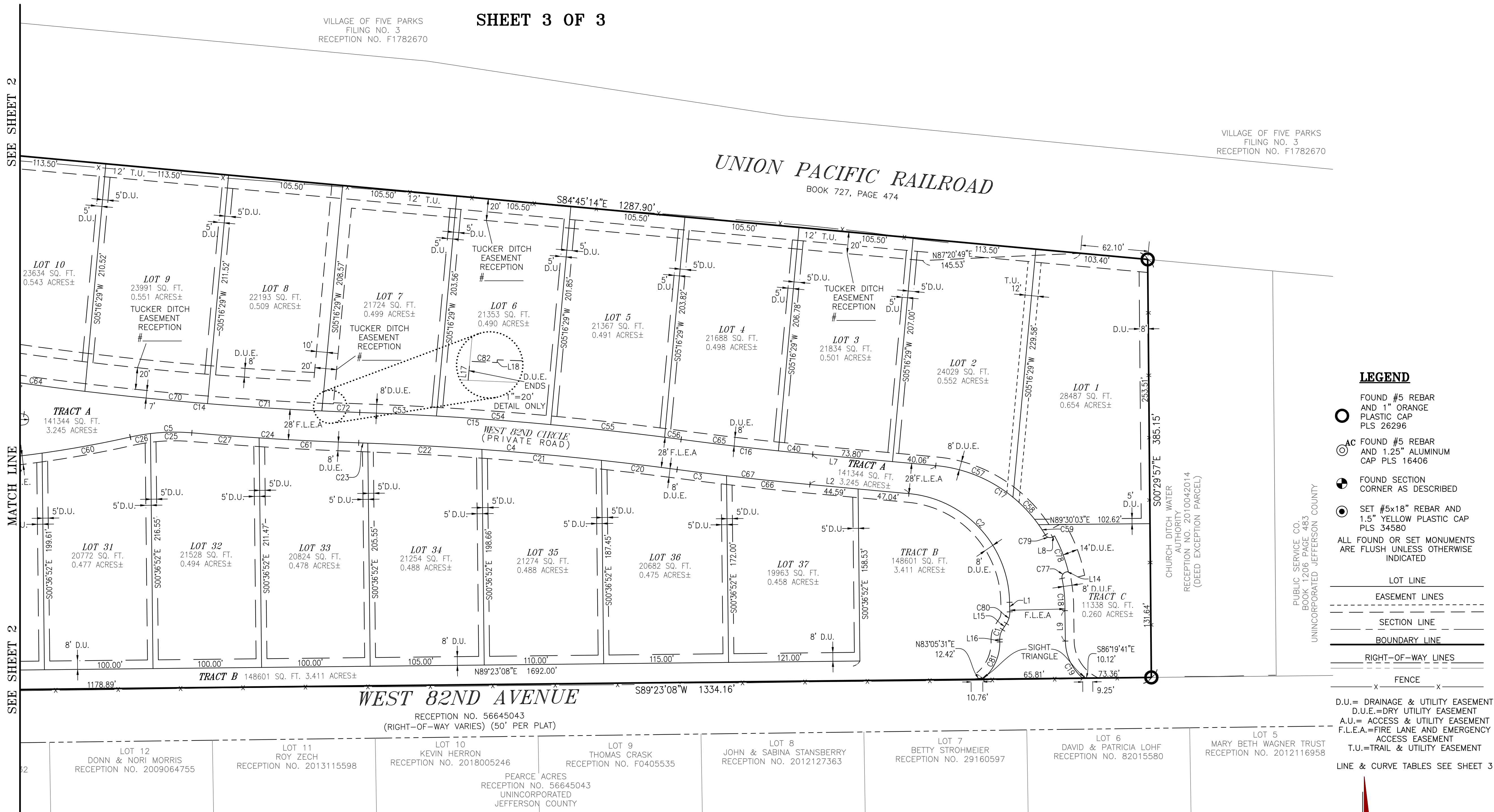
- LEGEND**
- FOUND #5 REBAR AND 1" ORANGE PLASTIC CAP PLS 26296
 - FOUND #5 REBAR AND 1.25" ALUMINUM CAP PLS 16406
 - FOUND SECTION CORNER AS DESCRIBED
 - SET #5x18" REBAR AND 1.5" YELLOW PLASTIC CAP PLS 34580
 - ALL FOUND OR SET MONUMENTS ARE FLUSH UNLESS OTHERWISE INDICATED
- LOT LINE
EASEMENT LINES
SECTION LINE
BOUNDARY LINE
RIGHT-OF-WAY LINES
FENCE
- D.U.= DRAINAGE & UTILITY EASEMENT
D.U.E.= DRY UTILITY EASEMENT
A.U.= ACCESS & UTILITY EASEMENT
F.I.E.A.= FIRE LANE AND EMERGENCY ACCESS EASEMENT
T.U.= TRAIL & UTILITY EASEMENT
LINE & CURVE TABLES SEE SHEET 3



CURVE TABLE					
CURVE #	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD LENGTH
C1	9.41'	16.00'	033°41'24"	S16°01'07"W	9.27'
C2	149.36'	102.00'	083°53'56"	N42°46'33"W	136.37'
C3	45.88'	3014.00'	000°52'20"	S82°49'20"E	45.88'
C4	294.33'	2986.00'	005°38'52"	N85°12'36"W	294.21'
C5	57.01'	186.00'	017°33'44"	S86°06'42"W	56.79'
C6	324.78'	1014.00'	018°21'05"	N86°30'23"E	323.39'
C7	425.29'	1986.00'	012°16'10"	S89°32'50"W	424.48'
C8	105.71'	1014.00'	005°58'23"	N86°23'56"E	105.66'
C9	100.53'	64.00'	090°00'00"	S45°36'52"E	90.51'
C10	107.11'	64.00'	095°53'21"	S47°19'48"W	95.04'
C11	123.05'	3014.00'	002°20'21"	N83°33'21"W	123.05'
C12	294.33'	2986.00'	005°38'52"	S85°12'36"E	294.21'
C13	348.08'	3014.00'	006°37'01"	N84°43'31"W	347.88'
C14	344.84'	2986.00'	006°37'01"	S84°43'31"E	344.65'
C15	297.09'	3014.00'	005°38'52"	N85°12'36"W	296.97'
C16	121.90'	2986.00'	002°20'21"	S83°33'21"E	121.90'
C17	123.91'	131.00'	054°11'44"	N57°37'39"W	119.34'
C18	29.80'	131.91'	012°56'35"	N5°10'45"W	29.74'
C19	38.83'	46.08'	048°16'19"	S24°57'45"E	37.69'
C20	70.15'	2986.00'	001°20'46"	N83°03'33"W	70.15'
C21	110.58'	2986.00'	002°07'18"	N84°47'35"W	110.57'
C22	105.23'	2986.00'	002°01'09"	N86°51'49"W	105.23'
C23	8.37'	2986.00'	000°09'38"	N87°57'13"W	8.37'
C24	153.95'	3014.00'	002°55'36"	S86°34'14"E	153.94'
C25	38.15'	186.00'	011°45'08"	S89°01'00"W	38.08'
C26	18.86'	186.00'	005°48'36"	S80°14'08"W	18.85'
C27	62.15'	3014.00'	001°10'53"	S85°41'52"E	62.15'
C28	105.36'	1014.00'	005°57'12"	N84°58'27"E	105.31'
C29	105.08'	1014.00'	005°56'16"	S89°04'49"E	105.04'
C30	31.74'	1014.00'	001°47'36"	S85°12'53"E	31.74'
C31	73.72'	1986.00'	002°07'36"	N85°22'53"W	73.71'
C32	100.12'	1986.00'	002°53'19"	N87°53'20"W	100.11'
C33	100.01'	1986.00'	002°53'07"	S89°13'27"W	100.00'
C34	100.15'	1986.00'	002°53'22"	S86°20'13"W	100.14'
C35	51.29'	1986.00'	001°28'47"	S84°09'08"W	51.29'
C36	54.10'	1014.00'	003°03'24"	N84°56'27"E	54.09'
C37	51.61'	1014.00'	002°54'58"	N87°55'38"E	51.60'
C38	21.59'	64.00'	019°19'38"	S80°57'04"E	21.49'
C39	48.66'	64.00'	043°33'48"	S22°23'46"E	47.50'
C40	31.70'	2986.00'	000°36'30"	S84°25'16"E	31.70'
C41	47.66'	64.00'	042°39'53"	S20°43'04"W	46.56'
C42	28.23'	64.00'	025°16'17"	S82°38'20"W	28.00'
C43	3.89'	3014.00'	000°04'26"	N84°41'18"W	3.89'
C44	105.52'	3014.00'	002°00'22"	N83°38'55"W	105.52'
C45	30.28'	64.00'	027°06'34"	S57°43'58"E	30.00'
C46	105.51'	2986.00'	002°01'28"	S85°09'43"E	105.50'
C47	96.92'	2986.00'	001°51'35"	S87°06'14"E	96.92'
C48	91.90'	2986.00'	001°45'48"	S83°16'04"E	91.90'
C49	13.64'	3014.00'	000°15'34"	N82°30'57"W	13.64'
C50	105.58'	3014.00'	002°00'25"	N86°51'55"W	105.57'
C51	8.68'	3014.00'	000°09'54"	N87°57'05"W	8.68'
C52	105.51'	3014.00'	002°00'20"	N84°51'32"W	105.50'
C53	70.71'	3014.00'	001°20'39"	N87°21'42"W	70.71'
C54	105.52'	3014.00'	002°00'21"	N85°41'12"W	105.51'
C55	105.52'	3014.00'	002°00'22"	N83°40'51"W	105.52'
C56	15.34'	3014.00'	000°17'30"	N82°31'55"W	15.34'
C57	77.96'	131.00'	034°05'51"	N67°40'36"W	76.81'
C58	34.65'	131.00'	015°09'11"	N43°03'05"W	34.54'
C59	11.31'	131.00'	004°56'42"	N33°00'08"W	11.30'
C60	82.60'	1014.00'	004°40'01"	N79°39'51"E	82.57'
C61	91.81'	3014.00'	001°44'43"	S87°09'40"E	91.80'
C62	31.22'	64.00'	027°57'11"	S56°01'36"W	30.92'
C63	14.39'	5.00'	164°53'59"	N01°17'58"E	9.91'
C64	90.87'	2986.00'	001°44'37"	S82°17'20"E	90.87'
C65	90.21'	2986.00'	001°43'51"	S83°15'06"E	90.20'
C66	77.16'	3014.00'	001°28'01"	S83°59'31"E	77.16'

PRELIMINARY PLAT
WHITEWING AT RALSTON SUMMIT
A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30,
TOWNSHIP 2 SOUTH, RANGE 69 WEST 6TH P.M.
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO

SHEET 3 OF 3





REPORT TO CITY COUNCIL PUBLIC HEARING

**AGENDA ITEM
10.E.**

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street.

Report in Brief

Ralston Valley Land Partners, LLC is requesting approval of applications for Annexation, Zoning, Major Subdivision Preliminary Plat, and PUD Development Plan (PDP) of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation and Zoning applications also include the right-of-way (ROW) of W 82nd Avenue between Indiana Street and Alkire Street containing 5.9 acres of land.

The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Ave via an existing ROW adjacent to the west property line of Ralston Valley High School.

The Arvada team recommends that the City Council approve the PDP for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street.

Financial Impact

The approval of this property will have no financial impact.

Background

Ralston Valley Land Partners, LLC is requesting approval of applications for Annexation, Zoning, PUD Development Plan (PDP), and Major Subdivision Preliminary Plat of a 25.5 acre vacant parcel currently located in Unincorporated Jefferson County zoned as Jefferson County Agricultural-Two (A-2). The Annexation and Zoning applications also include the right-of-way (ROW) of W 82nd Avenue between Indiana Street and Alkire Street, containing 5.9 acres of land.

The proposed development consists of 37 residential lots on 25.5 acres with a density of 1.5 dwelling units per acre (du/ac). The requested zoning is Planned Unit Development (PUD). The homes will be custom built on large lots with the goal of providing a rural feel while meeting City requirements for infrastructure and services. In order to provide service to the site, the developer will be extending a sanitary sewer main from W 80th Avenue via an existing ROW adjacent to the west property line of Ralston Valley High School.

Discussion

SUBJECT: PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street.

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ITEM: 10.E.

It is the responsibility of the applicant to justify the requested land use application. The City Council must reach a decision based on its findings regarding the approval criteria shown in the table below and upon testimony heard during the public hearing as it applied to the criteria.

The Community and Economic Development team performed an analysis of the proposal, based on the approval criteria listed in Division 8-3-10, PUD Development Plan, and presents the following findings:

DIV. 8-3-10 PUD DEVELOPMENT PLAN APPROVAL CRITERIA	FINDING	RATIONALE
1. The plan is consistent with the Comprehensive Plan or reflects conditions that have changed since the adoption of the Comprehensive Plan.	Complies	The PDP to develop single-family homes with a max. density of 1.5 du/ac complies with the Comprehensive Plan Low Density Residential designation.
2. The plan is consistent with and implements and previously approved Outline Development Plan in effect for the subject property, per Section 8-3-10-7, PUDs Approved Prior to Effective Date.	N/A	There is not a previously approved Outline Development Plan.
3. The plan represents a development that will address a unique situation, confer a substantial benefit to the City, or incorporate creative site design such that it achieves the purposes set out in Section 8-3-10-1, Purpose of Planned Development Zone, and represents an improvement in quality over what could have been accomplished through application of the otherwise applicable zoning district or development standards.	Complies	The plan will confer a substantial benefit to the City through extension of water and sewer main lines, infrastructure improvements, and fees-in-lieu of improvements. The plan addresses the unique situation presented by the significant grades on the site by creating large lot standards not found in established zone districts.
4. The plan generally complies with the intent of the use, development and design standards set forth in the LDC.	Mostly Complies	The PDP complies with almost all applicable development and design standards set forth in the LDC with the exception of the requested modification to allow gated access to the private road serving the development. Staff does not support the requested modification.
5. To the extent reasonably feasible, the plan provides for integration and connection with adjoining development through street connections, sidewalks, trails, and similar features; unless due to the nature of the uses that are allowable in the plan such connections are not desirable.	Mostly Complies	The development will improve W 82 nd Ave. to Arvada local street standards including constructing a sidewalk along the property frontage. The applicant will also pay fees-in-lieu of constructing improvements to Indiana St., which include a sidewalk/trail that will ultimately connect to existing sidewalk/trail to the north. The requested modification to allow gated access to the private road serving the development does not provide for integration and connection and staff does not support the request.
6. Sufficient public safety, transportation, and utility facilities and services will, prior to development, be available to serve the subject	Complies	With the extension of water and sanitary sewer mains as well as roadway improvements to W 82 nd Ave and fees-in-lieu for improvements to Indiana St. as part of this proposal, there will be capacity and

property, while maintaining sufficient levels of service to existing development.		infrastructure to adequately serve residents while maintaining adequate levels of service to existing development. As noted in the analysis above, AFPD will require all homes within the development to install automatic sprinkler systems meeting the adopted IFC standards.
7. The proposed uses (or group of uses) are appropriately located and designed, both within the boundaries of the plan and in relation to adjacent uses, such that the foreseeable, material adverse impacts that may be created by the scale, design, and operating characteristics (e.g., hours of operation, traffic generation, lighting, noise, odor, dust, and other external impacts) of the uses are avoided or mitigated.	Complies	The proposed use will not have a significant impact to adjacent uses. The development will provide landscaping along W 82 nd Ave. offering a larger than typical buffer from existing homes and the proposed setbacks are in line with the existing neighborhood.
8. If the application for plan approval is accompanied by an application for rezoning to the PUD zoning district, the rezoning application is concurrently approved.	Complies	The zoning application and PDP are being considered concurrently.

Public Contact

The required neighborhood meeting for this project took place virtually on October 7, 2020. The applicant, staff, and 34 neighbors were in attendance. The primary concerns of neighbors were about whether anyone located in Unincorporated Jefferson County would be required to annex into the City and whether the new development would negatively impact the soil or water in the area, since all of the property owners along this section of W 82nd Avenue have septic systems. City team members informed the neighbors that the City does not have a policy of unilateral or forced annexation. The developer addressed concerns about the potential environmental impact and stated that any impacts would be required to be mitigated. The applicant has prepared a summary of the meeting, which is attached.

A written notice was sent 15 days prior to the meeting, a published notice was posted in the newspaper 15 days prior to the meeting, and a public hearing sign was posted 15 days prior to the meeting. In addition, the City Council agenda was posted.

Commission Recommendation

The Planning Commission voted 6 to 0 in favor of the Council's approval of this project on September 7, 2021 during a public hearing. The Planning Commission made an amendment to remove condition of approval number five in the staff report, which would have the effect of allowing a gate for the development.

Strategic Alignment

The project is consistent with the principles stated in the Community and Economic Development Priority Area within the City Council Strategic Plan.

Alternative Courses of Action

N/A

Recommendation for Action

SUBJECT: PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street.

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ITEM: 10.E.

The Arvada team recommends that Council approve the PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue also known as 8200 Indiana Street.

Suggested Motion:

I move that the PUD Development Plan for Whitewing at Ralston Summit, a 25.5 acre parcel of land approximately located at the Northeast corner of Indiana Street and W 82nd Avenue, also known as 8200 Indiana Street be (approval subject to the conditions stated in the Staff Report, Items 1-4, Page 14) (rejected).

This motion is based on the findings of fact adopted by Planning Commission (if approved).

This motion is based on the following findings of fact for denial: (Recite approval criteria you believe the evidence fails to satisfy and your reasons)

Prepared by:
Abigail Ogg, Administrative Specialist

Reviewed by:

Approved by:

Jonathan Moore, Planner I	9/29/2021
Josie Suk, Development Systems and Administrative Manager	9/30/2021
Robert Smetana, Manager of City Planning and Development	9/30/2021
Ryan Stachelski, Director of Community and Economic Development	9/30/2021
Gail Walker, Legal Specialist-Contracts	9/30/2021
Emily Grogg, Senior Assistant City Attorney	10/4/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/7/2021

Enclosure, exhibits & attachments required to support the report

WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALTON SUMMIT LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M., CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO COVER SHEET

LEGAL DESCRIPTION

A PARCEL OF LAND LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE WEST LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 30 BEING ASSUMED TO BEAR NORTH 00°28'43" WEST, A DISTANCE OF 2644.86 FEET BETWEEN THE FOLLOWING DESCRIBED MONUMENTS:

– THE SOUTHWEST CORNER OF SECTION 30 BEING A FOUND 3 2.5" ALUMINUM CAP PLS 11434 REFERENCE MONUMENTS AS DESCRIBED ON MONUMENT RECORD FILED 11/30/11 IN GOOD CONDITION.

– THE WEST QUARTER CORNER OF SECTION 30 BEING A FOUND #6 REBAR & 2.5" ALUMINUM CAP PLS 28286 MATCHING MONUMENT RECORD FILED 4/28/07.

COMMENCING AT SAID SOUTHWEST CORNER OF SECTION 30 FROM WHENCE THE WEST QUARTER CORNER OF SECTION 30 BEARS NORTH 00°28'43" WEST, A DISTANCE OF 2644.86 FEET;

THENCE ALONG SAID WEST LINE OF SAID SOUTHWEST QUARTER NORTH 00°28'43" WEST, A DISTANCE OF 1,409.39 FEET;

THENCE NORTH 89°23'08" EAST, A DISTANCE OF 99.94 FEET TO A FOUND #5 REBAR AND 1.5" ALUMINUM CAP, PLS 16406, BEING A POINT ON THE NORTHERLY RIGHT-OF-WAY OF WEST 82ND AVENUE AND THE POINT OF BEGINNING;

THENCE NORTH 45°34'41" WEST, A DISTANCE OF 70.50 FEET TO A FOUND #5 REBAR AND 1.5" ALUMINUM CAP, PLS 16406 BEING ALSO A POINT ON THE EASTERLY RIGHT-OF-WAY OF INDIANA STREET;

THENCE ALONG SAID EASTERLY RIGHT-OF-WAY NORTH 00°28'43" WEST, A DISTANCE OF 563.83 FEET TO A FOUND #5 REBAR AND 1.5" ALUMINUM CAP, PLS 16406;

THENCE SOUTH 84°45'14" EAST, A DISTANCE OF 2,238.36 FEET TO A FOUND #5 REBAR AND 1" ORANGE PLASTIC CAP, PLS 26296;

THENCE SOUTH 00°29'57" EAST, A DISTANCE OF 385.15 FEET TO A FOUND #5 REBAR AND 1" ORANGE PLASTIC CAP, PLS 26296 BEING ALSO A POINT ON THE NORTHERLY RIGHT-OF-WAY OF SAID WEST 82ND AVENUE;

THENCE ALONG SAID NORTHERLY RIGHT-OF-WAY SOUTH 89°23'08" WEST, A DISTANCE OF 2,177.40 FEET TO THE POINT OF BEGINNING.

CONTAINING 1,111,102 SQUARE FEET OR 25.507 ACRES, MORE OR LESS.

BENCHMARK

CITY OF ARVADA BENCHMARK #920, BEING A CHISELED SQUARE NORTHEAST CORNER OF HEADWALL AT CHURCH DITCH, SOUTH SIDE OF 80TH AVE APPROXIMATELY 150' EAST OF INDIANA ST. CITY OF ARVADA DATUM ELEVATION 5,624.31.

CONTACTS:

OWNER / DEVELOPER

RALSTON VALLEY LAND PARTNERS LLC
1660 17TH STREET, SUITE 300
DENVER, COLORADO 80202
CONTACT: GREGORY BAMFORD
PHONE: (480) 941-1584

CIVIL ENGINEER / SURVEYOR

JEHN ENGINEERING, INC.
5690 WEBSTER STREET
ARVADA, CO 80002
CONTACT: DEBBIE KLISIS, P.E.
PHONE: (303) 423-6036
FAX: (303) 467-9438

LANDSCAPE ARCHITECT

JEHN ENGINEERING, INC.
5690 WEBSTER STREET
ARVADA, CO 80002
CONTACT: KIM NELSON
PHONE: (303) 483-3500

FIRE PROTECTION

ARVADA FIRE PROTECTION DISTRICT
STEVEN PARKER
7903 ALLISON WAY
ARVADA, CO 80005
PHONE: (303) 424-3012

TRAFFIC ENGINEER

RICK ENGINEERING COMPANY
SANJAY PAUL, PE
5690 WEBSTER STREET
ARVADA, CO 80002
PHONE: (303) 423-6036

UTILITIES

STREET/STORM/WATER
CITY OF ARVADA
8101 RALSTON ROAD
ARVADA, CO 80002
PHONE: (720) 898-7640

PHONE:
CENTURYLINK
DEVELOPER CONTACT GROUP
P.O. BOX 1720
DENVER, CO 80201
PHONE: (800) 526-3557

CABLE TV:
COMCAST/ XFINITY
7400 W ALASKA DR.
LAKEWOOD, CO 80226
PHONE: (800) 934-6489

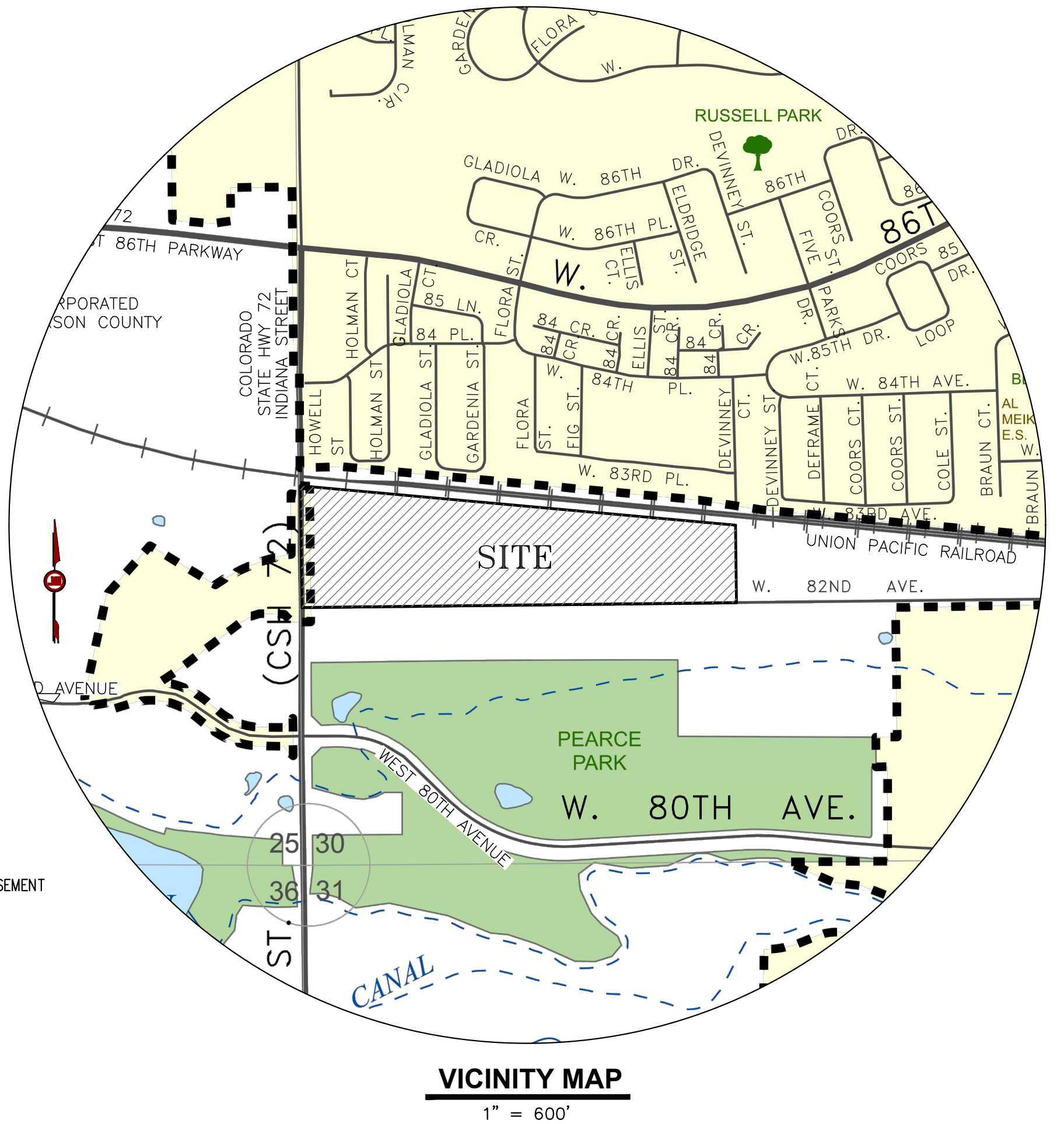
GAS AND ELECTRIC:
XCEL ENERGY OF COLORADO
BUILDERS CALL LINE
5460 W. 60TH AVE
ARVADA, CO 80003
PHONE: (800) 628-2121

LEGEND

	EXISTING	PROPOSED
RIGHT-OF-WAY/ BOUNDARY	---	---
LOT LINE	---	---
SANITARY SEWER	---	---
STORM SEWER	---	---
WATER LINE	---	---
WATER SERVICE		W/S
SANITARY SERVICE		S/S
EASEMENT LINE	---	---
CONTOUR LINE	---5300---	---5315---
CURB & GUTTER	===	===
SECTION LINE	---	---
FENCE	-x-x-x-	-x-x-x-
SANITARY SEWER MH	⊙	●
STORM SEWER MH	⊙	●
WATER MH	⊙	●
TELEPHONE MH	⊙	●
WATER VALVE	⊗	⊗
FIRE HYDRANT	⊕	⊕
PROPOSED REDUCER		▶
PROPOSED BLOWOFF		⬇
PROPOSED BEND WITH THRUST BLOCK		⬇
PROPOSED TYPE "R" INLET		⬇
PROPOSED WATER METER		⬇
PROPOSED BIKE RACK		⬇
PROPOSED LIGHT POLE		⬇

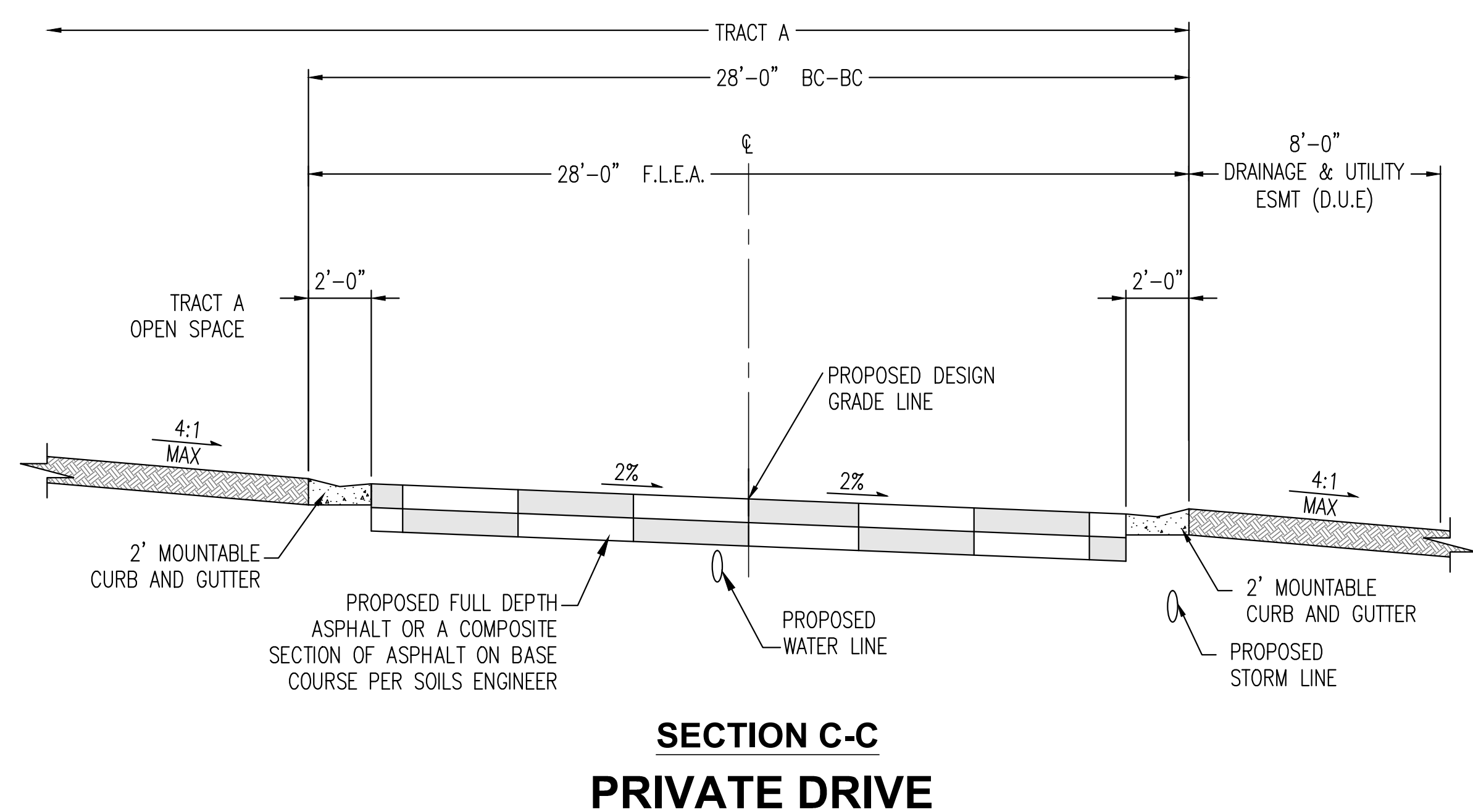
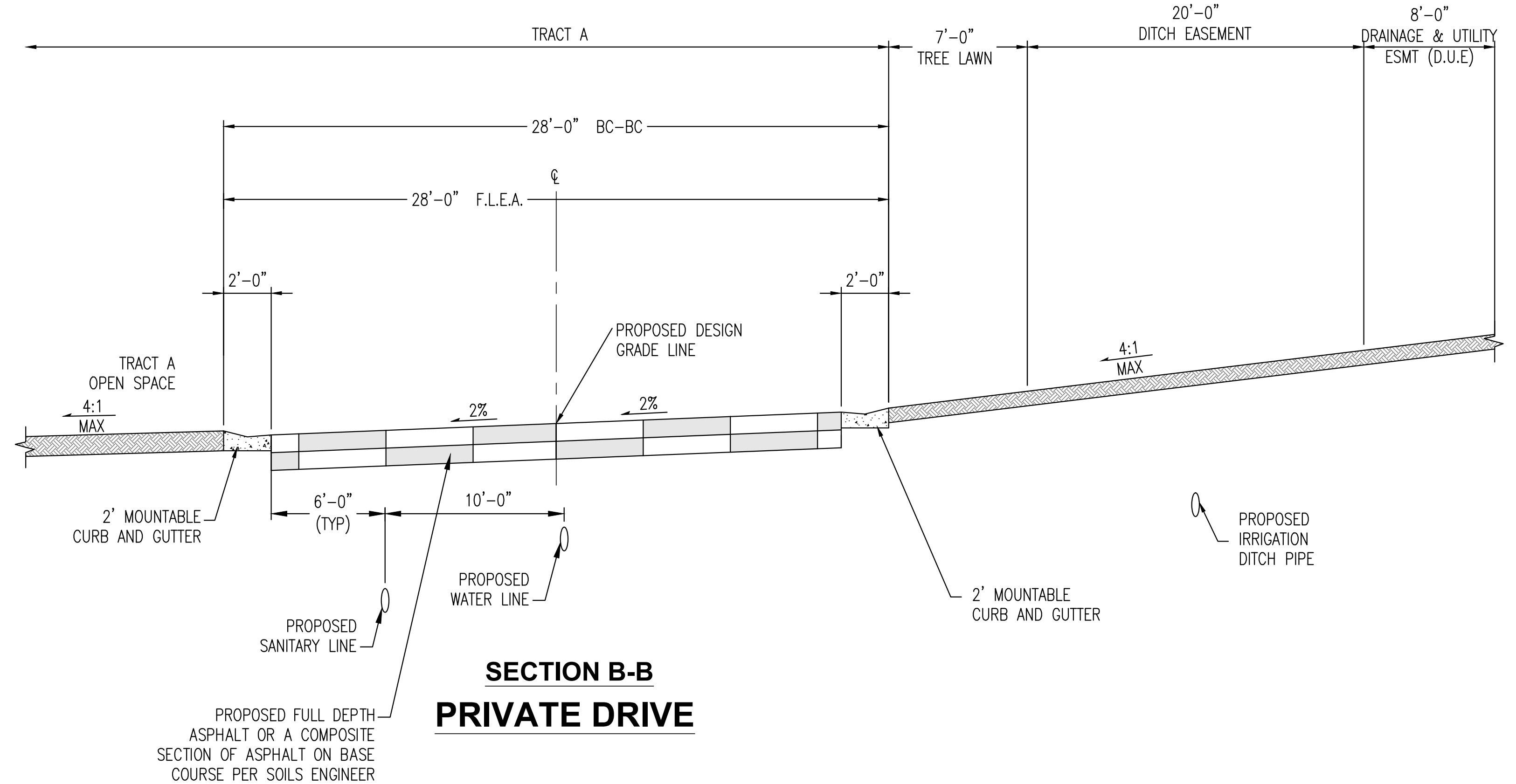
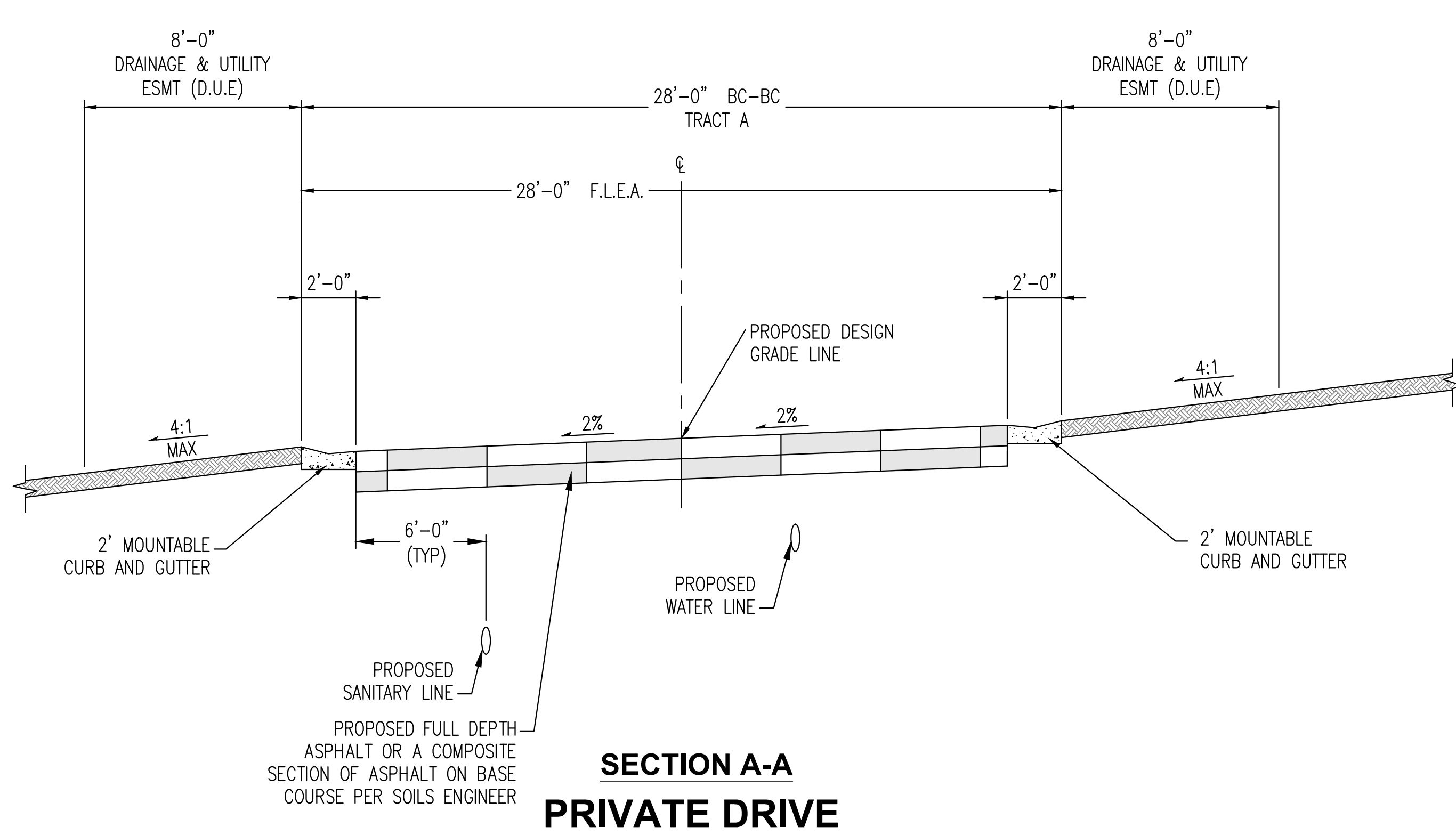
ABBREVIATIONS

A.U.	-ACCESS & UTILITY EASEMENT
COA	-CITY OF ARVADA
CONC	-CONCRETE
CL	-CENTER LINE
D.E.	-DRAINAGE EASEMENT
DIA	-DIAMETER
D.U.	-DRAINAGE & UTILITY EASEMENT
D.U.E.	-DRY UTILITY EASEMENT
E.G.M.E.	-EXCLUSIVE GAS MAIN EASEMENT
ELEC	-ELECTRIC
EL	-ELEVATION
EOA	-EDGE OF ASPHALT
EQ	-EQUAL
ESMT	-EASEMENT
EX	-EXISTING
EXIST	-EXISTING
FF	-FINISHED FLOOR
FG	-FINISHED GRADE
FH	-FIRE HYDRANT
FL	-FLOW LINE
F.L.E.A.	-FIRE LANE, EMERGENCY ACCESS EASEMENT
F.L.E.&P.A.E.	-FIRE LANE, EMERGENCY AND PUBLIC ACCESS EASEMENT
G	-GAS
GB	-GRADE BREAK
HP	-HIGH POINT
LF	-LINEAL FEET
LS	-LANDSCAPE
MH	-MANHOLE
NP	-NO PARKING
PAE	-PUBLIC ACCESS EASEMENT
PC	-POINT OF CURVATURE
PT	-POINT OF TANGENCY
PVC	-POLYVINYL CHLORIDE PIPE
RCP	-REINFORCED CONCRETE PIPE
S	-SANITARY SEWER SERVICE
SAN	-SANITARY
SQ. FT.	-SQUARE FOOTAGE
STM	-STORM
TC	-TOP OF CURB
TC	-TOP OF GRATE
T.U.	-TRAIL & UTILITY EASEMENT
TW	-TOP OF WALL
TYP.	-TYPICAL
UTIL	-UTILITY
W	-WATER SERVICE
WAT	-WATER

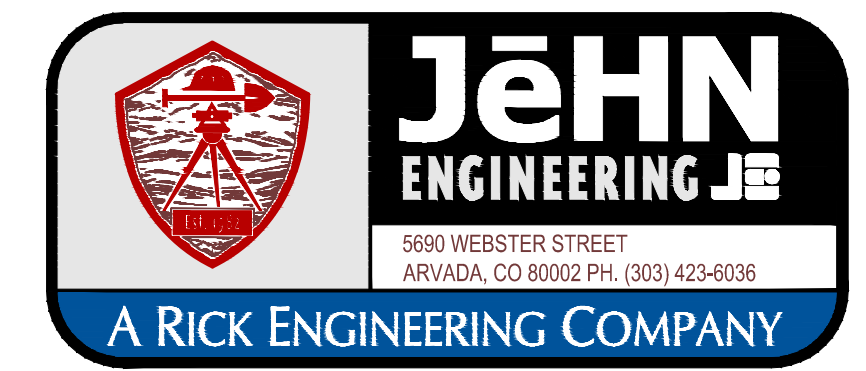


WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
PRIVATE DRIVE STREET SECTIONS



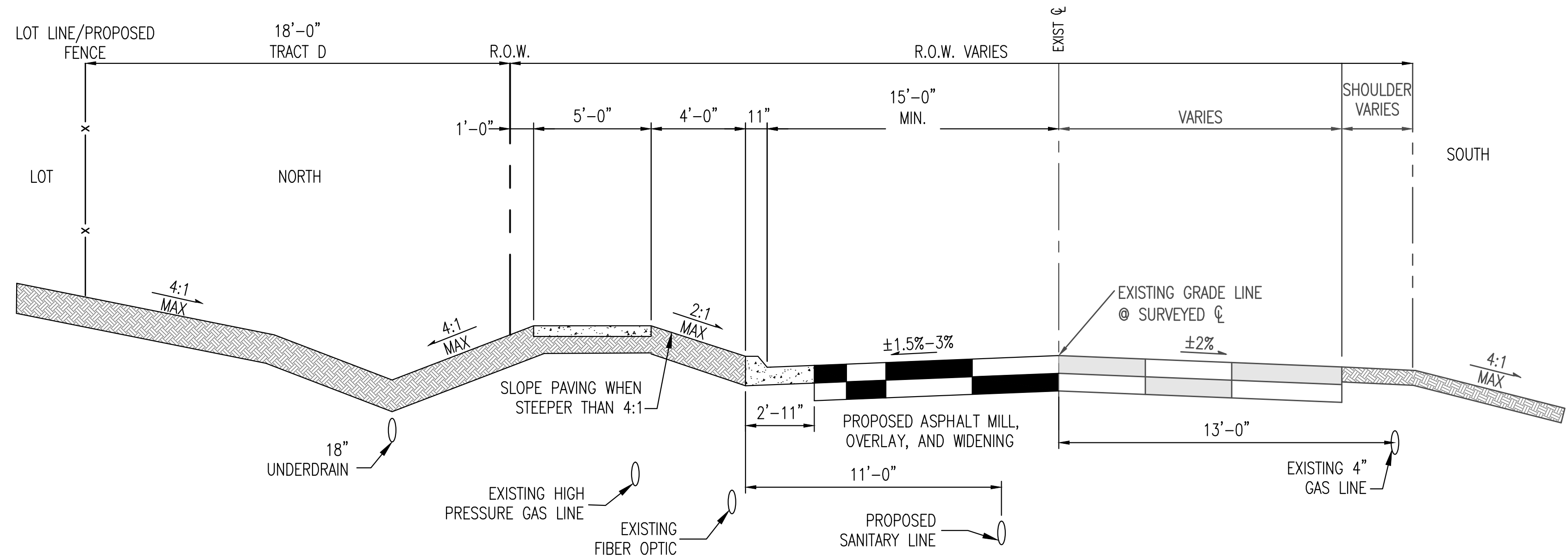
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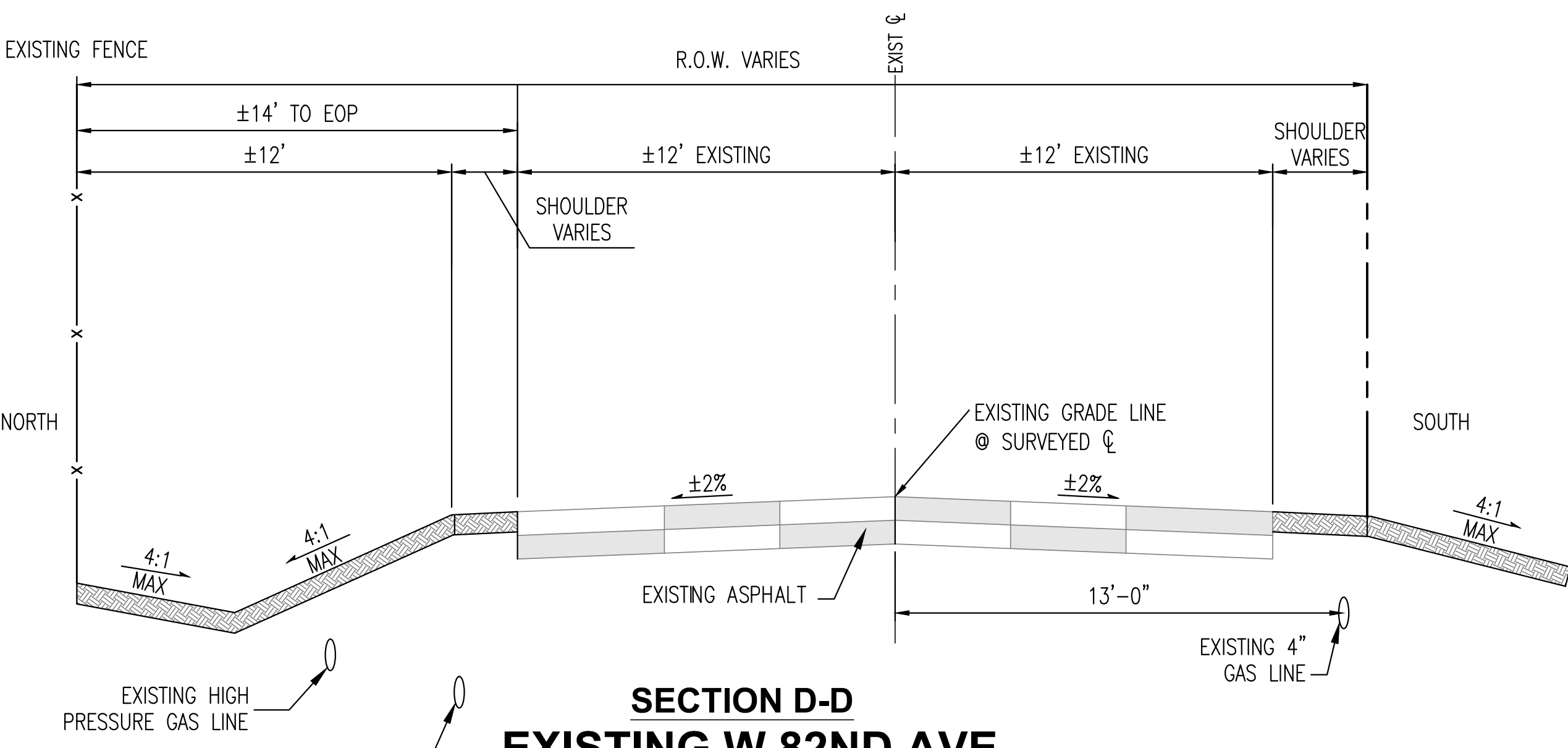
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WHITEWING AT RALSTON SUMMIT

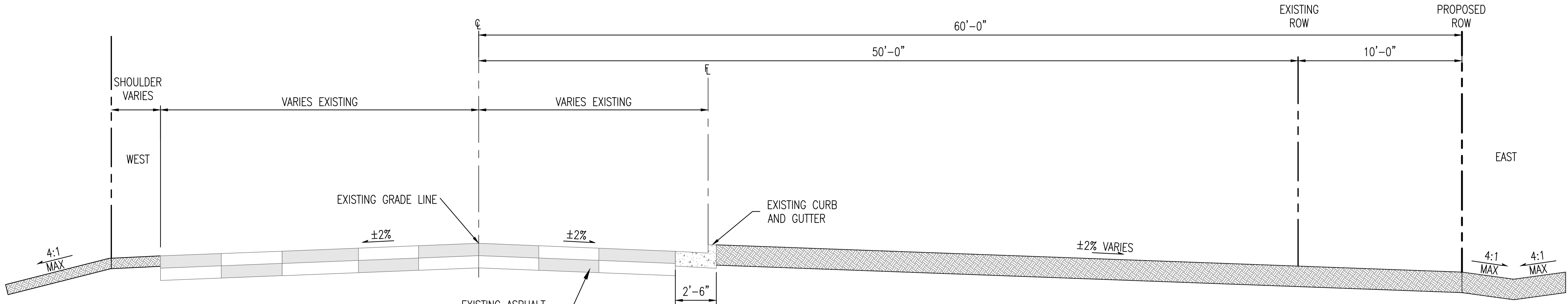
PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
W 82ND AVE & SH 72 STREET SECTIONS



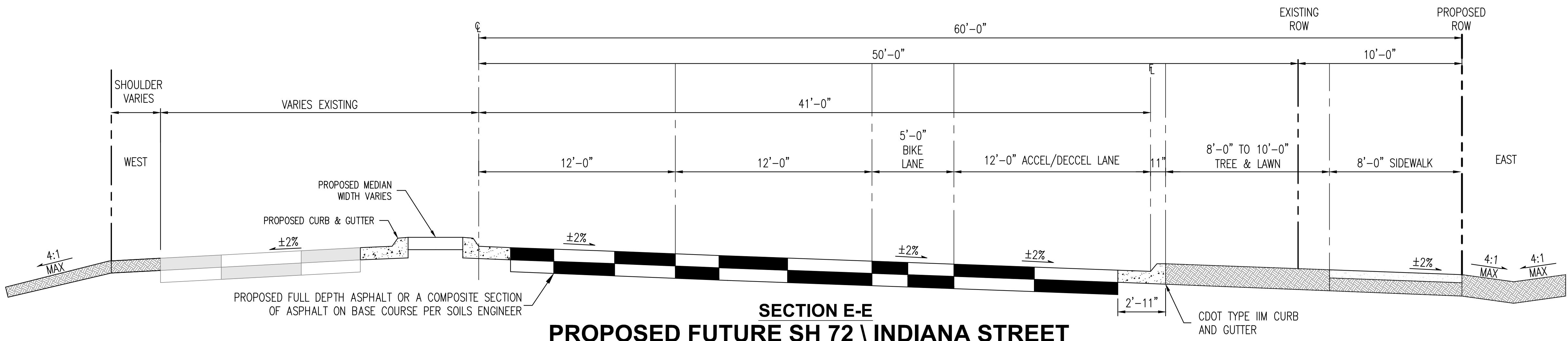
SECTION D-D
PROPOSED W 82ND AVE



SECTION D-D
EXISTING W 82ND AVE

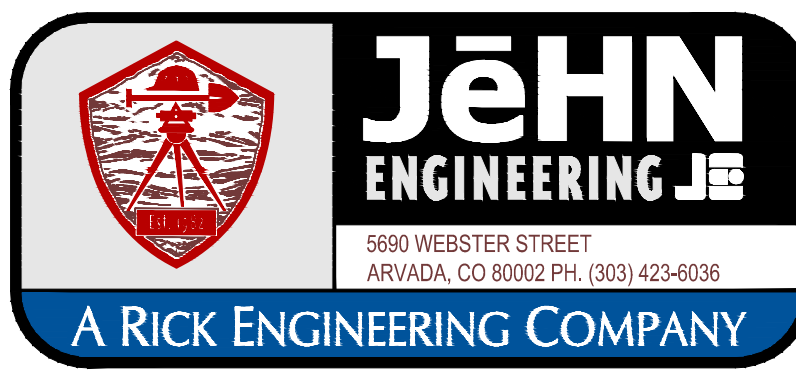


SECTION E-E
PROPOSED SH 72 \ INDIANA STREET



SECTION E-E
PROPOSED FUTURE SH 72 \ INDIANA STREET

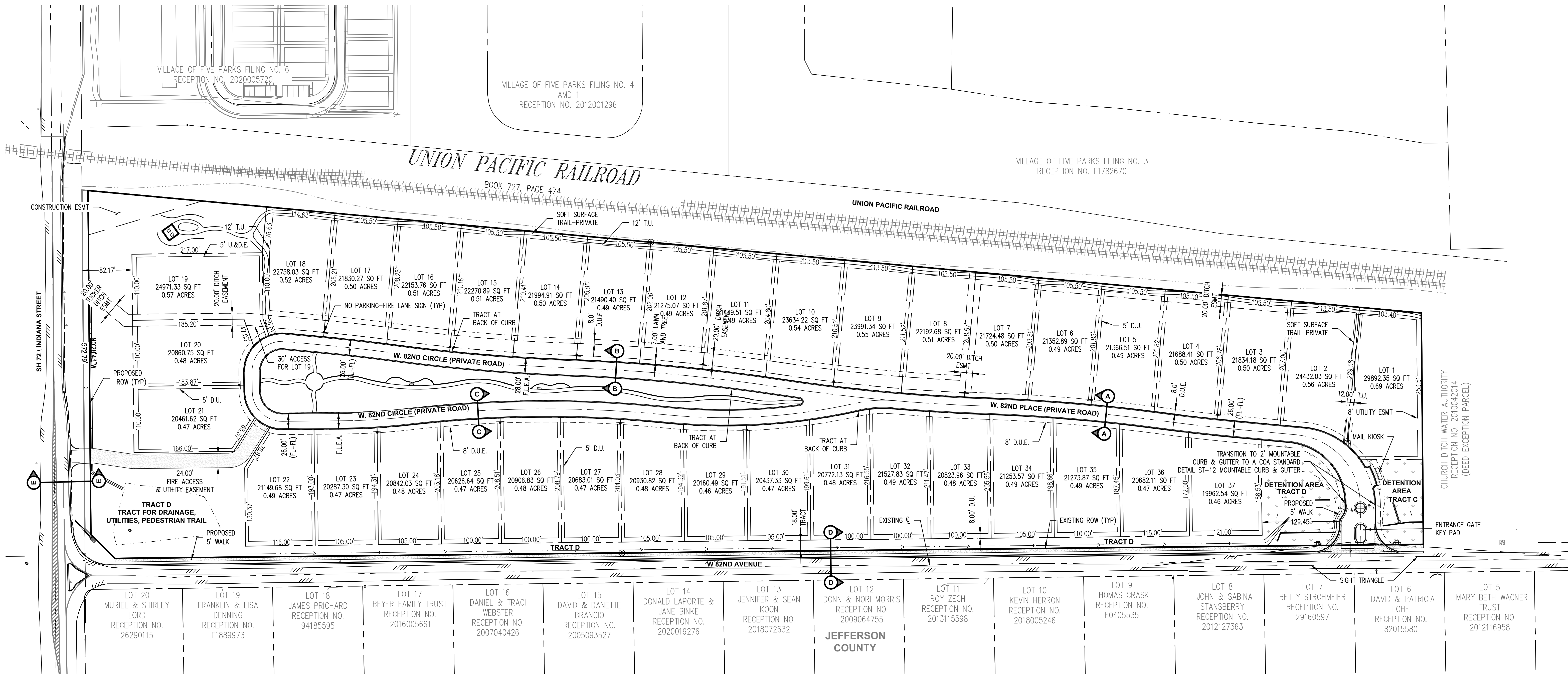
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WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
OVERALL SITE PLAN

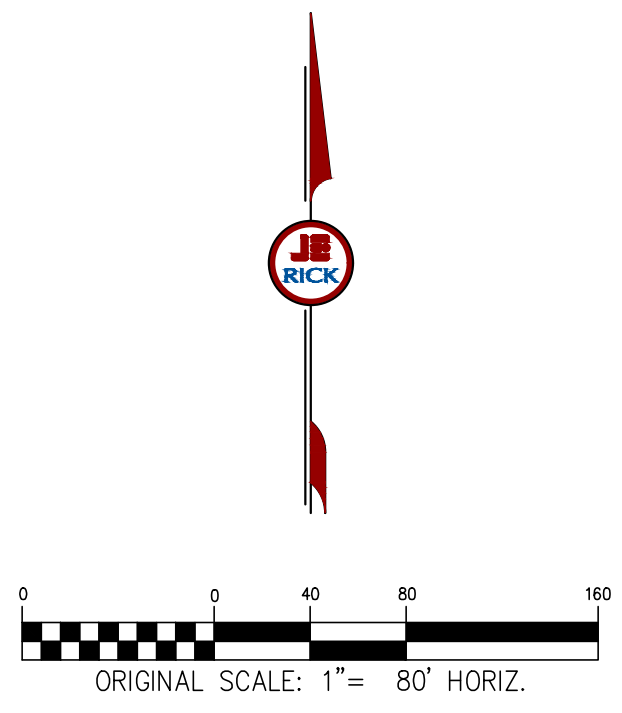


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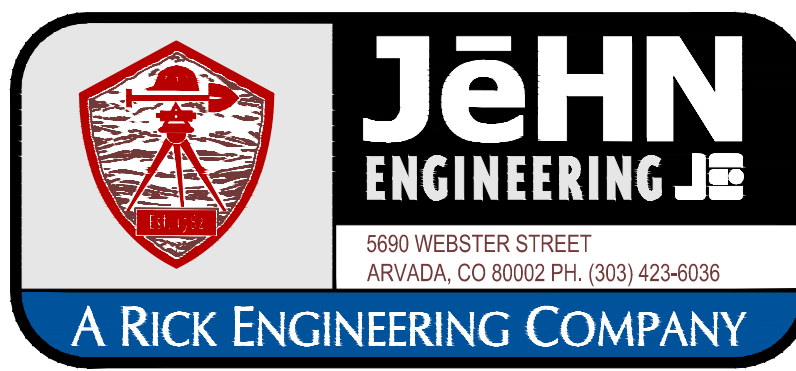
- PROVIDE "NO PARKING - FIRE LANE" SIGNS AT EACH LOCATION SHOWN BY THIS SYMBOL.
- PROPERTY LINE
- LOT LINE
- ESMT ACCESS LINE
- MOUNTABLE CURB AND GUTTER
- PROPOSED RETAINING WALL
- OPEN SPACE AREA
- D.U. DRAINAGE & UTILITY EASEMENT
- D.U.E. DRY UTILITY EASEMENT
- F.L.E.A. FIRE LANE, EMERGENCY ACCESS EASEMENT
- T.U. TRAIL & UTILITY EASEMENT

GENERAL NOTES:

- MINIMUM LOT SIZE = 19,963 SF
- TOTAL SITE AREA = 25.5 AC
- TOTAL LOTS = 37
- DENSITY = 1.5 DU/AC
- APPROVED FIRE LANE AND EMERGENCY ACCESS SHALL BE PROVIDED DURING VERTICAL CONSTRUCTION. UNLESS OTHERWISE APPROVED, THE EVA SHALL CONSIST OF THE FIRST LIFT OF ASPHALT OR CONCRETE AND BE PROVIDED PRIOR TO COMMENCING VERTICAL CONSTRUCTION.
- PROPOSED FENCES, WALLS, SIGNS AND ACCESSORY STRUCTURES SHOWN ON THIS PLAN ARE ILLUSTRATIVE ONLY AND SUBJECT TO SEPARATE REVIEWS AND PERMITS.



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PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
OVERALL UTILITY PLAN



JēHN
ENGINEERING

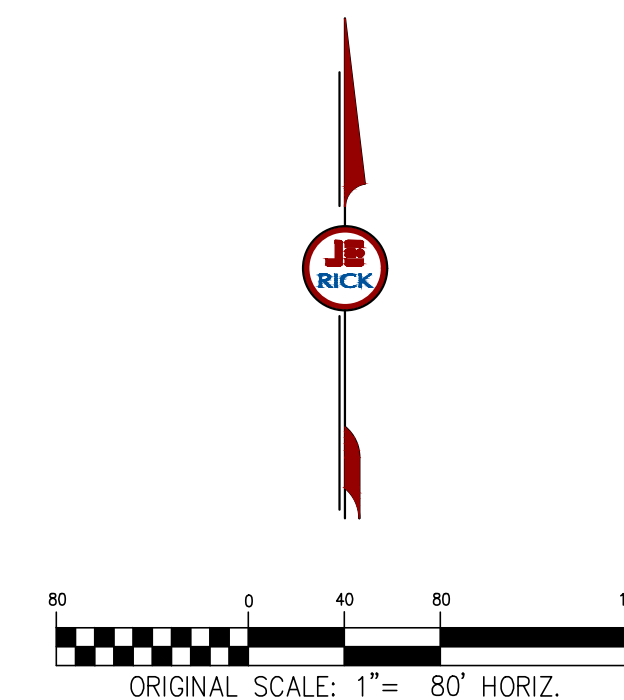
5690 WEBSTER STREET
ARVADA, CO 80002 PH. (303) 423-6036

A RICK ENGINEERING COMPANY

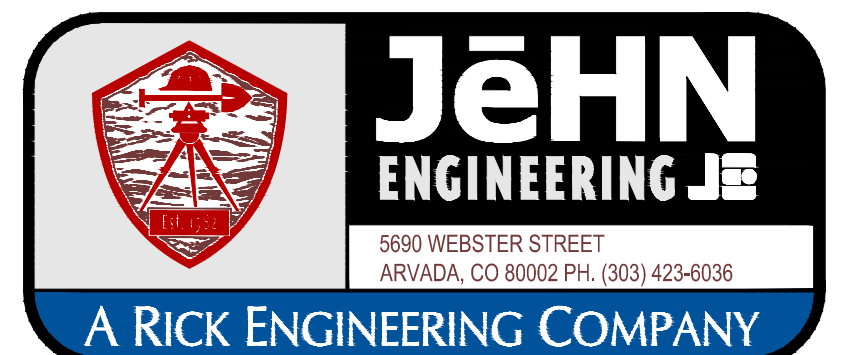
PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
OVERALL GRADING PLAN



<u>1.0%</u>	PROPOSED GRADE AND FLOW DIRECTION	5700'	PROPOSED ELEVATION
-----5720-----	EXIST. MAJOR CONTOUR		PROP. MINOR CONTOUR
-----5723-----	EXIST. MINOR CONTOUR	HP	PROP. HIGH POINT
5682	FINISHED PAD ELEVATION	LP	PROP. LOW POINT

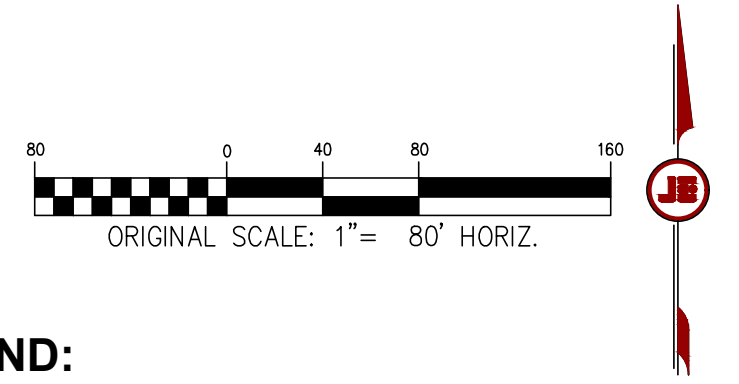


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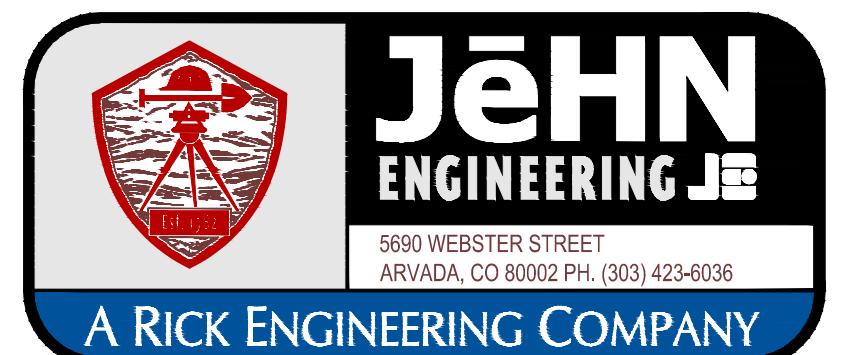
WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
TURNING MOVEMENT ANALYSIS



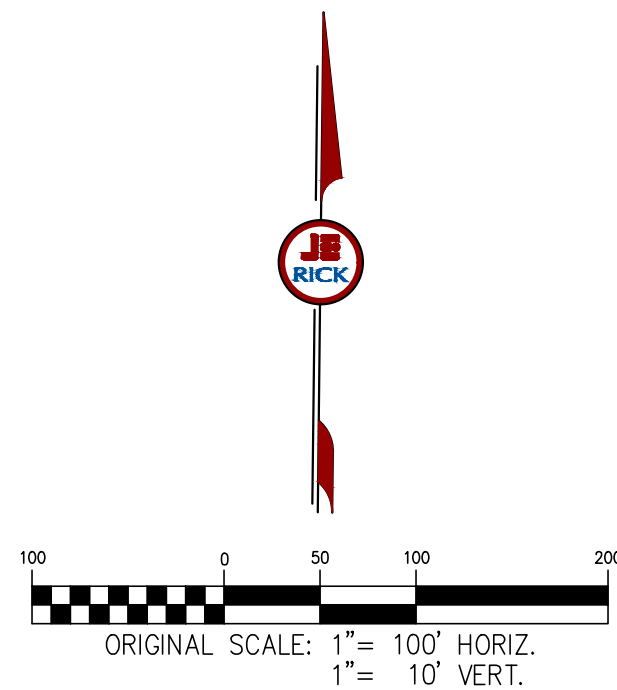
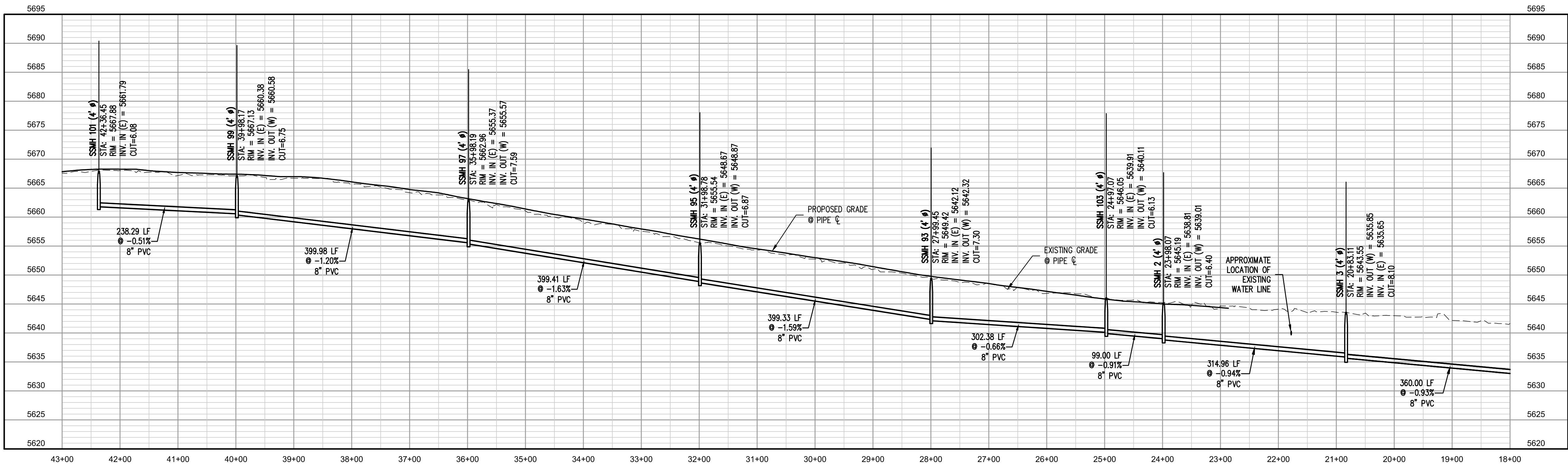
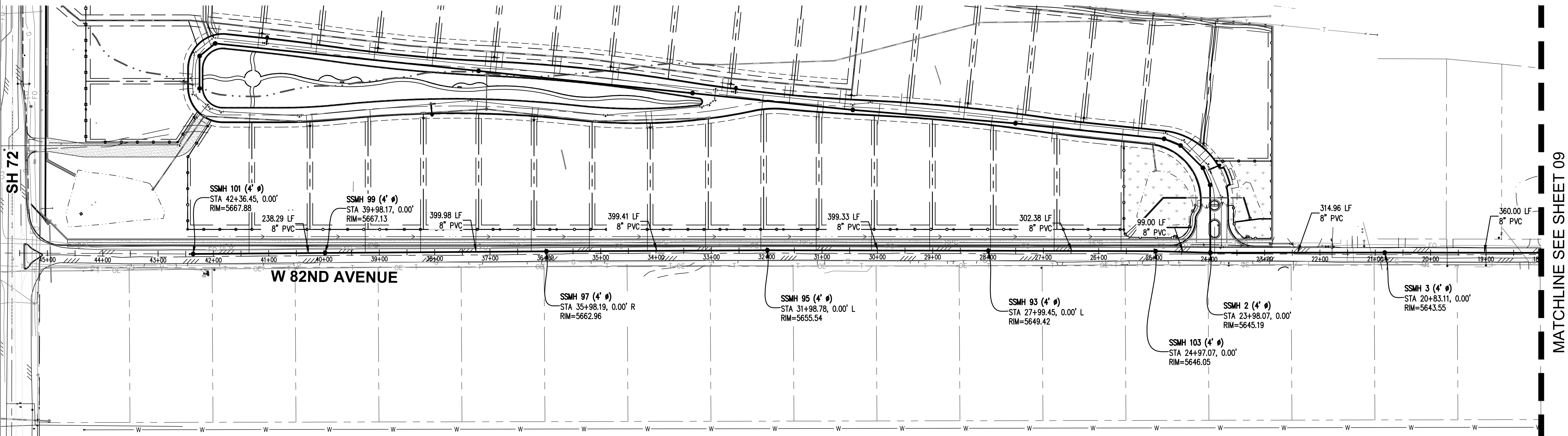
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DATE: 08/01/2021
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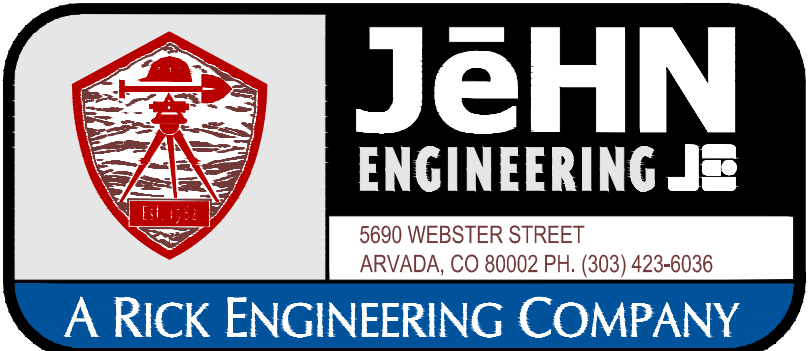


WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN
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LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
OFFSITE SANITARY CONNECTION

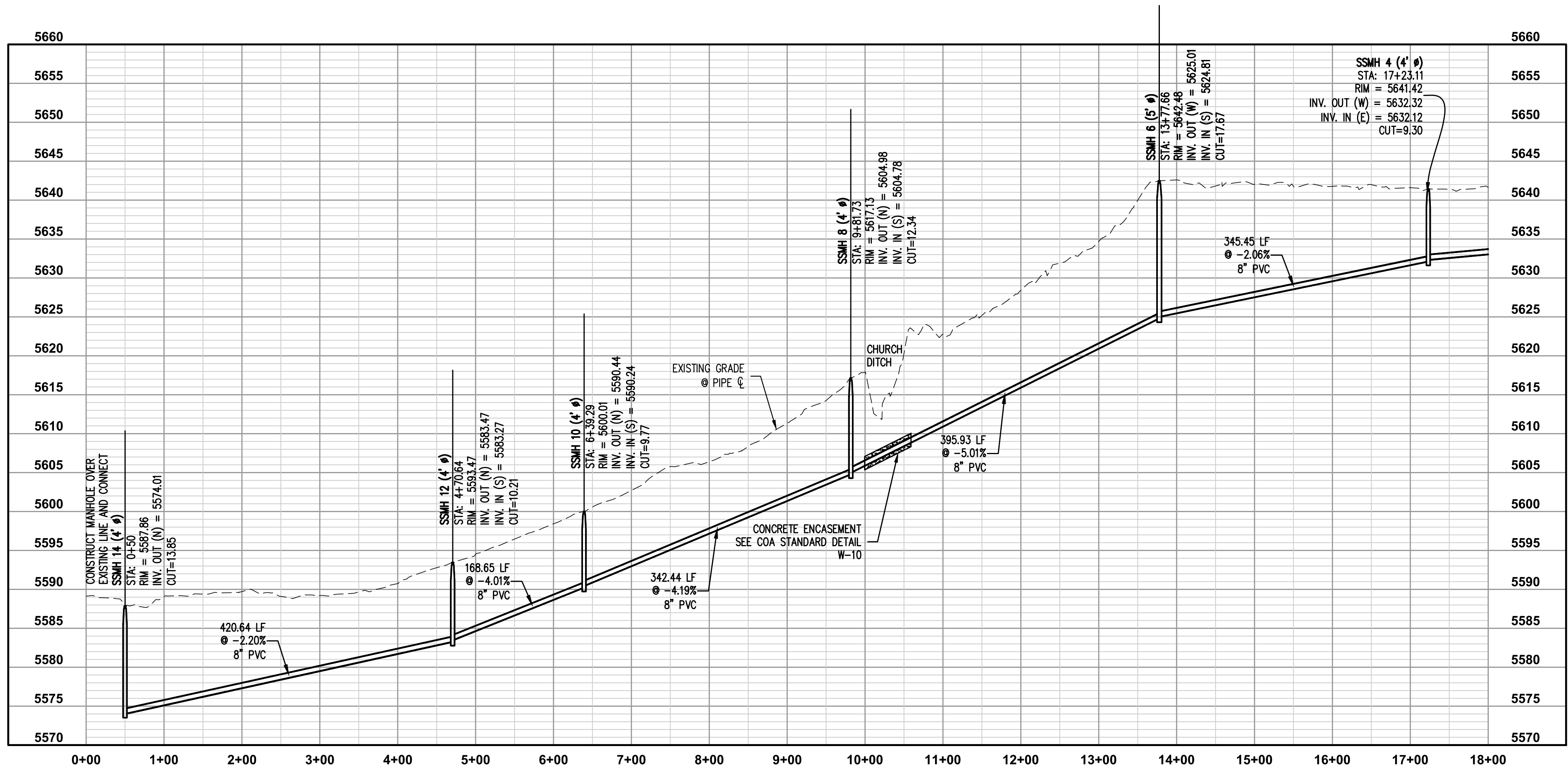
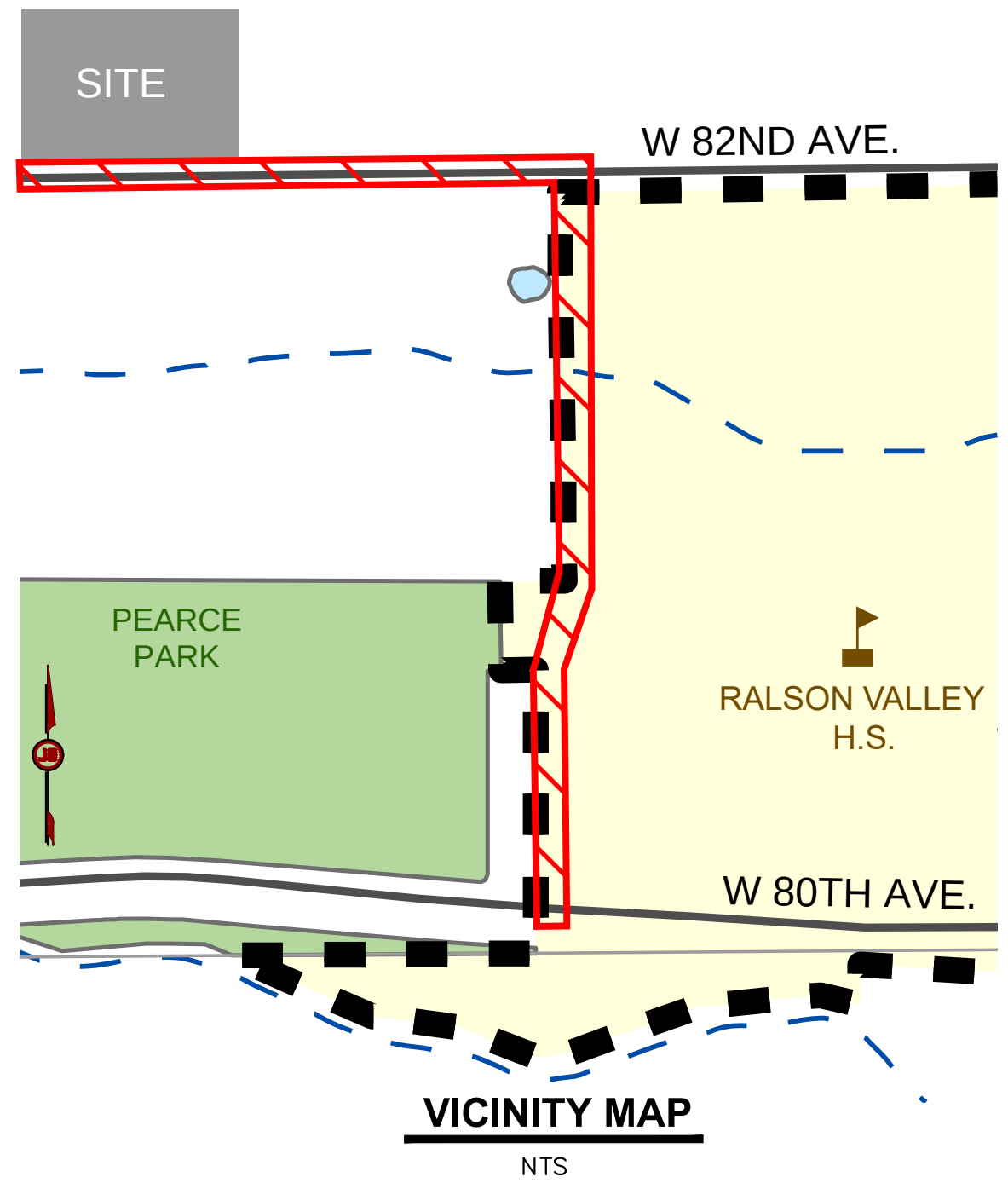
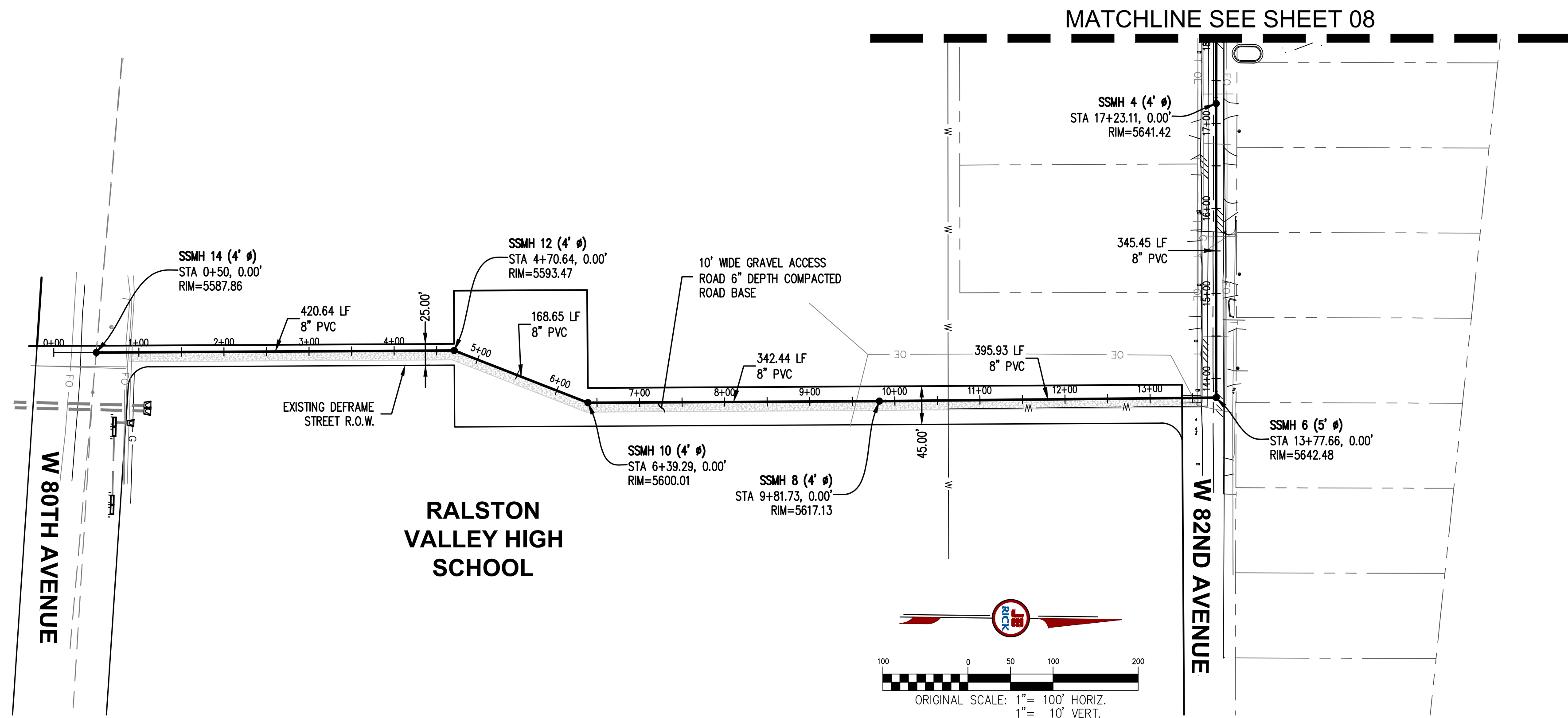


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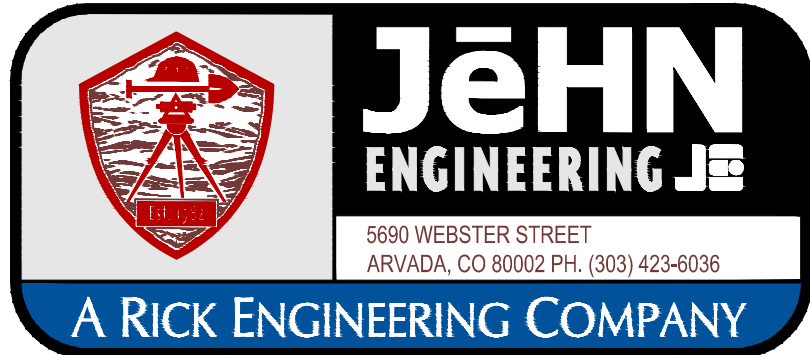


WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
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OFFSITE SANITARY CONNECTION



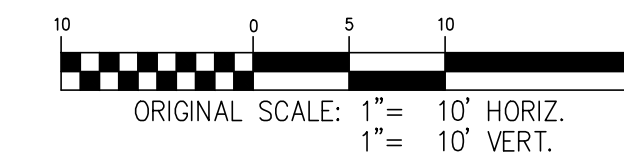
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SHEET 09 OF 20



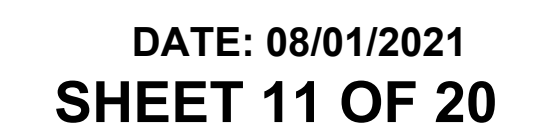
PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO

60' PROPOSED ROW

INDIANA INTERIM BUILDOUT EXHIBIT



	<u>DESCRIPTION</u>
	EXISTING RIGHT-OF-WAY
	PROPOSED PROPERTY BOUNDARY
	PROPOSED SLOPE EASEMENT
	PROPOSED BACK OF CURB
	PROPOSED FLOWLINE
	PROPOSED GUTTER LINE
	PROPOSED SIDEWALK
	PROPOSED STORM LINE
	PROPOSED ASPHALT
	EXISTING ASPHALT
	PROPOSED SIDEWALK
	LANDSCAPE

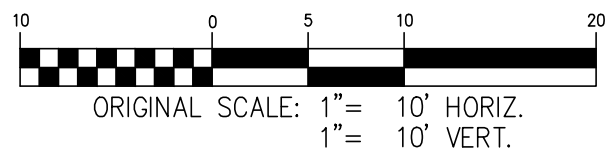
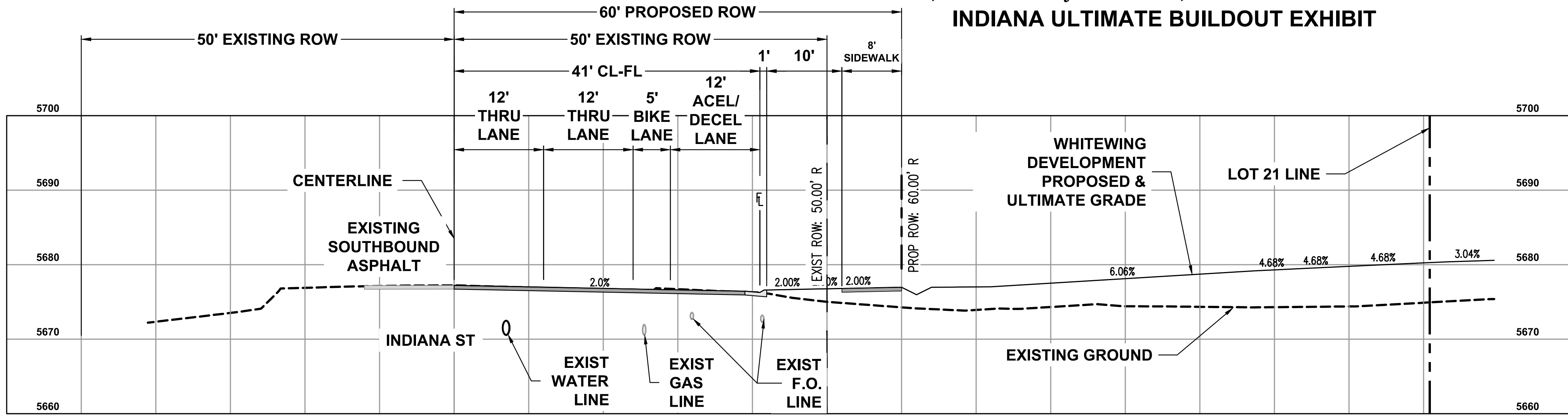


WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN

A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
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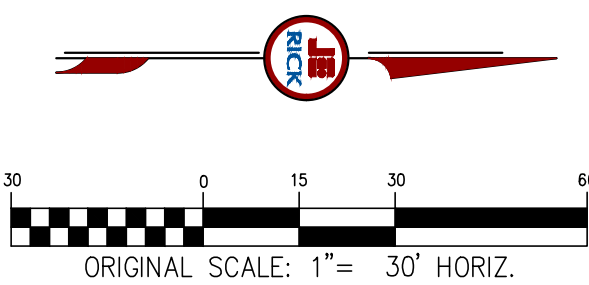
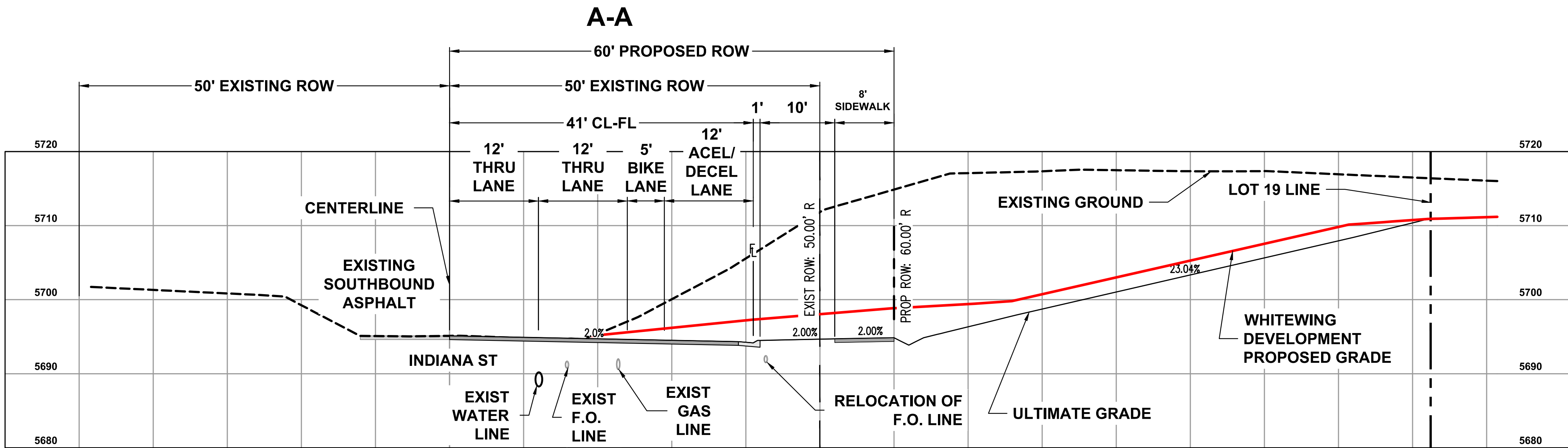
INDIANA ULTIMATE BUILDOUT EXHIBIT



GENERAL LEGEND

DESCRIPTION	
	EXISTING RIGHT-OF-WAY
	PROPOSED PROPERTY BOUNDARY
	PROPOSED SLOPE EASEMENT
	PROPOSED BACK OF CURB
	PROPOSED FLOWLINE
	PROPOSED GUTTER LINE
	PROPOSED SIDEWALK
	PROPOSED STORM LINE
	PROPOSED ASPHALT
	EXISTING ASPHALT
	PROPOSED SIDEWALK
	LANDSCAPE

*ULTIMATE CONDITION REFERS TO THE FULL WIDENING OF INDIANA ST



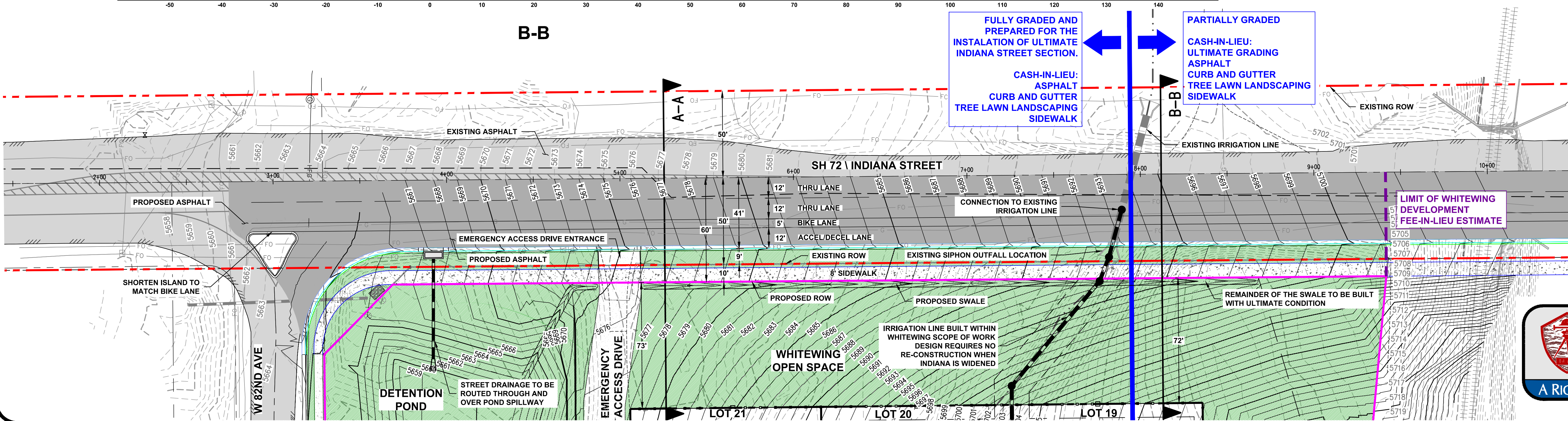
B-B

FULLY GRADED AND PREPARED FOR THE INSTALLATION OF ULTIMATE INDIANA STREET SECTION.

CASH-IN-LIEU: ASPHALT CURB AND GUTTER TREE LAWN LANDSCAPING SIDEWALK

PARTIALLY GRADED

CASH-IN-LIEU: ULTIMATE GRADING ASPHALT CURB AND GUTTER TREE LAWN LANDSCAPING SIDEWALK

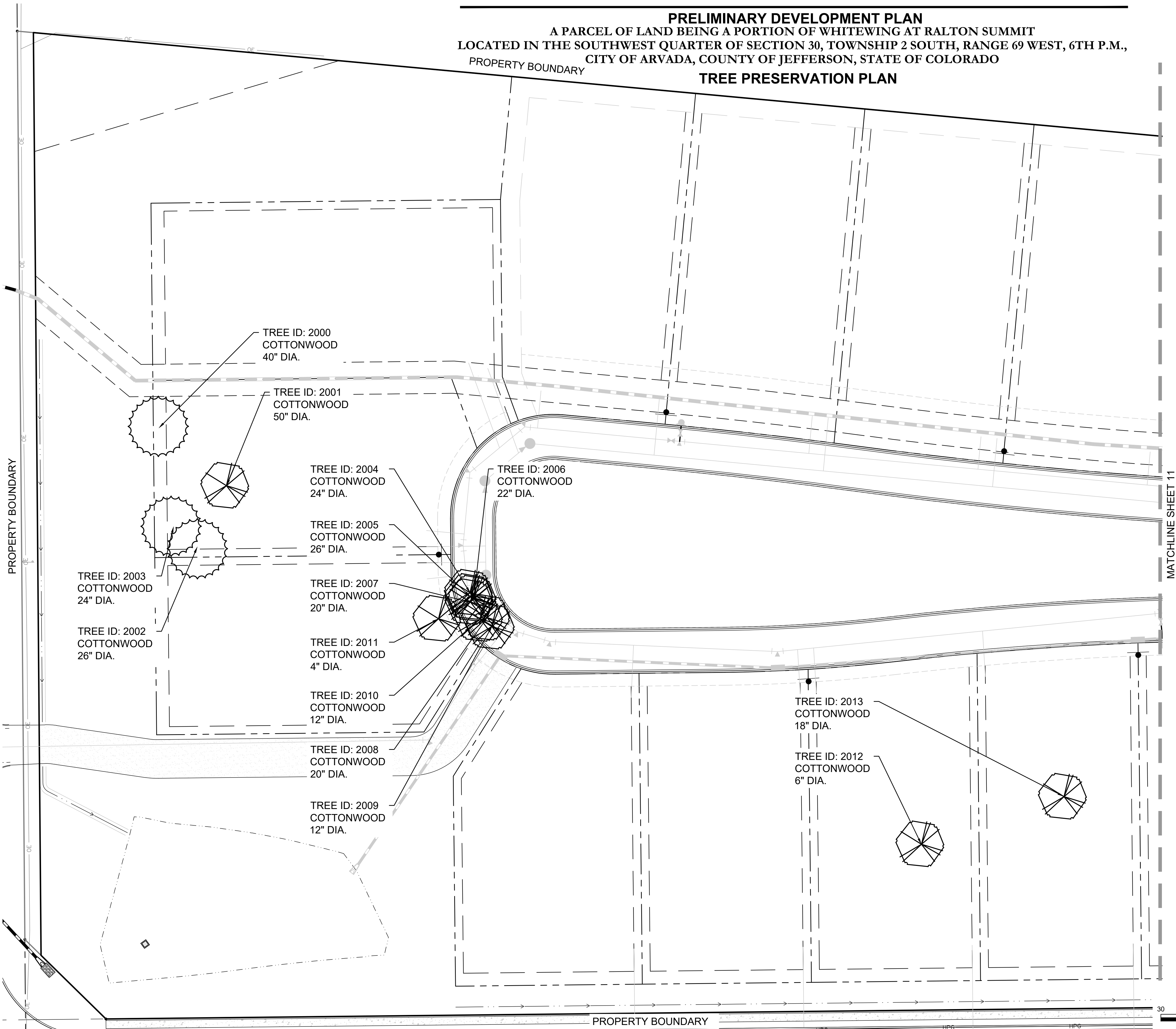


WHITEWING AT RALSTON SUMMIT

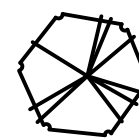
PRELIMINARY DEVELOPMENT PLAN

A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
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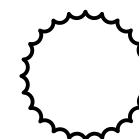
TREE PRESERVATION PLAN



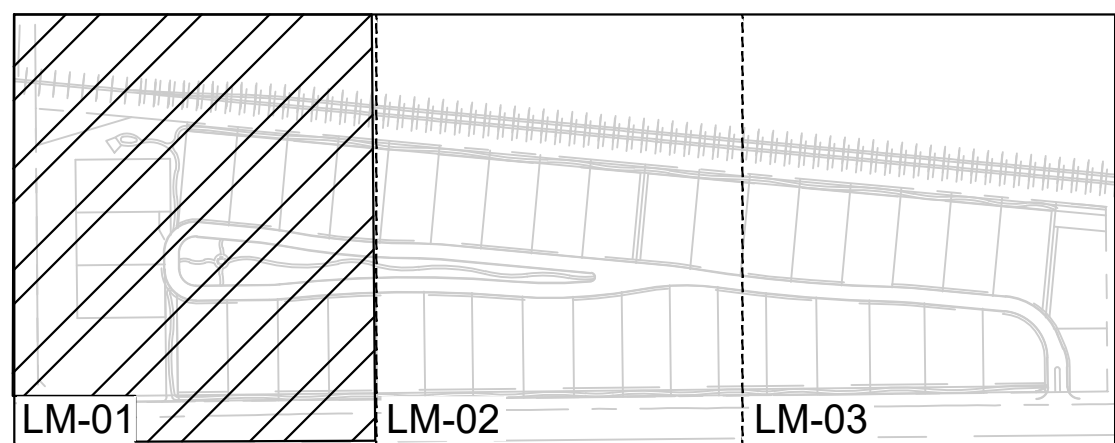
EXISTING TREE LEGEND



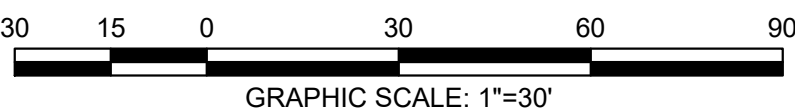
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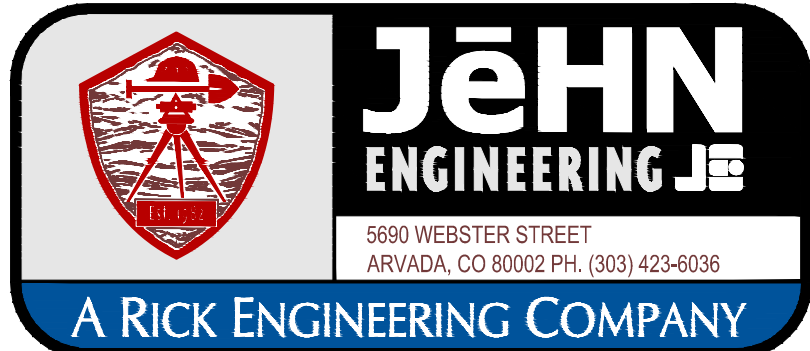
TO PROTECT IN PLACE



KEYMAP



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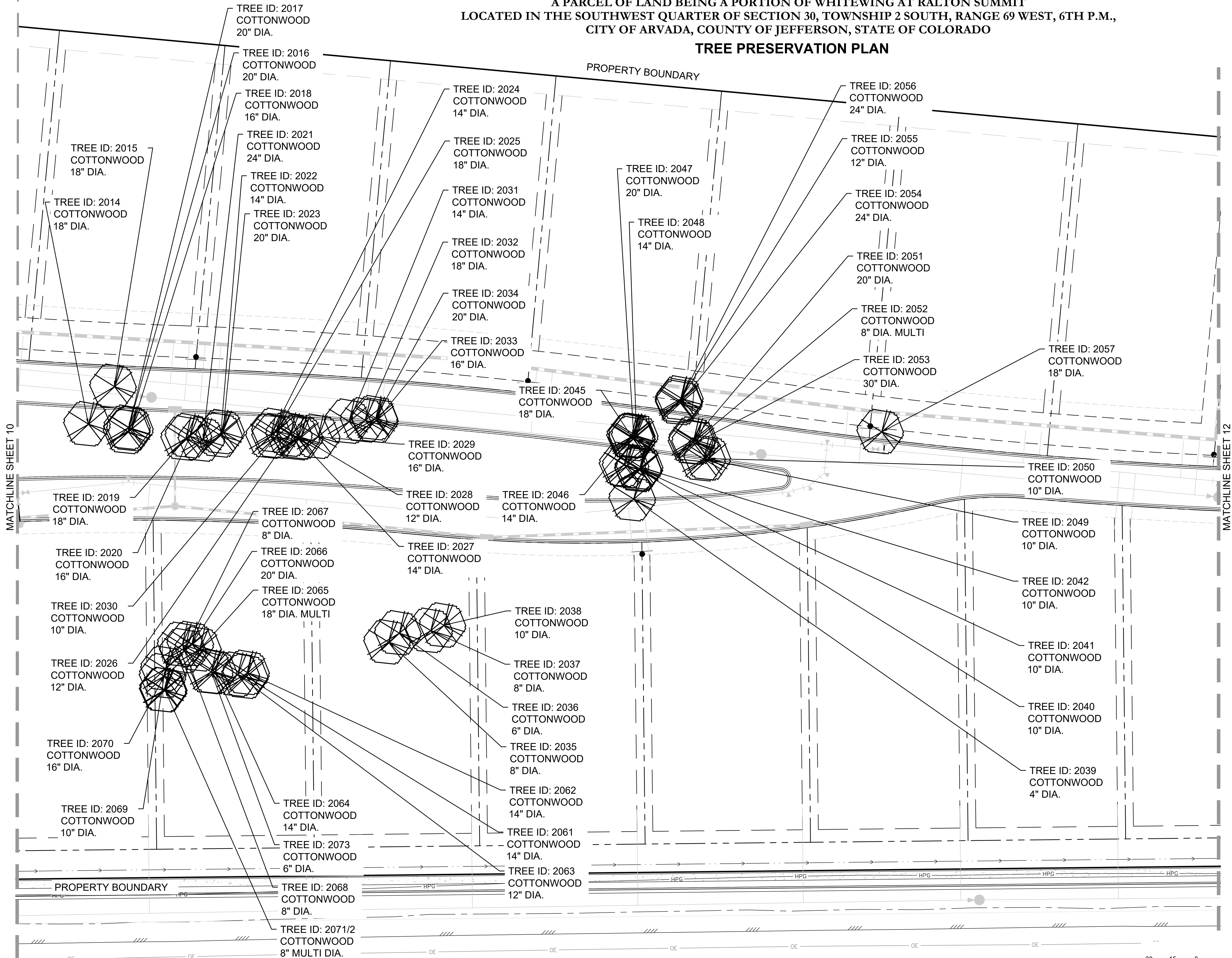


WHITEWING AT RALSTON SUMMIT

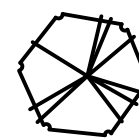
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LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO

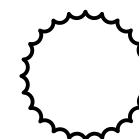
TREE PRESERVATION PLAN



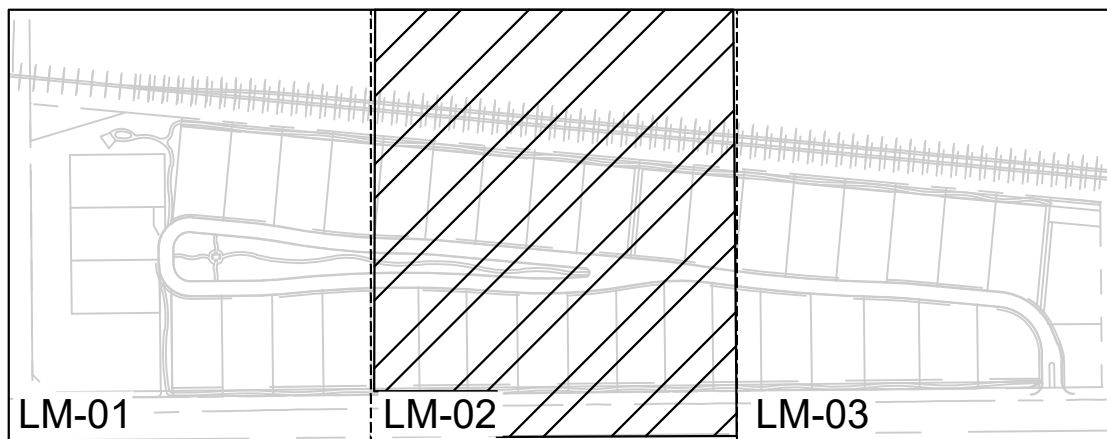
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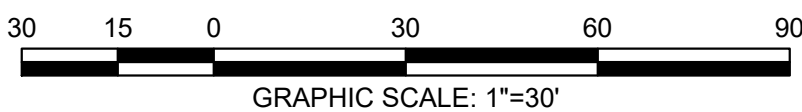
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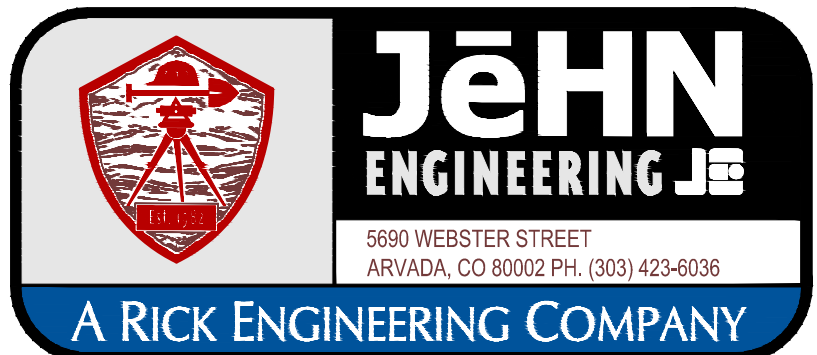
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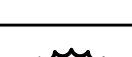
KEYMAP

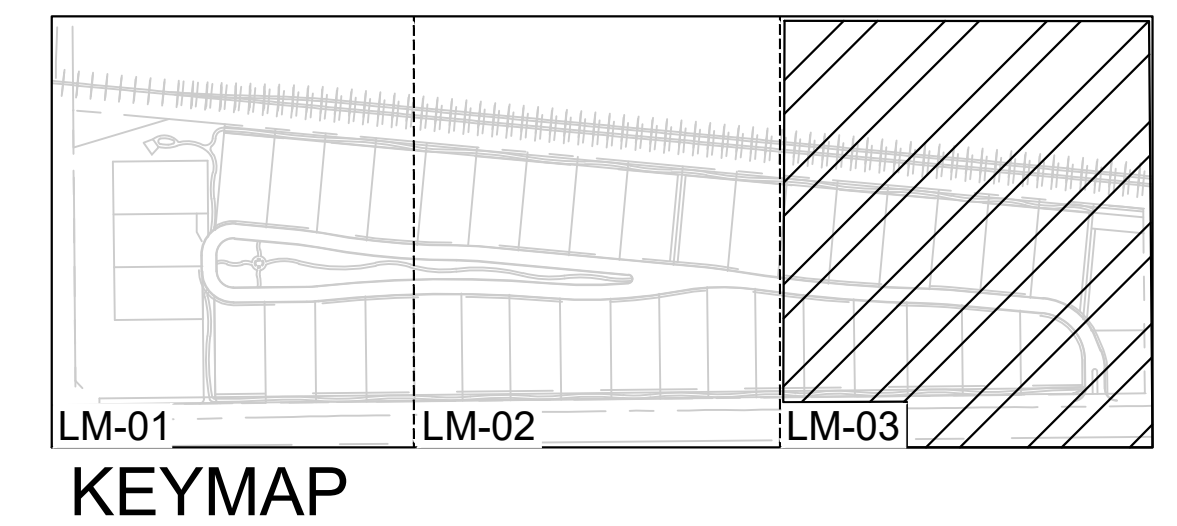
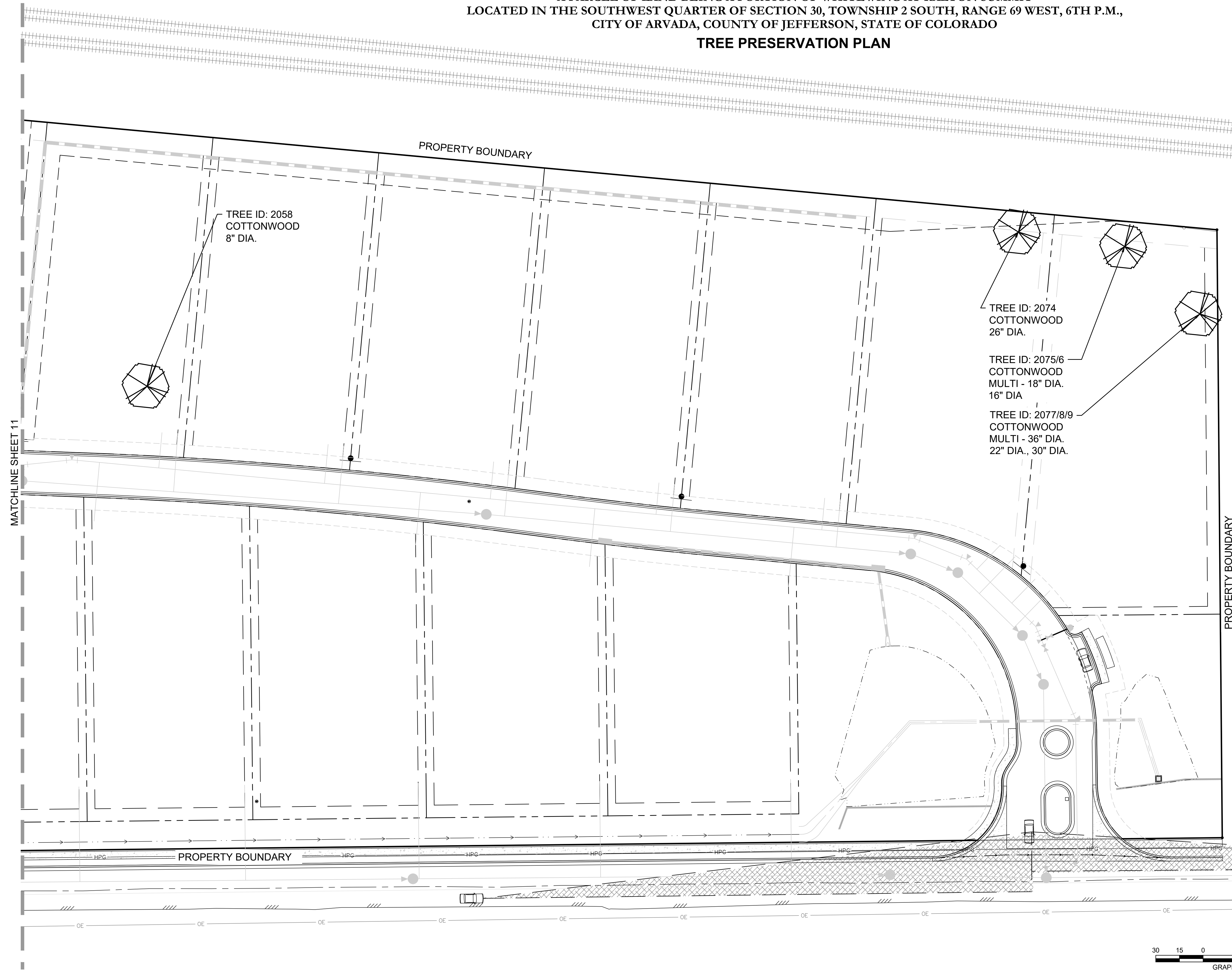


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PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
TREE PRESERVATION PLAN

EXISTING TREE LEGEND	
	TO BE REMOVED
	TO PROTECT IN PLACE



WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M., CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO

TREE PRESERVATION DETAILS

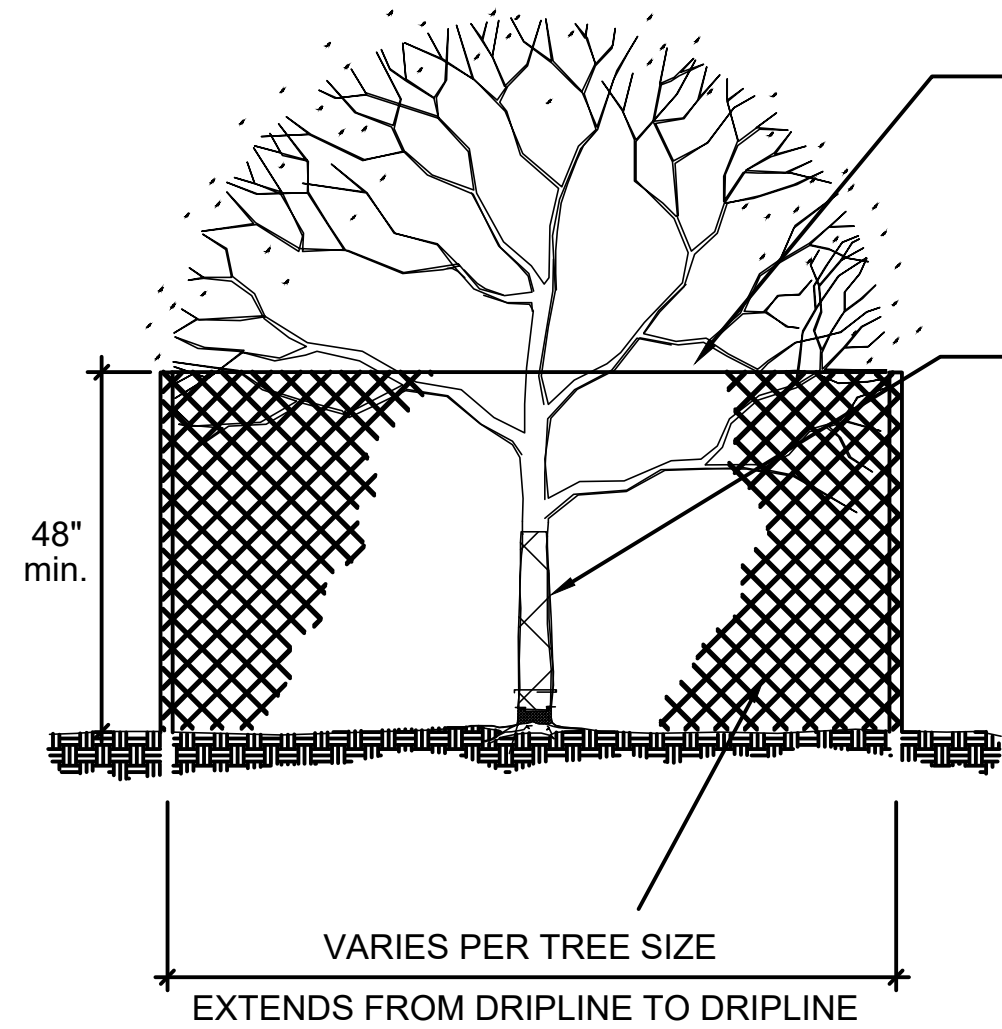
Tree ID #	Name	Total DBH (Inches)	Condition	Species Value	Condition Rating	Calculated Mitigation Inches
2000	Populus sargentii - Plains Cottonwood	40	Good	45%	40%	7
2001	Populus sargentii - Plains Cottonwood	50	Good	45%	40%	9
2002	Populus sargentii - Plains Cottonwood	26	Good	45%	40%	5
2003	Populus sargentii - Plains Cottonwood	24	Good	45%	40%	4
2004	Populus sargentii - Plains Cottonwood	24	Good	45%	40%	4
2005	Populus sargentii - Plains Cottonwood	26	Good	45%	40%	5
2006	Populus sargentii - Plains Cottonwood	22	Good	45%	40%	4
2007	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2008	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2009	Populus sargentii - Plains Cottonwood	12	Good	45%	40%	2
2010	Populus sargentii - Plains Cottonwood	12	Good	45%	40%	2
2011	Populus sargentii - Plains Cottonwood	4	Good	45%	40%	1
2012	Populus sargentii - Plains Cottonwood	6	Good	45%	40%	1
2013	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2014	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2015	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2016	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2017	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2018	Populus sargentii - Plains Cottonwood	16	Good	45%	40%	3
2019	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2020	Populus sargentii - Plains Cottonwood	16	Good	45%	40%	3
2021	Populus sargentii - Plains Cottonwood	24	Good	45%	40%	4
2022	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2023	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2024	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2025	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2026	Populus sargentii - Plains Cottonwood	12	Good	45%	40%	2
2027	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2028	Populus sargentii - Plains Cottonwood	12	Good	45%	40%	2
2029	Populus sargentii - Plains Cottonwood	16	Good	45%	40%	3
2030	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2031	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2032	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2033	Populus sargentii - Plains Cottonwood	16	Good	45%	40%	3
2034	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2035	Populus sargentii - Plains Cottonwood (Multi)	8	Good	45%	40%	1
2036	Populus sargentii - Plains Cottonwood	6	Good	45%	40%	1
2037	Populus sargentii - Plains Cottonwood	8	Good	45%	40%	1
2038	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2039	Populus sargentii - Plains Cottonwood	4	Good	45%	40%	1
2040	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2041	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2042	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2045	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2046	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2047	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2048	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2049	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2050	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2051	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2052	Populus sargentii - Plains Cottonwood	8	Good	45%	40%	1
2053	Populus sargentii - Plains Cottonwood	30	Good	45%	40%	6
2054	Populus sargentii - Plains Cottonwood	24	Good	45%	40%	4
2055	Populus sargentii - Plains Cottonwood	12	Good	45%	40%	2
2056	Populus sargentii - Plains Cottonwood	24	Good	45%	40%	4
2057	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2058	Populus sargentii - Plains Cottonwood	8	Good	45%	40%	1
2061	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2062	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2063	Populus sargentii - Plains Cottonwood	12	Good	45%	40%	2
2064	Populus sargentii - Plains Cottonwood	14	Good	45%	40%	3
2065	Populus sargentii - Plains Cottonwood	18	Good	45%	40%	3
2066	Populus sargentii - Plains Cottonwood	20	Good	45%	40%	4
2067	Populus sargentii - Plains Cottonwood	8	Good	45%	40%	1
2068	Populus sargentii - Plains Cottonwood	8	Good	45%	40%	1
2069	Populus sargentii - Plains Cottonwood	10	Good	45%	40%	2
2070	Populus sargentii - Plains Cottonwood	16	Good	45%	40%	3

2071	Populus sargentii - Plains Cottonwood	8	Good	45%	40%	1
2072	Populus sargentii - Plains Cottonwood	8	Good	45%	40%	1
2073	Populus sargentii - Plains Cottonwood	6	Good	45%	40%	1
2074	Populus sargentii - Plains Cottonwood	26	Poor	45%	20%	2
2075	Populus sargentii - Plains Cottonwood	18	Poor	45%	20%	2
2076	Populus sargentii - Plains Cottonwood	16	Poor	45%	20%	3
2077	Populus sargentii - Plains Cottonwood	36	Poor	45%	20%	3
2078	Populus sargentii - Plains Cottonwood	22	Poor	45%	20%	2
2079	Populus sargentii - Plains Cottonwood	30	Poor	45%	20%	3
TOTAL		1252"				217"

EXISTING TREE MITIGATION				
TOTAL DBH (INCHES)	TOTAL CALCULATED MITIGATION INCHES	TOTAL CALCULATED MITIGATION INCHES PROTECTED IN PLACE	TOTAL CALCULATED MITIGATION INCHES TO BE REMOVED	TOTAL NUMBER OF REPLACEMENT TREES @ 2" CAL.
1252"	217"	16"	201"	101

TREE MITIGATION NOTES:

- PRIOR TO THE PRECONSTRUCTION MEETING, LAYOUT THE LIMITS OF THE TREE PROTECTION AREA AND THEN ALIGNMENTS OF REQUIRED TREE PROTECTION FENCING AND ROOT PRUNING. OBTAIN OWNER'S REPRESENTATIVE'S APPROVAL OF THE LIMITS OF THE PROTECTION AREA AND ALIGNMENT OF ALL FENCING AND ROOT PRUNING.
- PRIOR TO ANY CONSTRUCTION ACTIVITY AT THE SITE INCLUDING UTILITY WORK, GRADING, STORAGE OF MATERIALS OR INSTALLATION OF TEMPORARY CONSTRUCTION FACILITIES, INSTALL ALL TREE PROTECTION FENCING.
- PROTECT THE TREE PROTECTION AREA AT ALL TIMES FROM COMPACTION OF THE SOIL; DAMAGE OF ANY KIND TO TRUNKS, BARK, BRANCHES, LEAVES WITH CONSTRUCTION MATERIAL, DEBRIS, SILT, FUELS, OILS AND ANY CHEMICAL SUBSTANCE.
- PROVIDE A SIGNIFICANT WATER SUPPLY DELIVERABLE TO EXISTING TREES FROM THE FIRST DAY OF CONSTRUCTION TO THE COMPLETION THAT INCLUDES A NEW IRRIGATION SYSTEM. (ACTUAL WATERING SCHEDULE AND AMOUNT WILL COMPLY WITH FORESTER/ARBORIST RECOMMENDATIONS.)
- FENCE AROUND DRIP LINE OF DECIDUOUS TREES AND FENCE AROUND ONE AND ONE-HALF (1.5) TIMES THE SQUARE FOOTAGE OF DRIP LINES FOR EVERGREENS.
- SPRAY TREES WITH PESTICIDES BEFORE CONSTRUCTION STARTS AND BEFORE EACH GROWING SEASON DURING CONSTRUCTION.
- AVOID TRENCHING THROUGH ROOT ZONES WITHIN DRIP LINES BY BORING OR PUSHING UTILITIES UNDER ROOTS.
- ROOT PRUNE DAMAGED ROOTS WITHIN ONE (1) HOUR AFTER DAMAGE OCCURS.
- THE MAXIMUM AREA OF CUTS AND FILLS WITHIN THE FENCED ROOT ZONE SHALL NOT EXCEED 25% OF SUCH ZONE.
- AVOID PLACING FILL AGAINST TREE TRUNKS (USING RETAINING WALLS, ETC.)
- AVOID CONSTRUCTION ACTIVITY (MATERIALS, STORAGE, VEHICULAR TRAFFIC, CHEMICAL DISPOSAL, FIRES, CUT, FILL, ETC.) WITHIN THE FENCED ROOT ZONE.
- NOTIFY THE OWNER'S REPRESENTATIVE OF ANY SPILLS, COMPACTION OR DAMAGE AND TAKE CORRECTIVE ACTION IMMEDIATELY USING METHODS APPROVED BY OWNER'S REPRESENTATIVE.
- THE CONTRACTOR SHALL NOT ENGAGE IN ANY CONSTRUCTION ACTIVITY WITHIN THE TREE PROTECTION AREA WITHOUT APPROVAL OF THE OWNER'S REPRESENTATIVE INCLUDING: OPERATING, MOVING OR STORING EQUIPMENT, STORING SUPPLIES OR MATERIALS; LOCATING TEMPORARY FACILITIES INCLUDING TRAILERS OR PORTABLE TOILETS AND SHALL NOT PERMIT EMPLOYEES TO TRAVERSE THE AREA TO ACCESS ADJACENT AREAS OF THE PROJECT OR USE THE AREA FOR LUNCH OR ANY OTHER WORK BREAKS.
- IN THE EVENT THAT CONSTRUCTION ACTIVITY IS UNAVOIDABLE WITHIN THE TREE PROTECTION AREA, NOTIFY THE OWNER'S REPRESENTATIVE AND SUBMIT A DETAILED WRITTEN PLAN OF ACTION FOR APPROVAL.
- TREE REMOVALS SHALL BE PERFORMED BY A CERTIFIED ARBORIST AND COMPANIES SHALL HAVE APPROPRIATE LICENSES AND INSURANCE FOR TREE REMOVAL OPERATIONS.
- REMOVE ALL TREES INDICATED BY THE DRAWINGS AND SPECIFICATIONS, AS REQUIRING REMOVAL, IN A MANNER THAT WILL NOT DAMAGE ADJACENT TREES OR STRUCTURES OR COMPACT THE SOIL.
- REMOVE TREES THAT ARE ADJACENT TO TREES OR STRUCTURES TO REMAIN, IN SECTIONS, TO LIMIT THE OPPORTUNITY OF DAMAGE TO ADJACENT CROWNS, TRUNKS, GROUND PLANE AND STRUCTURES.
- DO NOT DROP TREES WITH A SINGLE CUT UNLESS THE TREE WILL FALL IN AN AREA NOT INCLUDED IN THE TREE PROTECTION AREA AND THERE ARE NO UNDERGROUND UTILITIES THAT MAY BE DAMAGED. NO TREE TO BE REMOVED WITHIN 50 FEET OF THE TREE PROTECTION AREA SHALL BE PUSHED OVER OR UP-ROOTED USING A PIECE OF GRADING EQUIPMENT.
- PROTECT ADJACENT PAVING, SOIL, TREE, SHRUBS, GROUND COVER PLANTINGS AND UNDERSTORY PLANTINGS TO REMAIN FROM DAMAGE DURING ALL TREE REMOVAL OPERATIONS, AND FROM CONSTRUCTION OPERATIONS. PROTECTION SHALL INCLUDE ROOT SYSTEM, TRUNK, LIMBS, AND CROWN FROM BREAKAGE OR SCARRING, AND FROM THE SOIL COMPACTION.



**ZONE 1
ROOT PROTECTION**
Any digging, excavating, trenching, changing of grade, or other actions that may potentially impact the rooting environment must be authorized by the City Forester prior to work commencement. Work within the CRZ must take place in accordance with the conditions established by the City Forester.

TREE PROTECTION DETAIL

SCALE: NTS

TREE PROTECTION AREA

The area inside a perimeter established at the Critical Root Zone (CRZ). The (CRZ) is equal to the dripline (furthest extent of the tree canopy) or is equal to one foot radially from the tree for every one inch of trunk diameter at breast height (DBH), whichever is greater.

ZONE 2 LOWER CANOPY PROTECTION.

Contact the City Forester if any pruning is needed prior to work if potential for damage exist.

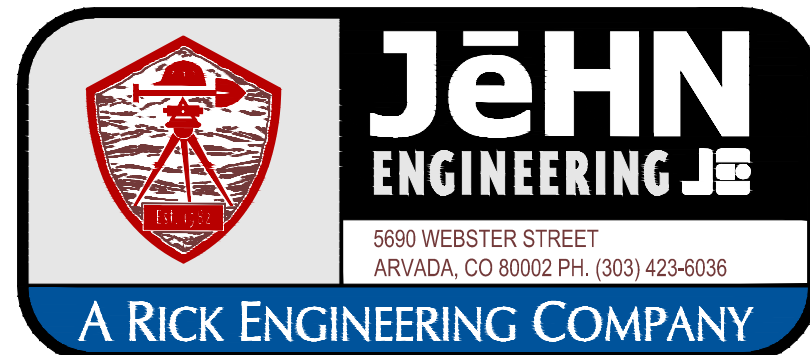
ZONE 3 TRUNK PROTECTION

Required if construction equipment involved within ten feet or less (permitted inside the CRZ only if equipment is operated exclusively on existing hardscape and no soil compaction takes place).

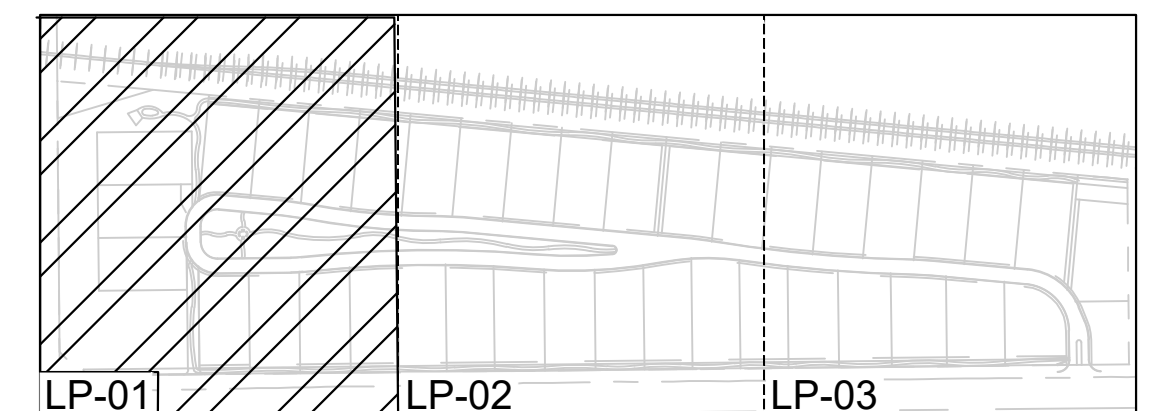
NOTES:

- Fencing Height must be at least 48" high.
- Attach "Tree Protection Area" Signs to Fencing every 50 feet.
- The Tree Protection Area shall NOT be modified or removed prior to consent of the City Forester.
- Materials, debris, equipment, and site amenities shall NOT be stored within the Tree Protection Area.
- Entrance to the Tree Protection Area is NOT permitted without consent of the owner's representative.

DATE: 08/01/2021
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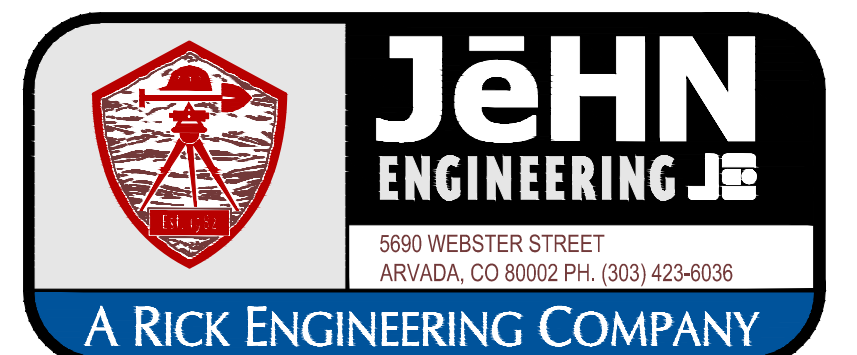


PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO
LANDSCAPE PLAN



*LANDSCAPING SHOWN ON LOTS IS ILLUSTRATIVE ONLY, SEE SHEET 17 FOR MORE INFORMATION.

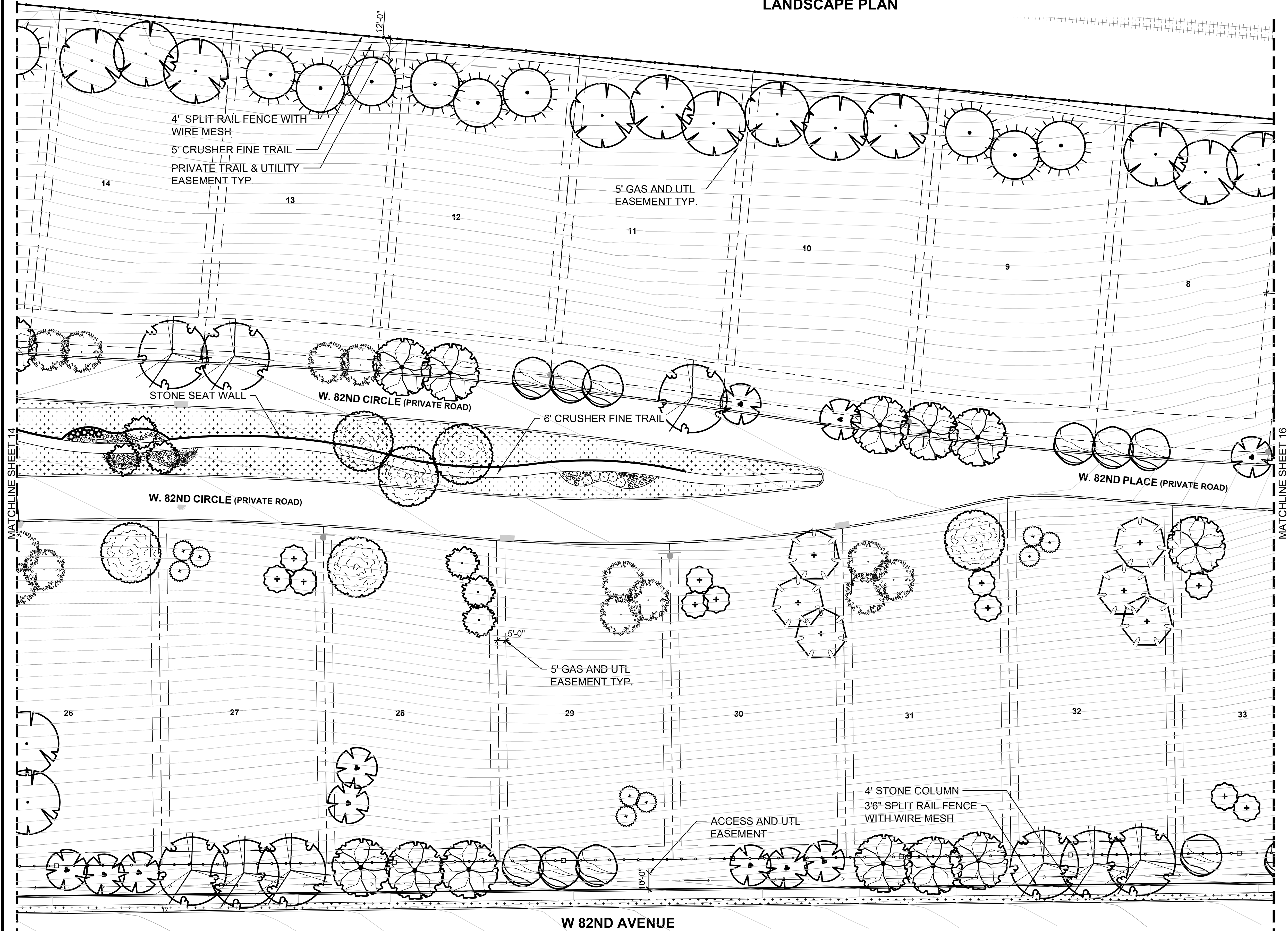
DATE: 08/01/2021
SHEET 16 OF 20



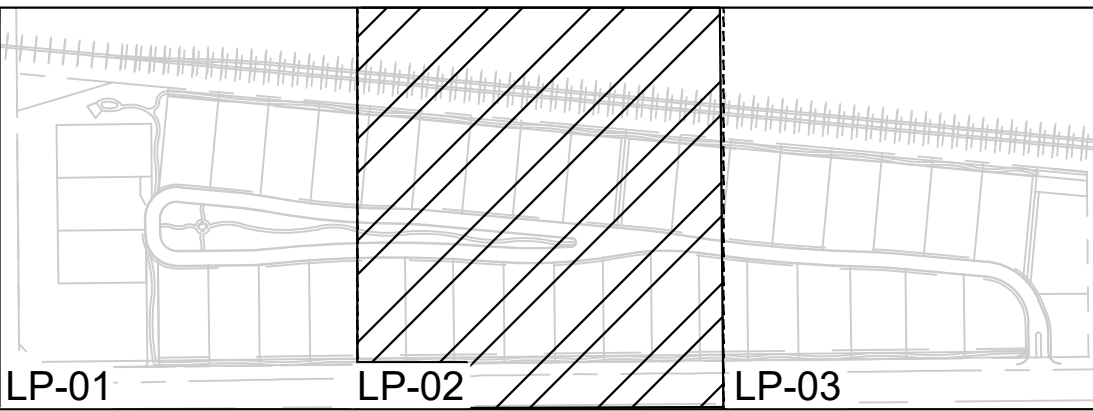
WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN
A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT
LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M.,
CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO

LANDSCAPE PLAN



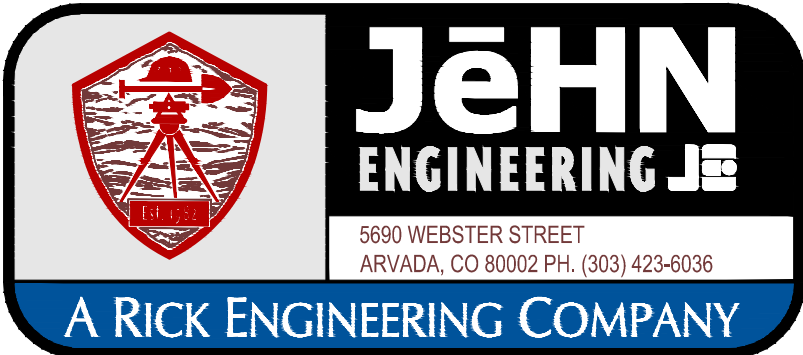
PLANT LEGEND			
SYM	ABBV	BOTANICAL NAME	COMMON NAME
DECIDUOUS TREES			
	ACFR	ACER X FREMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE
	GLSH	GLEDITSIA TRIACANTHOS INERMIS 'SHADEMASTER'	SHADEMASTER HONEY LOCUST
	GLTR	GLEDITSIA TRIACANTHOS INERMIS 'SUNBURST'	SUNBURST HONEYLOCUST
	KOPA	KOELREUTERIA PANICULATA	GOLDENRAIN TREE
	TICO	TILIA CORTADA 'GREENSPIRE'	GREENSPIRE LINDEN
	QUMA	QUERCUS MACROCARPA	BUR OAK
ORNAMENTAL TREES			
	ACAM	ACER GINNALA 'FLAME'	AMUR MAPLE
	CRCR	CRATAEGUS CRUS-GALLI INERMUS	THORNLESS COCKSPUR HAWTHORN
	PRPA	PRUNUS PADUS	MAYDAY TREE
	PYCA	PYRUS CALLERYANA 'ARISTOCRAT'	ARISTOCRAT PEAR
	PYUS	PYRUS USSURIENSIS	USSURIAN PEAR
EVERGREEN TREES			
	JUSC	JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER
	PIPU	PICEA PUNGENS	COLORADO SPRUCE
	PINI	PINUS PONDEROSA	PONDEROSA PINE
DECIDUOUS SHRUBS			
	AMCA	AMORPHA CANESCENS	LEADPLANT
	COSF	CORNUS SERICEA FLAVIRAMEA	YELLOW TWIG DOGWOOD
	DABU	DAPHNE X BURKWOODII 'CAROL MACKIE'	CAROL MACKIE DAPHNE
	GETI	GENISTA TINCTORIA 'ROYAL GOLD'	ROYAL GOLD WOODWAXEN
	PRBE	PRUNUS BESSEYI 'PAWNEE BUTTES'	WESTERN SAND CHERRY
	RIAL	RIBES ALPINUM	ALPINE CURRANT
	SYPA	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC
	WEFR	WEIGELA FLORIDA 'RED PRINCE'	RED PRINCE WEIGELA
EVERGREEN SHRUBS			
	ARCO	ARCTOSTAPHYLOS X COLORADENSIS	COLORADO MANZANITA
	JUPR	JUNIPERUS PROCUMBENS 'GREEN MOUND'	GREEN MOUND JUNIPER
	PIGL	PICEA PUNGENS 'GLAUCOA GLOBOSA'	BLUE GLOBE SPRUCE
	PIMU	PINUS MUGO PUMILIO	DWARF MUGO PINE
ORNAMENTAL GRASSES			
	HESE	HELIOTRICHON SEMPERVIRENS	BLUE AVENA GRASS
	PEAL	PENNISETUM ALOPECUROIDES 'LITTLE BUNNY'	LITTLE BUNNY GRASS
	RHNE	RHYNCHELYTRUM NERVIOLUM	RUBY GRASS
PERENNIALS			
	SOSF	SOLIDAGO SPHACELATA 'GOLDEN FLEECE'	GOLDENROD
GROUND COVERS			
	TURF		
	LOW GROW NATIVE SEED MIX		ARKANSAS VALLEY SEED CO.
	DETENTION POND MIX		ARKANSAS VALLEY SEED CO.
	ROCK MULCH (SHRUB BEDS)		1 1/2" WESTERN RIVER ROCK



KEYMAP

*LANDSCAPING SHOWN ON LOTS IS ILLUSTRATIVE ONLY. SEE SHEET 17 FOR MORE INFORMATION.

DATE: 08/01/2021
SHEET 17 OF 20

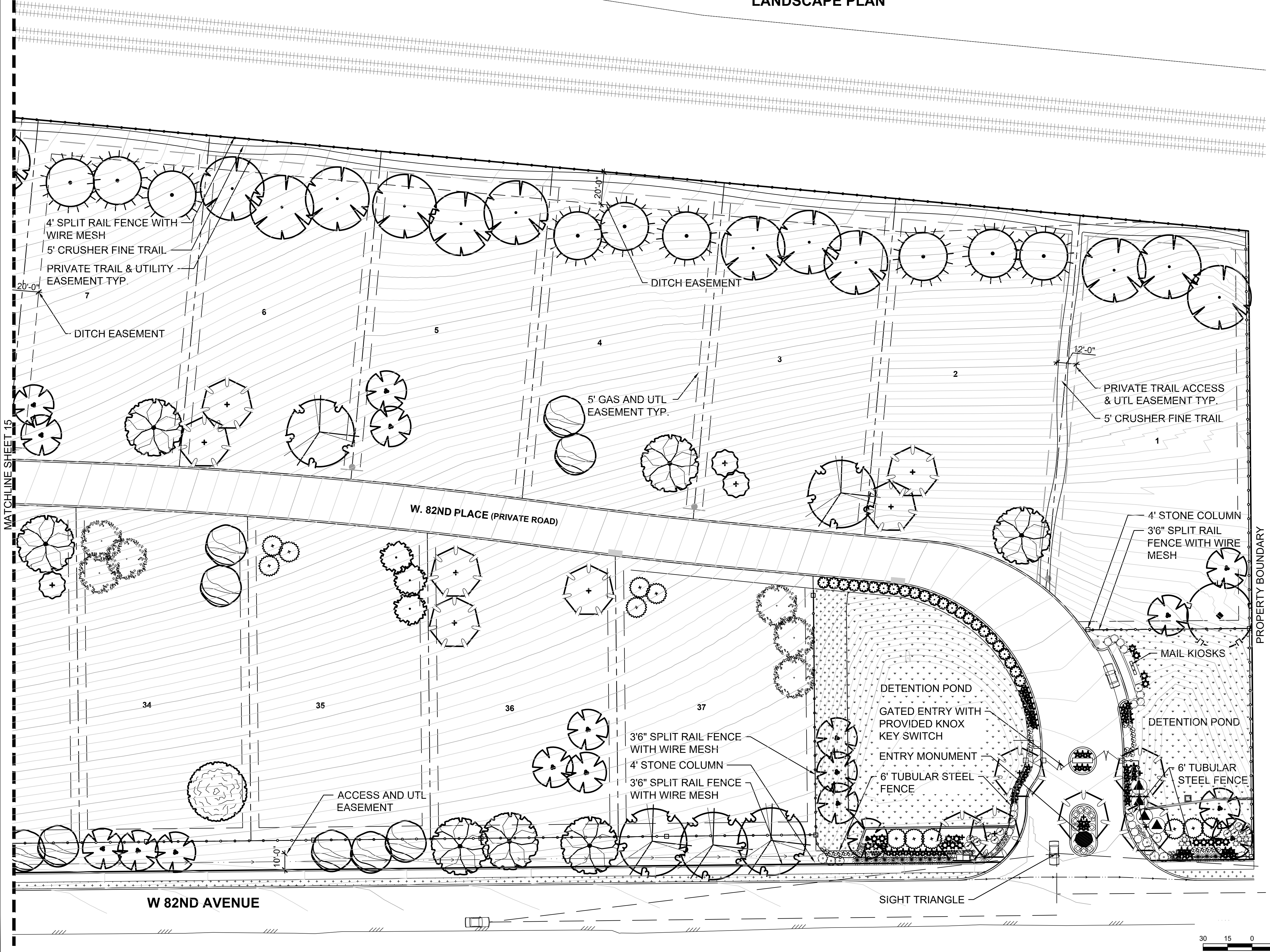


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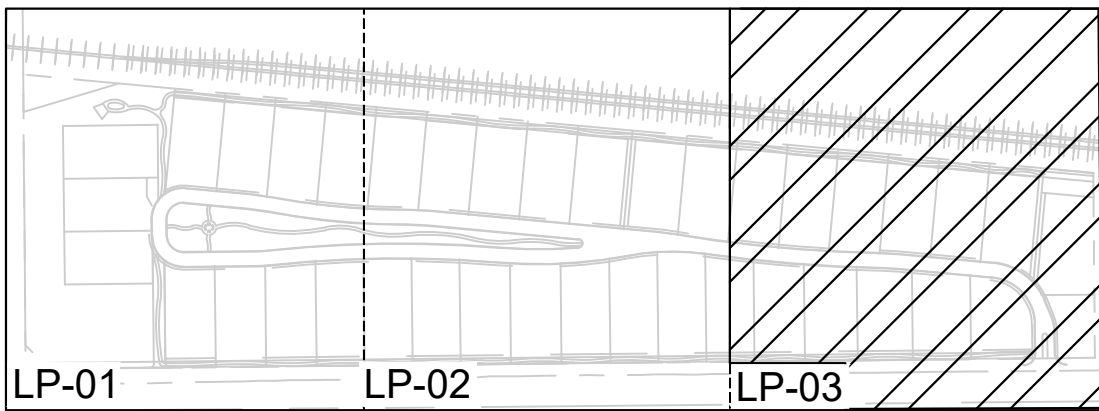
GRAPHIC SCALE: 1"=30'

WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M., CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO LANDSCAPE PLAN



PLANT LEGEND			
SYM	ABBV	BOTANICAL NAME	COMMON NAME
DECIDUOUS TREES			
	ACFR	ACER X FREMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE
	GLSH	GLEDITSIA TRIACANTHOS INERMIS 'SHADEMASTER'	SHADEMASTER HONEY LOCUST
	GLTR	GLEDITSIA TRIACANTHOS INERMIS 'SUNBURST'	SUNBURST HONEYLOCUST
	KOPA	KOELREUTERIA PANICULATA	GOLDENRAIN TREE
	TICO	TILIA CORTADA 'GREENSPIRE'	GREENSPIRE LINDEN
	QUMA	QUERCUS MACROCARPA	BUR OAK
ORNAMENTAL TREES			
	ACAM	ACER GINNALA 'FLAME'	AMUR MAPLE
	CRCR	CRATAEGUS CRUS-GALLI INERMIS	THORNLESS COCKSPUR HAWTHORN
	PRPA	PRUNUS PADUS	MAYDAY TREE
	PYCA	PYRUS CALLERYANA 'ARISTOCRAT'	ARISTOCRAT PEAR
	PYUS	PYRUS USSURIENSIS	USSURIAN PEAR
EVERGREEN TREES			
	JUSC	JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER
	PIPU	PICEA PUNGENS	COLORADO SPRUCE
	PINI	PINUS PONDEROSA	PONDEROSA PINE
DECIDUOUS SHRUBS			
	AMCA	AMORPHA CANESCENS	LEADPLANT
	COSF	CORNUS SERICEA FLAVIRAMEA	YELLOW TWIG DOGWOOD
	DABU	DAPHNE X BURKWOODII 'CAROL MACKIE'	CAROL MACKIE DAPHNE
	GETI	GENISTA TINCTORIA 'ROYAL GOLD'	ROYAL GOLD WOODWAXEN
	PRBE	PRUNUS BESSEYI 'PAWNEE BUTTES'	WESTERN SAND CHERRY
	RIAL	RIBES ALPINUM	ALPINE CURRANT
	SYPA	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC
	WEFR	WEIGELA FLORIDA 'RED PRINCE'	RED PRINCE WEIGELA
EVERGREEN SHRUBS			
	ARCO	ARCTOSTAPHYLOS X COLORADENSIS	COLORADO MANZANITA
	JUPR	JUNIPERUS PROCUMBENS 'GREEN MOUND'	GREEN MOUND JUNIPER
	PIGL	PICEA PUNGENS 'GLAUCA GLOBOSA'	BLUE GLOBE SPRUCE
	PIMU	PINUS MUGO PUMILIO	DWARF MUGO PINE
ORNAMENTAL GRASSES			
	HESE	HELICTOTRICHON SEMPERVIRENS	BLUE AVENA GRASS
	PEAL	PENNISETUM ALOPECUROIDES 'LITTLE BUNNY'	LITTLE BUNNY GRASS
	RHNE	RHYNCHELYTRUM NERVIGLUME	RUBY GRASS
PERENNIALS			
	SOSP	SOLIDAGO SPHACELATA 'GOLDEN FLEECE'	GOLDENROD
GROUND COVERS			
		TURF	
		LOW GROW NATIVE SEED MIX	ARKANSAS VALLEY SEED CO.
		DETENTION POND MIX	ARKANSAS VALLEY SEED CO.
		ROCK MULCH (SHRUB BEDS)	1 1/2" WESTERN RIVER ROCK



KEYMAP

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DATE: 08/01/2021
SHEET 18 OF 20



WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALTON SUMMIT LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M., CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO

LANDSCAPE DETAILS

PLANT LEGEND					
SYM	ABBV	QTY	BOTANICAL NAME	COMMON NAME	SIZE
DECIDUOUS TREES					
	ACFR	3	ACER X FREMANII 'AUTUMN BLAZE'	AUTUMN BLAZE MAPLE	2"
	GLSH	18	GLEDITSIA TRIACANTHOS INERMIS 'SHADEMASTER'	SHADEMASTER HONEY LOCUST	2"
	GLTR	32	GLEDITSIA TRIACANTHOS INERMIS 'SUNBURST'	SUNBURST HONEYLOCUST	2"
	KOPA	8	KOELREUTERIA PANICULATA	GOLDENRAIN TREE	2"
	TICO	13	TILIA CORTADA 'GREENSPIRE'	GREENSPIRE LINDEN	2"
	QUMA	5	QUERCUS MACROCARPA	BUR OAK	2"
TOTAL DECIDUOUS TREES: 79					
ORNAMENTAL TREES					
	ACAM	6	ACER GINNALA 'FLAME'	AMUR MAPLE	1 1/2"
	CRCR	6	CRATAEGUS CRUS-GALLI INERMUS	THORNLESS COCKSPUR HAWTHORN	1 1/2"
	PRPA	6	PRUNUS PADUS	MAYDAY TREE	1 1/2"
	PYCA	5	PYRUS CALLERYANA 'ARISTOCRAT'	ARISTOCRAT PEAR	1 1/2"
	PYUS	12	PYRUS USSURIENSIS	USSURIAN PEAR	1 1/2"
TOTAL ORNAMENTAL TREES: 35					
EVERGREEN TREES					
	JUSC	22	JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER	6' H
	PIPU	3	PICEA PUNGENS 'GLAUCA'	COLORADO BLUE SPRUCE	6' H
	PINI	3	PINUS PONDEROSA	PONDEROSA PINE	6' H
TOTAL EVERGREEN TREES: 28					
DECIDUOUS SHRUBS					
	AMCA	108	AMORPHA CANESCENS	LEADPLANT	5 GAL.
	COSF	23	CORNUS SERICEA FLAVIRAMEA	YELLOW TWIG DOGWOOD	5 GAL.
	DABU	39	DAPHNE X BURKWOODII 'CAROL MACKIE'	CAROL MACKIE DAPHNE	5 GAL.
	GETI	135	GENISTA TINCTORIA 'ROYAL GOLD'	ROYAL GOLD WOADWAXEN	5 GAL.
	PRBE	56	PRUNUS BESSEYI 'PAWNEE BUTTES'	WESTERN SAND CHERRY	5 GAL.
	RIAL	51	RIBES ALPINUM	ALPINE CURRANT	5 GAL.
	SYPA	24	SYRINGA PATULA 'MISS KIM'	MISS KIM LILAC	5 GAL.
	WEFR	42	WEIGELA FLORIDA 'RED PRINCE'	RED PRINCE WEIGELA	5 GAL.
TOTAL DECIDUOUS SHRUBS: 478					
EVERGREEN SHRUBS					
	ARCO	58	ARCTOSTAPHYLOS X COLORADENSIS	COLORADO MANZANITA	5 GAL.
	JUPR	65	JUNIPERUS PROCUMBENS 'GREEN MOUND'	GREEN MOUND JUNIPER	5 GAL.
	PIGL	62	PICEA PUNGENS 'GLAUCA GLOBOSA'	BLUE GLOBE SPRUCE	5 GAL.
	PIMU	4	PINUS MUGO PUMILIO	DWARF MUGO PINE	5 GAL.
TOTAL EVERGREEN SHRUBS: 189					
ORNAMENTAL GRASSES					
	HESE	200	HELICTOTRICHON SEMPERVIRENS	BLUE AVENA GRASS	1 GAL.
	PEAL	38	PENNISETUM ALOPECUROIDES 'LITTLE BUNY'	LITTLE BUNNY GRASS	1 GAL.
	RHNE	129	RHYNCHELYTRUM NERVIGLUME	RUBY GRASS	1 GAL.
TOTAL ORNAMENTAL GRASSES: 367					
PERENNIALS					
	SOSP	32	SOLIDAGO SPHACELATA 'GOLDEN FLEECE'	DWARF GOLDENROD	1 GAL.
TOTAL PERENNIALS: 32					
GROUNDCOVERS					
		7,420 SF	TURF		
		82,150 SF	LOW GROW NATIVE SEED MIX	ARKANSAS VALLEY SEED CO.	
		53,950 SF	DETENTION POND MIX	ARKANSAS VALLEY SEED CO.	
		20,415 SF	ROCK MULCH (SHRUB BEDS)	1 1/2" WESTERN RIVER ROCK (COLORADO MATERIALS OR APPROVED EQUAL)	

LANDSCAPE TABLES

INTERIOR STREET FRONTAGE				
TREES REQUIRED (1 PER 40 LF)	TREES PROVIDED ON STREET FRONTAGE	TREES REQUIRED PER INDIVIDUAL LOTS	TOTAL TREES PROVIDED ON INDIVIDUAL LOTS	TOTAL TREES PROVIDED
93	0	3	111	111

*ALL TREES MUST BE PLANTED IN FRONT OF PROPERTIES. SEE TYPICAL LOT LAYOUT FOR PLACEMENT.

EXTERIOR STREET FRONTAGE					
	TREES REQUIRED (1 PER 40 LF)	TREES PROVIDED ON STREET FRONTAGE	TREES REQUIRED PER INDIVIDUAL LOTS	TOTAL TREES PROVIDED ON INDIVIDUAL LOTS	TOTAL TREES PROVIDED
INDIANA STREET (564 LF)	14	14	0	0	14
82ND AVENUE (2,111 LF)	53	5	3	48	53

*ALL TREES MUST BE PLANTED IN REAR OF SOUTHERN PROPERTIES ALONG 82ND AVENUE. SEE LANDSCAPE PLANS.

OPEN SPACE TABLE (50% OF TOTAL PARCEL)*									
TREES REQUIRED (1 PER 3,000 SF)	TREES PROVIDED	TREES REQUIRED PER INDIVIDUAL LOTS	TOTAL TREES PROVIDED ON LOTS	TOTAL TREES PROVIDED	SHRUBS REQUIRED (1 PER 600 SF)	SHRUBS PROVIDED	SHRUBS REQUIRED PER INDIVIDUAL LOTS	TOTAL SHRUBS ON INDIVIDUAL LOTS	TOTAL SHRUBS
186	75**	3	111**	186	926	667	7	259	926

*TREE QUANTITY REQUIREMENTS ARE BASED ON REQUIREMENT FOR 50% OF PARCEL (50% OF 25.5 AC = 12.75 AC). THIS IS NOT THE ACTUAL AMOUNT OF OPEN SPACE SHOWN ON PLANS.

**BALANCE OF TREES AND SHRUBS TO MEET OPEN SPACE REQUIREMENTS WILL BE PROVIDED ON INDIVIDUAL LOTS. 3 TREES AND 4 SHRUBS PER LOT WILL BE REQUIRED OF HOMEOWNER TOWARDS OPEN SPACE REQUIREMENTS.

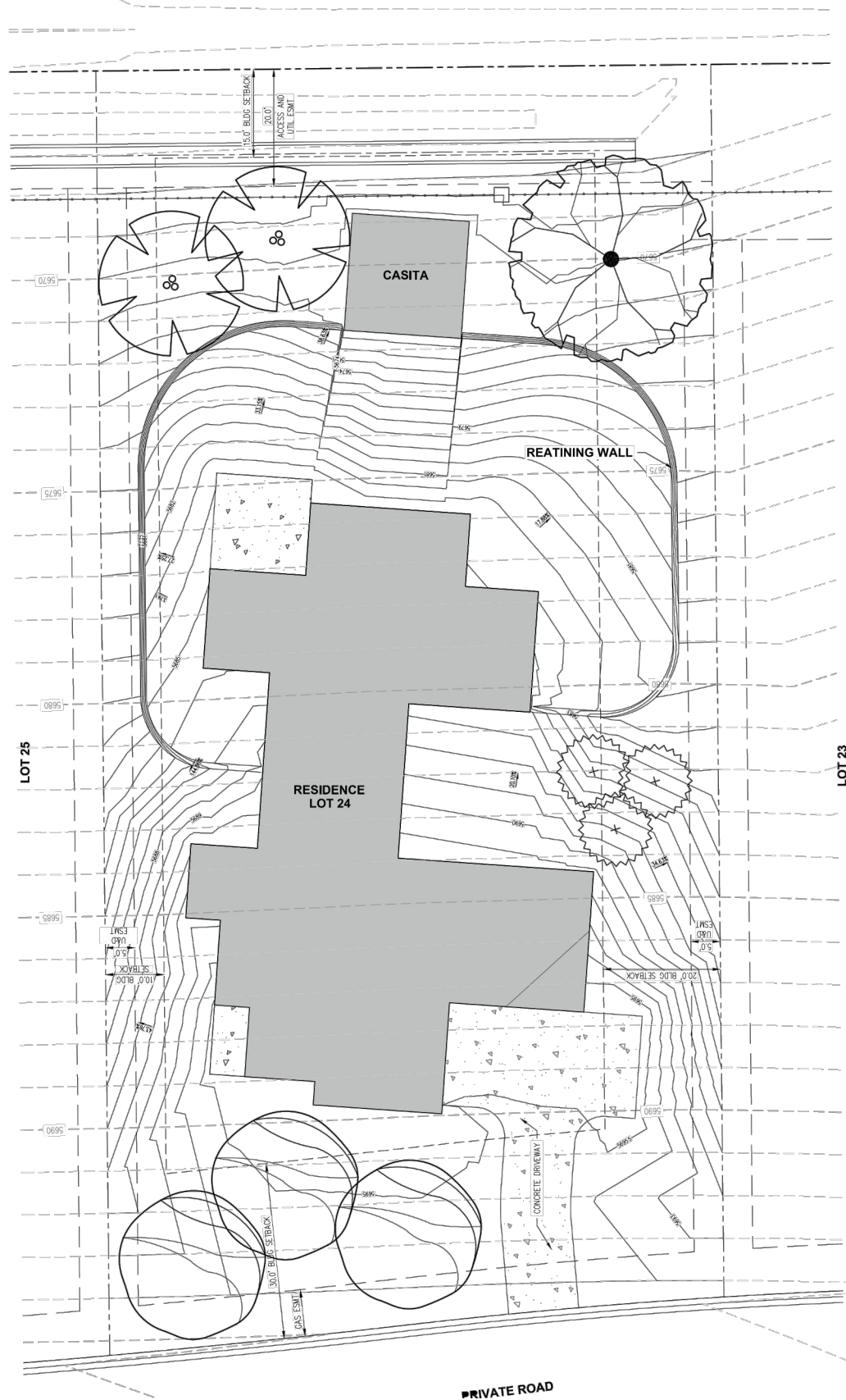
***10% OF OPEN SPACE TREES REQUIRED ON LOTS SHALL BE EVERGREEN.

EVERGREEN TREES REQUIRED			
TOTAL NUMBER OF TREES PROVIDED ON PLAN	10% OF TOTAL TREES TO BE EVERGREEN	TOTAL EVERGREEN TREES PROVIDED	TOTAL % OF EVERGREEN TREES PROVIDED
142	15	28	20%

GRAND TOTAL OF TREES ON SITE			
TOTAL REQUIRED TREES ON SITE	TOTAL TREES PROVIDED ON LOTS	TOTAL TREES PROVIDED IN COMMUNAL AREAS	TOTAL TREES PROVIDED ON SITE
346	270	94	364

EXISTING TREE MITIGATION			
TOTAL EXISTING DBH	TOTAL DBH TO BE PROTECTED IN PLACE	TOTAL CALCULATED MITIGATION INCHES	TOTAL NUMBER OF REPLACEMENT TREES @ 2" CAL.
1252"	16"	217"	101

*SEE TREE PRESERVATION PLAN FOR MITIGATION CALCULATIONS. MITIGATION TREES INCLUDED IN OPEN SPACE AND STREET FRONTAGE REQUIREMENTS.



TYPICAL LOT

NTS

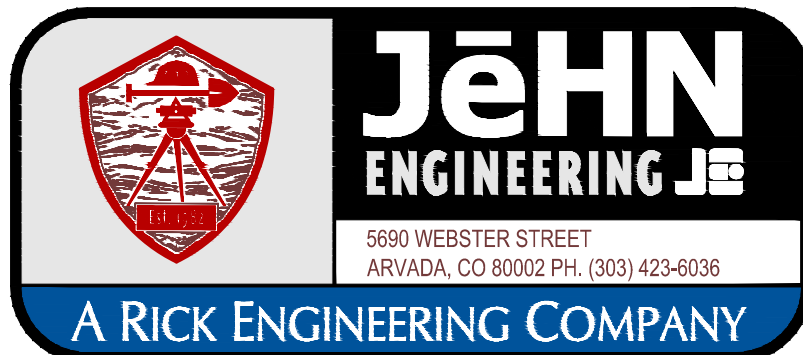
GENERAL LANDSCAPE NOTES

- IT IS THE CONTRACTORS RESPONSIBILITY TO INSPECT THE JOB SITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT COULD AFFECT THE INSTALLATION OF ANY WORK SET FORTH IN THESE PLANS OR SPECIFICATIONS PRIOR TO SUBMITTING A BID. BEFORE BEGINNING WORK, THE CONTRACTOR SHALL VERIFY THE ACCURACY OF THE PLANS TO THE SITE CONDITIONS AND SHALL REPORT ALL DISCREPANCIES TO THE OWNERS REPRESENTATIVE. WRITTEN DIMENSIONS AND GRADES PREVAIL OVER SCALED DIMENSIONS. NOTIFY OWNERS REPRESENTATIVE OF ANY DISCREPANCIES.
- IF ANY UTILITIES CONFLICT WITH THE ORIGINAL PLACEMENT OF INTENDED PLANT MATERIAL ON SITE, THE LANDSCAPE ARCHITECT WILL AID THE CONTRACTOR IN THE RELOCATION OR SHIFTING OF PLANT MATERIAL ON SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY TYPE AND LOCATION OF UTILITIES AS NECESSARY TO AVOID DAMAGE THERETO. ALL UTILITIES SHALL BE LOCATED AND VERIFIED PRIOR TO ANY EXCAVATION. THE LOCATIONS OF UTILITIES, STRUCTURES AND SERVICES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. ANY DISCREPANCIES BETWEEN THESE PLANS AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNERS REPRESENTATIVE IMMEDIATELY. PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL CONTACT 811 TO VERIFY LOCATIONS AND DEPTHS OF UNDERGROUND UTILITIES THAT MAY BE AFFECTED BY THIS WORK, AND SHALL BE RESPONSIBLE FOR DAMAGES TO SUCH UTILITIES CAUSED AS A RESULT OF THE WORK.
- THE CONTRACTOR SHALL COMPLY WITH ALL LAWS, RULES AND REGULATION OF ALL AUTHORITIES HAVING JURISDICTION OVER THE PREMISES. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR THIS WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST CONTROL DURING CONSTRUCTION AND SHALL ACQUIRE A DUST CONTROL PERMIT IF REQUIRED FROM THE COUNTY HEALTH DEPARTMENT. ALL COSTS ASSOCIATED WITH DUST CONTROL AND PERMITS IS CONSIDERED INCIDENTAL TO THE PROJECT.
- LANDSCAPE CONTRACTOR SHALL PROVIDE FINISH GRADING AND REMOVAL OF DEBRIS IN PLANTING AREAS TO INSURE POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES. ANY DISCREPANCIES IN ACTUAL FIELD MEASUREMENTS ARE TO BE REPORTED TO OWNERS REPRESENTATIVE.
- PRIOR TO PLANTING, ALL SITES FOR PLANTING SHALL INCORPORATE SOIL AMENDMENTS AT A RATE OF 3 CUBIC YARDS PER 1,000 SQUARE FEET TO A MINIMUM DEPTH OF 6". A LESSER AMOUNT SHALL BE ALLOWED IF A SOIL TEST SHOWS THAT 3 CUBIC YARDS PER 1,000 SQUARE FEET IS NOT NECESSARY FOR WATER RETENTION AND DEEP ROOTING OF PLANT MATERIALS. IF THE SPECIFIED PLANT MATERIALS REQUIRES LESS FERTILE SOIL, THOSE AREAS MAY HAVE LESS SOIL AMENDMENTS INSTALLED IF APPROVED BY THE COMMUNITY DEVELOPMENT DIRECTOR. THESE AREAS SHALL BE IDENTIFIED ON THE LANDSCAPE PLAN. EXISTING TOPSOIL SHALL BE SALVAGED AND STOCKPILED FOR USE AS SOIL AMENDMENTS OR TOPSOIL NO TOPSOIL SHALL BE REMOVED FROM THE SITE UNLESS THE CITY APPROVES THE TRANSFER OF TOPSOIL TO A CITY-OWNED PARK OR OPEN SPACE AREA.
- PRIOR TO PLANTING, THE CONTRACTOR SHALL PERFORM ONE (1) PERCOLATION TEST PER 10,000 SQUARE FEET OF PLANTING AREA. THE CONTRACTOR SHALL FILL A 24" BOX SIZE HOLE WITH WATER. IF IT DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS THE CONTRACTOR SHALL NOTIFY THE OWNERS REPRESENTATIVE. TEST SHALL BE DONE UNDER THE SUPERVISION OF THE OWNERS REPRESENTATIVE. IF PROPER DRAINAGE DOES NOT OCCUR WITHIN 24 HOURS CONTRACTOR WILL BE REQUIRED TO CHIMNEY GRAVEL SUMP PER OWNERS REPRESENTATIVE.
- PRIOR TO PLANTING THE IRRIGATION SYSTEM SHALL BE FULLY OPERATIONAL AND ALL PLANTING AREAS SHALL BE THOROUGHLY SOAKED.
- ALL PLANT MATERIALS SHALL CONFORM TO NURSERY STANDARDS ACCORDING TO AMERICAN ASSOCIATION OF NURSERYMEN INC. AND SHALL BE FREE FROM PESTS, EGGS, DISEASES AND TO BE REPRESENTATIVE OF SPECIES IN SIZE, QUALITY, FORM, COLOR AND NOT BE ROOT BOUND, DAMAGED OR SUBSTANDARD IN ANY WAY. FINAL LOCATION OF ALL PLANT MATERIAL SHALL BE APPROVED BY THE OWNERS REPRESENTATIVE PRIOR TO INSTALLATION. ANY PLANT SUBSTITUTIONS SHALL BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO PURCHASE. REMOVE NURSERY STAKES AND TIES FROM ALL CONTAINER STOCK.
- NO PLANT SUBSTITUTIONS, TYPE, OR QUANTITY DEVIATIONS FROM THE APPROVED LANDSCAPE OR IRRIGATION PLANS WITHOUT PRIOR APPROVAL FROM THE OWNERS REPRESENTATIVE AND CITY REPRESENTATIVES.
- THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND LEGAL DISPOSAL OF ANY DEBRIS RESULTING FROM THE CONSTRUCTION. AT NO TIME SHALL ANY OF THIS MATERIAL OBSTRUCT THE NORMAL OPERATION OF ANY ADJOINING STREET ASSOCIATED WITH THIS PROJECT.
- THE JOB SITE AT THE COMPLETION OF THE CONSTRUCTION SHALL BE CLEANED OF AN DEBRIS RESULTING FROM CONSTRUCTION. NO JOB SITE UTILITIES, CURBS, GUTTERS AND PAVEMENT HAVE BEEN SWEEPED CLEAN OF ALL DIRT AND DEBRIS AND ARE IN COMPLIANCE WITH THE AGENCY SPECIFICATIONS.
- THE CONTRACTOR IS ADVISED THAT DAMAGE TO ANY PORTION OF ANY EXISTING CURBS, GUTTERS, PAVEMENTS, FENCING, WALLS, LIGHTING AND SURROUNDING AREAS THAT ARE NOT NOTED ON THE PLANS TO BE DISTURBED ARE TO BE REPAIRED AT THE CONTRACTORS EXPENSE.
- ALL PLANTER BEDS TO BE MULCHED WITH 2-4" RIVER ROCK AT A 3" DEPTH OVER MIRAFI WEED BARRIER FABRIC (OR APPROVED EQUAL).
- PERMALOC GREEN INTERLOCKING METAL EDGER (OR APPROVED EQUAL) SHALL SEPARATE ALL PLANTER BEDS FROM GRASS AREAS. DRY RIVER BED SHALL BE SEPARATED FROM THE REST OF ROCK PLANTER BED WITH PERMALOC GREEN INTERLOCKING METAL EDGER.
- PRIOR TO PLANTING, ALL SITES FOR PLANTING SHALL INCORPORATE SOIL AMENDMENTS AT A RATE OF 3 CUBIC YARDS PER 1,000 SQUARE FEET AT A MINIMUM DEPTH OF 6". A LESSER AMOUNT SHALL BE ALLOWED IF A SOIL TEST SHOWS THAT 3 CUBIC YARDS PER 1,000 SQUARE FEET IS NOT NECESSARY FOR WATER RETENTION AND DEEP ROOTING OF PLANT MATERIALS.
- ALL LANDSCAPE TO BE IRRIGATED BY WATER EFFICIENT AUTOMATION IRRIGATION SYSTEM. SYSTEM TO BE A DESIGN BUILD SYSTEM. SYSTEM WILL INCLUDE:
 - A RAIN SENSOR WITH AUTOMATIC SHUT-OFF OF THE SYSTEM DURING PERIODS OF HIGH MOISTURE.
 - A DRIP, SUB-SURFACE, BUBBLER OR LOW VOLUME IRRIGATION SYSTEM FOR ALL PLANTINGS STRIPS LESS THAN 8' WIDE AND ALL PLANTING BEDS INVOLVING TREES, SHRUBS, PERENNIALS AND GROUND COVER.
 - AN IRRIGATION CLOCK WITH REMOTE CONTROL WHICH ALLOWS PROGRAMMING TO MEET THE DIFFERENTIAL NEEDS OF THE SPECIFIED PLANTING ON PLAN (RACHIO GEN 3 WITH FLOW SENSOR, RAINBIRD ESP WITH WIFI MODUL OR APPROVED EQUAL). LANDSCAPE MAINTENANCE: ALL PLANTS SHALL BE MAINTAINED CONTINUALLY IN A HEALTHY CONDITION IN A ACCORDANCE WITH GENERALLY ACCEPTED PROFESSIONAL HORTICULTURAL STANDARDS AND PRACTICES. PLANTS THAT DIE OR ARE UNHEALTHY SHALL BE REPLACED. REGULAR PRUNING TRIMMING SHALL APPLY TO MAINTAIN HEALTH AND AN ATTRACTIVE APPEARANCE AND TO PERMIT THE PLANT TO ACHIEVE THEIR INTENDED FORM AND HEIGHT. LANDSCAPE AREAS SHALL REMAIN FREE OF WEEDS, LITTER, JUNK, RUBBISH AND OTHER NUISANCES AND OBSTRUCTIONS. TO PREVENT WEED GROWTH, EROSION AND BLOWING DUST, AREAS NOT COVERED BY VEGETATION SHALL BE COVERED WITH ROCK MULCH OR DECORATIVE ROCKS, OR COBBLE, OR SIMILAR NATURAL MATERIALS PROVIDING A CLEAN, UNIFORM APPEARANCE. LANDSCAPE CONTRACTOR SHALL REPLACE ALL PLANT MATERIAL FOUND TO BE IN AN UNHEALTHY, DAMAGED, IMPAIRED CONDITION, MISSING OR DEAD DURING THE MAINTENANCE PERIOD.
- LANDSCAPE MAINTENANCE: ALL PLANTS SHALL BE MAINTAINED CONTINUALLY IN A HEALTHY CONDITION IN A ACCORDANCE WITH GENERALLY ACCEPTED PROFESSIONAL HORTICULTURAL STANDARDS AND PRACTICES. PLANTS THAT DIE OR ARE UNHEALTHY SHALL BE REPLACED. REGULAR PRUNING TRIMMING SHALL APPLY TO MAINTAIN HEALTH AND AN ATTRACTIVE APPEARANCE AND TO PERMIT THE PLANT TO ACHIEVE THEIR INTENDED FORM AND HEIGHT. LANDSCAPE AREAS SHALL REMAIN FREE OF WEEDS, LITTER, JUNK, RUBBISH AND OTHER NUISANCES AND OBSTRUCTIONS. TO PREVENT WEED GROWTH, EROSION AND BLOWING DUST, AREAS NOT COVERED BY VEGETATION SHALL BE COVERED WITH ROCK MULCH OR DECORATIVE ROCKS, OR COBBLE, OR SIMILAR NATURAL MATERIALS PROVIDING A CLEAN, UNIFORM APPEARANCE. LANDSCAPE CONTRACTOR SHALL REPLACE ALL PLANT MATERIAL FOUND TO BE IN AN UNHEALTHY, DAMAGED, IMPAIRED CONDITION, MISSING OR DEAD DURING THE MAINTENANCE PERIOD.
- A FINAL SITE WALK INSPECTION IS REQUIRED AT THE END OF THE LANDSCAPE MAINTENANCE PERIOD PRIOR TO FINAL PROJECT ACCEPTANCE.
- A MINIMUM 3'-0" CLEAR ZONE SHALL BE MAINTAINED AROUND ALL FIRE HYDRANTS AND SHALL NOT BE OBSTRUCTED.
- TREES WITHIN THIS DEVELOPMENT, WHEN FULLY MATURE, SHALL PROVIDE AN UNOBSTRUCTED VERTICAL CLEARANCE OF 13'-6".
- TREE QUANTITY REQUIREMENTS ARE BASED ON REQUIREMENT FOR 50% OF PARCEL (50% OF 25.5 AC = 12.75 AC). THIS IS NOT THE ACTUAL AMOUNT OF OPEN SPACE SHOWN ON PLANS.
- TREES SHOWN ON PRIVATE PROPERTY WILL BE INSTALLED BY THE HOME CONTRACTOR AS PART OF THE BUILDING PERMIT PROCESS FOR EACH LOT, AND INDIVIDUAL PROPERTY OWNERS ARE REQUIRED TO IRRIGATE AND MAINTAIN THE TREES. THE OWNERS ARE RESPONSIBLE FOR REPLACING ANY TREES THAT DIE.
- HOA IS RESPONSIBLE FOR REPLACING ANY TREES OR PLANTINGS THAT DIE IN THE PARKS, ENTRY AND OPEN SPACE AREAS.

*LANDSCAPING SHOWN ON LOTS IS ILLUSTRATIVE ONLY AND MEANT TO SHOW TYPICAL PLANTINGS MEETING CITY REQUIREMENTS. LANDSCAPING WITHIN LOTS IS TO BE DESIGNED AND INSTALLED BY INDIVIDUAL HOME CONTRACTOR.

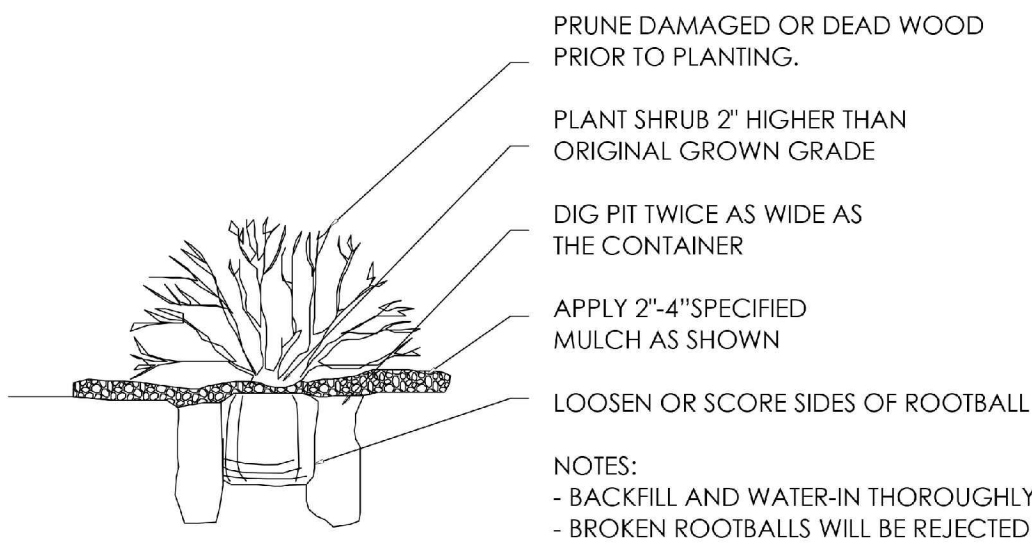
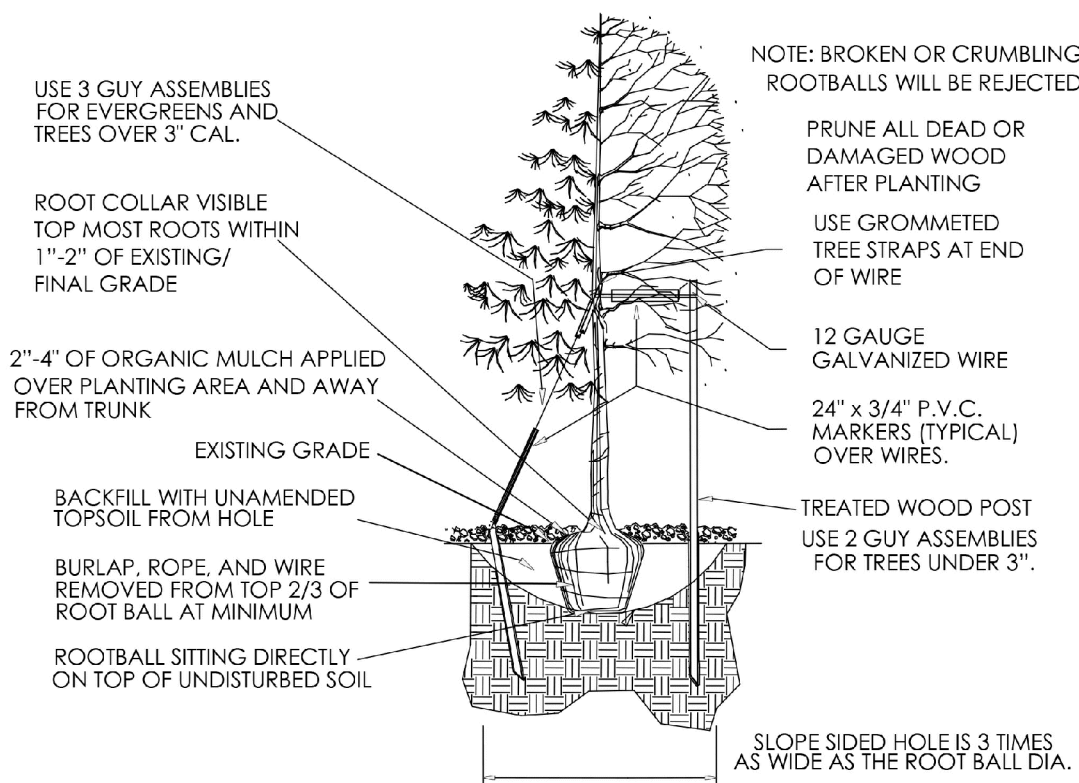
PROPOSED FENCES, WALLS, SIGNS AND ACCESSORY STRUCTURES SHOWN ON THIS PLAN ARE ILLUSTRATIVE ONLY AND SUBJECT TO SEPARATE REVIEWS AND PERMITS.

DATE: 08/01/2021
SHEET 19 OF 20



WHITEWING AT RALSTON SUMMIT

PRELIMINARY DEVELOPMENT PLAN A PARCEL OF LAND BEING A PORTION OF WHITEWING AT RALSTON SUMMIT LOCATED IN THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 69 WEST, 6TH P.M., CITY OF ARVADA, COUNTY OF JEFFERSON, STATE OF COLORADO LANDSCAPE DETAILS

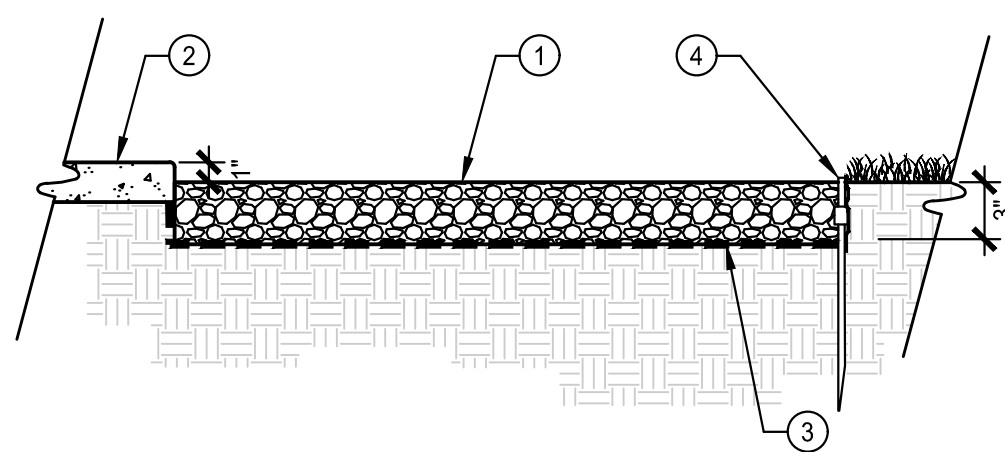


TREE PLANTING

NTS

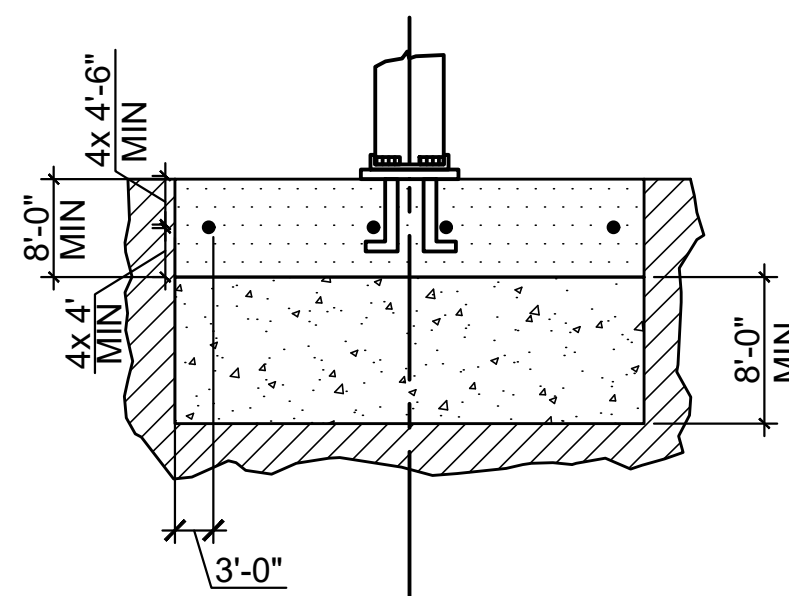
SHRUB PLANTING

NTS

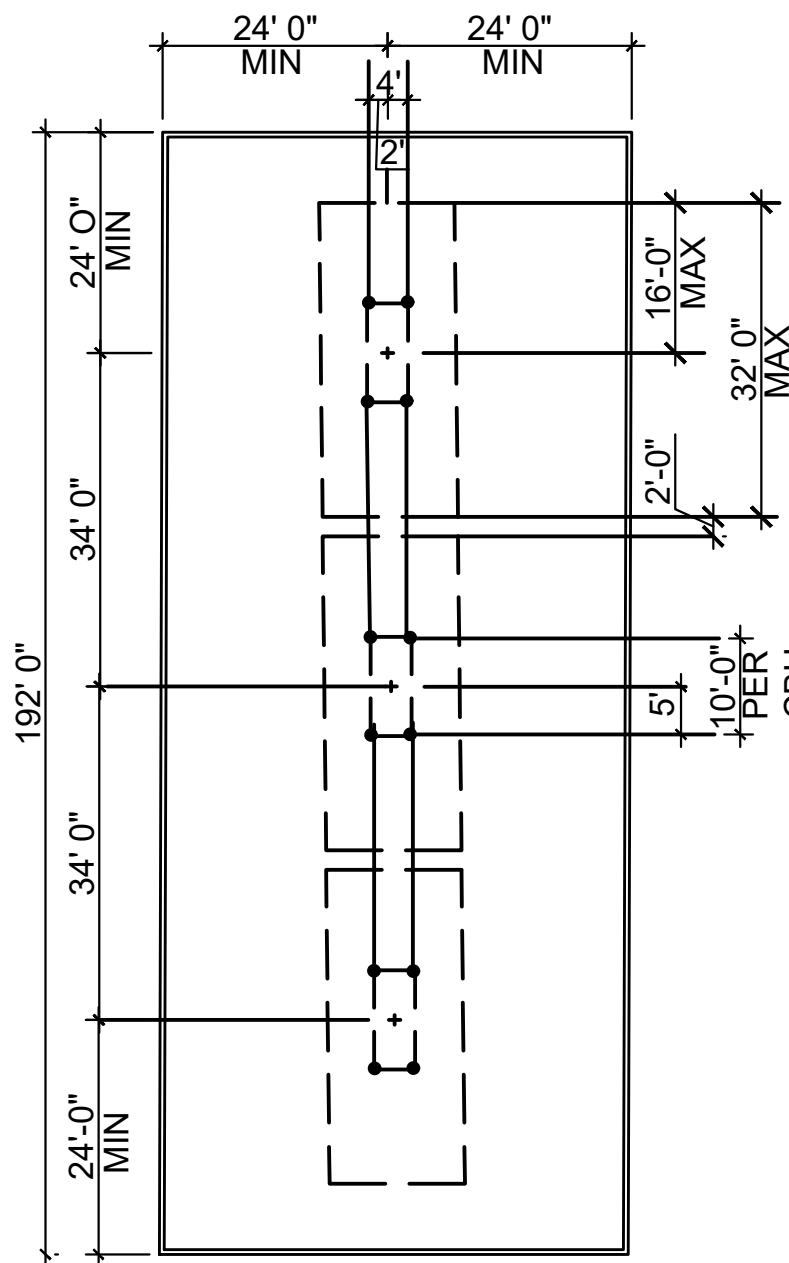


CRUSHER FINE PATH

NTS



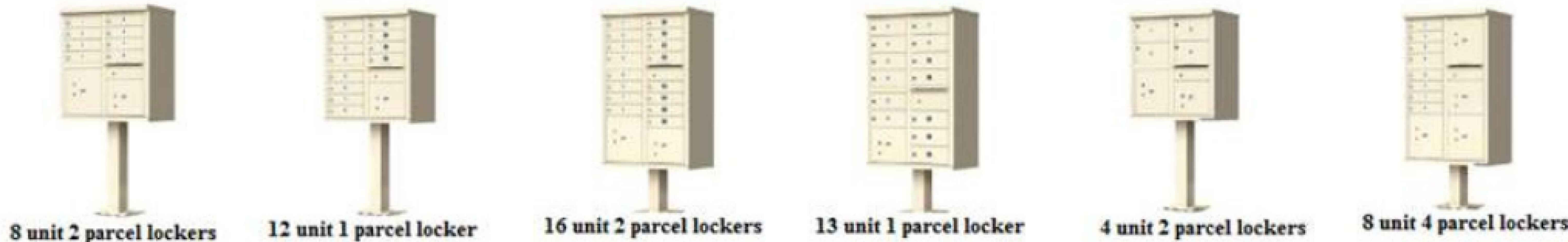
SECTION



PLAN VIEW

MAILBOX KIOSK FOOTING

NTS



Whether you plan to serve four or 2,000 residents, cluster box units (CBU) provide a flexible solution to accommodate your building project needs. Simply select the pre-configured unit(s) that has the best options for your residents. These standard stock units can be used individually or in larger group installations - all providing a convenient, secure method of mail and package delivery to residents.

MAIL KIOSK - CLUSTER BOX UNIT OPTIONS

NTS

DATE: 08/01/2021
SHEET 20 OF 20



REPORT TO CITY COUNCIL PUBLIC HEARING

AGENDA ITEM
10.F.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-034 An Ordinance Certifying the City of Arvada Mill Levy for 2021 for the Board of County Commissioners for Jefferson and Adams Counties (Ordinance No. 4781)

Report in Brief

The purpose of this ordinance is to certify the City's Mill Levy for the valuation year 2021. The 2022 proposed budget estimates that \$7,949,427 will be collected in 2022 based on a mill levy of 4.31 mills. There is no change in the mill levy from the previous year.

This mill levy will be used to assess all property within the City for taxes to be collected in 2022 for the valuation year of 2021.

The Arvada team recommends that the City Council approve CB21- 034, An Ordinance Certifying the City of Arvada Mill Levy for 2021 for the Board of County Commissioners for Jefferson and Adams Counties on final reading, numbered 4781 and ordered published by title only.

Financial Impact

The proposed revised 2021-2022 budget estimates that \$7,949,427 will be collected based on the proposed mill levy of 4.31 mills. This mill levy is part of the revenue sources that generate the estimated \$101,455,282 for the General Fund.

Background

This action is associated with the adoption of the 2022 budget. Certification of the mill levy for the valuation year 2021 will enable the City to receive property tax in 2022.

Discussion

As described herein, the estimated property tax of \$7,949,427 for 2022 represents approximately 7.8% of the estimated General Fund revenue. Without the mill levy, the City would not be able to fund several critical services.

Public Contact

Posting of the City Council agenda. The City Council also received information regarding the proposed 2022 Budget on August 9, September 27 and October 11.

Commission Recommendation

N/A

Strategic Alignment

The ordinance supports the following principle within the Organizational and Service Effectiveness Priority Area within the City Council Strategic Plan:

"Provides a well-managed, fiscally responsible government that operates effectively and efficiently while identifying revenue requirements to sustain current service levels and achieve future requested levels of service".

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve CB21- 034, An Ordinance Certifying the City of Arvada Mill Levy for 2021 for the Board of County Commissioners for Jefferson and Adams Counties on final reading, numbered 4781 and ordered published by title only.

Suggested Motion:

I move that CB21-034, An Ordinance Certifying the City of Arvada Mill Levy for 2021 for the Board of County Commissioners for Jefferson and Adams Counties, be (approved on final reading, numbered 4781 and ordered published by title only) (rejected).

Prepared by:
Lisa Yagi, Assistant Finance Director

Reviewed by:

Approved by:

Jenna Belec, Executive Assistant	9/28/2021
Bryan Archer, Director of Finance	9/28/2021
Gail Walker, Legal Specialist-Contracts	9/28/2021
Kylie Justus, Assistant City Attorney	9/28/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-034
ORDINANCE NO. 4781

AN ORDINANCE CERTIFYING THE CITY OF ARVADA MILL LEVY FOR 2021 FOR THE
BOARD OF COUNTY COMMISSIONERS FOR JEFFERSON AND ADAMS COUNTIES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Pursuant to the provisions of CRS 39-5-128(1), the City of Arvada does hereby certify the levy at 4.31 mills to be assessed against all property within the City of Arvada for taxes to be collected in 2022 for the valuation year of 2021.

Section 2. This Ordinance shall be effective five days after publication, following final passage.

INTRODUCED, READ, AND ORDERED PUBLISHED IN FULL this 4th day of October,
2021.

PASSED, ADOPTED AND APPROVED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

Publication Dates: October 7, 2021
 October 21, 2021



REPORT TO CITY COUNCIL PUBLIC HEARING

AGENDA ITEM
10.G.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-035 An Ordinance Appropriating Funds for Fiscal Year 2022 (Ordinance No. 4782)

Report in Brief

This is the public hearing for the budget appropriation ordinance. Pursuant to Section 10.4 of the Home Rule Charter, Council shall adopt an ordinance for the annual appropriation.

The ordinance is in the amount of \$262,859,447.

The Arvada team recommends that the City Council approve CB21-035, An Ordinance Appropriating Funds for Fiscal Year 2022 on final reading, numbered 4782 and ordered published by title only.

Financial Impact

The appropriation ordinance is in the amount of \$262,859,447.

Background

The Arvada team's presentation of the budget started on August 9 when the Finance and CMO teams presented the revised 10-year models along with a detailed review of current and previous revenue estimates. This included changes related to the COVID-19 pandemic and how they would affect the 10-year model.

On August 23, 2021, members from the Infrastructure Work System along with the Finance and CMO teams presented recommendations for funding the City's water and wastewater infrastructure. A follow-up presentation occurred on September 20 in order to continue this much needed conversation and answer additional questions from the City Council.

On September 10, 2021, the budget document was provided to the Council and posted to the City's website. The budget document includes the City Manager's transmittal letter which provides an overview of the budget document as well as the major changes and issues associated with the proposed expenditure of nearly \$263 million of public funds.

On September 27, the Council received a presentation focused on the major changes between the 2021-2022 Biennial Operating and Capital Budget approved last year by the City Council and the proposed update. The City Manager's Office and Finance teams facilitated the presentation in collaboration with Works Systems Leaders, who provided additional details and information associated with the proposed changes.

Finally, additional information associated with the proposed 2022 Budget was presented when major changes in the City's Capital Improvement Plan were reviewed.

Discussion

The 2021-2022 Proposed Revised Biennial Operating and Capital Budget was released to the City Council and the Arvada community on September 10. Information within the Proposed Revised Biennial Budget provides an excellent overview of proposed allocations of resources and the priorities identified by the City Council and team members, as well as the relationship

of each work system to the Strategic Plan, including milestones and performance measures.

[2021-2022 Proposed Revised Biennial Operating and Capital Budget](#)

A complete summary of the budget by section and funded priorities associated with the proposed budget is provided in the City Manager's Budget Transmittal Letter dated September 10.

Public Contact

Posting of the City Council agenda. The Proposed Revised Biennial Operating and Capital Budget has been available on the City website since September 10 and the Director of Finance presented a comprehensive review of the budget during the September 27 workshop. As described herein, additional information was presented on August 9, August 23, and October 11.

Commission Recommendation

N/A

Strategic Alignment

The ordinance supports the following principle within the Organizational and Service Effectiveness Priority Area within the City Council Strategic Plan:

"Provides a well-managed, fiscally responsible government that operates effectively and efficiently while identifying revenue requirements to sustain current service levels and achieve future requested levels of service".

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve CB21-035, An Ordinance Appropriating Funds for the Fiscal Year 2022 on final reading, numbered 4782 and ordered published by title only.

Suggested Motion:

I move that CB21-035, An Ordinance Appropriating Funds for Fiscal Year 2022, be (approved on final reading, numbered 4782 and ordered published by title only) (rejected).

Prepared by:
Lisa Yagi, Assistant Finance Director

Reviewed by:

Approved by:

Jenna Belec, Executive Assistant	9/28/2021
Bryan Archer, Director of Finance	9/28/2021
Gail Walker, Legal Specialist-Contracts	9/28/2021

Kylie Justus, Assistant City Attorney 9/28/2021

Rachel Morris, City Attorney 10/6/2021

Lorie Gillis, Deputy City Manager 10/6/2021

Mark Deven, City Manager 10/6/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-035
ORDINANCE NO. 21-4782

AN ORDINANCE APPROPRIATING FUNDS FOR FISCAL YEAR 2022

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Pursuant to the provisions of Section 10.4 of the Home Rule Charter, there is hereby appropriated money for fiscal year 2022 by fund in the following amounts:

Fund	Amount
General Fund	\$102,764,645
Grants Fund	\$187,999
Streets Maintenance Fund	\$10,269,631
Community Development	\$1,288,602
Arvada Housing Authority	\$5,827,286
Parks	\$11,585,697
Police Seizure	\$29,864
Police Tax Increment Fund .21	\$6,059,185
Police Tax Increment Fund .25	\$6,965,343
COP Debt Service	\$2,133,211
Debt Service Fund	\$5,364,782
Capital Projects Fund	\$6,997,769
Water Fund	\$52,546,099
Wastewater Fund	\$17,393,680
Golf Course Fund	\$7,015,082
Stormwater Fund	\$4,903,344

Solid Waste	\$6,238,247
Insurance Fund	\$2,487,138
Computers	\$5,674,966
Print Shop	\$443,526
Vehicles	\$6,217,114
Buildings	\$466,237
TOTAL APPROPRIATION	\$262,859,447

Section 2. This ordinance shall be effective five days after publication following final passage.

INTRODUCED, READ AND ORDERED PUBLISHED this 4th day of October, 2021.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

Publication Dates: October 7, 2021
 October 21, 2021



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
10.G.1.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-130 A Resolution Adopting the Budget for Fiscal Year 2022

Report in Brief

The City's Charter provides that the annual budget must be adopted by City Council 60 days prior to the first day of the next fiscal year. The budget be adopted by both ordinance and resolution. Presented is the resolution for adoption of the 2022 budget.

The Arvada team recommends that the City Council approve R21-130, A Resolution Adopting the Budget for Fiscal Year 2022.

Financial Impact

This resolution is in the amount of \$262,859,447.

Background

The Arvada team presentation of the budget started on August 9 with the presentation of the preliminary ten-year financial plans and a review of the major assumptions. On August 23 a review of the Utilities funds was presented. A second workshop for the Utilities funds was held on September 20. A workshop held on September 27 provided an overview of major changes to the budget, which was followed by a summary of changes to the Capital Improvement Program on October 11.

Discussion

The 2021-2022 Proposed Revised Biennial Operating and Capital Budget was released to the City Council on September 10. Information within the Proposed Revised Biennial Budget provides an excellent overview of proposed allocations of resources and the priorities identified by the City Council and team members, as well as the relationship of each work system to the Strategic Plan, including milestones and performance measures.

[2021-2022 Proposed Revised Biennial Operating and Capital Budget](#)

A complete summary of the budget by section and funded priorities associated with the proposed budget is provided in the City Manager's Budget Transmittal Letter dated September 10.

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A.

Strategic Alignment

The resolution supports the Organizational and Service Effectiveness Priority Area of the City Council Strategic Plan and the following Principle:

Provides a well-managed, fiscally responsible government that operates effectively and efficiently while identifying revenue requirements to sustain current service levels and achieve future requested levels of service.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R 21-130, A Resolution Adopting the Budget for Fiscal Year 2022.

Suggested Motion:

I move that R21-130, A Resolution Adopting the Budget for Fiscal Year 2022, be (approved) (rejected).

Prepared by:

Lisa Yagi, Assistant Finance Director

Reviewed by:

Approved by:

Jenna Belec, Executive Assistant	9/16/2021
Bryan Archer, Director of Finance	9/20/2021
Gail Walker, Legal Specialist-Contracts	9/21/2021
Kylie Justus, Assistant City Attorney	9/21/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-130

A RESOLUTION ADOPTING THE BUDGET FOR FISCAL YEAR 2022

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Pursuant to the provision of Section 10.4 of the Home Rule Charter, there is hereby adopted a budget for fiscal year 2022 in both a program-based and line-item format.

Section 2. This Resolution shall be effective upon its approval by the Arvada City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
10.G.2.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-131 A Resolution Adopting the 2022 Capital Improvement Fund Budget and Allocating for Specific Projects in 2022

Report in Brief

In accordance with Chapter 2, Article 7, Section 2-295 of the City Code, the capital improvement plan shall be adopted by resolution.

The City of Arvada 2021-2022 ten-year Capital Improvement Plan is primarily a management tool used for the purpose of planning the direction for the City relative to capital projects. The City Council, by adopting this resolution, is directing the City Manager and the Arvada team to begin the 2022 capital projects according to the priorities set forth by the City Council. Funding for the 2022 capital improvement budget is appropriated by Ordinance.

The Arvada team recommends that the City Council approve R21-131, A Resolution Adopting the 2022 Capital Improvement Fund Budget and Allocating for Specific Projects in 2022.

Financial Impact

The Capital Improvement Plan by major area is summarized as follows:

Debt Service	\$6,494,579
Personnel	\$145,000
General Government	\$2,202,661
Transportation	\$3,412,078
Street Maintenance	\$9,513,851
Parks	\$886,916
Water	\$25,412,362
Wastewater	\$3,683,646
Stormwater	<u>\$876,227</u>
TOTAL	\$52,627,320

Background

The Capital Improvement Plan (CIP) is a ten-year road map for creating, maintaining and paying for Arvada's present and future infrastructure needs. The CIP outlines the project costs, funding sources and estimated future operating costs associated with each capital improvement. The CIP summarizes the City's focus on Taking Lasting Care (TLC) and implementing the priorities and projects identified by the Citizen's Capital Improvement Project Committee (CCIPC), which was formed in 2015

at the direction of the City Council. The CIP also summarizes the Strategic Results included in the 2020-2025 City Council Strategic Plan that determines funding priorities within the 2021-2030 Capital Improvement Plan.

Discussion

The 2021-2022 Proposed Revised Biennial Operating and Capital Budget was released to the City Council on September 10. Information within the Proposed Revised Biennial Budget provides an excellent overview of proposed allocations of resources and the priorities identified by the City Council and the Arvada team related to capital projects. More information regarding the Capital Budget is available through the following link:

[2021-2022 Proposed Revised Biennial Operating and Capital Budget](#)

Public Contact

Posting of the City Council agenda.

Commission Recommendation

N/A

Strategic Alignment

The resolution supports the following Principle within the Organizational and Service Effectiveness Priority Area of the City Council Strategic Plan:

Provides a well-managed, fiscally responsible government that operates effectively and efficiently while identifying revenue requirements to sustain current service levels and achieve future requested levels of service.

Alternative Courses of Action

N/A

Recommendation for Action

The Arvada team recommends that the City Council approve R21-131, A Resolution Adopting the 2022 Capital Improvement Fund Budget and Allocating for Specific Projects in 2022.

Suggested Motion:

I move that R21-131, A Resolution Adopting the 2022 Capital Improvement Fund Budget and Allocating for Specific Projects in 2022, be (approved) (rejected).

Prepared by:
Lisa Yagi, Assistant Finance Director

Reviewed by:

Approved by:

Jenna Belec, Executive Assistant	9/16/2021
Bryan Archer, Director of Finance	9/20/2021
Gail Walker, Legal Specialist-Contracts	9/21/2021
Kylie Justus, Assistant City Attorney	9/21/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

RESOLUTION NO. R21-131

A RESOLUTION ADOPTING THE 2022 CAPITAL IMPROVEMENT FUND BUDGET AND
ALLOCATING FOR SPECIFIC PROJECTS IN 2022

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Pursuant to the provision of Chapter 2, Article 7, Section 2-295 of the Arvada City Code, the Council hereby adopts the Capital Improvement Fund Budget for 2022 and allocating for specific projects in 2022 in the areas and amounts set forth below:

Area	Amount
Debt Service	\$6,494,579
Personnel	\$145,000
General Administration	\$2,202,661
Street Maintenance	\$9,513,851
Parks	\$886,916
Water	\$25,412,362
Wastewater	\$3,683,646
Stormwater	\$876,227
Transportation	\$3,412,078
Total	\$52,627,320

Section 2. This Resolution shall be effective upon its approval by the Arvada City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

Rachel A. Morris, City Attorney



REPORT TO CITY COUNCIL RESOLUTION

AGENDA ITEM
10.G.3.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: R21-132 A Resolution Adopting the Pay Plan for Fiscal Year 2022

Report in Brief

On October 18, 2021, City Council will consider a Resolution Adopting the Pay Plan for Fiscal Year 2022. The 2022 Pay Plan, attached as Exhibit "A," includes market increases for each job family, additional adjustments for specific pay grades, reclassifications, job title changes, new and eliminated positions for 2022, and step increases. These updates are an important and critical step to meeting the City's Total Compensation Philosophy, which includes being an employer of choice in the Denver/Boulder region, offering competitive market-based pay in a fiscally responsible manner. These updates will also support compliance with state laws regarding pay equity.

The Arvada team recommends that the City Council approve R21-132, A Resolution Adopting the Pay Plan for Fiscal Year 2022.

Financial Impact

The total financial impact of the 2022 Pay Plan is \$62,766,399. This includes:

- 4.94% or \$2,807,158 for market increases in the form of salary range adjustments
- 0.3% or \$167,815 for reclassifications
- 1.35% or \$765,548 for step increases.
- 27 new positions (net) at a cost of \$2,198,068.

1.5% of the market increases were given to employees in September 2021, retroactive to the beginning of the year, and are funded from the 2021 Budget. The remaining 3.47% for market increases and reclassifications, and 1.35% for step increases will be funded from the 2022 budget.

The City's budget includes 3% for market increases and 1.35% for step increases. The proposed changes to the pay plan are above the budget by approximately 0.47%. The Arvada Team is committed to funding these additional costs from other funding sources and recommends that the proposed pay plan changes be approved as they are critical to maintaining our position as an employer of choice in an increasingly competitive employment market.

Background

The City's Total Compensation Philosophy includes being an employer of choice in the Denver/Boulder region, offering competitive market-based pay and benefits to our employees, while also being fiscally responsible and within the City's ability to fund.

To support the philosophy of competitive market-based pay, the HR department has a performance measure as follows:
Competitive Market-Based Compensation: 85% of the City's matched jobs are graded according to their market value.

In order to meet the performance target, the HR department conducts a comprehensive study of the employment market each

year and recommends updates to the City's pay plan, such as market increases in the form of salary range adjustments, and position reclassifications. Currently, 70% of the City's jobs are aligned to the market. The proposed updates to the pay plan will bring the City back above its target at 86% for 2022. These changes are an important and critical step to meeting our compensation philosophy and providing competitive and equitable pay so the City can be an employer of choice and attract and retain our high-performing workforce in a very difficult employment market.

Employment Market

The City is experiencing historic highs in turnover and applicant pools are at all-time lows on the heels of the COVID-19 pandemic. Recruitments are taking longer to complete as both the quantity and quality of candidates are decreasing. The City has experienced zero applicants for job openings, as well as no-shows for interviews at unprecedented levels.

Turnover: The City's current year-to-date turnover (through August) is 12.41%. At this rate, we will exceed the 2020 total year turnover of 12.46%. The heaviest turnover is in our Public Safety, Public Works, Legal, Municipal Courts and IT departments.

Recruitment challenges: The HR department has been reposting jobs multiple times and keeping them open longer due to a lack of qualified candidates. Examples include:

- Chief Surveyor - posted 4 times due to lack of applicants
- Custodians and Building Maintenance Workers -posted multiple times and unable to fill due to lack of candidates
- Financial Business Analyst and Claims Specialist - re-posted due to candidate withdrawals, and lack of quality candidates.

Unemployment: As of August, the unemployment rate is currently 5.3% in Arvada and 6.2% in Colorado. Despite strong job growth, the elevated unemployment rate is an indicator that Coloradans are staying unemployed by choice.

Pay increases: The HR department uses multiple sources to collect data on pay increases, including the Bureau of Labor Statistics' Employment Cost Index (ECI), which measures the increase in the cost of labor on a national level; World at Work, which surveys employers nationally and reports pay increases and projections; and, Employers Council which reports pay increases and projections locally. The Employers Council also publishes salary surveys which we use to match our jobs to the market. We also match our jobs to surveys published by the Colorado Municipal League (CML) and the Economic Research Institute (ERI).

- The ECI for 2020 and 2021 was 2.9% and 3.2% for a combined increase of 6.1%.
- World at Work reported average pay increases of 2.9% in 2020 and projected pay increases of 2.9% for 2021, for a combined wage growth of 5.8%.
- Employers Council reported pay increases of 3.2% for 2020 and 3.2% for 2021 for a combined total of 6.4% over a two- year period.
- Using Employers Council, CML and ERI salary surveys, HR's analysis of our market-matched jobs showed that the market moved an average of 1.6% in 2020 and 3% in 2021 for a combined 4.6% market movement.

Based on the above information and the current employment market conditions we are facing, the following updates to the City's pay plan are proposed:

Market Increases by Job Family: these are salary range adjustments made to each job family to ensure the City's pay ranges stay up to date with market movement and the City's jobs are graded according to their market value. These increases ensure the City maintains a competitive position in the market.

For 2021, all job families were adjusted by 1.5%. Employees received this increase in September, retroactive to the beginning of the year.

For 2022, the following salary range adjustments are proposed:

- A 2.5% increase for the following job families: Executive (EXEC), Management (MGMT) , Professional (PROF), Labor Trades, Crafts and Utilities (LTCU) and Technical and Business Support (TBS)
- A 3% increase for the Information Technology (INFT) job family
- A 4% increase for the Police (PD) job family.

Additional increases by Pay Grade – this year additional increases are being recommended for specific pay grades to respond to market competition and compression issues. They are as follows:

- **Police Officers:** In order to maintain a competitive market position for police officers, an additional 1.5% increase to the maximum pay for police officers is proposed.
- **Supervisors:** an additional 2.5% increase is recommended for pay grades MGMT5, MGMT6, MGMT7 and MGMT8 to address compression issues and market competitiveness. Compression occurs when there is little difference in pay between a supervisor and their direct reports. The HR team conducted an analysis and found that compression exists between first-line supervisors and their direct reports that earn overtime. Adding an additional 2.5% increase to the MGMT5, MGMT6 and MGMT7 pay grades, where the majority of these supervisors are graded, will address this issue. In order to avoid compression between these supervisors and their next level managers, a 2.5% adjustment is also recommended for the MGMT8 pay grade.
- **Department Heads:** An additional 2.5% increase is recommended for the EXEC7 pay grade to bring this group of Department Heads to a more competitively aligned position with their peers in the market. It will also serve to address compression that is beginning to exist for this group.

Reclassifications

Reclassifications occur when positions experience significant changes in job responsibilities and/or have significant, sustained changes in market value over time. A combined total of 32 positions are proposed for reclassification. This includes reclassifications that should have occurred in 2021, but were postponed due to freezing the pay plan.

Step Increases

Every organization has a way of rewarding and compensating employees for increased knowledge and performance during their employment with an organization. The City uses a step system which is designed to award employees as they gain experience and increase their contribution to the City. Each year, employees who are step eligible may be granted a step increase on their anniversary date based on performance. If the employee has reached the top of their pay grade, the employee is no longer eligible for a step increase. Step increases are an important tool for rewarding employees and maintaining pay equity. Approximately 47% of the City's sworn employees and 78% of the City's civilian employees are eligible for step increases in 2022.

Discussion

The recommended updates to the City's Pay Plan are an important and critical step to support the City's Total Compensation Philosophy and meet the OSE strategic performance measure of *Competitive Market-Based Compensation: 85% of the City's matched jobs are graded according to their market value.* The changes will ensure the City maintains a competitive position in the market and continues to be an employer of choice that can attract and retain a high-performing workforce in a very difficult employment market.

Public Contact

Posting of the City Council agenda

Commission Recommendation

N/A.

Strategic Alignment

The City's Pay Plan Update is guided by the City's Personnel Rules and Total Compensation Philosophy. It is aligned to the City Council Strategic Plan as follows:

OSE Principles

- Maintains appropriate staffing levels, collaborative communications, information technology and financial management support, as well as, leadership services to all work systems to achieve strategic and operational results.
- Fosters a top workplace environment that attracts and retains a highly engaged, inclusive workforce and fosters a culture of wellness, safety, cycles of learning and performance excellence.

Strategic Result: By 12/23 implement an organizational performance excellence framework as evidenced by obtaining a Malcolm Baldrige National Quality site visit.

Strategic Milestone: Achieve a Denver Post Top Workplace Designation

OSE / HR Strategic Performance Measure: Competitive Market-Based Compensation: 85% of the City's matched jobs are graded according to their market value.

Alternative Courses of Action

N/A.

Recommendation for Action

The Arvada team recommends that the City Council approve R21-132, A Resolution Adopting the Pay Plan for Fiscal Year 2022.

Suggested Motion:

I move that R21-132, A Resolution Adopting the Pay Plan for Fiscal Year 2022, be (approved) (rejected).

Prepared by:

Gabriella Bommer, Deputy Director of Human Resources

Reviewed by:

Gail Walker, Legal Specialist-Contracts 9/28/2021

Approved by:

Gabriella Bommer, Deputy Director of Human Resources 9/27/2021

Linda Haley, Director of Human Resources 9/27/2021

Bryan Archer, Director of Finance 9/27/2021

Rachel Morris, City Attorney 10/6/2021

Lorie Gillis, Deputy City Manager 10/6/2021

Mark Deven, City Manager 10/6/2021

Enclosure, exhibits & attachments required to support the report

SUBJECT: R21-132 A Resolution Adopting the Pay Plan for Fiscal Year 2022

PAGE: 5

ITEM: 10.G.3.

RESOLUTION NO. R21-132

A RESOLUTION ADOPTING THE PAY PLAN FOR FISCAL YEAR 2022

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. In accordance with Section 7.1(c) of the Arvada City Charter and pursuant to Section 70-50.1 of the Arvada City Code, there is hereby adopted a pay plan, which is attached hereto as Exhibit "A" for fiscal year 2022.

Section 2. The City Manager is directed to implement the revised pay plan for the first pay period in 2022.

Section 3. This Resolution shall be effective upon its approval by the Arvada City Council.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

Exhibit "A"



2022 PAY PLAN

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Title	Exempt or Non-Exempt	Job Family	Grade	Page
Accountant	E	Professional	PROF5	22
Accounting Specialist	N	Technical & Business Support	TBS7	24
Accounting Supervisor	E	Management	MGMT5	16
Accounting Technician II	N	Technical & Business Support	TBS4	25
Accounting Technician III	N	Technical & Business Support	TBS5	25
Accounts Payable Technician	N	Technical & Business Support	TBS6	24
Accounts Receivable Technician	N	Technical & Business Support	TBS6	24
ADA Coordinator	E	Professional	PROF7	21
Administrative Analyst	N	Technical & Business Support	TBS8	24
Administrative Assistant	N	Technical & Business Support	TBS4	25
Administrative Coordinator	N	Technical & Business Support	TBS5	25
Administrative Court Clerk	N	Technical & Business Support	TBS5	25
Administrative Specialist	N	Technical & Business Support	TBS5	25
Animal Management Officer	N	Technical & Business Support	TBS6	24
Applications Systems Administrator	E	Information Technology	INFT3	11
Assistant Building Official	E	Management	MGMT6	16
Assistant City Attorney	E	Professional	PROF8	21
Assistant City Engineer	E	Management	MGMT11	15
Assistant Finance Director	E	Management	MGMT10	15
Assistant Fleet Manager	E	Management	MGMT5	16
Assistant Golf Manager	E	Professional	PROF4	22
Assistant Golf Professional	N	Technical & Business Support	TBS6	24
Assistant Nature Center Director	E	Professional	PROF5	22
Assistant Restaurant Manager	E	Professional	PROF4	22
Assistant to the City Manager	E	Professional	PROF8	21
Associate Technical Support Analyst	N	Technical & Business Support	TBS6	24
AURA Project Manager	E	Professional	PROF8	21
Benefits Specialist	E	Professional	PROF6	21
Budget Analyst	E	Professional	PROF7	21
Building Craftsworker	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Building Maintenance Leadworker	N	Management	MGMT4	17
Building Maintenance Worker	N	Labor, Trades, Crafts & Utilities	LTCU4	13
Business Analyst	E	Professional	PROF5	22
CAD / GIS Supervisor	E	Management	MGMT7	16
Chief Building Official	E	Management	MGMT9	15
Chief Communications Manager	E	Management	MGMT9	15
Chief Information Officer	E	Executive	EXEC7	9
Chief of Police	E	Executive	EXEC8	9

Title	Exempt or Non-Exempt	Job Family	Grade	Page
Chief Plant Operator	N	Management	MGMT5	16
Chief Surveyor	E	Management	MGMT7	16
City Clerk	E	Executive	EXEC4	9
City Engineer	E	Management	MGMT12	15
City Forester	E	Management	MGMT5	16
Civil Engineer I	E	Professional	PROF7	21
Civil Engineer II	E	Professional	PROF8	21
Civil Engineer III	E	Professional	PROF9	21
Civil Engineer IV	E	Professional	PROF10	21
Claims Specialist	E	Professional	PROF6	21
Cloud Systems Administrator	E	Information Technology	INFT4	11
Code Compliance Officer	N	Technical & Business Support	TBS6	24
Combination Inspector I	N	Technical & Business Support	TBS7	24
Combination Inspector II	N	Technical & Business Support	TBS8	24
Combination Inspector III	N	Technical & Business Support	TBS9	24
Communications Coordinator	E	Professional	PROF5	22
Community Connectivity Manager	E	Professional	PROF9	21
Community Resilience Coordinator	E	Professional	PROF8	21
Compensation Analyst	E	Professional	PROF6	21
Computerized Irrigation Supervisor	E	Management	MGMT5	16
Computerized Irrigation System Administrator	N	Technical & Business Support	TBS8	24
Construction and Inspection Supervisor	E	Management	MGMT6	16
Construction and Maintenance Supervisor	N	Management	MGMT5	16
Controller	E	Management	MGMT9	15
Court Administrator	E	Management	MGMT9	15
Craftsworker	N	Labor, Trades, Crafts & Utilities	LTCU5	13
Creative Services Designer	E	Professional	PROF4	22
Crime Analyst	E	Professional	PROF6	21
Criminalist	N	Technical & Business Support	TBS9	24
CSI Technician	N	Technical & Business Support	TBS6	25
Custodian	N	Labor, Trades, Crafts & Utilities	LTCU2	13
Customer Information Manager	E	Management	MGMT8	15
Customer Information Specialist	N	Technical & Business Support	TBS4	25
Customer Information Supervisor	E	Management	MGMT6	16
Deputy City Attorney	E	Management	MGMT13	15
Deputy City Clerk	N	Technical & Business Support	TBS8	24
Deputy City Manager	E	Executive	EXEC9	9
Deputy Court Administrator	E	Management	MGMT5	16

Title	Exempt or Non-Exempt	Job Family	Grade	Page
Deputy Director of Human Resources	E	Management	MGMT10	15
Deputy Director of Vibrant Community and Neighborhoods	E	Management	MGMT10	15
Deputy Police Chief	E	Police	PD5	19
Development Manager (Ralston House)	E	Management	MGMT5	16
Digital Content Producer	E	Professional	PROF4	22
Digital Media Technician	N	Technical & Business Support	TBS6	25
Direct Mail Specialist	N	Technical & Business Support	TBS4	25
Director of Community and Economic Development	E	Executive	EXEC7	9
Director of Finance	E	Executive	EXEC7	9
Director of Human Resources	E	Executive	EXEC7	9
Director of Public Works	E	Executive	EXEC7	9
Director of Utilities	E	Executive	EXEC7	9
Director of Vibrant Community and Neighborhoods	E	Executive	EXEC7	9
Economic Development Manager	E	Management	MGMT8	15
Economic Development Specialist	E	Professional	PROF6	21
Electrician	N	Technical & Business Support	TBS9	24
Electro Mechanical Technician	N	Labor, Trades, Crafts & Utilities	LTCU9	13
Engagement Coordinator	E	Professional	PROF5	22
Engineering Manager	E	Management	MGMT10	15
Engineering Manager - City Traffic Engineer	E	Management	MGMT10	15
Engineering Permit Coordinator	N	Technical & Business Support	TBS6	25
Evidence Supervisor	E	Management	MGMT5	16
Evidence Technician	N	Technical & Business Support	TBS6	25
Executive Assistant	N	Technical & Business Support	TBS7	24
Executive Director Ralston House	E	Management	MGMT8	15
Financial Business Analyst	E	Professional	PROF7	21
Financial Systems Analyst	E	Professional	PROF7	21
Fleet Equipment Technician	N	Labor, Trades, Crafts & Utilities	LTCU7	13
Fleet Lube Technician	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Fleet Manager	E	Management	MGMT8	15
Food and Beverage Manager	E	Management	MGMT7	16
Forensic Interviewer (Ralston House)	E	Professional	PROF5	22
Forestry Technician	N	Labor, Trades, Crafts & Utilities	LTCU6	13
GIS Analyst	E	Professional	PROF6	22
GIS Technician	N	Technical & Business Support	TBS6	25
Golf Course Computerized Irrigation Technician	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Golf Course Equipment Specialist	N	Labor, Trades, Crafts & Utilities	LTCU7	13
Golf Course Maintenance Worker	N	Labor, Trades, Crafts & Utilities	LTCU5	13

Title	Exempt or Non-Exempt	Job Family	Grade	Page
Golf Course Manager	E	Management	MGMT8	15
Golf Course Superintendent	E	Management	MGMT5	16
Golf Professional	E	Professional	PROF4	22
Grants Accountant	E	Professional	PROF5	22
Grants Administrator	E	Professional	PROF8	21
Grants Specialist (Ralston House)	E	Professional	PROF4	22
Head Golf Professional	E	Management	MGMT4	17
Homeless Navigator	N	Technical & Business Support	TBS7	24
Housing Choice Voucher Program Supervisor	E	Management	MGMT5	16
Housing Navigator	N	Technical & Business Support	TBS7	24
Housing Rehabilitation / Loan Specialist	E	Professional	PROF6	22
Housing Services Specialist	N	Technical & Business Support	TBS6	25
Housing Specialist	N	Technical & Business Support	TBS6	25
Human Resources Business Partner	E	Professional	PROF6	22
Human Resources Business Partner Manager	E	Management	MGMT7	16
Human Resources Coordinator	N	Technical & Business Support	TBS6	25
HVAC Specialist	N	Technical & Business Support	TBS9	24
Innovation and Performance Manager	E	Management	MGMT8	15
Irrigation Crew Supervisor	E	Management	MGMT5	16
Irrigation Maintenance Leadworker	N	Labor, Trades, Crafts & Utilities	LTCU8	13
Irrigation Maintenance Worker	N	Labor, Trades, Crafts & Utilities	LTCU5	13
IT Business Analyst	E	Information Technology	INFT3	11
IT Infrastructure Architect	E	Information Technology	INFT5	11
IT Project Manager	E	Information Technology	INFT2	11
Land Development Technician	N	Technical & Business Support	TBS8	24
Law Office Administrator	E	Management	MGMT6	16
Lead Crime Analyst	E	Professional	PROF7	21
Lead Master Fleet Technician	N	Labor, Trades, Crafts & Utilities	LTCU9	13
Legal Specialist	N	Technical & Business Support	TBS8	24
Liquor Licensing Control Administrator	N	Technical & Business Support	TBS8	24
Litigation Paralegal	N	Technical & Business Support	TBS9	24
Manager of City Facilities	E	Management	MGMT9	15
Manager of City Planning and Development	E	Management	MGMT9	15
Manager of Communications	E	Professional	PROF7	21
Manager of Communications and Marketing	E	Professional	PROF7	21
Manager of Golf Course Operations	E	Management	MGMT8	15
Manager of Housing Preservation and Resources	E	Management	MGMT8	15
Master Fleet Technician	N	Labor, Trades, Crafts & Utilities	LTCU8	13

Title	Exempt or Non-Exempt	Job Family	Grade	Page
Master Police Officer	N	Police	PDM	19
Media Services Manager	E	Management	MGMT5	16
Mobile Network Systems Administrator	E	Information Technology	INFT3	11
Mobility Planning and Innovation Manager	E	Management	MGMT8	15
Multi Media Technician	E	Professional	PROF4	22
Municipal Inspector Foreman	N	Technical & Business Support	TBS9	24
Municipal Inspector I	N	Technical & Business Support	TBS7	24
Municipal Inspector II	N	Technical & Business Support	TBS8	24
Municipal Services Worker	N	Labor, Trades, Crafts & Utilities	LTCU3	13
Nature Center Director	E	Management	MGMT5	16
Neighborhood Engagement Coordinator	E	Professional	PROF6	22
Network Systems Administrator	E	Information Technology	INFT3	11
NIBRS Data Specialist	N	Technical & Business Support	TBS6	25
Operations Supervisor	E	Management	MGMT6	16
Operations Support Supervisor	E	Management	MGMT7	16
Organizational Development Manager	E	Management	MGMT8	15
Parking and Travel Demand Management Coordinator	E	Professional	PROF7	21
Parks and Urban Design Manager	E	Management	MGMT8	15
Parks Maintenance Leadworker	N	Labor, Trades, Crafts & Utilities	LTCU8	13
Parks Manager	E	Management	MGMT8	15
Parks Program Manager	E	Management	MGMT5	16
Parks Supervisor	E	Management	MGMT5	16
Parks Worker II	N	Labor, Trades, Crafts & Utilities	LTCU5	13
Parks Worker III	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Parts Specialist	N	Labor, Trades, Crafts & Utilities	LTCU5	13
Patrol Investigative Specialist	N	Technical & Business Support	TBS7	24
Pavement Management Coordinator	E	Professional	PROF7	21
Pavement Manager	E	Management	MGMT7	16
Payroll Administrator	E	Professional	PROF7	21
Planner I	E	Professional	PROF5	22
Planner II	E	Professional	PROF6	22
Planning Technician	N	Technical & Business Support	TBS6	25
Plans Examiner I	N	Technical & Business Support	TBS8	24
Plans Examiner II	N	Technical & Business Support	TBS9	24
Plant Operator A	N	Labor, Trades, Crafts & Utilities	LTCU8	13
Plant Operator B	N	Labor, Trades, Crafts & Utilities	LTCU7	13
Plant Operator C	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Plant Operator D	N	Labor, Trades, Crafts & Utilities	LTCU5	13

Title	Exempt or Non-Exempt	Job Family	Grade	Page
Plant Supervisor - SCADA	E	Management	MGMT7	16
Police Accrediation Coordinator	N	Technical & Business Support	TBS6	25
Police Civilian Operations Manager	E	Management	MGMT8	15
Police Civilian Operations Supervisor	E	Management	MGMT5	16
Police Commander	E	Police	PD4	19
Police Courier	N	Technical & Business Support	TBS3	25
Police Equipment Coordinator	N	Technical & Business Support	TBS6	25
Police Lieutenant	E	Police	PD3	19
Police Officer	N	Police	PD1	19
Police Records Specialist	N	Technical & Business Support	TBS4	25
Police Recruit I	N	Police	PR1	19
Police Recruit II	N	Police	PR2	19
Police Recruiter	E	Professional	PROF6	22
Police Sergeant	N	Police	PD2	19
Police Services Technician	N	Technical & Business Support	TBS5	25
Police Training Coordinator	N	Technical & Business Support	TBS6	25
Printing Technician	N	Technical & Business Support	TBS6	25
Procurement Specialist	E	Professional	PROF5	22
Public Works Project Manager	E	Professional	PROF8	21
Purchasing Manager	E	Management	MGMT8	15
Radio Communications Administrator	E	Information Technology	INFT3	11
Ralston House Manager	E	Management	MGMT6	16
Records Management Coordinator	E	Professional	PROF7	21
Recruiting and Onboarding Manager	E	Management	MGMT6	16
Restaurant Manager	E	Management	MGMT3	17
Revenue Manager	E	Management	MGMT8	15
Revenue Technician	N	Technical & Business Support	TBS5	25
Risk and Claims Analyst	E	Professional	PROF6	22
Risk and Safety Manager	E	Management	MGMT8	15
Sales Coordinator	E	Professional	PROF5	22
Sales Tax Auditor	E	Professional	PROF6	22
Sales Tax Auditor Supervisor	E	Management	MGMT6	16
SCADA Process and Controls Technician I	N	Technical & Business Support	TBS9	24
SCADA Process and Controls Technician II	N	Technical & Business Support	TBS10	24
Security Operations Analyst	E	Information Technology	INFT4	11
Senior Assistant City Attorney	E	Professional	PROF11	21
Senior Civil Designer	N	Technical & Business Support	TBS9	24
Senior Customer Information Specialist	N	Technical & Business Support	TBS5	25

Title	Exempt or Non-Exempt	Job Family	Grade	Page
Senior Database Administrator	E	Information Technology	INFT5	11
Senior Economic Development Specialist	E	Professional	PROF7	21
Senior GIS Analyst	E	Professional	PROF7	21
Senior Human Resources Coordinator	N	Technical & Business Support	TBS7	24
Senior IT Project Manager	E	Information Technology	INFT5	11
Senior Landscape Architect	E	Professional	PROF8	21
Senior Network Engineer	E	Information Technology	INFT4	11
Senior Network Systems Administrator	E	Information Technology	INFT4	11
Senior Planner	E	Professional	PROF8	21
Senior Probation Officer	E	Professional	PROF6	22
Senior Procurement Specialist	E	Professional	PROF6	22
Senior SQL Data Analyst/Developer	E	Information Technology	INFT5	11
Senior Survey Technician	N	Technical & Business Support	TBS7	24
Senior Technical Support Analyst	N	Technical & Business Support	TBS8	24
Senior Utilities Design Engineer	E	Professional	PROF10	21
Service Desk Manager	E	Management	MGMT7	16
Software Developer	E	Information Technology	INFT5	11
Sous Chef / Kitchen Manager	E	Management	MGMT3	17
Special Events Associate (Ralston House)	N	Technical & Business Support	TBS6	25
Special Events Coordinator	E	Professional	PROF5	22
Storeskeeper	N	Technical & Business Support	TBS5	25
Stormwater Administrator	E	Management	MGMT8	15
Stormwater Inspector II	N	Technical & Business Support	TBS8	24
Stormwater Regulatory Analyst	E	Professional	PROF6	22
Streets Foreman	N	Labor, Trades, Crafts & Utilities	LTCU9	13
Streets Manager	E	Management	MGMT8	15
Streets Supervisor	E	Management	MGMT6	16
Streets Technician I	N	Labor, Trades, Crafts & Utilities	LTCU4	13
Streets Technician II	N	Labor, Trades, Crafts & Utilities	LTCU5	13
Streets Technician III	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Streets Technician IV	N	Labor, Trades, Crafts & Utilities	LTCU7	13
Survey Party Chief	N	Management	MGMT4	17
Survey Technician	N	Technical & Business Support	TBS6	25
Systems and Administrative Manager	E	Management	MGMT6	16
Technical Support Analyst	N	Technical & Business Support	TBS7	24
Technology and Project Services Manager	E	Management	MGMT10	15
Technology Infrastructure and Operations Manager	E	Management	MGMT10	15
Traffic Crew Foreman	N	Labor, Trades, Crafts & Utilities	LTCU9	13

Title	Exempt or Non-Exempt	Job Family	Grade	Page
Traffic Engineer I	E	Professional	PROF7	21
Traffic Engineer II	E	Professional	PROF8	21
Traffic Engineer III	E	Professional	PROF9	21
Traffic Engineer IV	E	Professional	PROF10	21
Traffic Field Operations Supervisor	E	Management	MGMT6	16
Traffic Technician I	N	Labor, Trades, Crafts & Utilities	LTCU5	13
Traffic Technician II	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Transportation Planner	E	Professional	PROF6	22
Utilities Business Manager	E	Management	MGMT8	15
Utilities Systems Analyst Supervisor	E	Management	MGMT6	16
Utility Foreman	N	Labor, Trades, Crafts & Utilities	LTCU9	13
Utility Supervisor	E	Management	MGMT6	16
Utility System Technician I	N	Labor, Trades, Crafts & Utilities	LTCU4	13
Utility System Technician II	N	Labor, Trades, Crafts & Utilities	LTCU5	13
Utility System Technician III	N	Labor, Trades, Crafts & Utilities	LTCU6	13
Utility System Technician IV	N	Labor, Trades, Crafts & Utilities	LTCU7	13
Utility Systems Analyst	E	Professional	PROF7	21
Victim-Family Support Advocate (Ralston House)	N	Technical & Business Support	TBS7	24
Wastewater and Stormwater Manager	E	Management	MGMT8	15
Water Quality Administrator	E	Management	MGMT6	16
Water Quality Analyst	N	Technical & Business Support	TBS8	24
Water Quality Scientist	E	Professional	PROF6	22
Water Quality Technician I	N	Technical & Business Support	TBS6	25
Water Quality Technician II	N	Technical & Business Support	TBS7	24
Water Resources Administrator	E	Management	MGMT8	15
Water Resources Analyst	E	Professional	PROF6	22
Water System Manager	E	Management	MGMT8	15
Water Treatment Manager	E	Management	MGMT8	15
Web Architect	E	Information Technology	INFT3	11
Web Systems Administrator	E	Information Technology	INFT3	11
SALARY SCHEDULES				
ANNUAL				27
MONTHLY				29
BI-WEEKLY				31
HOURLY				33

EXECUTIVE JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Deputy City Manager	EXEC9	\$ 154,155	\$ 181,322	\$ 210,783	\$12,846.24	\$17,565.26	\$5,929.03	\$6,973.92	\$ 74.11	\$ 101.34
Chief of Police	EXEC8	\$ 148,226	\$ 174,348	\$ 202,676	\$12,352.15	\$16,889.67	\$5,700.99	\$6,705.69	\$ 71.26	\$ 97.44
Chief Information Officer	EXEC7	\$ 140,498	\$ 165,259	\$ 192,110	\$11,708.20	\$16,009.17	\$5,403.79	\$6,356.10	\$ 67.55	\$ 92.36
Director of Community and Economic Development										
Director of Finance										
Director of Human Resources										
Director of Public Works										
Director of Utilities										
Director of Vibrant Community and Neighborhoods										
City Clerk	EXEC4	\$ 108,680	\$ 127,833	\$ 148,603	\$9,056.66	\$12,383.60	\$4,180.00	\$4,916.65	\$ 52.25	\$ 71.44

EXECUTIVE

ANNUAL

	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$ 86,619	3.75%	\$ 89,867	3.50%	\$ 93,013	3.25%	\$ 96,035	3.0%	\$ 98,917	3.0%	\$ 101,884	3.0%	\$ 104,941	3.0%	\$ 108,089	2.50%	\$ 110,791	2.50%	\$ 113,561	2.25%	\$ 116,116	2.0%	\$ 118,438
EXEC2	\$ 93,600	3.75%	\$ 97,110	3.50%	\$ 100,509	3.25%	\$ 103,776	3.0%	\$ 106,889	3.0%	\$ 110,096	3.0%	\$ 113,399	3.0%	\$ 116,801	2.50%	\$ 119,721	2.50%	\$ 122,714	2.25%	\$ 125,475	2.0%	\$ 127,984
EXEC3	\$ 101,145	3.75%	\$ 104,938	3.50%	\$ 108,610	3.25%	\$ 112,140	3.0%	\$ 115,504	3.0%	\$ 118,970	3.0%	\$ 122,539	3.0%	\$ 126,215	2.50%	\$ 129,370	2.50%	\$ 132,604	2.25%	\$ 135,588	2.0%	\$ 138,300
EXEC4	\$ 108,680	3.75%	\$ 112,755	3.50%	\$ 116,702	3.25%	\$ 120,495	3.0%	\$ 124,110	3.0%	\$ 127,833	3.0%	\$ 131,668	3.0%	\$ 135,618	2.50%	\$ 139,008	2.50%	\$ 142,484	2.25%	\$ 145,689	2.0%	\$ 148,603
EXEC5	\$ 118,092	3.75%	\$ 122,520	3.50%	\$ 126,808	3.25%	\$ 130,930	3.0%	\$ 134,857	3.0%	\$ 138,903	3.0%	\$ 143,070	3.0%	\$ 147,362	2.50%	\$ 151,046	2.50%	\$ 154,823	2.25%	\$ 158,306	2.0%	\$ 161,472
EXEC6	\$ 127,610	3.75%	\$ 132,395	3.50%	\$ 137,029	3.25%	\$ 141,482	3.0%	\$ 145,727	3.0%	\$ 150,099	3.0%	\$ 154,602	3.0%	\$ 159,240	2.50%	\$ 163,221	2.50%	\$ 167,301	2.25%	\$ 171,066	2.0%	\$ 174,487
EXEC7	\$ 140,498	3.75%	\$ 145,767	3.50%	\$ 150,869	3.25%	\$ 155,772	3.0%	\$ 160,445	3.0%	\$ 165,259	3.0%	\$ 170,216	3.0%	\$ 175,323	2.50%	\$ 179,706	2.50%	\$ 184,199	2.25%	\$ 188,343	2.0%	\$ 192,110
EXEC8	\$ 148,226	3.75%	\$ 153,784	3.50%	\$ 159,167	3.25%	\$ 164,340	3.0%	\$ 169,270	3.0%	\$ 174,348	3.0%	\$ 179,578	3.0%	\$ 184,966	2.50%	\$ 189,590	2.50%	\$ 194,330	2.25%	\$ 198,702	2.0%	\$ 202,676
EXEC9	\$ 154,155	3.75%	\$ 159,936	3.50%	\$ 165,533	3.25%	\$ 170,913	3.0%	\$ 176,041	3.0%	\$ 181,322	3.0%	\$ 186,762	3.0%	\$ 192,364	2.50%	\$ 197,173	2.50%	\$ 202,103	2.25%	\$ 206,650	2.0%	\$ 210,783

MONTHLY

	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$7,218.25	3.75%	\$7,488.93	3.5%	\$7,751.05	3.25%	\$8,002.96	3.0%	\$8,243.04	3.0%	\$8,490.34	3.0%	\$8,745.05	3.0%	\$9,007.40	2.5%	\$9,232.58	2.5%	\$9,463.40	2.25%	\$9,676.32	2.0%	\$9,869.85
EXEC2	\$7,800.04	3.75%	\$8,092.54	3.5%	\$8,375.78	3.25%	\$8,647.99	3.0%	\$8,907.43	3.0%	\$9,174.66	3.0%	\$9,449.90	3.0%	\$9,733.39	2.5%	\$9,976.73	2.5%	\$10,226.15	2.25%	\$10,456.23	2.0%	\$10,665.36
EXEC3	\$8,428.72	3.75%	\$8,744.80	3.5%	\$9,050.87	3.25%	\$9,345.02	3.0%	\$9,625.37	3.0%	\$9,914.13	3.0%	\$10,211.56	3.0%	\$10,517.90	2.5%	\$10,780.85	2.5%	\$11,050.37	2.25%	\$11,299.01	2.0%	\$11,524.99
EXEC4	\$9,056.66	3.75%	\$9,396.29	3.5%	\$9,725.16	3.25%	\$10,041.23	3.0%	\$10,342.46	3.0%	\$10,652.74	3.0%	\$10,972.32	3.0%	\$11,301.49	2.5%	\$11,584.03	2.5%	\$11,873.63	2.25%	\$12,140.78	2.0%	\$12,383.60
EXEC5	\$9,840.97	3.75%	\$10,210.01	3.5%	\$10,567.36	3.25%	\$10,910.80	3.0%	\$11,238.12	3.0%	\$11,575.26	3.0%	\$11,922.52	3.0%	\$12,280.20	2.5%	\$12,587.20	2.5%	\$12,901.88	2.25%	\$13,192.17	2.0%	\$13,456.02
EXEC6	\$10,634.15	3.75%	\$11,032.93	3.5%	\$11,419.09	3.25%	\$11,790.21	3.0%	\$12,143.91	3.0%	\$12,508.23	3.0%	\$12,883.48	3.0%	\$13,269.98	2.5%	\$13,601.73	2.5%	\$13,941.77	2.25%	\$14,255.46	2.0%	\$14,540.57
EXEC7	\$11,708.20	3.75%	\$12,147.26	3.5%	\$12,572.41	3.25%	\$12,981.02	3.0%	\$13,370.45	3.0%	\$13,771.56	3.0%	\$14,184.71	3.0%	\$14,610.25	2.5%	\$14,975.51	2.5%	\$15,349.89	2.25%	\$15,695.27	2.0%	\$16,009.17
EXEC8	\$12,352.15	3.75%	\$12,815.36	3.5%	\$13,263.90	3.25%	\$13,694.97	3.0%	\$14,105.82	3.0%	\$14,529.00	3.0%	\$14,964.87	3.0%	\$15,413.81	2.5%	\$15,799.16	2.5%	\$16,194.14	2.25%	\$16,558.50	2.0%	\$16,889.67
EXEC9	\$12,846.24	3.75%	\$13,327.97	3.5%	\$13,794.45	3.25%	\$14,242.77	3.0%	\$14,670.05	3.0%	\$15,110.16	3.0%	\$15,563.46	3.0%	\$16,030.37	2.5%	\$16,431.12	2.5%	\$16,841.90	2.25%	\$17,220.85	2.0%	\$17,565.26

BIWEEKLY

	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$ 3,331.50	3.75%	\$ 3,456.43	3.50%	\$ 3,577.41	3.25%	\$ 3,693.67	3.0%	\$ 3,804.48	3.0%	\$ 3,918.62	3.0%	\$ 4,036.17	3.0%	\$ 4,157.26	2.50%	\$ 4,261.19	2.50%	\$ 4,367.72	2.25%	\$ 4,465.99	2.0%	\$ 4,555.31
EXEC2	\$ 3,600.02	3.75%	\$ 3,735.02	3.50%	\$ 3,865.74	3.25%	\$ 3,991.38	3.0%	\$ 4,111.12	3.0%	\$ 4,234.46	3.0%	\$ 4,361.49	3.0%	\$ 4,492.34	2.50%	\$ 4,604.64	2.50%	\$ 4,719.76	2.25%	\$ 4,825.95	2.0%	\$ 4,922.47
EXEC3	\$ 3,890.18	3.75%	\$ 4,036.06	3.50%	\$ 4,177.32	3.25%	\$ 4,313.09	3.0%	\$ 4,442.48	3.0%	\$ 4,575.75	3.0%	\$ 4,713.03	3.0%	\$ 4,854.42	2.50%	\$ 4,975.78	2.50%	\$ 5,100.17	2.25%	\$ 5,214.93	2.0%	\$ 5,319.22
EXEC4	\$ 4,180.00	3.75%	\$ 4,336.75	3.50%	\$ 4,488.53	3.25%	\$ 4,634.41	3.0%	\$ 4,773.44	3.0%	\$ 4,916.65	3.0%	\$ 5,064.15	3.0%	\$ 5,216.07	2.50%	\$ 5,346.47	2.50%	\$ 5,480.14	2.25%	\$ 5,603.44	2.0%	\$ 5,715.51
EXEC5	\$ 4,541.99	3.75%	\$ 4,712.31	3.50%	\$ 4,877.24	3.25%	\$ 5,035.75	3.0%	\$ 5,186.82	3.0%	\$ 5,342.43	3.0%	\$ 5,502.70	3.0%	\$ 5,667.78	2.50%	\$ 5,809.48	2.50%	\$ 5,954.71	2.25%	\$ 6,088.70	2.0%	\$ 6,210.47
EXEC6	\$ 4,908.07	3.75%	\$ 5,092.12	3.50%	\$ 5,270.35	3.25%	\$ 5,441.63	3.0%	\$ 5,604.88	3.0%	\$ 5,773.03	3.0%	\$ 5,946.22	3.0%	\$ 6,124.61	2.50%	\$ 6,277.72	2.50%	\$ 6,434.66	2.25%	\$ 6,579.44	2.0%	\$ 6,711.03
EXEC7	\$ 5,403.79	3.75%	\$ 5,606.43	3.50%	\$ 5,802.65	3.25%	\$ 5,991.24	3.0%	\$ 6,170.98	3.0%	\$ 6,356.10	3.0%	\$ 6,546.79	3.0%	\$ 6,743.19	2.50%	\$ 6,911.77	2.50%	\$ 7,084.57	2.25%	\$ 7,243.97	2.0%	\$ 7,388.85
EXEC8	\$ 5,700.99	3.75%	\$ 5,914.78	3.50%	\$ 6,121.80	3.25%	\$ 6,320.76	3.0%	\$ 6,510.38	3.0%	\$ 6,705.69	3.0%	\$ 6,906.86	3.0%	\$ 7,114.07	2.50%	\$ 7,291.92	2.50%	\$ 7,474.22	2.25%	\$ 7,642.39	2.0%	\$ 7,795.23
EXEC9	\$ 5,929.03	3.75%	\$ 6,151.37	3.50%	\$ 6,366.67	3.25%	\$ 6,573.59	3.0%	\$ 6,770.79	3.0%	\$ 6,973.92	3.0%	\$ 7,183.14	3.0%	\$ 7,398.63	2.50%	\$ 7,583.60	2.50%	\$ 7,773.19	2.25%	\$ 7,948.08	2.0%	\$ 8,107.04

HOURLY

	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$ 41.64375	3.75%	\$ 43.20539	3.50%	\$ 44.71757	3.25%	\$ 46.17090	3.0%	\$ 47.55602	3.0%	\$ 48.98270	3.0%	\$ 50.45218	3.0%	\$ 51.96575	2.50%	\$ 53.26489	2.50%	\$ 54.59652	2.25%	\$ 55.82494	2.0%	\$ 56.94144
EXEC2	\$ 45.00023	3.75%	\$ 46.68774	3.50%	\$ 48.32181	3.25%	\$ 49.89227	3.0%	\$ 51.38904	3.0%	\$ 52.93071	3.0%	\$ 54.51863	3.0%	\$ 56.15419	2.50%	\$ 57.55804	2.50%	\$ 58.99699	2.25%	\$ 60.32443	2.0%	\$ 61.53092
EXEC3	\$ 48.62725	3.75%	\$ 50.45077	3.50%	\$ 52.21655	3.25%	\$ 53.91359	3.0%	\$ 55.53099	3.0%	\$ 57.19692	3.0%	\$ 58.91283	3.0%	\$ 60.68022	2.50%	\$ 62.19722	2.50%	\$ 63.75215	2.25%	\$ 65.18658	2.0%	\$ 66.49031
EXEC4	\$ 52.24998	3.75%	\$ 54.20935	3.50%	\$ 56.10668	3.25%	\$ 57.93015	3.0%	\$ 59.66805	3.0%	\$ 61.45809	3.0%	\$ 63.30184	3.0%	\$ 65.20089	2.50%	\$ 66.83091	2.50%	\$ 68.50169	2.25%	\$ 70.04298	2.0%	\$ 71.44384
EXEC5	\$ 56.77483	3.75%	\$ 58.90388	3.50%	\$ 60.96552	3.25%	\$ 62.94690	3.0%	\$ 64.83531	3.0%	\$ 66.78037	3.0%	\$ 68.78378	3.0%	\$ 70.84729	2.50%	\$ 72.61847	2.50%	\$ 74.43393	2.25%	\$ 76.10870	2.0%	\$ 77.63087
EXEC6	\$ 61.35088	3.75%	\$ 63.65154	3.50%	\$ 65.87934	3.25%	\$ 68.02042	3.0%	\$ 70.06103	3.0%	\$ 72.16286	3.0%	\$ 74.32775	3.0%	\$ 76.55758	2.50%	\$ 78.47152	2.50%	\$ 80.43331	2.25%	\$ 82.24306	2.0%	\$ 83.88792
EXEC7	\$ 67.54732	3.75%	\$ 70.08034	3.50%	\$ 72.53315	3.25%	\$ 74.89048	3.0%	\$ 77.13720	3.0%	\$ 79.45131	3.0%	\$ 81.83485	3.0%	\$ 84.28990	2.50%	\$ 86.39714	2.50%	\$ 88.55707	2.25%	\$ 90.54961	2.0%	\$ 92.36060
EXEC8	\$ 71.26242	3.75%	\$ 73.93476	3.50%	\$ 76.52248	3.25%	\$ 79.00946	3.0%	\$ 81.37974	3.0%	\$ 83.82113	3.0%	\$ 86.33577	3.0%	\$ 88.92584	2.50%	\$ 91.14899	2.50%	\$ 93.42771	2.25%	\$ 95.52984	2.0%	\$ 97.44043
EXEC9	\$ 74.11292	3.75%	\$ 76.89215	3.50%	\$ 79.58338	3.25%	\$ 82.16984	3.0%	\$ 84.63493	3.0%	\$ 87.17398	3.0%	\$ 89.78920	3.0%	\$ 92.48288	2.50%	\$ 94.79495	2.50%	\$ 97.16482	2.25%	\$ 99.35103	2.0%	\$ 101.33805

INFORMATION TECHNOLOGY JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
IT Infrastructure Architect	INFT5	\$ 101,055	\$ 118,864	\$ 138,177	\$8,421.26	\$11,514.78	\$3,886.73	\$5,314.51	\$ 48.58	\$66.43
Senior Database Administrator										
Senior IT Project Manager										
Software Developer										
Senior SQL Data Analyst/Developer										
Senior Network Engineer	INFT4	\$ 93,397	\$ 109,856	\$ 127,706	\$7,783.05	\$10,642.13	\$3,592.18	\$4,911.75	\$ 44.90	\$ 61.40
Security Operations Analyst										
Cloud Systems Administrator										
Senior Network Systems Administrator										
Applications Systems Administrator	INFT3	\$ 86,318	\$ 101,531	\$ 118,027	\$7,193.21	\$9,835.61	\$3,319.94	\$4,539.51	\$ 41.50	\$ 56.74
IT Business Analyst										
Mobile Network Systems Administrator										
Network Systems Administrator										
Radio Communications Administrator										
Web Architect										
Web Systems Administrator										
IT Project Manager	INFT2	\$ 79,777	\$ 93,836	\$ 109,083	\$6,648.06	\$9,090.21	\$3,068.34	\$4,195.48	\$ 38.35	\$ 52.44

INFORMATION TECHNOLOGY

ANNUAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$ 73,731	3.75%	\$ 76,496	3.50%	\$ 79,173	3.25%	\$ 81,746	3.00%	\$ 84,199	3.00%	\$ 86,725	3.00%	\$ 89,326	3.00%	\$ 92,006	2.50%	\$ 94,306	2.50%	\$ 96,664	2.25%	\$ 98,839	2.00%	\$ 100,816
INFT2	\$ 79,777	3.75%	\$ 82,768	3.50%	\$ 85,665	3.25%	\$ 88,449	3.00%	\$ 91,103	3.00%	\$ 93,836	3.00%	\$ 96,651	3.00%	\$ 99,551	2.50%	\$ 102,039	2.50%	\$ 104,590	2.25%	\$ 106,944	2.00%	\$ 109,083
INFT3	\$ 86,318	3.75%	\$ 89,555	3.50%	\$ 92,690	3.25%	\$ 95,702	3.00%	\$ 98,573	3.00%	\$ 101,531	3.00%	\$ 104,576	3.00%	\$ 107,714	2.50%	\$ 110,407	2.50%	\$ 113,167	2.25%	\$ 115,713	2.00%	\$ 118,027
INFT4	\$ 93,397	3.75%	\$ 96,899	3.50%	\$ 100,290	3.25%	\$ 103,550	3.00%	\$ 106,656	3.00%	\$ 109,856	3.00%	\$ 113,152	3.00%	\$ 116,546	2.50%	\$ 119,460	2.50%	\$ 122,446	2.25%	\$ 125,201	2.00%	\$ 127,706
INFT5	\$ 101,055	3.75%	\$ 104,845	3.50%	\$ 108,514	3.25%	\$ 112,041	3.00%	\$ 115,402	3.00%	\$ 118,864	3.00%	\$ 122,430	3.00%	\$ 126,103	2.50%	\$ 129,256	2.50%	\$ 132,487	2.25%	\$ 135,468	2.00%	\$ 138,177

MONTHLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$6,144.24	3.75%	\$6,374.65	3.5%	\$6,597.76	3.25%	\$6,812.19	3.0%	\$7,016.55	3.0%	\$7,227.05	3.0%	\$7,443.86	3.0%	\$7,667.17	2.5%	\$7,858.85	2.5%	\$8,055.33	2.25%	\$8,236.57	2.0%	\$8,401.30
INFT2	\$6,648.06	3.75%	\$6,897.37	3.5%	\$7,138.77	3.25%	\$7,370.78	3.0%	\$7,591.91	3.0%	\$7,819.67	3.0%	\$8,054.26	3.0%	\$8,295.88	2.5%	\$8,503.28	2.5%	\$8,715.86	2.25%	\$8,911.97	2.0%	\$9,090.21
INFT3	\$7,193.21	3.75%	\$7,462.95	3.5%	\$7,724.15	3.25%	\$7,975.19	3.0%	\$8,214.44	3.0%	\$8,460.88	3.0%	\$8,714.70	3.0%	\$8,976.15	2.5%	\$9,200.55	2.5%	\$9,430.56	2.25%	\$9,642.75	2.0%	\$9,835.61
INFT4	\$7,783.05	3.75%	\$8,074.91	3.5%	\$8,357.53	3.25%	\$8,629.15	3.0%	\$8,888.03	3.0%	\$9,154.67	3.0%	\$9,429.31	3.0%	\$9,712.19	2.5%	\$9,954.99	2.5%	\$10,203.87	2.25%	\$10,433.46	2.0%	\$10,642.13
INFT5	\$8,421.26	3.75%	\$8,737.06	3.5%	\$9,042.85	3.25%	\$9,336.75	3.0%	\$9,616.85	3.0%	\$9,905.35	3.0%	\$10,202.51	3.0%	\$10,508.59	2.5%	\$10,771.30	2.5%	\$11,040.59	2.25%	\$11,289.00	2.0%	\$11,514.78

BIWEEKLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$ 2,835.80	3.75%	\$ 2,942.14	3.50%	\$ 3,045.12	3.25%	\$ 3,144.09	3.00%	\$ 3,238.41	3.00%	\$ 3,335.56	3.00%	\$ 3,435.63	3.00%	\$ 3,538.70	2.50%	\$ 3,627.16	2.50%	\$ 3,717.84	2.25%	\$ 3,801.49	2.0%	\$ 3,877.52
INFT2	\$ 3,068.34	3.75%	\$ 3,183.40	3.50%	\$ 3,294.82	3.25%	\$ 3,401.90	3.00%	\$ 3,503.96	3.00%	\$ 3,609.08	3.00%	\$ 3,717.35	3.00%	\$ 3,828.87	2.50%	\$ 3,924.59	2.50%	\$ 4,022.71	2.25%	\$ 4,113.22	2.0%	\$ 4,195.48
INFT3	\$ 3,319.94	3.75%	\$ 3,444.44	3.50%	\$ 3,564.99	3.25%	\$ 3,680.86	3.00%	\$ 3,791.28	3.00%	\$ 3,905.02	3.00%	\$ 4,022.17	3.00%	\$ 4,142.84	2.50%	\$ 4,246.41	2.50%	\$ 4,352.57	2.25%	\$ 4,450.50	2.0%	\$ 4,539.51
INFT4	\$ 3,592.18	3.75%	\$ 3,726.88	3.50%	\$ 3,857.32	3.25%	\$ 3,982.69	3.00%	\$ 4,102.17	3.00%	\$ 4,225.23	3.00%	\$ 4,351.99	3.00%	\$ 4,482.55	2.50%	\$ 4,594.61	2.50%	\$ 4,709.48	2.25%	\$ 4,815.44	2.0%	\$ 4,911.75
INFT5	\$ 3,886.73	3.75%	\$ 4,032.49	3.50%	\$ 4,173.62	3.25%	\$ 4,309.27	3.00%	\$ 4,438.54	3.00%	\$ 4,571.70	3.00%	\$ 4,708.85	3.00%	\$ 4,850.12	2.50%	\$ 4,971.37	2.50%	\$ 5,095.66	2.25%	\$ 5,210.31	2.0%	\$ 5,314.51

HOURLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$ 35.44752	3.75%	\$ 36.77680	3.50%	\$ 38.06399	3.25%	\$ 39.30107	3.00%	\$ 40.48010	3.00%	\$ 41.69450	3.00%	\$ 42.94534	3.00%	\$ 44.23370	2.50%	\$ 45.33954	2.50%	\$ 46.47303	2.25%	\$ 47.51867	2.00%	\$ 48.46905
INFT2	\$ 38.35422	3.75%	\$ 39.79250	3.50%	\$ 41.18524	3.25%	\$ 42.52376	3.00%	\$ 43.79947	3.00%	\$ 45.11345	3.00%	\$ 46.46686	3.00%	\$ 47.86086	2.50%	\$ 49.05739	2.50%	\$ 50.28382	2.25%	\$ 51.41521	2.00%	\$ 52.44351
INFT3	\$ 41.49926	3.75%	\$ 43.05548	3.50%	\$ 44.56243	3.25%	\$ 46.01071	3.00%	\$ 47.39103	3.00%	\$ 48.81276	3.00%	\$ 50.27714	3.00%	\$ 51.78545	2.50%	\$ 53.08009	2.50%	\$ 54.40709	2.25%	\$ 55.63125	2.00%	\$ 56.74388
INFT4	\$ 44.90220	3.75%	\$ 46.58603	3.50%	\$ 48.21655	3.25%	\$ 49.78358	3.00%	\$ 51.27709	3.00%	\$ 52.81540	3.00%	\$ 54.39987	3.00%	\$ 56.03186	2.50%	\$ 57.43266	2.50%	\$ 58.86847	2.25%	\$ 60.19302	2.00%	\$ 61.39688
INFT5	\$ 48.58418	3.75%	\$ 50.40609	3.50%	\$ 52.17030	3.25%	\$ 53.86584	3.00%	\$ 55.48181	3.00%	\$ 57.14627	3.00%	\$ 58.86065	3.00%	\$ 60.62647	2.50%	\$ 62.14214	2.50%	\$ 63.69569	2.25%	\$ 65.12884	2.00%	\$ 66.43142

LABOR, TRADES, CRAFTS AND UTILITIES JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Electro Mechanical Technician Lead Master Fleet Technician Streets Foreman Traffic Crew Foreman Utility Foreman	LTCU9	\$ 64,069	\$ 75,360	\$ 87,604	\$5,339.06	\$7,300.34	\$2,464.18	\$3,369.39	\$ 30.80	\$ 42.12
Irrigation Maintenance Leadworker Master Fleet Technician Parks Maintenance Leadworker Plant Operator A	LTCU8	\$ 58,117	\$ 68,360	\$ 79,467	\$4,843.12	\$6,622.23	\$2,235.29	\$3,056.41	\$ 27.94	\$ 38.21
Fleet Equipment Technician Golf Course Equipment Specialist Plant Operator B Streets Technician IV Utility System Technician IV	LTCU7	\$ 52,719	\$ 62,010	\$ 72,085	\$4,393.25	\$6,007.10	\$2,027.65	\$2,772.51	\$ 25.35	\$ 34.66
Building Craftworker Fleet Lube Technician Forestry Technician Golf Course Computerized Irrigation Technician Plant Operator C Parks Worker III Streets Technician III Traffic Technician II Utility System Technician III	LTCU6	\$ 47,822	\$ 56,250	\$ 65,389	\$3,985.17	\$5,449.11	\$1,839.31	\$2,514.97	\$ 22.99	\$ 31.44
Craftworker Golf Course Maintenance Worker Irrigation Maintenance Worker Parks Worker II Parts Specialist Plant Operator D Streets Technician II Traffic Technician I Utility System Technician II	LTCU5	\$ 43,380	\$ 51,025	\$ 59,315	\$3,615.00	\$4,942.95	\$1,668.46	\$2,281.36	\$ 20.86	\$ 28.52
Building Maintenance Worker Streets Technician I Utility System Technician I	LTCU4	\$ 39,350	\$ 46,285	\$ 53,806	\$3,279.20	\$4,483.81	\$1,513.48	\$2,069.45	\$ 18.92	\$ 25.87
Municipal Services Worker	LTCU3	\$ 35,695	\$ 41,986	\$ 48,808	\$2,974.61	\$4,067.32	\$1,372.89	\$1,877.22	\$ 17.16	\$ 23.47
Custodian	LTCU2	\$ 32,380	\$ 38,086	\$ 44,274	\$2,698.30	\$3,689.51	\$1,245.37	\$1,702.85	\$ 15.57	\$ 21.29

LABOR, TRADES, CRAFTS AND UTILITIES

ANNUAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$ 29,372	3.75%	\$ 30,473	3.50%	\$ 31,540	3.25%	\$ 32,565	3.0%	\$ 33,542	3.0%	\$ 34,548	3.0%	\$ 35,585	3.0%	\$ 36,652	2.5%	\$ 37,568	2.5%	\$ 38,508	2.25%	\$ 39,374	2.0%	\$ 40,162
LTCU2	\$ 32,380	3.75%	\$ 33,594	3.50%	\$ 34,770	3.25%	\$ 35,900	3.0%	\$ 36,977	3.0%	\$ 38,086	3.0%	\$ 39,228	3.0%	\$ 40,405	2.5%	\$ 41,415	2.5%	\$ 42,451	2.25%	\$ 43,406	2.0%	\$ 44,274
LTCU3	\$ 35,695	3.75%	\$ 37,034	3.50%	\$ 38,330	3.25%	\$ 39,576	3.0%	\$ 40,763	3.0%	\$ 41,986	3.0%	\$ 43,245	3.0%	\$ 44,543	2.5%	\$ 45,656	2.5%	\$ 46,798	2.25%	\$ 47,851	2.0%	\$ 48,808
LTCU4	\$ 39,350	3.75%	\$ 40,826	3.50%	\$ 42,255	3.25%	\$ 43,628	3.0%	\$ 44,937	3.0%	\$ 46,285	3.0%	\$ 47,674	3.0%	\$ 49,104	2.5%	\$ 50,332	2.5%	\$ 51,590	2.25%	\$ 52,751	2.0%	\$ 53,806
LTCU5	\$ 43,380	3.75%	\$ 45,007	3.50%	\$ 46,582	3.25%	\$ 48,096	3.0%	\$ 49,539	3.0%	\$ 51,025	3.0%	\$ 52,556	3.0%	\$ 54,132	2.5%	\$ 55,486	2.5%	\$ 56,873	2.25%	\$ 58,152	2.0%	\$ 59,315
LTCU6	\$ 47,822	3.75%	\$ 49,615	3.50%	\$ 51,352	3.25%	\$ 53,021	3.0%	\$ 54,611	3.0%	\$ 56,250	3.0%	\$ 57,937	3.0%	\$ 59,675	2.5%	\$ 61,167	2.5%	\$ 62,697	2.25%	\$ 64,107	2.0%	\$ 65,389
LTCU7	\$ 52,719	3.75%	\$ 54,696	3.50%	\$ 56,610	3.25%	\$ 58,450	3.0%	\$ 60,204	3.0%	\$ 62,010	3.0%	\$ 63,870	3.0%	\$ 65,786	2.5%	\$ 67,431	2.5%	\$ 69,117	2.25%	\$ 70,672	2.0%	\$ 72,085
LTCU8	\$ 58,117	3.75%	\$ 60,297	3.50%	\$ 62,407	3.25%	\$ 64,435	3.0%	\$ 66,369	3.0%	\$ 68,360	3.0%	\$ 70,410	3.0%	\$ 72,523	2.5%	\$ 74,336	2.5%	\$ 76,194	2.25%	\$ 77,909	2.0%	\$ 79,467
LTCU9	\$ 64,069	3.75%	\$ 66,471	3.50%	\$ 68,798	3.25%	\$ 71,034	3.0%	\$ 73,165	3.0%	\$ 75,360	3.0%	\$ 77,620	3.0%	\$ 79,949	2.5%	\$ 81,948	2.5%	\$ 83,996	2.25%	\$ 85,886	2.0%	\$ 87,604

MONTHLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$2,447.66	3.75%	\$2,539.45	3.5%	\$2,628.33	3.25%	\$2,713.75	3.0%	\$2,795.16	3.0%	\$2,879.01	3.0%	\$2,965.39	3.0%	\$3,054.35	2.5%	\$3,130.71	2.5%	\$3,208.97	2.25%	\$3,281.18	2.0%	\$3,346.80
LTCU2	\$2,698.30	3.75%	\$2,799.49	3.5%	\$2,897.47	3.25%	\$2,991.64	3.0%	\$3,081.38	3.0%	\$3,173.83	3.0%	\$3,269.04	3.0%	\$3,367.11	2.5%	\$3,451.29	2.5%	\$3,537.57	2.25%	\$3,617.17	2.0%	\$3,689.51
LTCU3	\$2,974.61	3.75%	\$3,086.15	3.5%	\$3,194.17	3.25%	\$3,297.98	3.0%	\$3,396.92	3.0%	\$3,498.83	3.0%	\$3,603.79	3.0%	\$3,711.90	2.5%	\$3,804.70	2.5%	\$3,899.82	2.25%	\$3,987.57	2.0%	\$4,067.32
LTCU4	\$3,279.20	3.75%	\$3,402.18	3.5%	\$3,521.25	3.25%	\$3,635.69	3.0%	\$3,744.76	3.0%	\$3,857.11	3.0%	\$3,972.82	3.0%	\$4,092.00	2.5%	\$4,194.30	2.5%	\$4,299.16	2.25%	\$4,395.89	2.0%	\$4,483.81
LTCU5	\$3,615.00	3.75%	\$3,750.56	3.5%	\$3,881.83	3.25%	\$4,007.99	3.0%	\$4,128.23	3.0%	\$4,252.07	3.0%	\$4,379.64	3.0%	\$4,511.02	2.5%	\$4,623.80	2.5%	\$4,739.39	2.25%	\$4,846.03	2.0%	\$4,942.95
LTCU6	\$3,985.17	3.75%	\$4,134.61	3.5%	\$4,279.33	3.25%	\$4,418.40	3.0%	\$4,550.96	3.0%	\$4,687.49	3.0%	\$4,828.11	3.0%	\$4,972.95	2.5%	\$5,097.28	2.5%	\$5,224.71	2.25%	\$5,342.26	2.0%	\$5,449.11
LTCU7	\$4,393.25	3.75%	\$4,558.00	3.5%	\$4,717.53	3.25%	\$4,870.85	3.0%	\$5,016.97	3.0%	\$5,167.48	3.0%	\$5,322.51	3.0%	\$5,482.18	2.5%	\$5,619.24	2.5%	\$5,759.72	2.25%	\$5,889.31	2.0%	\$6,007.10
LTCU8	\$4,843.12	3.75%	\$5,024.74	3.5%	\$5,200.60	3.25%	\$5,369.62	3.0%	\$5,530.71	3.0%	\$5,696.63	3.0%	\$5,867.53	3.0%	\$6,043.56	2.5%	\$6,194.65	2.5%	\$6,349.51	2.25%	\$6,492.38	2.0%	\$6,622.23
LTCU9	\$5,339.06	3.75%	\$5,539.27	3.5%	\$5,733.15	3.25%	\$5,919.47	3.0%	\$6,097.06	3.0%	\$6,279.97	3.0%	\$6,468.37	3.0%	\$6,662.42	2.5%	\$6,828.98	2.5%	\$6,999.70	2.25%	\$7,157.20	2.0%	\$7,300.34

BIWEEKLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$ 1,129.69	3.75%	\$ 1,172.05	3.50%	\$ 1,213.07	3.25%	\$ 1,252.50	3.0%	\$ 1,290.07	3.0%	\$ 1,328.78	3.0%	\$ 1,368.64	3.0%	\$ 1,409.70	2.5%	\$ 1,444.94	2.5%	\$ 1,481.06	2.25%	\$ 1,514.39	2.0%	\$ 1,544.68
LTCU2	\$ 1,245.37	3.75%	\$ 1,292.07	3.50%	\$ 1,337.29	3.25%	\$ 1,380.75	3.0%	\$ 1,422.18	3.0%	\$ 1,464.84	3.0%	\$ 1,508.79	3.0%	\$ 1,554.05	2.5%	\$ 1,592.90	2.5%	\$ 1,632.73	2.25%	\$ 1,669.46	2.0%	\$ 1,702.85
LTCU3	\$ 1,372.89	3.75%	\$ 1,424.38	3.50%	\$ 1,474.23	3.25%	\$ 1,522.14	3.0%	\$ 1,567.81	3.0%	\$ 1,614.84	3.0%	\$ 1,663.29	3.0%	\$ 1,713.19	2.5%	\$ 1,756.02	2.5%	\$ 1,799.92	2.25%	\$ 1,840.41	2.0%	\$ 1,877.22
LTCU4	\$ 1,513.48	3.75%	\$ 1,570.23	3.50%	\$ 1,625.19	3.25%	\$ 1,678.01	3.0%	\$ 1,728.35	3.0%	\$ 1,780.20	3.0%	\$ 1,833.61	3.0%	\$ 1,888.62	2.5%	\$ 1,935.83	2.5%	\$ 1,984.23	2.25%	\$ 2,028.87	2.0%	\$ 2,069.45
LTCU5	\$ 1,668.46	3.75%	\$ 1,731.03	3.50%	\$ 1,791.61	3.25%	\$ 1,849.84	3.0%	\$ 1,905.34	3.0%	\$ 1,962.50	3.0%	\$ 2,021.37	3.0%	\$ 2,082.01	2.5%	\$ 2,134.06	2.5%	\$ 2,187.41	2.25%	\$ 2,236.63	2.0%	\$ 2,281.36
LTCU6	\$ 1,839.31	3.75%	\$ 1,908.28	3.50%	\$ 1,975.07	3.25%	\$ 2,039.26	3.0%	\$ 2,100.44	3.0%	\$ 2,163.45	3.0%	\$ 2,228.36	3.0%	\$ 2,295.21	2.5%	\$ 2,352.59	2.5%	\$ 2,411.40	2.25%	\$ 2,465.66	2.0%	\$ 2,514.97
LTCU7	\$ 2,027.65	3.75%	\$ 2,103.69	3.50%	\$ 2,177.32	3.25%	\$ 2,248.08	3.0%	\$ 2,315.53	3.0%	\$ 2,384.99	3.0%	\$ 2,456.54	3.0%	\$ 2,530.24	2.5%	\$ 2,593.49	2.5%	\$ 2,658.33	2.25%	\$ 2,718.14	2.0%	\$ 2,772.51
LTCU8	\$ 2,235.29	3.75%	\$ 2,319.11	3.50%	\$ 2,400.28	3.25%	\$ 2,478.29	3.0%	\$ 2,552.64	3.0%	\$ 2,629.22	3.0%	\$ 2,708.09	3.0%	\$ 2,789.34	2.5%	\$ 2,859.07	2.5%	\$ 2,930.55	2.25%	\$ 2,996.48	2.0%	\$ 3,056.41
LTCU9	\$ 2,464.18	3.75%	\$ 2,556.59	3.50%	\$ 2,646.07	3.25%	\$ 2,732.06	3.0%	\$ 2,814.03	3.0%	\$ 2,898.45	3.0%	\$ 2,985.40	3.0%	\$ 3,074.96	2.5%	\$ 3,151.84	2.5%	\$ 3,230.63	2.25%	\$ 3,303.32	2.0%	\$ 3,369.39

HOURLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$ 14.12111	3.75%	\$ 14.65065	3.50%	\$ 15.16342	3.25%	\$ 15.65624	3.0%	\$ 16.12592	3.0%	\$ 16.60970	3.0%	\$ 17.10799	3.0%	\$ 17.62123	2.5%	\$ 18.06176	2.5%	\$ 18.51331	2.25%	\$ 18.92986	2.0%	\$ 19.30845
LTCU2	\$ 15.56711	3.75%	\$ 16.15088	3.50%	\$ 16.71616	3.25%	\$ 17.25943	3.0%	\$ 17.77722	3.0%	\$ 18.31053	3.0%	\$ 18.85985	3.0%	\$ 19.42565	2.5%	\$ 19.91129	2.5%	\$ 20.40907	2.25%	\$ 20.86827	2.0%	\$ 21.28564
LTCU3	\$ 17.16118	3.75%	\$ 17.80473	3.50%	\$ 18.42789	3.25%	\$ 19.02680	3.0%	\$ 19.59760	3.0%	\$ 20.18553	3.0%	\$ 20.79110	3.0%	\$ 21.41483	2.5%	\$ 21.95020	2.5%	\$ 22.49896	2.25%	\$ 23.00518	2.0%	\$ 23.46529
LTCU4	\$ 18.91849	3.75%	\$ 19.62793	3.50%	\$ 20.31491	3.25%	\$ 20.97515	3.0%	\$ 21.60440	3.0%	\$ 22.25253	3.0%	\$ 22.92011	3.0%	\$ 23.60771	2.5%	\$ 24.19790	2.5%	\$ 24.80285	2.25%	\$ 25.36092	2.0%	\$ 25.86813
LTCU5	\$ 20.85574	3.75%	\$ 21.63783	3.50%	\$ 22.39516	3.25%	\$ 23.12300	3.0%	\$ 23.81669	3.0%	\$ 24.53119	3.0%	\$ 25.26713	3.0%	\$ 26.02514	2.5%	\$ 26.67577	2.5%	\$ 27.34266	2.25%	\$ 27.95787	2.0%	\$ 28.51703
LTCU6	\$ 22.99137	3.75%	\$ 23.85355	3.50%	\$ 24.68842	3.25%	\$ 25.49080	3.0%	\$ 26.25552	3.0%	\$ 27.04318	3.0%	\$ 27.85448	3.0%	\$ 28.69011	2.5%	\$ 29.40737	2.5%	\$ 30.14255	2.25%	\$ 30.82076	2.0%	\$ 31.43717
LTCU7	\$ 25.34569	3.75%	\$ 26.29615	3.50%	\$ 27.21652	3.25%	\$ 28.10105	3.0%	\$ 28.94408	3.0%	\$ 29.81241	3.0%	\$ 30.70678	3.0%	\$ 31.62798	2.5%	\$ 32.41868	2.5%	\$ 33.22915	2.25%	\$ 33.97680	2.0%	\$ 34.65634
LTCU8	\$ 27.94109	3.75%	\$ 28.98888	3.50%	\$ 30.00349	3.25%	\$ 30.97860	3.0%	\$ 31.90796	3.0%	\$ 32.86520	3.0%	\$ 33.85115	3.0%	\$ 34.86669	2.5%	\$ 35.73836	2.5%	\$ 36.63181	2.25%	\$ 37.45603	2.0%	\$ 38.20515
LTCU9	\$ 30.80225	3.75%	\$ 31.95734	3.50%	\$ 33.07584	3.25%	\$ 34.15081	3.0%	\$ 35.17533	3.0%	\$ 36.23059	3.0%	\$ 37.31751	3.0%	\$ 38.43704	2.5%	\$ 39.39796	2.5%	\$ 40.38291	2.25%	\$ 41.29153	2.0%	\$ 42.11736

MANAGEMENT JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Deputy City Attorney	MGMT13	\$ 134,519	\$ 158,226	\$ 183,935	\$11,209.95	\$15,327.88	\$ 5,173.82	\$7,074.41	\$ 64.67	\$ 88.43
City Engineer	MGMT12	\$ 128,114	\$ 150,691	\$ 175,176	\$10,676.14	\$14,597.98	\$ 4,927.45	\$6,737.53	\$ 61.59	\$ 84.22
Assistant City Engineer	MGMT11	\$ 120,862	\$ 142,162	\$ 165,260	\$10,071.83	\$13,771.68	\$ 4,648.54	\$6,356.16	\$ 58.11	\$ 79.45
Assistant Finance Director	MGMT10	\$ 114,021	\$ 134,115	\$ 155,906	\$9,501.73	\$12,992.15	\$ 4,385.41	\$5,996.38	\$ 54.82	\$ 74.95
Deputy Director of Human Resources										
Deputy Director of Vibrant Community and Neighborhoods										
Engineering Manager										
Engineering Manager - City Traffic Engineer										
Technology Infrastructure and Operations Manager										
Technology and Project Services Manager										
Chief Building Official	MGMT9	\$ 103,411	\$ 121,635	\$ 141,398	\$8,617.56	\$11,783.20	\$ 3,977.34	\$5,438.40	\$ 49.72	\$ 67.98
Chief Communications Manager										
Controller										
Court Administrator										
Manager of City Facilities										
Manager of City Planning and Development										
Customer Information Manager	MGMT8	\$ 95,973	\$ 112,886	\$ 131,228	\$7,997.74	\$10,935.68	\$ 3,691.26	\$5,047.24	\$ 46.14	\$ 63.09
Economic Development Manager										
Executive Director Ralston House										
Fleet Manager										
Golf Course Manager										
Innovation and Performance Manager										
Manager of Golf Course Operations										
Manager of Housing Preservation and Resources										
Mobility Planning and Innovation Manager										
Organizational Development Manager										
Parks and Urban Design Manager										
Parks Manager										
Police Civilian Operations Manager										
Purchasing Manager										
Revenue Manager										
Risk and Safety Manager										
Stormwater Administrator										
Streets Manager										
Utilities Business Manager										
Wastewater and Stormwater Manager										
Water Resources Administrator										
Water System Manager										
Water Treatment Manager										

MANAGEMENT JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
CAD/GIS Supervisor	MGMT7	\$ 87,042	\$ 102,382	\$ 119,017	\$7,253.53	\$9,918.09	\$ 3,347.78	\$4,577.58	\$ 41.85	\$ 57.22
Chief Surveyor										
Food and Beverage Manager										
HR Business Partner Manager										
Operations Support Supervisor										
Pavement Manager										
Plant Supervisor - SCADA										
Service Desk Manager										
Assistant Building Official	MGMT6	\$ 78,943	\$ 92,855	\$ 107,942	\$6,578.57	\$8,995.18	\$ 3,036.26	\$4,151.62	\$ 37.95	\$ 51.90
Construction and Inspection Supervisor										
Customer Information Supervisor										
Law Office Administrator										
Operations Supervisor										
Ralston House Manager										
Recruiting and Onboarding Manager										
Sales Tax Auditor Supervisor										
Streets Supervisor										
Systems and Administrative Manager										
Traffic Field Operations Supervisor										
Utilities Systems Analyst Supervisor										
Utility Supervisor										
Water Quality Administrator										
Accounting Supervisor	MGMT5	\$ 71,597	\$ 84,215	\$ 97,898	\$5,966.41	\$8,158.15	\$ 2,753.73	\$3,765.30	\$ 34.42	\$ 47.07
Assistant Fleet Manager										
Chief Plant Operator										
City Forester										
Computerized Irrigation Supervisor										
Construction and Maintenance Supervisor										
Deputy Court Administrator										
Development Manager (Ralston House)										
Evidence Supervisor										
Golf Course Superintndent										
Housing Choice Voucher Program Supervisor										
Irrigation Crew Supervisor										
Media Services Manager										
Nature Center Director										
Parks Program Manager										
Parks Supervisor										
Police Civillian Operations Supervisor										

MANAGEMENT JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Building Maintenance Leadworker Head Golf Professional Survey Party Chief	MGMT4	\$ 63,461	\$ 74,645	\$ 86,773	\$5,288.44	\$7,231.12	\$ 2,440.82	\$3,337.44	\$ 30.51	\$ 41.72
Restaurant Manager Sous Chef /Kitchen Manager	MGMT3	\$ 57,556	\$ 67,699	\$ 78,699	\$4,796.33	\$6,558.25	\$ 2,213.69	\$3,026.88	\$ 27.67	\$ 37.84

MANAGEMENT

ANNUAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$ 52,200	3.75%	\$ 54,158	3.50%	\$ 56,053	3.25%	\$ 57,875	3.00%	\$ 59,611	3.00%	\$ 61,400	3.00%	\$ 63,242	3.00%	\$ 65,139	2.50%	\$ 66,767	2.50%	\$ 68,436	2.25%	\$ 69,976	2.00%	\$ 71,376
MGMT3	\$ 57,556	3.75%	\$ 59,714	3.50%	\$ 61,804	3.25%	\$ 63,813	3.00%	\$ 65,727	3.00%	\$ 67,699	3.00%	\$ 69,730	3.00%	\$ 71,822	2.50%	\$ 73,618	2.50%	\$ 75,458	2.25%	\$ 77,156	2.00%	\$ 78,699
MGMT4	\$ 63,461	3.75%	\$ 65,841	3.50%	\$ 68,145	3.25%	\$ 70,360	3.00%	\$ 72,471	3.00%	\$ 74,645	3.00%	\$ 76,884	3.00%	\$ 79,191	2.50%	\$ 81,171	2.50%	\$ 83,200	2.25%	\$ 85,072	2.00%	\$ 86,773
MGMT5	\$ 71,597	3.75%	\$ 74,282	3.50%	\$ 76,882	3.25%	\$ 79,380	3.00%	\$ 81,762	3.00%	\$ 84,215	3.00%	\$ 86,741	3.00%	\$ 89,343	2.50%	\$ 91,577	2.50%	\$ 93,866	2.25%	\$ 95,978	2.00%	\$ 97,898
MGMT6	\$ 78,943	3.75%	\$ 81,903	3.50%	\$ 84,770	3.25%	\$ 87,525	3.00%	\$ 90,151	3.00%	\$ 92,855	3.00%	\$ 95,641	3.00%	\$ 98,510	2.50%	\$ 100,973	2.50%	\$ 103,497	2.25%	\$ 105,826	2.00%	\$ 107,942
MGMT7	\$ 87,042	3.75%	\$ 90,306	3.50%	\$ 93,467	3.25%	\$ 96,505	3.00%	\$ 99,400	3.00%	\$ 102,382	3.00%	\$ 105,453	3.00%	\$ 108,617	2.50%	\$ 111,332	2.50%	\$ 114,116	2.25%	\$ 116,683	2.00%	\$ 119,017
MGMT8	\$ 95,973	3.75%	\$ 99,572	3.50%	\$ 103,057	3.25%	\$ 106,406	3.00%	\$ 109,598	3.00%	\$ 112,886	3.00%	\$ 116,273	3.00%	\$ 119,761	2.50%	\$ 122,755	2.50%	\$ 125,824	2.25%	\$ 128,655	2.00%	\$ 131,228
MGMT9	\$ 103,411	3.75%	\$ 107,289	3.50%	\$ 111,044	3.25%	\$ 114,653	3.00%	\$ 118,092	3.00%	\$ 121,635	3.00%	\$ 125,284	3.00%	\$ 129,043	2.50%	\$ 132,269	2.50%	\$ 135,575	2.25%	\$ 138,626	2.00%	\$ 141,398
MGMT10	\$ 114,021	3.75%	\$ 118,296	3.50%	\$ 122,437	3.25%	\$ 126,416	3.00%	\$ 130,209	3.00%	\$ 134,115	3.00%	\$ 138,138	3.00%	\$ 142,282	2.50%	\$ 145,839	2.50%	\$ 149,485	2.25%	\$ 152,849	2.00%	\$ 155,906
MGMT11	\$ 120,862	3.75%	\$ 125,394	3.50%	\$ 129,783	3.25%	\$ 134,001	3.00%	\$ 138,021	3.00%	\$ 142,162	3.00%	\$ 146,427	3.00%	\$ 150,819	2.50%	\$ 154,590	2.50%	\$ 158,455	2.25%	\$ 162,020	2.00%	\$ 165,260
MGMT12	\$ 128,114	3.75%	\$ 132,918	3.50%	\$ 137,570	3.25%	\$ 142,041	3.00%	\$ 146,302	3.00%	\$ 150,691	3.00%	\$ 155,212	3.00%	\$ 159,869	2.50%	\$ 163,865	2.50%	\$ 167,962	2.25%	\$ 171,741	2.00%	\$ 175,176
MGMT13	\$ 134,519	3.75%	\$ 139,564	3.50%	\$ 144,449	3.25%	\$ 149,143	3.00%	\$ 153,617	3.00%	\$ 158,226	3.00%	\$ 162,973	3.00%	\$ 167,862	2.50%	\$ 172,058	2.50%	\$ 176,360	2.25%	\$ 180,328	2.00%	\$ 183,935

MONTHLY

	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$4,350.02	3.75%	\$4,513.15	3.5%	\$4,671.11	3.25%	\$4,822.92	3.0%	\$4,967.60	3.0%	\$5,116.63	3.0%	\$5,270.13	3.0%	\$5,428.23	2.5%	\$5,563.94	2.5%	\$5,703.04	2.25%	\$5,831.36	2.0%	\$5,947.98
MGMT3	\$4,796.33	3.75%	\$4,976.19	3.5%	\$5,150.36	3.25%	\$5,317.75	3.0%	\$5,477.28	3.0%	\$5,641.60	3.0%	\$5,810.85	3.0%	\$5,985.17	2.5%	\$6,134.80	2.5%	\$6,288.17	2.25%	\$6,429.65	2.0%	\$6,558.25
MGMT4	\$5,288.44	3.75%	\$5,486.75	3.5%	\$5,678.79	3.25%	\$5,863.35	3.0%	\$6,039.25	3.0%	\$6,220.43	3.0%	\$6,407.04	3.0%	\$6,599.25	2.5%	\$6,764.23	2.5%	\$6,933.34	2.25%	\$7,089.34	2.0%	\$7,231.12
MGMT5	\$5,966.41	3.75%	\$6,190.15	3.5%	\$6,406.81	3.25%	\$6,615.03	3.0%	\$6,813.48	3.0%	\$7,017.89	3.0%	\$7,228.42	3.0%	\$7,445.27	2.5%	\$7,631.41	2.5%	\$7,822.19	2.25%	\$7,998.19	2.0%	\$8,158.15
MGMT6	\$6,578.57	3.75%	\$6,825.26	3.5%	\$7,064.15	3.25%	\$7,293.73	3.0%	\$7,512.54	3.0%	\$7,737.92	3.0%	\$7,970.06	3.0%	\$8,209.16	2.5%	\$8,414.39	2.5%	\$8,624.75	2.25%	\$8,818.81	2.0%	\$8,995.18
MGMT7	\$7,253.53	3.75%	\$7,525.53	3.5%	\$7,788.93	3.25%	\$8,042.07	3.0%	\$8,283.33	3.0%	\$8,531.83	3.0%	\$8,787.79	3.0%	\$9,051.42	2.5%	\$9,277.70	2.5%	\$9,509.65	2.25%	\$9,723.61	2.0%	\$9,918.09
MGMT8	\$7,997.74	3.75%	\$8,297.65	3.5%	\$8,588.07	3.25%	\$8,867.19	3.0%	\$9,133.20	3.0%	\$9,407.20	3.0%	\$9,689.41	3.0%	\$9,980.09	2.5%	\$10,229.60	2.5%	\$10,485.34	2.25%	\$10,721.26	2.0%	\$10,935.68
MGMT9	\$8,617.56	3.75%	\$8,940.72	3.5%	\$9,253.65	3.25%	\$9,554.39	3.0%	\$9,841.02	3.0%	\$10,136.25	3.0%	\$10,440.34	3.0%	\$10,753.55	2.5%	\$11,022.39	2.5%	\$11,297.95	2.25%	\$11,552.15	2.0%	\$11,783.20
MGMT10	\$9,501.73	3.75%	\$9,858.04	3.5%	\$10,203.07	3.25%	\$10,534.67	3.0%	\$10,850.71	3.0%	\$11,176.23	3.0%	\$11,511.52	3.0%	\$11,856.87	2.5%	\$12,153.29	2.5%	\$12,457.12	2.25%	\$12,737.41	2.0%	\$12,992.15
MGMT11	\$10,071.83	3.75%	\$10,449.52	3.5%	\$10,815.26	3.25%	\$11,166.75	3.0%	\$11,501.76	3.0%	\$11,846.81	3.0%	\$12,202.21	3.0%	\$12,568.28	2.5%	\$12,882.49	2.5%	\$13,204.55	2.25%	\$13,501.65	2.0%	\$13,771.68
MGMT12	\$10,676.14	3.75%	\$11,076.50	3.5%	\$11,464.17	3.25%	\$11,836.76	3.0%	\$12,191.86	3.0%	\$12,557.62	3.0%	\$12,934.35	3.0%	\$13,322.38	2.5%	\$13,655.43	2.5%	\$13,996.82	2.25%	\$14,311.75	2.0%	\$14,597.98
MGMT13	\$11,209.95	3.75%	\$11,630.32	3.5%	\$12,037.38	3.25%	\$12,428.60	3.0%	\$12,801.45	3.0%	\$13,185.50	3.0%	\$13,581.06	3.0%	\$13,988.49	2.5%	\$14,338.21	2.5%	\$14,696.66	2.25%	\$15,027.34	2.0%	\$15,327.88

BIWEEKLY

	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$ 2,007.70	3.75%	\$ 2,082.99	3.50%	\$ 2,155.89	3.25%	\$ 2,225.96	3.00%	\$ 2,292.74	3.00%	\$ 2,361.52	3.00%	\$ 2,432.37	3.00%	\$ 2,505.34	2.50%	\$ 2,567.97	2.50%	\$ 2,632.17	2.25%	\$ 2,691.40	2.0%	\$ 2,745.22
MGMT3	\$ 2,213.69	3.75%	\$ 2,296.70	3.50%	\$ 2,377.09	3.25%	\$ 2,454.35	3.00%	\$ 2,527.98	3.00%	\$ 2,603.81	3.00%	\$ 2,681.93	3.00%	\$ 2,762.39	2.50%	\$ 2,831.45	2.50%	\$ 2,902.23	2.25%	\$ 2,967.53	2.0%	\$ 3,026.88
MGMT4	\$ 2,440.82	3.75%	\$ 2,532.35	3.50%	\$ 2,620.98	3.25%	\$ 2,706.16	3.00%	\$ 2,787.35	3.00%	\$ 2,870.97	3.00%	\$ 2,957.10	3.00%	\$ 3,045.81	2.50%	\$ 3,121.95	2.50%	\$ 3,200.00	2.25%	\$ 3,272.00	2.0%	\$ 3,337.44
MGMT5	\$ 2,753.73	3.75%	\$ 2,856.99	3.50%	\$ 2,956.99	3.25%	\$ 3,053.09	3.00%	\$ 3,144.68	3.00%	\$ 3,239.02	3.00%	\$ 3,336.19	3.00%	\$ 3,436.28	2.50%	\$ 3,522.19	2.50%	\$ 3,610.24	2.25%	\$ 3,691.47	2.0%	\$ 3,765.30
MGMT6	\$ 3,036.26	3.75%	\$ 3,150.12	3.50%	\$ 3,260.38	3.25%	\$ 3,366.34	3.00%	\$ 3,467.33	3.00%	\$ 3,571.35	3.00%	\$ 3,678.49	3.00%	\$ 3,788.84	2.50%	\$ 3,883.56	2.50%	\$ 3,980.65	2.25%	\$ 4,070.22	2.0%	\$ 4,151.62
MGMT7	\$ 3,347.78	3.75%	\$ 3,473.32	3.50%	\$ 3,594.89	3.25%	\$ 3,711.72	3.00%	\$ 3,823.08	3.00%	\$ 3,937.77	3.00%	\$ 4,055.90	3.00%	\$ 4,177.58	2.50%	\$ 4,282.02	2.50%	\$ 4,389.07	2.25%	\$ 4,487.82	2.0%	\$ 4,577.58
MGMT8	\$ 3,691.26	3.75%	\$ 3,829.69	3.50%	\$ 3,963.73	3.25%	\$ 4,092.55	3.00%	\$ 4,215.32	3.00%	\$ 4,341.78	3.00%	\$ 4,472.04	3.00%	\$ 4,606.20	2.50%	\$ 4,721.35	2.50%	\$ 4,839.39	2.25%	\$ 4,948.27	2.0%	\$ 5,047.24
MGMT9	\$ 3,977.34	3.75%	\$ 4,126.49	3.50%	\$ 4,270.91	3.25%	\$ 4,409.72	3.00%	\$ 4,542.01	3.00%	\$ 4,678.27	3.00%	\$ 4,818.62	3.00%	\$ 4,963.18	2.50%	\$ 5,087.26	2.50%	\$ 5,214.44	2.25%	\$ 5,331.76	2.0%	\$ 5,438.40
MGMT10	\$ 4,385.41	3.75%	\$ 4,549.87	3.50%	\$ 4,709.11	3.25%	\$ 4,862.16	3.00%	\$ 5,008.02	3.00%	\$ 5,158.26	3.00%	\$ 5,313.01	3.00%	\$ 5,472.40	2.50%	\$ 5,609.21	2.50%	\$ 5,749.44	2.25%	\$ 5,878.80	2.0%	\$ 5,996.38
MGMT11	\$ 4,648.54	3.75%	\$ 4,822.86	3.50%	\$ 4,991.66	3.25%	\$ 5,153.89	3.00%	\$ 5,308.50	3.00%	\$ 5,467.76	3.00%	\$ 5,631.79	3.00%	\$ 5,800.74	2.50%	\$ 5,945.76	2.50%	\$ 6,094.41	2.25%	\$ 6,231.53	2.0%	\$ 6,356.16
MGMT12	\$ 4,927.45	3.75%	\$ 5,112.23	3.50%	\$ 5,291.16	3.25%	\$ 5,463.12	3.00%	\$ 5,627.01	3.00%	\$ 5,795.82	3.00%	\$ 5,969.70	3.00%	\$ 6,148.79	2.50%	\$ 6,302.51	2.50%	\$ 6,460.07	2.25%	\$ 6,605.42	2.0%	\$ 6,737.53
MGMT13	\$ 5,173.82	3.75%	\$ 5,367.84	3.50%	\$ 5,555.71	3.25%	\$ 5,736.28	3.00%	\$ 5,908.36	3.00%	\$ 6,085.61	3.00%	\$ 6,268.18	3.00%	\$ 6,456.23	2.50%	\$ 6,617.63	2.50%	\$ 6,783.07	2.25%	\$ 6,935.69	2.0%	\$ 7,074.41

HOURLY

	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$ 25.09627	3.75%	\$ 26.03738	3.50%	\$ 26.94869	3.25%	\$ 27.82452	3.00%	\$ 28.65925	3.00%	\$ 29.51903	3.00%	\$ 30.40460	3.00%	\$ 31.31674	2.50%	\$ 32.09966	2.50%	\$ 32.90215	2.25%	\$ 33.64245	2.00%	\$ 34.31530
MGMT3	\$ 27.67114	3.75%	\$ 28.70881	3.50%	\$ 29.71362	3.25%	\$ 30.67931	3.00%	\$ 31.59969	3.00%	\$ 32.54768	3.00%	\$ 33.52411	3.00%	\$ 34.52984	2.50%	\$ 35.39308	2.50%	\$ 36.27791	2.25%	\$ 37.09416	2.00%	\$ 37.83605
MGMT4	\$ 30.51020	3.75%	\$ 31.65434	3.50%	\$ 32.76224	3.25%	\$ 33.82701	3.00%	\$ 34.84182	3.00%	\$ 35.88708	3.00%	\$ 36.96369	3.00%	\$ 38.07260	2.50%	\$ 39.02441	2.50%	\$ 40.00002	2.25%	\$ 40.90002	2.00%	\$ 41.71803
MGMT5	\$ 34.42161	3.75%	\$ 35.71242	3.50%	\$ 36.96236	3.25%	\$ 38.16363	3.00%	\$ 39.30854	3.00%	\$ 40.48780	3.00%	\$ 41.70243	3.00%	\$ 42.95351	2.50%	\$ 44.02734	2.50%	\$ 45.12803	2.25%	\$ 46.14341	2.00%	\$ 47.06628
MGMT6	\$ 37.95327	3.75%	\$ 39.37652	3.50%	\$ 40.75469	3.25%	\$ 42.07922	3.00%	\$ 43.34160	3.00%	\$ 44.64185	3.00%	\$ 45.98110	3.00%	\$ 47.36054	2.50%	\$ 48.54455	2.50%	\$ 49.75816	2.25%	\$ 50.87772	2.00%	\$ 51.89528
MGMT7	\$ 41.84727	3.75%	\$ 43.41655	3.50%	\$ 44.93613	3.25%	\$ 46.39655	3.00%	\$ 47.78845	3.00%	\$ 49.22210	3.00%	\$ 50.69876	3.00%	\$ 52.21973	2.50%	\$ 53.52522	2.50%	\$ 54.86335	2.25%	\$ 56.09778	2.00%	\$ 57.21973
MGMT8	\$ 46.14080	3.75%	\$ 47.87109	3.50%	\$ 49.54657	3.25%	\$ 51.15684	3.00%	\$ 52.69154	3.00%	\$ 54.27229	3.00%	\$ 55.90046	3.00%	\$ 57.57747	2.50%	\$ 59.01691	2.50%	\$ 60.49233	2.25%	\$ 61.85341	2.00%	\$ 63.09048
MGMT9	\$ 49.71672	3.75%	\$ 51.58109	3.50%	\$ 53.38643	3.25%	\$ 55.12149	3.00%	\$ 56.77514	3.00%	\$ 58.47839	3.00%	\$ 60.23274	3.00%	\$ 62.03972	2.50%	\$ 63.59072	2.50%	\$ 65.18049	2.25%	\$ 66.64705	2.00%	\$ 67.97999
MGMT10	\$ 54.81765	3.75%	\$ 56.87331	3.50%	\$ 58.86388	3.25%	\$ 60.77696	3.00%	\$ 62.60027	3.00%	\$ 64.47827	3.00%	\$ 66.41262	3.00%	\$ 68.40500	2.50%	\$ 70.11513	2.50%	\$ 71.86800	2.25%	\$ 73.48503	2.00%	\$ 74.95473
MGMT11	\$ 58.10671	3.75%	\$ 60.28571	3.50%	\$ 62.39571	3.25%	\$ 64.42357	3.00%	\$ 66.35628	3.00%	\$ 68.34697	3.00%	\$ 70.39738	3.00%	\$ 72.50930	2.50%	\$ 74.32203	2.50%	\$ 76.18008	2.25%	\$ 77.89414	2.00%	\$ 79.45202
MGMT12	\$ 61.59311	3.75%	\$ 63.90286	3.50%	\$ 66.13946	3.25%	\$ 68.28899	3.00%	\$ 70.33766	3.00%	\$ 72.44779	3.00%	\$ 74.62122	3.00%	\$ 76.85986	2.50%	\$ 78.78135	2.50%	\$ 80.75089	2.25%	\$ 82.56778	2.00%	\$ 84.21914
MGMT13	\$ 64.67277	3.75%	\$ 67.09800	3.50%	\$ 69.44643	3.25%	\$ 71.70344	3.00%	\$ 73.85454	3.00%	\$ 76.07018	3.00%	\$ 78.35228	3.00%	\$ 80.70285	2.50%	\$ 82.72042	2.50%	\$ 84.78843	2.25%	\$ 86.69617	2.00%	\$ 88.43010

POLICE SWORN JOB FAMILY									
TITLE	GRADE	ANNUAL		MONTHLY		BIWEEKLY		HOURLY	
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Deputy Police Chief	PD5	\$ 165,794	\$ 169,525	\$ 13,816.21	\$ 14,127.07	\$ 6,376.71	\$ 6,520.19	\$ 79.71	\$ 81.50
Police Commander	PD4	\$ 146,845	\$ 150,149	\$ 12,237.08	\$ 12,512.41	\$ 5,647.88	\$ 5,774.96	\$ 70.60	\$ 72.19
Police Lieutenant	PD3	\$ 135,485	\$ 138,533	\$ 11,290.38	\$ 11,544.41	\$ 5,210.94	\$ 5,328.19	\$ 65.14	\$ 66.60
Police Sergeant	PD2	\$ 111,515	\$ 120,968	\$ 9,292.93	\$ 10,080.70	\$ 4,289.05	\$ 4,652.63	\$ 53.61	\$ 58.16
Master Police Officer	PDM	\$ 101,924		\$ 8,493.68		\$ 3,920.16		\$ 49.00	
Police Officer	PD1	\$ 74,361	\$ 97,512	\$ 6,196.78	\$ 8,125.98	\$ 2,860.05	\$ 3,750.45	\$ 35.75	\$ 46.88
Police Recruit I	PR1	\$ 65,245		\$ 5,437.07		\$ 2,509.42		\$ 31.37	
Police Recruit II	PR2	\$ 69,486		\$ 5,790.48		\$ 2,672.53		\$ 33.41	

POLICE SWORN

ANNUAL									
	1		2		3		4		5
PD1	\$ 74,361	7.00%	\$ 79,583	7.00%	\$ 85,171	7.00%	\$ 91,132	7.00%	\$ 97,512
PDM	\$ 101,924								
PD2	\$ 111,515	3.00%	\$ 114,861	3.00%	\$ 118,306	2.25%	\$ 120,968		
PD3	\$ 135,485	2.25%	\$ 138,533						
PD4	\$ 146,845	2.25%	\$ 150,149						
PD5	\$ 165,794	2.25%	\$ 169,525						
PR1	\$ 65,245								
PR2	\$ 69,486								

MONTHLY									
	1		2		3		4		5
PD1	\$6,196.78	7.00%	\$6,631.88	7.00%	\$7,097.54	7.00%	\$7,594.37	7.00%	\$8,125.98
PDM	\$8,493.68								
PD2	\$9,292.93	3.00%	\$9,571.72	3.00%	\$9,858.87	2.25%	\$10,080.70		
PD3	\$11,290.38	2.25%	\$11,544.41						
PD4	\$12,237.08	2.25%	\$12,512.41						
PD5	\$13,816.21	2.25%	\$14,127.07						
PR1	\$5,437.07								
PR2	\$5,790.48								

BIWEEKLY									
	1		2		3		4		5
PD1	\$ 2,860.05	7.00%	\$ 3,060.87	7.00%	\$ 3,275.79	7.00%	\$ 3,505.09	7.00%	\$ 3,750.45
PDM	\$ 3,920.16								
PD2	\$ 4,289.05	3.00%	\$ 4,417.72	3.00%	\$ 4,550.25	2.25%	\$ 4,652.63		
PD3	\$ 5,210.94	2.25%	\$ 5,328.19						
PD4	\$ 5,647.88	2.25%	\$ 5,774.96						
PD4	\$ 6,376.71	2.25%	\$ 6,520.19						
PR1	\$ 2,509.42								
PR2	\$ 2,672.53								

HOURLY									
	1		2		3		4		5
PD1	\$ 35.75064	7.00%	\$ 38.26087	7.00%	\$ 40.94736	7.00%	\$ 43.81368	7.00%	\$ 46.88063
PDM	\$ 49.00198								
PD2	\$ 53.61307	3.00%	\$ 55.22146	3.00%	\$ 56.87810	2.25%	\$ 58.15786		
PD3	\$ 65.13680	2.25%	\$ 66.60238						
PD4	\$ 70.59852	2.25%	\$ 72.18699						
PD5	\$ 79.70888	2.25%	\$ 81.50233						
PR1	\$ 31.36770								
PR2	\$ 33.40660								

PROFESSIONAL JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Senior Assistant City Attorney	PROF11	\$ 107,666	\$ 126,641	\$ 147,217	\$8,972.19	\$12,268.09	\$4,141.01	\$5,662.20	\$ 51.76	\$ 70.78
Senior Utilities Design Engineer	PROF10	\$ 97,436	\$ 114,607	\$ 133,228	\$8,119.63	\$11,102.35	\$3,747.52	\$5,124.16	\$ 46.84	\$ 64.05
Civil Engineer IV										
Traffic Engineer IV										
Civil Engineer III	PROF9	\$ 88,177	\$ 103,717	\$ 120,568	\$7,348.08	\$10,047.37	\$3,391.42	\$4,637.25	\$ 42.39	\$ 57.97
Community Connectivity Manager										
Traffic Engineer III										
Assistant City Attorney	PROF8	\$ 79,798	\$ 93,861	\$ 109,112	\$6,649.85	\$9,092.64	\$3,069.16	\$4,196.61	\$ 38.36	\$ 52.46
Assistant to the City Manager										
AURA Project Manager										
Civil Engineer II										
Community Resilience Coordinator										
Grants Administrator										
Public Works Project Manager										
Senior Landscape Architect										
Senior Planner										
Traffic Engineer II										
ADA Coordinator	PROF7	\$ 72,216	\$ 84,942	\$ 98,744	\$6,017.96	\$8,228.64	\$2,777.52	\$3,797.83	\$ 34.72	\$ 47.47
Budget Analyst										
Civil Engineer I										
Financial Business Analyst										
Financial Systems Analyst										
Lead Crime Analyst										
Manager of Communications										
Manager of Communications and Marketing										
Parking and Travel Demand Management Coordinator										
Pavement Managmeent Coordinator										
Payroll Administrator										
Records Management Coordinator										
Senior Economic Development Specialist										
Senior GIS Analyst										
Traffic Engineer I										
Utility Systems Analyst										
Benefits Specialist	PROF6	\$ 65,353	\$ 76,871	\$ 89,361	\$5,446.12	\$7,446.73	\$2,513.59	\$3,436.95	\$ 31.42	\$ 42.96
Claims Specialist										
Compensation Analyst										
Crime Analyst										
Economic Development Specialist										

PROFESSIONAL JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Housing Rehabilitation / Loan Specialist	PROF6	\$ 65,353	\$ 76,871	\$ 89,361	\$5,446.12	\$7,446.73	\$2,513.59	\$3,436.95	\$ 31.42	\$ 42.96
GIS Analyst										
Human Resources Business Partner										
Neighborhood Engagement Coordinator										
Planner II										
Police Recruiter										
Risk and Claims Analyst										
Sales Tax Auditor										
Senior Probation Officer										
Senior Procurement Specialist										
Stormwater Regulatory Analyst										
Transportation Planner										
Water Quality Scientist										
Water Resources Analyst										
Accountant	PROF5	\$ 59,143	\$ 69,566	\$ 80,869	\$4,928.61	\$6,739.12	\$2,274.74	\$3,110.36	\$ 28.43	\$ 38.88
Assistant Nature Center Director										
Business Analyst										
Communications Coordinator										
Engagement Coordinator										
Forensic Interviewer (Ralston House)										
Grants Accountant										
Planner I										
Procurement Specialist										
Sales Coordinator										
Special Events Coordinator										
Assistant Golf Manager	PROF4	\$ 53,523	\$ 62,956	\$ 73,185	\$4,460.28	\$6,098.75	\$2,058.59	\$2,814.81	\$ 25.73	\$ 35.19
Assistant Restaurant Manager										
Creative Services Designer										
Digital Content Producer										
Grants Specialist (Ralston House)										
Golf Professional										
Multi Media Technician										

PROFESSIONAL

ANNUAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$ 48,437	3.75%	\$ 50,254	3.50%	\$ 52,013	3.25%	\$ 53,703	3.00%	\$ 55,314	3.00%	\$ 56,974	3.00%	\$ 58,683	3.00%	\$ 60,443	2.50%	\$ 61,954	2.50%	\$ 63,503	2.25%	\$ 64,932	2.00%	\$ 66,231
PROF4	\$ 53,523	3.75%	\$ 55,531	3.50%	\$ 57,474	3.25%	\$ 59,342	3.00%	\$ 61,122	3.00%	\$ 62,956	3.00%	\$ 64,845	3.00%	\$ 66,790	2.50%	\$ 68,460	2.50%	\$ 70,171	2.25%	\$ 71,750	2.00%	\$ 73,185
PROF5	\$ 59,143	3.75%	\$ 61,361	3.50%	\$ 63,509	3.25%	\$ 65,573	3.00%	\$ 67,540	3.00%	\$ 69,566	3.00%	\$ 71,653	3.00%	\$ 73,803	2.50%	\$ 75,648	2.50%	\$ 77,539	2.25%	\$ 79,284	2.00%	\$ 80,869
PROF6	\$ 65,353	3.75%	\$ 67,804	3.50%	\$ 70,177	3.25%	\$ 72,458	3.00%	\$ 74,632	3.00%	\$ 76,871	3.00%	\$ 79,177	3.00%	\$ 81,552	2.50%	\$ 83,591	2.50%	\$ 85,681	2.25%	\$ 87,609	2.00%	\$ 89,361
PROF7	\$ 72,216	3.75%	\$ 74,924	3.50%	\$ 77,546	3.25%	\$ 80,066	3.00%	\$ 82,468	3.00%	\$ 84,942	3.00%	\$ 87,490	3.00%	\$ 90,115	2.50%	\$ 92,368	2.50%	\$ 94,677	2.25%	\$ 96,807	2.00%	\$ 98,744
PROF8	\$ 79,798	3.75%	\$ 82,791	3.50%	\$ 85,688	3.25%	\$ 88,473	3.00%	\$ 91,127	3.00%	\$ 93,861	3.00%	\$ 96,677	3.00%	\$ 99,577	2.50%	\$ 102,067	2.50%	\$ 104,618	2.25%	\$ 106,972	2.00%	\$ 109,112
PROF9	\$ 88,177	3.75%	\$ 91,484	3.50%	\$ 94,686	3.25%	\$ 97,763	3.00%	\$ 100,696	3.00%	\$ 103,717	3.00%	\$ 106,828	3.00%	\$ 110,033	2.50%	\$ 112,784	2.50%	\$ 115,603	2.25%	\$ 118,204	2.00%	\$ 120,568
PROF10	\$ 97,436	3.75%	\$ 101,089	3.50%	\$ 104,627	3.25%	\$ 108,028	3.00%	\$ 111,269	3.00%	\$ 114,607	3.00%	\$ 118,045	3.00%	\$ 121,586	2.50%	\$ 124,626	2.50%	\$ 127,742	2.25%	\$ 130,616	2.00%	\$ 133,228
PROF11	\$ 107,666	3.75%	\$ 111,704	3.50%	\$ 115,613	3.25%	\$ 119,371	3.00%	\$ 122,952	3.00%	\$ 126,641	3.00%	\$ 130,440	3.00%	\$ 134,353	2.50%	\$ 137,712	2.50%	\$ 141,155	2.25%	\$ 144,330	2.00%	\$ 147,217

MONTHLY

	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$4,036.46	3.75%	\$4,187.82	3.5%	\$4,334.40	3.25%	\$4,475.26	3.0%	\$4,609.52	3.0%	\$4,747.81	3.0%	\$4,890.24	3.0%	\$5,036.95	2.5%	\$5,162.87	2.5%	\$5,291.95	2.25%	\$5,411.01	2.0%	\$5,519.23
PROF4	\$4,460.28	3.75%	\$4,627.54	3.5%	\$4,789.51	3.25%	\$4,945.17	3.0%	\$5,093.52	3.0%	\$5,246.33	3.0%	\$5,403.72	3.0%	\$5,565.83	2.5%	\$5,704.97	2.5%	\$5,847.60	2.25%	\$5,979.17	2.0%	\$6,098.75
PROF5	\$4,928.61	3.75%	\$5,113.44	3.5%	\$5,292.41	3.25%	\$5,464.41	3.0%	\$5,628.34	3.0%	\$5,797.19	3.0%	\$5,971.11	3.0%	\$6,150.24	2.5%	\$6,304.00	2.5%	\$6,461.60	2.25%	\$6,606.98	2.0%	\$6,739.12
PROF6	\$5,446.12	3.75%	\$5,650.35	3.5%	\$5,848.11	3.25%	\$6,038.17	3.0%	\$6,219.32	3.0%	\$6,405.90	3.0%	\$6,598.07	3.0%	\$6,796.02	2.5%	\$6,965.92	2.5%	\$7,140.06	2.25%	\$7,300.72	2.0%	\$7,446.73
PROF7	\$6,017.96	3.75%	\$6,243.63	3.5%	\$6,462.16	3.25%	\$6,672.18	3.0%	\$6,872.35	3.0%	\$7,078.52	3.0%	\$7,290.87	3.0%	\$7,509.60	2.5%	\$7,697.34	2.5%	\$7,889.77	2.25%	\$8,067.29	2.0%	\$8,228.64
PROF8	\$6,649.85	3.75%	\$6,899.21	3.5%	\$7,140.69	3.25%	\$7,372.76	3.0%	\$7,593.94	3.0%	\$7,821.76	3.0%	\$8,056.41	3.0%	\$8,298.11	2.5%	\$8,505.56	2.5%	\$8,718.20	2.25%	\$8,914.36	2.0%	\$9,092.64
PROF9	\$7,348.08	3.75%	\$7,623.63	3.5%	\$7,890.46	3.25%	\$8,146.90	3.0%	\$8,391.31	3.0%	\$8,643.05	3.0%	\$8,902.34	3.0%	\$9,169.41	2.5%	\$9,398.64	2.5%	\$9,633.61	2.25%	\$9,850.36	2.0%	\$10,047.37
PROF10	\$8,119.63	3.75%	\$8,424.11	3.5%	\$8,718.96	3.25%	\$9,002.32	3.0%	\$9,272.39	3.0%	\$9,550.57	3.0%	\$9,837.08	3.0%	\$10,132.20	2.5%	\$10,385.50	2.5%	\$10,645.14	2.25%	\$10,884.65	2.0%	\$11,102.35
PROF11	\$8,972.19	3.75%	\$9,308.65	3.5%	\$9,634.45	3.25%	\$9,947.57	3.0%	\$10,246.00	3.0%	\$10,553.38	3.0%	\$10,869.98	3.0%	\$11,196.08	2.5%	\$11,475.98	2.5%	\$11,762.88	2.25%	\$12,027.54	2.0%	\$12,268.09

BIWEEKLY

	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$ 1,862.98	3.75%	\$ 1,932.84	3.50%	\$ 2,000.49	3.25%	\$ 2,065.51	3.00%	\$ 2,127.47	3.00%	\$ 2,191.30	3.00%	\$ 2,257.03	3.00%	\$ 2,324.75	2.50%	\$ 2,382.86	2.50%	\$ 2,442.44	2.25%	\$ 2,497.39	2.0%	\$ 2,547.34
PROF4	\$ 2,058.59	3.75%	\$ 2,135.79	3.50%	\$ 2,210.54	3.25%	\$ 2,282.38	3.00%	\$ 2,350.86	3.00%	\$ 2,421.38	3.00%	\$ 2,494.02	3.00%	\$ 2,568.84	2.50%	\$ 2,633.07	2.50%	\$ 2,698.89	2.25%	\$ 2,759.62	2.0%	\$ 2,814.81
PROF5	\$ 2,274.74	3.75%	\$ 2,360.05	3.50%	\$ 2,442.65	3.25%	\$ 2,522.04	3.00%	\$ 2,597.70	3.00%	\$ 2,675.63	3.00%	\$ 2,755.90	3.00%	\$ 2,838.57	2.50%	\$ 2,909.54	2.50%	\$ 2,982.28	2.25%	\$ 3,049.38	2.0%	\$ 3,110.36
PROF6	\$ 2,513.59	3.75%	\$ 2,607.85	3.50%	\$ 2,699.13	3.25%	\$ 2,786.85	3.00%	\$ 2,870.45	3.00%	\$ 2,956.57	3.00%	\$ 3,045.27	3.00%	\$ 3,136.62	2.50%	\$ 3,215.04	2.50%	\$ 3,295.41	2.25%	\$ 3,369.56	2.0%	\$ 3,436.95
PROF7	\$ 2,777.52	3.75%	\$ 2,881.68	3.50%	\$ 2,982.54	3.25%	\$ 3,079.47	3.00%	\$ 3,171.85	3.00%	\$ 3,267.01	3.00%	\$ 3,365.02	3.00%	\$ 3,465.97	2.50%	\$ 3,552.62	2.50%	\$ 3,641.43	2.25%	\$ 3,723.37	2.0%	\$ 3,797.83
PROF8	\$ 3,069.16	3.75%	\$ 3,184.25	3.50%	\$ 3,295.70	3.25%	\$ 3,402.81	3.00%	\$ 3,504.90	3.00%	\$ 3,610.04	3.00%	\$ 3,718.34	3.00%	\$ 3,829.90	2.50%	\$ 3,925.64	2.50%	\$ 4,023.78	2.25%	\$ 4,114.32	2.0%	\$ 4,196.61
PROF9	\$ 3,391.42	3.75%	\$ 3,518.60	3.50%	\$ 3,641.75	3.25%	\$ 3,760.11	3.00%	\$ 3,872.91	3.00%	\$ 3,989.10	3.00%	\$ 4,108.77	3.00%	\$ 4,232.03	2.50%	\$ 4,337.83	2.50%	\$ 4,446.28	2.25%	\$ 4,546.32	2.0%	\$ 4,637.25
PROF10	\$ 3,747.52	3.75%	\$ 3,888.05	3.50%	\$ 4,024.13	3.25%	\$ 4,154.92	3.00%	\$ 4,279.57	3.00%	\$ 4,407.95	3.00%	\$ 4,540.19	3.00%	\$ 4,676.40	2.50%	\$ 4,793.31	2.50%	\$ 4,913.14	2.25%	\$ 5,023.69	2.0%	\$ 5,124.16
PROF11	\$ 4,141.01	3.75%	\$ 4,296.30	3.50%	\$ 4,446.67	3.25%	\$ 4,591.19	3.00%	\$ 4,728.92	3.00%	\$ 4,870.79	3.00%	\$ 5,016.91	3.00%	\$ 5,167.42	2.50%	\$ 5,296.60	2.50%	\$ 5,429.02	2.25%	\$ 5,551.17	2.0%	\$ 5,662.20

HOURLY

	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$ 23.28724	3.75%	\$ 24.16052	3.50%	\$ 25.00613	3.25%	\$ 25.81883	3.00%	\$ 26.59340	3.00%	\$ 27.39120	3.00%	\$ 28.21294	3.00%	\$ 29.05932	2.50%	\$ 29.78581	2.50%	\$ 30.53045	2.25%	\$ 31.21739	2.00%	\$ 31.84174
PROF4	\$ 25.73240	3.75%	\$ 26.69737	3.50%	\$ 27.63178	3.25%	\$ 28.52981	3.00%	\$ 29.38570	3.00%	\$ 30.26728	3.00%	\$ 31.17529	3.00%	\$ 32.11055	2.50%	\$ 32.91332	2.50%	\$ 33.73615	2.25%	\$ 34.49521	2.00%	\$ 35.18512
PROF5	\$ 28.43431	3.75%	\$ 29.50059	3.50%	\$ 30.53311	3.25%	\$ 31.52544	3.00%	\$ 32.47120	3.00%	\$ 33.44534	3.00%	\$ 34.44870	3.00%	\$ 35.48216	2.50%	\$ 36.36922	2.50%	\$ 37.27845	2.25%	\$ 38.11721	2.00%	\$ 38.87955
PROF6	\$ 31.41991	3.75%	\$ 32.59816	3.50%	\$ 33.73909	3.25%	\$ 34.83561	3.00%	\$ 35.88068	3.00%	\$ 36.95710	3.00%	\$ 38.06581	3.00%	\$ 39.20779	2.50%	\$ 40.18798	2.50%	\$ 41.19268	2.25%	\$ 42.11952	2.00%	\$ 42.96191
PROF7	\$ 34.71900	3.75%	\$ 36.02096	3.50%	\$ 37.28170	3.25%	\$ 38.49335	3.00%	\$ 39.64815	3.00%	\$ 40.83760	3.00%	\$ 42.06272	3.00%	\$ 43.32461	2.50%	\$ 44.40772	2.50%	\$ 45.51791	2.25%	\$ 46.54207	2.00%	\$ 47.47291
PROF8	\$ 38.36449	3.75%	\$ 39.80316	3.50%	\$ 41.19627	3.25%	\$ 42.53515	3.00%	\$ 43.81121	3.00%	\$ 45.12554	3.00%	\$ 46.47931	3.00%	\$ 47.87369	2.50%	\$ 49.07053	2.50%	\$ 50.29729	2.25%	\$ 51.42898	2.00%	\$ 52.45756
PROF9	\$ 42.39277	3.75%	\$ 43.98250	3.50%	\$ 45.52188	3.25%	\$ 47.00134	3.00%	\$ 48.41138	3.00%	\$ 49.86373	3.00%	\$ 51.35964	3.00%	\$ 52.90043	2.50%	\$ 54.22294	2.50%	\$ 55.57851	2.25%	\$ 56.82903	2.00%	\$ 57.96561
PROF10	\$ 46.84401	3.75%	\$ 48.60066	3.50%	\$ 50.30168	3.25%	\$ 51.93649	3.00%	\$ 53.49458	3.00%	\$ 55.09942	3.00%	\$ 56.75240	3.00%	\$ 58.45497	2.50%	\$ 59.91635	2.50%	\$ 61.41425	2.25%	\$ 62.79608	2.00%	\$ 64.05200
PROF11	\$ 51.76263	3.75%	\$ 53.70373	3.50%	\$ 55.58336	3.25%	\$ 57.38982	3.00%	\$ 59.11151	3.00%	\$ 60.88486	3.00%	\$ 62.71140	3.00%	\$ 64.59274	2.50%	\$ 66.20756	2.50%	\$ 67.86275	2.25%	\$ 69.38966	2.00%	\$ 70.77746

TECHNICAL & BUSINESS SUPPORT JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
SCADA Process and Controls Technician II	TBS10	\$ 74,300	\$ 87,394	\$ 101,594	\$6,191.69	\$8,466.19	\$2,857.70	\$3,907.47	\$ 35.72	\$ 48.84
Combination Inspector III	TBS9	\$ 67,454	\$ 79,341	\$ 92,233	\$5,621.14	\$7,686.05	\$2,594.37	\$3,547.41	\$ 32.43	\$ 44.34
Criminalist										
Electrician										
HVAC Specialist										
Litigation Paralegal										
Municipal Inspector Foreman										
Plans Examiner II										
SCADA Process and Controls Technician I										
Senior Civil Designer										
Administrative Analyst	TBS8	\$ 61,238	\$ 72,030	\$ 83,734	\$5,103.17	\$6,977.81	\$2,355.31	\$3,220.53	\$ 29.44	\$ 40.26
Combination Inspector II										
Computerized Irrigation System Administrator										
Deputy City Clerk										
Land Development Technican										
Legal Specialist										
Liquor Licensing Control Administrator										
Municipal Inspector II										
Plans Examiner I										
Stormwater Inspector II										
Senior Technical Support Analyst										
Water Quality Analyst										
Accounting Specialist	TBS7	\$ 55,595	\$ 65,393	\$ 76,018	\$4,632.93	\$6,334.82	\$2,138.28	\$2,923.76	\$ 26.73	\$ 36.55
Combination Inspector I										
Executive Assistant										
Homeless Navigator										
Housing Navigator										
Municipal Inspector I										
Patrol Investigative Specialist										
Senior Human Resources Coordinator										
Senior Survey Technician										
Technical Support Analyst										
Victim-Family Support Advocate (Ralston House)										
Water Quality Technican II										
Accounts Payable Technician	TBS6	\$ 50,472	\$ 59,367	\$ 69,013	\$4,206.02	\$5,751.09	\$1,941.24	\$2,654.35	\$ 24.27	\$ 33.18
Accounts Receivable Technician										
Associate Technical Support Analyst										
Assistant Golf Professional										
Animal Management Officer										
Code Compliance Officer										

TECHNICAL & BUSINESS SUPPORT JOB FAMILY										
		ANNUAL			MONTHLY		BIWEEKLY		HOURLY	
TITLE	GRADE	MIN	MID	MAX	MIN	MAX	MIN	MAX	MIN	MAX
CSI Technician	TBS6	\$ 50,472	\$ 59,367	\$ 69,013	\$4,206.02	\$5,751.09	\$1,941.24	\$2,654.35	\$ 24.27	\$ 33.18
Digital Media Technician										
Engineering Permit Coordinator										
Evidence Technician										
GIS Technician										
Housing Services Specialist										
Housing Specialist										
Human Resources Coordinator										
NIBRS Data Specialist										
Planning Technician										
Police Accreditation Coordinator										
Police Equipment Coordinator										
Police Training Coordinator										
Printing Technician										
Special Events Associate (Ralston House)										
Storeskeeper										
Survey Technician										
Water Quality Analyst I										
Accounting Technician III	TBS5	\$ 45,821	\$ 53,897	\$ 62,654	\$3,818.45	\$5,221.14	\$1,762.36	\$2,409.76	\$ 22.03	\$ 30.12
Administrative Coordinator										
Administrative Court Clerk										
Administrative Specialist										
Police Services Technician										
Revenue Technician										
Senior Customer Information Specialist										
Accounting Technician II	TBS4	\$ 41,599	\$ 48,930	\$ 56,880	\$3,466.59	\$4,740.03	\$1,599.96	\$2,187.70	\$ 20.00	\$ 27.35
Administrative Assistant										
Customer Information Specialist										
Direct Mail Specialist										
Police Records Specialist										
Police Courier	TBS3	\$ 37,766	\$ 44,421	\$ 51,639	\$3,147.15	\$4,303.25	\$1,452.53	\$1,986.11	\$ 18.16	\$ 24.83

TECHNICAL AND BUSINESS SUPPORT

ANNUAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$ 31,126	3.75%	\$ 32,294	3.50%	\$ 33,424	3.25%	\$ 34,510	3.00%	\$ 35,546	3.00%	\$ 36,612	3.00%	\$ 37,710	3.00%	\$ 38,842	2.50%	\$ 39,813	2.50%	\$ 40,808	2.25%	\$ 41,726	2.00%	\$ 42,561
TBS2	\$ 34,286	3.75%	\$ 35,572	3.50%	\$ 36,817	3.25%	\$ 38,013	3.00%	\$ 39,153	3.00%	\$ 40,328	3.00%	\$ 41,538	3.00%	\$ 42,784	2.50%	\$ 43,854	2.50%	\$ 44,950	2.25%	\$ 45,961	2.00%	\$ 46,881
TBS3	\$ 37,766	3.75%	\$ 39,182	3.50%	\$ 40,553	3.25%	\$ 41,871	3.00%	\$ 43,128	3.00%	\$ 44,421	3.00%	\$ 45,754	3.00%	\$ 47,127	2.50%	\$ 48,305	2.50%	\$ 49,512	2.25%	\$ 50,626	2.00%	\$ 51,639
TBS4	\$ 41,599	3.75%	\$ 43,159	3.50%	\$ 44,670	3.25%	\$ 46,121	3.00%	\$ 47,505	3.00%	\$ 48,930	3.00%	\$ 50,398	3.00%	\$ 51,910	2.50%	\$ 53,208	2.50%	\$ 54,538	2.25%	\$ 55,765	2.00%	\$ 56,880
TBS5	\$ 45,821	3.75%	\$ 47,540	3.50%	\$ 49,204	3.25%	\$ 50,803	3.00%	\$ 52,327	3.00%	\$ 53,897	3.00%	\$ 55,513	3.00%	\$ 57,179	2.50%	\$ 58,608	2.50%	\$ 60,074	2.25%	\$ 61,425	2.00%	\$ 62,654
TBS6	\$ 50,472	3.75%	\$ 52,365	3.50%	\$ 54,198	3.25%	\$ 55,959	3.00%	\$ 57,638	3.00%	\$ 59,367	3.00%	\$ 61,148	3.00%	\$ 62,982	2.50%	\$ 64,557	2.50%	\$ 66,171	2.25%	\$ 67,660	2.00%	\$ 69,013
TBS7	\$ 55,595	3.75%	\$ 57,680	3.50%	\$ 59,699	3.25%	\$ 61,639	3.00%	\$ 63,488	3.00%	\$ 65,393	3.00%	\$ 67,355	3.00%	\$ 69,375	2.50%	\$ 71,110	2.50%	\$ 72,887	2.25%	\$ 74,527	2.00%	\$ 76,018
TBS8	\$ 61,238	3.75%	\$ 63,534	3.50%	\$ 65,758	3.25%	\$ 67,895	3.00%	\$ 69,932	3.00%	\$ 72,030	3.00%	\$ 74,191	3.00%	\$ 76,417	2.50%	\$ 78,327	2.50%	\$ 80,285	2.25%	\$ 82,092	2.00%	\$ 83,734
TBS9	\$ 67,454	3.75%	\$ 69,983	3.50%	\$ 72,433	3.25%	\$ 74,787	3.00%	\$ 77,030	3.00%	\$ 79,341	3.00%	\$ 81,721	3.00%	\$ 84,173	2.50%	\$ 86,277	2.50%	\$ 88,434	2.25%	\$ 90,424	2.00%	\$ 92,233
TBS10	\$ 74,300	3.75%	\$ 77,087	3.50%	\$ 79,785	3.25%	\$ 82,378	3.00%	\$ 84,849	3.00%	\$ 87,394	3.00%	\$ 90,016	3.00%	\$ 92,717	2.50%	\$ 95,035	2.50%	\$ 97,410	2.25%	\$ 99,602	2.00%	\$ 101,594

MONTHLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$2,593.87	3.75%	\$2,691.14	3.5%	\$2,785.33	3.25%	\$2,875.86	3.0%	\$2,962.13	3.0%	\$3,051.00	3.0%	\$3,142.53	3.0%	\$3,236.80	2.5%	\$3,317.72	2.5%	\$3,400.67	2.25%	\$3,477.18	2.0%	\$3,546.72
TBS2	\$2,857.15	3.75%	\$2,964.29	3.5%	\$3,068.04	3.25%	\$3,167.76	3.0%	\$3,262.79	3.0%	\$3,360.67	3.0%	\$3,461.49	3.0%	\$3,565.34	2.5%	\$3,654.47	2.5%	\$3,745.83	2.25%	\$3,830.11	2.0%	\$3,906.72
TBS3	\$3,147.15	3.75%	\$3,265.17	3.5%	\$3,379.45	3.25%	\$3,489.28	3.0%	\$3,593.96	3.0%	\$3,701.78	3.0%	\$3,812.83	3.0%	\$3,927.22	2.5%	\$4,025.40	2.5%	\$4,126.03	2.25%	\$4,218.87	2.0%	\$4,303.25
TBS4	\$3,466.59	3.75%	\$3,596.59	3.5%	\$3,722.47	3.25%	\$3,843.45	3.0%	\$3,958.75	3.0%	\$4,077.51	3.0%	\$4,199.84	3.0%	\$4,325.83	2.5%	\$4,433.98	2.5%	\$4,544.83	2.25%	\$4,647.09	2.0%	\$4,740.03
TBS5	\$3,818.45	3.75%	\$3,961.64	3.5%	\$4,100.30	3.25%	\$4,233.56	3.0%	\$4,360.56	3.0%	\$4,491.38	3.0%	\$4,626.12	3.0%	\$4,764.90	2.5%	\$4,884.03	2.5%	\$5,006.13	2.25%	\$5,118.76	2.0%	\$5,221.14
TBS6	\$4,206.02	3.75%	\$4,363.74	3.5%	\$4,516.48	3.25%	\$4,663.26	3.0%	\$4,803.16	3.0%	\$4,947.25	3.0%	\$5,095.67	3.0%	\$5,248.54	2.5%	\$5,379.76	2.5%	\$5,514.25	2.25%	\$5,638.32	2.0%	\$5,751.09
TBS7	\$4,632.93	3.75%	\$4,806.66	3.5%	\$4,974.90	3.25%	\$5,136.58	3.0%	\$5,290.68	3.0%	\$5,449.40	3.0%	\$5,612.88	3.0%	\$5,781.27	2.5%	\$5,925.80	2.5%	\$6,073.95	2.25%	\$6,210.61	2.0%	\$6,334.82
TBS8	\$5,103.17	3.75%	\$5,294.54	3.5%	\$5,479.85	3.25%	\$5,657.95	3.0%	\$5,827.68	3.0%	\$6,002.51	3.0%	\$6,182.59	3.0%	\$6,368.07	2.5%	\$6,527.27	2.5%	\$6,690.45	2.25%	\$6,840.99	2.0%	\$6,977.81
TBS9	\$5,621.14	3.75%	\$5,831.94	3.5%	\$6,036.05	3.25%	\$6,232.23	3.0%	\$6,419.19	3.0%	\$6,611.77	3.0%	\$6,810.12	3.0%	\$7,014.43	2.5%	\$7,189.79	2.5%	\$7,369.53	2.25%	\$7,535.35	2.0%	\$7,686.05
TBS10	\$6,191.69	3.75%	\$6,423.88	3.5%	\$6,648.71	3.25%	\$6,864.80	3.0%	\$7,070.74	3.0%	\$7,282.86	3.0%	\$7,501.35	3.0%	\$7,726.39	2.5%	\$7,919.55	2.5%	\$8,117.54	2.25%	\$8,300.18	2.0%	\$8,466.19

BIWEEKLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$ 1,197.17	3.75%	\$ 1,242.07	3.50%	\$ 1,285.54	3.25%	\$ 1,327.32	3.00%	\$ 1,367.14	3.00%	\$ 1,408.15	3.00%	\$ 1,450.40	3.00%	\$ 1,493.91	2.50%	\$ 1,531.26	2.50%	\$ 1,569.54	2.25%	\$ 1,604.85	2.0%	\$ 1,636.95
TBS2	\$ 1,318.69	3.75%	\$ 1,368.14	3.50%	\$ 1,416.02	3.25%	\$ 1,462.04	3.00%	\$ 1,505.90	3.00%	\$ 1,551.08	3.00%	\$ 1,597.61	3.00%	\$ 1,645.54	2.50%	\$ 1,686.68	2.50%	\$ 1,728.85	2.25%	\$ 1,767.74	2.0%	\$ 1,803.10
TBS3	\$ 1,452.53	3.75%	\$ 1,507.00	3.50%	\$ 1,559.75	3.25%	\$ 1,610.44	3.00%	\$ 1,658.75	3.00%	\$ 1,708.51	3.00%	\$ 1,759.77	3.00%	\$ 1,812.56	2.50%	\$ 1,857.88	2.50%	\$ 1,904.32	2.25%	\$ 1,947.17	2.0%	\$ 1,986.11
TBS4	\$ 1,599.96	3.75%	\$ 1,659.96	3.50%	\$ 1,718.06	3.25%	\$ 1,773.90	3.00%	\$ 1,827.11	3.00%	\$ 1,881.93	3.00%	\$ 1,938.39	3.00%	\$ 1,996.54	2.50%	\$ 2,046.45	2.50%	\$ 2,097.61	2.25%	\$ 2,144.81	2.0%	\$ 2,187.70
TBS5	\$ 1,762.36	3.75%	\$ 1,828.45	3.50%	\$ 1,892.44	3.25%	\$ 1,953.95	3.00%	\$ 2,012.57	3.00%	\$ 2,072.94	3.00%	\$ 2,135.13	3.00%	\$ 2,199.19	2.50%	\$ 2,254.17	2.50%	\$ 2,310.52	2.25%	\$ 2,362.51	2.0%	\$ 2,409.76
TBS6	\$ 1,941.24	3.75%	\$ 2,014.04	3.50%	\$ 2,084.53	3.25%	\$ 2,152.27	3.00%	\$ 2,216.84	3.00%	\$ 2,283.35	3.00%	\$ 2,351.85	3.00%	\$ 2,422.40	2.50%	\$ 2,482.96	2.50%	\$ 2,545.04	2.25%	\$ 2,602.30	2.0%	\$ 2,654.35
TBS7	\$ 2,138.28	3.75%	\$ 2,218.46	3.50%	\$ 2,296.11	3.25%	\$ 2,370.73	3.00%	\$ 2,441.85	3.00%	\$ 2,515.11	3.00%	\$ 2,590.56	3.00%	\$ 2,668.28	2.50%	\$ 2,734.98	2.50%	\$ 2,803.36	2.25%	\$ 2,866.43	2.0%	\$ 2,923.76
TBS8	\$ 2,355.31	3.75%	\$ 2,443.63	3.50%	\$ 2,529.16	3.25%	\$ 2,611.36	3.00%	\$ 2,689.70	3.00%	\$ 2,770.39	3.00%	\$ 2,853.50	3.00%	\$ 2,939.11	2.50%	\$ 3,012.59	2.50%	\$ 3,087.90	2.25%	\$ 3,157.38	2.0%	\$ 3,220.53
TBS9	\$ 2,594.37	3.75%	\$ 2,691.66	3.50%	\$ 2,785.87	3.25%	\$ 2,876.41	3.00%	\$ 2,962.70	3.00%	\$ 3,051.59	3.00%	\$ 3,143.13	3.00%	\$ 3,237.43	2.50%	\$ 3,318.36	2.50%	\$ 3,401.32	2.25%	\$ 3,477.85	2.0%	\$ 3,547.41
TBS10	\$ 2,857.70	3.75%	\$ 2,964.87	3.50%	\$ 3,068.64	3.25%	\$ 3,168.37	3.00%	\$ 3,263.42	3.00%	\$ 3,361.32	3.00%	\$ 3,462.16	3.00%	\$ 3,566.03	2.50%	\$ 3,655.18	2.50%	\$ 3,746.56	2.25%	\$ 3,830.85	2.0%	\$ 3,907.47

HOURLY																							
	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$ 14.96465	3.75%	\$ 15.52583	3.50%	\$ 16.06923	3.25%	\$ 16.59148	3.00%	\$ 17.08923	3.00%	\$ 17.60190	3.00%	\$ 18.12996	3.00%	\$ 18.67386	2.50%	\$ 19.14070	2.50%	\$ 19.61922	2.25%	\$ 20.06065	2.00%	\$ 20.46187
TBS2	\$ 16.48356	3.75%	\$ 17.10170	3.50%	\$ 17.70026	3.25%	\$ 18.27552	3.00%	\$ 18.82378	3.00%	\$ 19.38849	3.00%	\$ 19.97015	3.00%	\$ 20.56925	2.50%	\$ 21.08349	2.50%	\$ 21.61057	2.25%	\$ 22.09681	2.00%	\$ 22.53875
TBS3	\$ 18.15665	3.75%	\$ 18.83752	3.50%	\$ 19.49683	3.25%	\$ 20.13048	3.00%	\$ 20.73440	3.00%	\$ 21.35643	3.00%	\$ 21.99712	3.00%	\$ 22.65703	2.50%	\$ 23.22346	2.50%	\$ 23.80405	2.25%	\$ 24.33964	2.00%	\$ 24.82643
TBS4	\$ 19.99955	3.75%	\$ 20.74953	3.50%	\$ 21.47576	3.25%	\$ 22.17372	3.00%	\$ 22.83894	3.00%	\$ 23.52410	3.00%	\$ 24.22983	3.00%	\$ 24.95672	2.50%	\$ 25.58064	2.50%	\$ 26.22016	2.25%	\$ 26.81011	2.00%	\$ 27.34631
TBS5	\$ 22.02950	3.75%	\$ 22.85561	3.50%	\$ 23.65555	3.25%	\$ 24.42436	3.00%	\$ 25.15709	3.00%	\$ 25.91180	3.00%	\$ 26.68916	3.00%	\$ 27.48983	2.50%	\$ 28.17708	2.50%	\$ 28.88150	2.25%	\$ 29.53134	2.00%	\$ 30.12196
TBS6	\$ 24.26549	3.75%	\$ 25.17545	3.50%	\$ 26.05659	3.25%	\$ 26.90343	3.00%	\$ 27.71053	3.00%	\$ 28.54185	3.00%	\$ 29.39810	3.00%	\$ 30.28005	2.50%	\$ 31.03705	2.50%	\$ 31.81297	2.25%	\$ 32.52877	2.00%	\$ 33.17934
TBS7	\$ 26.72844	3.75%	\$ 27.73076	3.50%	\$ 28.70133	3.25%	\$ 29.63413	3.00%	\$ 30.52315	3.00%	\$ 31.43885	3.00%	\$ 32.38201	3.00%	\$ 33.35347	2.50%	\$ 34.18731	2.50%	\$ 35.04199	2.25%	\$ 35.83044	2.00%	\$ 36.54705
TBS8	\$ 29.44138	3.75%	\$ 30.54543	3.50%	\$ 31.61452	3.25%	\$ 32.64199	3.00%	\$ 33.62125	3.00%	\$ 34.62989	3.00%	\$ 35.66879	3.00%	\$ 36.73885	2.50%	\$ 37.65732	2.50%	\$ 38.59875	2.25%	\$ 39.46723	2.00%	\$ 40.25657
TBS9	\$ 32.42968	3.75%	\$ 33.64579	3.50%	\$ 34.82339	3.25%	\$ 35.95515	3.00%	\$ 37.03381	3.00%	\$ 38.14482	3.00%	\$ 39.28917	3.00%	\$ 40.46784	2.50%	\$ 41.47954	2.50%	\$ 42.51653	2.25%	\$ 43.47315	2.00%	\$ 44.34261
TBS10	\$ 35.72129	3.75%	\$ 37.06084	3.50%	\$ 38.35797	3.25%	\$ 39.60460	3.00%	\$ 40.79274	3.00%	\$ 42.01652	3.00%	\$ 43.27702	3.00%	\$ 44.57533	2.50%	\$ 45.68971	2.50%	\$ 46.83196	2.25%	\$ 47.88567	2.00%	\$ 48.84339

ANNUAL- ALL JOB FAMILIES																							
EXECUTIVE																							
	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$ 86,619	3.75%	\$ 89,867	3.50%	\$ 93,013	3.25%	\$ 96,035	3.00%	\$ 98,917	3.00%	\$ 101,884	3.00%	\$ 104,941	3.00%	\$ 108,089	2.50%	\$ 110,791	2.50%	\$ 113,561	2.25%	\$ 116,116	2.00%	\$ 118,438
EXEC2	\$ 93,600	3.75%	\$ 97,110	3.50%	\$ 100,509	3.25%	\$ 103,776	3.00%	\$ 106,889	3.00%	\$ 110,096	3.00%	\$ 113,399	3.00%	\$ 116,801	2.50%	\$ 119,721	2.50%	\$ 122,714	2.25%	\$ 125,475	2.00%	\$ 127,984
EXEC3	\$ 101,145	3.75%	\$ 104,938	3.50%	\$ 108,610	3.25%	\$ 112,140	3.00%	\$ 115,504	3.00%	\$ 118,970	3.00%	\$ 122,539	3.00%	\$ 126,215	2.50%	\$ 129,370	2.50%	\$ 132,604	2.25%	\$ 135,588	2.00%	\$ 138,300
EXEC4	\$ 108,680	3.75%	\$ 112,755	3.50%	\$ 116,702	3.25%	\$ 120,495	3.00%	\$ 124,110	3.00%	\$ 127,833	3.00%	\$ 131,668	3.00%	\$ 135,618	2.50%	\$ 139,008	2.50%	\$ 142,484	2.25%	\$ 145,689	2.00%	\$ 148,603
EXEC5	\$ 118,092	3.75%	\$ 122,520	3.50%	\$ 126,808	3.25%	\$ 130,930	3.00%	\$ 134,857	3.00%	\$ 138,903	3.00%	\$ 143,070	3.00%	\$ 147,362	2.50%	\$ 151,046	2.50%	\$ 154,823	2.25%	\$ 158,306	2.00%	\$ 161,472
EXEC6	\$ 127,610	3.75%	\$ 132,395	3.50%	\$ 137,029	3.25%	\$ 141,482	3.00%	\$ 145,727	3.00%	\$ 150,099	3.00%	\$ 154,602	3.00%	\$ 159,240	2.50%	\$ 163,221	2.50%	\$ 167,301	2.25%	\$ 171,066	2.00%	\$ 174,487
EXEC7	\$ 140,498	3.75%	\$ 145,767	3.50%	\$ 150,869	3.25%	\$ 155,772	3.00%	\$ 160,445	3.00%	\$ 165,259	3.00%	\$ 170,216	3.00%	\$ 175,323	2.50%	\$ 179,706	2.50%	\$ 184,199	2.25%	\$ 188,343	2.00%	\$ 192,110
EXEC8	\$ 148,226	3.75%	\$ 153,784	3.50%	\$ 159,167	3.25%	\$ 164,340	3.00%	\$ 169,270	3.00%	\$ 174,348	3.00%	\$ 179,578	3.00%	\$ 184,966	2.50%	\$ 189,590	2.50%	\$ 194,330	2.25%	\$ 198,702	2.00%	\$ 202,676
EXEC9	\$ 154,155	3.75%	\$ 159,936	3.50%	\$ 165,533	3.25%	\$ 170,913	3.00%	\$ 176,041	3.00%	\$ 181,322	3.00%	\$ 186,762	3.00%	\$ 192,364	2.50%	\$ 197,173	2.50%	\$ 202,103	2.25%	\$ 206,650	2.00%	\$ 210,783
INFORMATION TECHNOLOGY																							
	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$ 73,731	3.75%	\$ 76,496	3.50%	\$ 79,173	3.25%	\$ 81,746	3.00%	\$ 84,199	3.00%	\$ 86,725	3.00%	\$ 89,326	3.00%	\$ 92,006	2.50%	\$ 94,306	2.50%	\$ 96,664	2.25%	\$ 98,839	2.00%	\$ 100,816
INFT2	\$ 79,777	3.75%	\$ 82,768	3.50%	\$ 85,665	3.25%	\$ 88,449	3.00%	\$ 91,103	3.00%	\$ 93,836	3.00%	\$ 96,651	3.00%	\$ 99,551	2.50%	\$ 102,039	2.50%	\$ 104,590	2.25%	\$ 106,944	2.00%	\$ 109,083
INFT3	\$ 86,318	3.75%	\$ 89,555	3.50%	\$ 92,690	3.25%	\$ 95,702	3.00%	\$ 98,573	3.00%	\$ 101,531	3.00%	\$ 104,576	3.00%	\$ 107,714	2.50%	\$ 110,407	2.50%	\$ 113,167	2.25%	\$ 115,713	2.00%	\$ 118,027
INFT4	\$ 93,397	3.75%	\$ 96,899	3.50%	\$ 100,290	3.25%	\$ 103,550	3.00%	\$ 106,656	3.00%	\$ 109,856	3.00%	\$ 113,152	3.00%	\$ 116,546	2.50%	\$ 119,460	2.50%	\$ 122,446	2.25%	\$ 125,201	2.00%	\$ 127,706
INFT5	\$ 101,055	3.75%	\$ 104,845	3.50%	\$ 108,514	3.25%	\$ 112,041	3.00%	\$ 115,402	3.00%	\$ 118,864	3.00%	\$ 122,430	3.00%	\$ 126,103	2.50%	\$ 129,256	2.50%	\$ 132,487	2.25%	\$ 135,468	2.00%	\$ 138,177
LABOR, TRADES, CRAFTS AND UTILITIES																							
	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$ 29,372	3.75%	\$ 30,473	3.50%	\$ 31,540	3.25%	\$ 32,565	3.00%	\$ 33,542	3.00%	\$ 34,548	3.00%	\$ 35,585	3.00%	\$ 36,652	2.50%	\$ 37,568	2.50%	\$ 38,508	2.25%	\$ 39,374	2.00%	\$ 40,162
LTCU2	\$ 32,380	3.75%	\$ 33,594	3.50%	\$ 34,770	3.25%	\$ 35,900	3.00%	\$ 36,977	3.00%	\$ 38,086	3.00%	\$ 39,228	3.00%	\$ 40,405	2.50%	\$ 41,415	2.50%	\$ 42,451	2.25%	\$ 43,406	2.00%	\$ 44,274
LTCU3	\$ 35,695	3.75%	\$ 37,034	3.50%	\$ 38,330	3.25%	\$ 39,576	3.00%	\$ 40,763	3.00%	\$ 41,986	3.00%	\$ 43,245	3.00%	\$ 44,543	2.50%	\$ 45,656	2.50%	\$ 46,798	2.25%	\$ 47,851	2.00%	\$ 48,808
LTCU4	\$ 39,350	3.75%	\$ 40,826	3.50%	\$ 42,255	3.25%	\$ 43,628	3.00%	\$ 44,937	3.00%	\$ 46,285	3.00%	\$ 47,674	3.00%	\$ 49,104	2.50%	\$ 50,332	2.50%	\$ 51,590	2.25%	\$ 52,751	2.00%	\$ 53,806
LTCU5	\$ 43,380	3.75%	\$ 45,007	3.50%	\$ 46,582	3.25%	\$ 48,096	3.00%	\$ 49,539	3.00%	\$ 51,025	3.00%	\$ 52,556	3.00%	\$ 54,132	2.50%	\$ 55,486	2.50%	\$ 56,873	2.25%	\$ 58,152	2.00%	\$ 59,315
LTCU6	\$ 47,822	3.75%	\$ 49,615	3.50%	\$ 51,352	3.25%	\$ 53,021	3.00%	\$ 54,611	3.00%	\$ 56,250	3.00%	\$ 57,937	3.00%	\$ 59,675	2.50%	\$ 61,167	2.50%	\$ 62,697	2.25%	\$ 64,107	2.00%	\$ 65,389
LTCU7	\$ 52,719	3.75%	\$ 54,696	3.50%	\$ 56,610	3.25%	\$ 58,450	3.00%	\$ 60,204	3.00%	\$ 62,010	3.00%	\$ 63,870	3.00%	\$ 65,786	2.50%	\$ 67,431	2.50%	\$ 69,117	2.25%	\$ 70,672	2.00%	\$ 72,085
LTCU8	\$ 58,117	3.75%	\$ 60,297	3.50%	\$ 62,407	3.25%	\$ 64,435	3.00%	\$ 66,369	3.00%	\$ 68,360	3.00%	\$ 70,410	3.00%	\$ 72,523	2.50%	\$ 74,336	2.50%	\$ 76,194	2.25%	\$ 77,909	2.00%	\$ 79,467
LTCU9	\$ 64,069	3.75%	\$ 66,471	3.50%	\$ 68,798	3.25%	\$ 71,034	3.00%	\$ 73,165	3.00%	\$ 75,360	3.00%	\$ 77,620	3.00%	\$ 79,949	2.50%	\$ 81,948	2.50%	\$ 83,996	2.25%	\$ 85,886	2.00%	\$ 87,604
MANAGEMENT																							
	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$ 52,200	3.75%	\$ 54,158	3.50%	\$ 56,053	3.25%	\$ 57,875	3.00%	\$ 59,611	3.00%	\$ 61,400	3.00%	\$ 63,242	3.00%	\$ 65,139	2.50%	\$ 66,767	2.50%	\$ 68,436	2.25%	\$ 69,976	2.00%	\$ 71,376
MGMT3	\$ 57,556	3.75%	\$ 59,714	3.50%	\$ 61,804	3.25%	\$ 63,813	3.00%	\$ 65,727	3.00%	\$ 67,699	3.00%	\$ 69,730	3.00%	\$ 71,822	2.50%	\$ 73,618	2.50%	\$ 75,458	2.25%	\$ 77,156	2.00%	\$ 78,699
MGMT4	\$ 63,461	3.75%	\$ 65,841	3.50%	\$ 68,145	3.25%	\$ 70,360	3.00%	\$ 72,471	3.00%	\$ 74,645	3.00%	\$ 76,884	3.00%	\$ 79,191	2.50%	\$ 81,171	2.50%	\$ 83,200	2.25%	\$ 85,072	2.00%	\$ 86,773
MGMT5	\$ 71,597	3.75%	\$ 74,282	3.50%	\$ 76,882	3.25%	\$ 79,380	3.00%	\$ 81,762	3.00%	\$ 84,215	3.00%	\$ 86,741	3.00%	\$ 89,343	2.50%	\$ 91,577	2.50%	\$ 93,866	2.25%	\$ 95,978	2.00%	\$ 97,898
MGMT6	\$ 78,943	3.75%	\$ 81,903	3.50%	\$ 84,770	3.25%	\$ 87,525	3.00%	\$ 90,151	3.00%	\$ 92,855	3.00%	\$ 95,641	3.00%	\$ 98,510	2.50%	\$ 100,973	2.50%	\$ 103,497	2.25%	\$ 105,826	2.00%	\$ 107,942
MGMT7	\$ 87,042	3.75%	\$ 90,306	3.50%	\$ 93,467	3.25%	\$ 96,505	3.00%	\$ 99,400	3.00%	\$ 102,382	3.00%	\$ 105,453	3.00%	\$ 108,617	2.50%	\$ 111,332	2.50%	\$ 114,116	2.25%	\$ 116,683	2.00%	\$ 119,017
MGMT8	\$ 95,973	3.75%	\$ 99,572	3.50%	\$ 103,057	3.25%	\$ 106,406	3.00%	\$ 109,598	3.00%	\$ 112,886	3.00%	\$ 116,273	3.00%	\$ 119,761	2.50%	\$ 122,755	2.50%	\$ 125,824	2.25%	\$ 128,655	2.00%	\$ 131,228
MGMT9	\$ 103,411	3.75%	\$ 107,289	3.50%	\$ 111,044	3.25%	\$ 114,653	3.00%	\$ 118,092	3.00%	\$ 121,635	3.00%	\$ 125,284	3.00%	\$ 129,043	2.50%	\$ 132,269	2.50%	\$ 135,575	2.25%	\$ 138,626	2.00%	\$ 141,398
MGMT10	\$ 114,021	3.75%	\$ 118,296	3.50%	\$ 122,437	3.25%	\$ 126,416	3.00%	\$ 130,209	3.00%	\$ 134,115	3.00%	\$ 138,138	3.00%	\$ 142,282	2.50%	\$ 145,839	2.50%	\$ 149,485	2.25%	\$ 152,849	2.00%	\$ 155,906
MGMT11	\$ 120,862	3.75%	\$ 125,394	3.50%	\$ 129,783	3.25%	\$ 134,001	3.00%	\$ 138,021	3.00%	\$ 142,162	3.00%	\$ 146,427	3.00%	\$ 150,819	2.50%	\$ 154,590	2.50%	\$ 158,455	2.25%	\$ 162,020	2.00%	\$ 165,260
MGMT12	\$ 128,114	3.75%	\$ 132,918	3.50%	\$ 137,570	3.25%	\$ 142,041	3.00%	\$ 146,302	3.00%	\$ 150,691	3.00%	\$ 155,212	3.00%	\$ 159,869	2.50%	\$ 163,865	2.50%	\$ 167,962	2.25%	\$ 171,741	2.00%	\$ 175,176
MGMT13	\$ 134,519	3.75%	\$ 139,564	3.50%	\$ 144,449	3.25%	\$ 149,143	3.00%	\$ 153,617	3.00%	\$ 158,226	3.00%	\$ 162,973	3.00%	\$ 167,862	2.50%	\$ 172,058	2.50%	\$ 176,360	2.25%	\$ 180,328	2.00%	\$ 183,935
POLICE SWORN																							
	1		2		3		4		5														
PD1	\$ 74,361	7.00%	\$ 79,583	7.00%	\$ 85,171	7.00%	\$ 91,132	7.00%	\$ 97,512														
PDM	\$ 101,924																						
PD2	\$ 111,515	3.00%	\$ 114,861	3.00%	\$ 118,306	2.25%	\$ 120,968																
PD3	\$ 135,485	2.25%	\$ 138,533																				
PD4	\$ 146,845	2.25%	\$ 150,149																				
PD5	\$ 165,794	2.25%	\$ 169,525																				
PR1	\$ 65,245																						
PR2	\$ 69,486																						

ANNUAL- ALL JOB FAMILIES																							
PROFESSIONAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$ 48,437	3.75%	\$ 50,254	3.50%	\$ 52,013	3.25%	\$ 53,703	3.00%	\$ 55,314	3.00%	\$ 56,974	3.00%	\$ 58,683	3.00%	\$ 60,443	2.50%	\$ 61,954	2.50%	\$ 63,503	2.25%	\$ 64,932	2.00%	\$ 66,231
PROF4	\$ 53,523	3.75%	\$ 55,531	3.50%	\$ 57,474	3.25%	\$ 59,342	3.00%	\$ 61,122	3.00%	\$ 62,956	3.00%	\$ 64,845	3.00%	\$ 66,790	2.50%	\$ 68,460	2.50%	\$ 70,171	2.25%	\$ 71,750	2.00%	\$ 73,185
PROF5	\$ 59,143	3.75%	\$ 61,361	3.50%	\$ 63,509	3.25%	\$ 65,573	3.00%	\$ 67,540	3.00%	\$ 69,566	3.00%	\$ 71,653	3.00%	\$ 73,803	2.50%	\$ 75,648	2.50%	\$ 77,539	2.25%	\$ 79,284	2.00%	\$ 80,869
PROF6	\$ 65,353	3.75%	\$ 67,804	3.50%	\$ 70,177	3.25%	\$ 72,458	3.00%	\$ 74,632	3.00%	\$ 76,871	3.00%	\$ 79,177	3.00%	\$ 81,552	2.50%	\$ 83,591	2.50%	\$ 85,681	2.25%	\$ 87,609	2.00%	\$ 89,361
PROF7	\$ 72,216	3.75%	\$ 74,924	3.50%	\$ 77,546	3.25%	\$ 80,066	3.00%	\$ 82,468	3.00%	\$ 84,942	3.00%	\$ 87,490	3.00%	\$ 90,115	2.50%	\$ 92,368	2.50%	\$ 94,677	2.25%	\$ 96,807	2.00%	\$ 98,744
PROF8	\$ 79,798	3.75%	\$ 82,791	3.50%	\$ 85,688	3.25%	\$ 88,473	3.00%	\$ 91,127	3.00%	\$ 93,861	3.00%	\$ 96,677	3.00%	\$ 99,577	2.50%	\$ 102,067	2.50%	\$ 104,618	2.25%	\$ 106,972	2.00%	\$ 109,112
PROF9	\$ 88,177	3.75%	\$ 91,484	3.50%	\$ 94,686	3.25%	\$ 97,763	3.00%	\$ 100,696	3.00%	\$ 103,717	3.00%	\$ 106,828	3.00%	\$ 110,033	2.50%	\$ 112,784	2.50%	\$ 115,603	2.25%	\$ 118,204	2.00%	\$ 120,568
PROF10	\$ 97,436	3.75%	\$ 101,089	3.50%	\$ 104,627	3.25%	\$ 108,028	3.00%	\$ 111,269	3.00%	\$ 114,607	3.00%	\$ 118,045	3.00%	\$ 121,586	2.50%	\$ 124,626	2.50%	\$ 127,742	2.25%	\$ 130,616	2.00%	\$ 133,228
PROF11	\$ 107,666	3.75%	\$ 111,704	3.50%	\$ 115,613	3.25%	\$ 119,371	3.00%	\$ 122,952	3.00%	\$ 126,641	3.00%	\$ 130,440	3.00%	\$ 134,353	2.50%	\$ 137,712	2.50%	\$ 141,155	2.25%	\$ 144,330	2.00%	\$ 147,217
TECHNICAL AND BUSINESS SUPPORT																							
	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$ 31,126	3.75%	\$ 32,294	3.50%	\$ 33,424	3.25%	\$ 34,510	3.00%	\$ 35,546	3.00%	\$ 36,612	3.00%	\$ 37,710	3.00%	\$ 38,842	2.50%	\$ 39,813	2.50%	\$ 40,808	2.25%	\$ 41,726	2.00%	\$ 42,561
TBS2	\$ 34,286	3.75%	\$ 35,572	3.50%	\$ 36,817	3.25%	\$ 38,013	3.00%	\$ 39,153	3.00%	\$ 40,328	3.00%	\$ 41,538	3.00%	\$ 42,784	2.50%	\$ 43,854	2.50%	\$ 44,950	2.25%	\$ 45,961	2.00%	\$ 46,881
TBS3	\$ 37,766	3.75%	\$ 39,182	3.50%	\$ 40,553	3.25%	\$ 41,871	3.00%	\$ 43,128	3.00%	\$ 44,421	3.00%	\$ 45,754	3.00%	\$ 47,127	2.50%	\$ 48,305	2.50%	\$ 49,512	2.25%	\$ 50,626	2.00%	\$ 51,639
TBS4	\$ 41,599	3.75%	\$ 43,159	3.50%	\$ 44,670	3.25%	\$ 46,121	3.00%	\$ 47,505	3.00%	\$ 48,930	3.00%	\$ 50,398	3.00%	\$ 51,910	2.50%	\$ 53,208	2.50%	\$ 54,538	2.25%	\$ 55,765	2.00%	\$ 56,880
TBS5	\$ 45,821	3.75%	\$ 47,540	3.50%	\$ 49,204	3.25%	\$ 50,803	3.00%	\$ 52,327	3.00%	\$ 53,897	3.00%	\$ 55,513	3.00%	\$ 57,179	2.50%	\$ 58,608	2.50%	\$ 60,074	2.25%	\$ 61,425	2.00%	\$ 62,654
TBS6	\$ 50,472	3.75%	\$ 52,365	3.50%	\$ 54,198	3.25%	\$ 55,959	3.00%	\$ 57,638	3.00%	\$ 59,367	3.00%	\$ 61,148	3.00%	\$ 62,982	2.50%	\$ 64,557	2.50%	\$ 66,171	2.25%	\$ 67,660	2.00%	\$ 69,013
TBS7	\$ 55,595	3.75%	\$ 57,680	3.50%	\$ 59,699	3.25%	\$ 61,639	3.00%	\$ 63,488	3.00%	\$ 65,393	3.00%	\$ 67,355	3.00%	\$ 69,375	2.50%	\$ 71,110	2.50%	\$ 72,887	2.25%	\$ 74,527	2.00%	\$ 76,018
TBS8	\$ 61,238	3.75%	\$ 63,534	3.50%	\$ 65,758	3.25%	\$ 67,895	3.00%	\$ 69,932	3.00%	\$ 72,030	3.00%	\$ 74,191	3.00%	\$ 76,417	2.50%	\$ 78,327	2.50%	\$ 80,285	2.25%	\$ 82,092	2.00%	\$ 83,734
TBS9	\$ 67,454	3.75%	\$ 69,983	3.50%	\$ 72,433	3.25%	\$ 74,787	3.00%	\$ 77,030	3.00%	\$ 79,341	3.00%	\$ 81,721	3.00%	\$ 84,173	2.50%	\$ 86,277	2.50%	\$ 88,434	2.25%	\$ 90,424	2.00%	\$ 92,233
TBS10	\$ 74,300	3.75%	\$ 77,087	3.50%	\$ 79,785	3.25%	\$ 82,378	3.00%	\$ 84,849	3.00%	\$ 87,394	3.00%	\$ 90,016	3.00%	\$ 92,717	2.50%	\$ 95,035	2.50%	\$ 97,410	2.25%	\$ 99,602	2.00%	\$ 101,594

MONTHLY- ALL JOB FAMILIES																							
EXECUTIVE																							
	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$ 7,218.25	3.75%	\$ 7,488.93	3.5%	\$ 7,751.05	3.25%	\$ 8,002.96	3.0%	\$ 8,243.04	3.0%	\$ 8,490.34	3.0%	\$ 8,745.05	3.0%	\$ 9,007.40	2.5%	\$ 9,232.58	2.5%	\$ 9,463.40	2.25%	\$ 9,676.32	2.0%	\$ 9,869.85
EXEC2	\$ 7,800.04	3.75%	\$ 8,092.54	3.5%	\$ 8,375.78	3.25%	\$ 8,647.99	3.0%	\$ 8,907.43	3.0%	\$ 9,174.66	3.0%	\$ 9,449.90	3.0%	\$ 9,733.39	2.5%	\$ 9,976.73	2.5%	\$ 10,226.15	2.25%	\$ 10,456.23	2.0%	\$ 10,665.36
EXEC3	\$ 8,428.72	3.75%	\$ 8,744.80	3.5%	\$ 9,050.87	3.25%	\$ 9,345.02	3.0%	\$ 9,625.37	3.0%	\$ 9,914.13	3.0%	\$ 10,211.56	3.0%	\$ 10,517.90	2.5%	\$ 10,780.85	2.5%	\$ 11,050.37	2.25%	\$ 11,299.01	2.0%	\$ 11,524.99
EXEC4	\$ 9,056.66	3.75%	\$ 9,396.29	3.5%	\$ 9,725.16	3.25%	\$ 10,041.23	3.0%	\$ 10,342.46	3.0%	\$ 10,652.74	3.0%	\$ 10,972.32	3.0%	\$ 11,301.49	2.5%	\$ 11,584.03	2.5%	\$ 11,873.63	2.25%	\$ 12,140.78	2.0%	\$ 12,383.60
EXEC5	\$ 9,840.97	3.75%	\$ 10,210.01	3.5%	\$ 10,567.36	3.25%	\$ 10,910.80	3.0%	\$ 11,238.12	3.0%	\$ 11,575.26	3.0%	\$ 11,922.52	3.0%	\$ 12,280.20	2.5%	\$ 12,587.20	2.5%	\$ 12,901.88	2.25%	\$ 13,192.17	2.0%	\$ 13,456.02
EXEC6	\$ 10,634.15	3.75%	\$ 11,032.93	3.5%	\$ 11,419.09	3.25%	\$ 11,790.21	3.0%	\$ 12,143.91	3.0%	\$ 12,508.23	3.0%	\$ 12,883.48	3.0%	\$ 13,269.98	2.5%	\$ 13,601.73	2.5%	\$ 13,941.77	2.25%	\$ 14,255.46	2.0%	\$ 14,540.57
EXEC7	\$ 11,708.20	3.75%	\$ 12,147.26	3.5%	\$ 12,572.41	3.25%	\$ 12,981.02	3.0%	\$ 13,370.45	3.0%	\$ 13,771.56	3.0%	\$ 14,184.71	3.0%	\$ 14,610.25	2.5%	\$ 14,975.51	2.5%	\$ 15,349.89	2.25%	\$ 15,695.27	2.0%	\$ 16,009.17
EXEC8	\$ 12,352.15	3.75%	\$ 12,815.36	3.5%	\$ 13,263.90	3.25%	\$ 13,694.97	3.0%	\$ 14,105.82	3.0%	\$ 14,529.00	3.0%	\$ 14,964.87	3.0%	\$ 15,413.81	2.5%	\$ 15,799.16	2.5%	\$ 16,194.14	2.25%	\$ 16,558.50	2.0%	\$ 16,889.67
EXEC9	\$ 12,846.24	3.75%	\$ 13,327.97	3.5%	\$ 13,794.45	3.25%	\$ 14,242.77	3.0%	\$ 14,670.05	3.0%	\$ 15,110.16	3.0%	\$ 15,563.46	3.0%	\$ 16,030.37	2.5%	\$ 16,431.12	2.5%	\$ 16,841.90	2.25%	\$ 17,220.85	2.0%	\$ 17,565.26
INFORMATION TECHNOLOGY																							
	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$6,144.24	3.75%	\$6,374.65	3.5%	\$6,597.76	3.25%	\$6,812.19	3.0%	\$7,016.55	3.0%	\$7,227.05	3.0%	\$7,443.86	3.0%	\$7,667.17	2.5%	\$7,858.85	2.5%	\$8,055.33	2.25%	\$8,236.57	2.0%	\$8,401.30
INFT2	\$6,648.06	3.75%	\$6,897.37	3.5%	\$7,138.77	3.25%	\$7,370.78	3.0%	\$7,591.91	3.0%	\$7,819.67	3.0%	\$8,054.26	3.0%	\$8,295.88	2.5%	\$8,503.28	2.5%	\$8,715.86	2.25%	\$8,911.97	2.0%	\$9,090.21
INFT3	\$7,193.21	3.75%	\$7,462.95	3.5%	\$7,724.15	3.25%	\$7,975.19	3.0%	\$8,214.44	3.0%	\$8,460.88	3.0%	\$8,714.70	3.0%	\$8,976.15	2.5%	\$9,200.55	2.5%	\$9,430.56	2.25%	\$9,642.75	2.0%	\$9,835.61
INFT4	\$7,783.05	3.75%	\$8,074.91	3.5%	\$8,357.53	3.25%	\$8,629.15	3.0%	\$8,888.03	3.0%	\$9,154.67	3.0%	\$9,429.31	3.0%	\$9,712.19	2.5%	\$9,954.99	2.5%	\$10,203.87	2.25%	\$10,433.46	2.0%	\$10,642.13
INFT5	\$8,421.26	3.75%	\$8,737.06	3.5%	\$9,042.85	3.25%	\$9,336.75	3.0%	\$9,616.85	3.0%	\$9,905.35	3.0%	\$10,202.51	3.0%	\$10,508.59	2.5%	\$10,771.30	2.5%	\$11,040.59	2.25%	\$11,289.00	2.0%	\$11,514.78
LABOR, TRADES, CRAFTS AND UTILITIES																							
	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$2,447.66	3.75%	\$2,539.45	3.5%	\$2,628.33	3.25%	\$2,713.75	3.0%	\$2,795.16	3.0%	\$2,879.01	3.0%	\$2,965.39	3.0%	\$3,054.35	2.5%	\$3,130.71	2.5%	\$3,208.97	2.25%	\$3,281.18	2.0%	\$3,346.80
LTCU2	\$2,698.30	3.75%	\$2,799.49	3.5%	\$2,897.47	3.25%	\$2,991.64	3.0%	\$3,081.38	3.0%	\$3,173.83	3.0%	\$3,269.04	3.0%	\$3,367.11	2.5%	\$3,451.29	2.5%	\$3,537.57	2.25%	\$3,617.17	2.0%	\$3,689.51
LTCU3	\$2,974.61	3.75%	\$3,086.15	3.5%	\$3,194.17	3.25%	\$3,297.98	3.0%	\$3,396.92	3.0%	\$3,498.83	3.0%	\$3,603.79	3.0%	\$3,711.90	2.5%	\$3,804.70	2.5%	\$3,899.82	2.25%	\$3,987.57	2.0%	\$4,067.32
LTCU4	\$3,279.20	3.75%	\$3,402.18	3.5%	\$3,521.25	3.25%	\$3,635.69	3.0%	\$3,744.76	3.0%	\$3,857.11	3.0%	\$3,972.82	3.0%	\$4,092.00	2.5%	\$4,194.30	2.5%	\$4,299.16	2.25%	\$4,395.89	2.0%	\$4,483.81
LTCU5	\$3,615.00	3.75%	\$3,750.56	3.5%	\$3,881.83	3.25%	\$4,007.99	3.0%	\$4,128.23	3.0%	\$4,252.07	3.0%	\$4,379.64	3.0%	\$4,511.02	2.5%	\$4,623.80	2.5%	\$4,739.39	2.25%	\$4,846.03	2.0%	\$4,942.95
LTCU6	\$3,985.17	3.75%	\$4,134.61	3.5%	\$4,279.33	3.25%	\$4,418.40	3.0%	\$4,550.96	3.0%	\$4,687.49	3.0%	\$4,828.11	3.0%	\$4,972.95	2.5%	\$5,097.28	2.5%	\$5,224.71	2.25%	\$5,342.26	2.0%	\$5,449.11
LTCU7	\$4,393.25	3.75%	\$4,558.00	3.5%	\$4,717.53	3.25%	\$4,870.85	3.0%	\$5,016.97	3.0%	\$5,167.48	3.0%	\$5,322.51	3.0%	\$5,482.18	2.5%	\$5,619.24	2.5%	\$5,759.72	2.25%	\$5,889.31	2.0%	\$6,007.10
LTCU8	\$4,843.12	3.75%	\$5,024.74	3.5%	\$5,200.60	3.25%	\$5,369.62	3.0%	\$5,530.71	3.0%	\$5,696.63	3.0%	\$5,867.53	3.0%	\$6,043.56	2.5%	\$6,194.65	2.5%	\$6,349.51	2.25%	\$6,492.38	2.0%	\$6,622.23
LTCU9	\$5,339.06	3.75%	\$5,539.27	3.5%	\$5,733.15	3.25%	\$5,919.47	3.0%	\$6,097.06	3.0%	\$6,279.97	3.0%	\$6,468.37	3.0%	\$6,662.42	2.5%	\$6,828.98	2.5%	\$6,999.70	2.25%	\$7,157.20	2.0%	\$7,300.34
MANAGEMENT																							
	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$4,350.02	3.75%	\$4,513.15	3.5%	\$4,671.11	3.25%	\$4,822.92	3.0%	\$4,967.60	3.0%	\$5,116.63	3.0%	\$5,270.13	3.0%	\$5,428.23	2.5%	\$5,563.94	2.5%	\$5,703.04	2.25%	\$5,831.36	2.0%	\$5,947.98
MGMT3	\$4,796.33	3.75%	\$4,976.19	3.5%	\$5,150.36	3.25%	\$5,317.75	3.0%	\$5,477.28	3.0%	\$5,641.60	3.0%	\$5,810.85	3.0%	\$5,985.17	2.5%	\$6,134.80	2.5%	\$6,288.17	2.25%	\$6,429.65	2.0%	\$6,558.25
MGMT4	\$5,288.44	3.75%	\$5,486.75	3.5%	\$5,678.79	3.25%	\$5,863.35	3.0%	\$6,039.25	3.0%	\$6,220.43	3.0%	\$6,407.04	3.0%	\$6,599.25	2.5%	\$6,764.23	2.5%	\$6,933.34	2.25%	\$7,089.34	2.0%	\$7,231.12
MGMT5	\$5,966.41	3.75%	\$6,190.15	3.5%	\$6,406.81	3.25%	\$6,615.03	3.0%	\$6,813.48	3.0%	\$7,017.89	3.0%	\$7,228.42	3.0%	\$7,445.27	2.5%	\$7,631.41	2.5%	\$7,822.19	2.25%	\$7,998.19	2.0%	\$8,158.15
MGMT6	\$6,578.57	3.75%	\$6,825.26	3.5%	\$7,064.15	3.25%	\$7,293.73	3.0%	\$7,512.54	3.0%	\$7,737.92	3.0%	\$7,970.06	3.0%	\$8,209.16	2.5%	\$8,414.39	2.5%	\$8,624.75	2.25%	\$8,818.81	2.0%	\$8,995.18
MGMT7	\$7,253.53	3.75%	\$7,525.53	3.5%	\$7,788.93	3.25%	\$8,042.07	3.0%	\$8,283.33	3.0%	\$8,531.83	3.0%	\$8,787.79	3.0%	\$9,051.42	2.5%	\$9,277.70	2.5%	\$9,509.65	2.25%	\$9,723.61	2.0%	\$9,918.09
MGMT8	\$7,997.74	3.75%	\$8,297.65	3.5%	\$8,588.07	3.25%	\$8,867.19	3.0%	\$9,133.20	3.0%	\$9,407.20	3.0%	\$9,689.41	3.0%	\$9,980.09	2.5%	\$10,229.60	2.5%	\$10,485.34	2.25%	\$10,721.26	2.0%	\$10,935.68
MGMT9	\$8,617.56	3.75%	\$8,940.72	3.5%	\$9,253.65	3.25%	\$9,554.39	3.0%	\$9,841.02	3.0%	\$10,136.25	3.0%	\$10,440.34	3.0%	\$10,753.55	2.5%	\$11,022.39	2.5%	\$11,297.95	2.25%	\$11,552.15	2.0%	\$11,783.20
MGMT10	\$9,501.73	3.75%	\$9,858.04	3.5%	\$10,203.07	3.25%	\$10,534.67	3.0%	\$10,850.71	3.0%	\$11,176.23	3.0%	\$11,511.52	3.0%	\$11,856.87	2.5%	\$12,153.29	2.5%	\$12,457.12	2.25%	\$12,737.41	2.0%	\$12,992.15
MGMT11	\$10,071.83	3.75%	\$10,449.52	3.5%	\$10,815.26	3.25%	\$11,166.75	3.0%	\$11,501.76	3.0%	\$11,846.81	3.0%	\$12,202.21	3.0%	\$12,568.28	2.5%	\$12,882.49	2.5%	\$13,204.55	2.25%	\$13,501.65	2.0%	\$13,771.68
MGMT12	\$10,676.14	3.75%	\$11,076.50	3.5%	\$11,464.17	3.25%	\$11,836.76	3.0%	\$12,191.86	3.0%	\$12,557.62	3.0%	\$12,934.35	3.0%	\$13,322.38	2.5%	\$13,655.43	2.5%	\$13,996.82	2.25%	\$14,311.75	2.0%	\$14,597.98
MGMT13	\$11,209.95	3.75%	\$11,630.32	3.5%	\$12,037.38	3.25%	\$12,428.60	3.0%	\$12,801.45	3.0%	\$13,185.50	3.0%	\$13,581.06	3.0%	\$13,988.49	2.5%	\$14,338.21	2.5%	\$14,696.66	2.25%	\$15,027.34	2.0%	\$15,327.88
POLICE SWORN																							
	1		2		3		4		5														
PD1	\$6,196.78	7.00%	\$6,631.88	7.0%	\$7,097.54	7.00%	\$7,594.37	7.00%	\$8,125.98														
PDM	\$8,493.68																						
PD2	\$9,292.93	3.00%	\$9,571.72	3.0%	\$9,858.87	2.25%	\$10,080.70																
PD3	\$11,290.38	2.25%	\$11,544.41																				
PD4	\$12,237.08	2.25%	\$12,512.41																				

MONTHLY- ALL JOB FAMILIES																							
PROFESSIONAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$4,036.46	3.75%	\$4,187.82	3.5%	\$4,334.40	3.25%	\$4,475.26	3.0%	\$4,609.52	3.0%	\$4,747.81	3.0%	\$4,890.24	3.0%	\$5,036.95	2.5%	\$5,162.87	2.5%	\$5,291.95	2.25%	\$5,411.01	2.0%	\$5,519.23
PROF4	\$4,460.28	3.75%	\$4,627.54	3.5%	\$4,789.51	3.25%	\$4,945.17	3.0%	\$5,093.52	3.0%	\$5,246.33	3.0%	\$5,403.72	3.0%	\$5,565.83	2.5%	\$5,704.97	2.5%	\$5,847.60	2.25%	\$5,979.17	2.0%	\$6,098.75
PROF5	\$4,928.61	3.75%	\$5,113.44	3.5%	\$5,292.41	3.25%	\$5,464.41	3.0%	\$5,628.34	3.0%	\$5,797.19	3.0%	\$5,971.11	3.0%	\$6,150.24	2.5%	\$6,304.00	2.5%	\$6,461.60	2.25%	\$6,606.98	2.0%	\$6,739.12
PROF6	\$5,446.12	3.75%	\$5,650.35	3.5%	\$5,848.11	3.25%	\$6,038.17	3.0%	\$6,219.32	3.0%	\$6,405.90	3.0%	\$6,598.07	3.0%	\$6,796.02	2.5%	\$6,965.92	2.5%	\$7,140.06	2.25%	\$7,300.72	2.0%	\$7,446.73
PROF7	\$6,017.96	3.75%	\$6,243.63	3.5%	\$6,462.16	3.25%	\$6,672.18	3.0%	\$6,872.35	3.0%	\$7,078.52	3.0%	\$7,290.87	3.0%	\$7,509.60	2.5%	\$7,697.34	2.5%	\$7,889.77	2.25%	\$8,067.29	2.0%	\$8,228.64
PROF8	\$6,649.85	3.75%	\$6,899.21	3.5%	\$7,140.69	3.25%	\$7,372.76	3.0%	\$7,593.94	3.0%	\$7,821.76	3.0%	\$8,056.41	3.0%	\$8,298.11	2.5%	\$8,505.56	2.5%	\$8,718.20	2.25%	\$8,914.36	2.0%	\$9,092.64
PROF9	\$7,348.08	3.75%	\$7,623.63	3.5%	\$7,890.46	3.25%	\$8,146.90	3.0%	\$8,391.31	3.0%	\$8,643.05	3.0%	\$8,902.34	3.0%	\$9,169.41	2.5%	\$9,398.64	2.5%	\$9,633.61	2.25%	\$9,850.36	2.0%	\$10,047.37
PROF10	\$8,119.63	3.75%	\$8,424.11	3.5%	\$8,718.96	3.25%	\$9,002.32	3.0%	\$9,272.39	3.0%	\$9,550.57	3.0%	\$9,837.08	3.0%	\$10,132.20	2.5%	\$10,385.50	2.5%	\$10,645.14	2.25%	\$10,884.65	2.0%	\$11,102.35
PROF11	\$8,972.19	3.75%	\$9,308.65	3.5%	\$9,634.45	3.25%	\$9,947.57	3.0%	\$10,246.00	3.0%	\$10,553.38	3.0%	\$10,869.98	3.0%	\$11,196.08	2.5%	\$11,475.98	2.5%	\$11,762.88	2.25%	\$12,027.54	2.0%	\$12,268.09
TECHNICAL AND BUSINESS SUPPORT																							
	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$2,593.87	3.75%	\$2,691.14	3.5%	\$2,785.33	3.25%	\$2,875.86	3.0%	\$2,962.13	3.0%	\$3,051.00	3.0%	\$3,142.53	3.0%	\$3,236.80	2.5%	\$3,317.72	2.5%	\$3,400.67	2.25%	\$3,477.18	2.0%	\$3,546.72
TBS2	\$2,857.15	3.75%	\$2,964.29	3.5%	\$3,068.04	3.25%	\$3,167.76	3.0%	\$3,262.79	3.0%	\$3,360.67	3.0%	\$3,461.49	3.0%	\$3,565.34	2.5%	\$3,654.47	2.5%	\$3,745.83	2.25%	\$3,830.11	2.0%	\$3,906.72
TBS3	\$3,147.15	3.75%	\$3,265.17	3.5%	\$3,379.45	3.25%	\$3,489.28	3.0%	\$3,593.96	3.0%	\$3,701.78	3.0%	\$3,812.83	3.0%	\$3,927.22	2.5%	\$4,025.40	2.5%	\$4,126.03	2.25%	\$4,218.87	2.0%	\$4,303.25
TBS4	\$3,466.59	3.75%	\$3,596.59	3.5%	\$3,722.47	3.25%	\$3,843.45	3.0%	\$3,958.75	3.0%	\$4,077.51	3.0%	\$4,199.84	3.0%	\$4,325.83	2.5%	\$4,433.98	2.5%	\$4,544.83	2.25%	\$4,647.09	2.0%	\$4,740.03
TBS5	\$3,818.45	3.75%	\$3,961.64	3.5%	\$4,100.30	3.25%	\$4,233.56	3.0%	\$4,360.56	3.0%	\$4,491.38	3.0%	\$4,626.12	3.0%	\$4,764.90	2.5%	\$4,884.03	2.5%	\$5,006.13	2.25%	\$5,118.76	2.0%	\$5,221.14
TBS6	\$4,206.02	3.75%	\$4,363.74	3.5%	\$4,516.48	3.25%	\$4,663.26	3.0%	\$4,803.16	3.0%	\$4,947.25	3.0%	\$5,095.67	3.0%	\$5,248.54	2.5%	\$5,379.76	2.5%	\$5,514.25	2.25%	\$5,638.32	2.0%	\$5,751.09
TBS7	\$4,632.93	3.75%	\$4,806.66	3.5%	\$4,974.90	3.25%	\$5,136.58	3.0%	\$5,290.68	3.0%	\$5,449.40	3.0%	\$5,612.88	3.0%	\$5,781.27	2.5%	\$5,925.80	2.5%	\$6,073.95	2.25%	\$6,210.61	2.0%	\$6,334.82
TBS8	\$5,103.17	3.75%	\$5,294.54	3.5%	\$5,479.85	3.25%	\$5,657.95	3.0%	\$5,827.68	3.0%	\$6,002.51	3.0%	\$6,182.59	3.0%	\$6,368.07	2.5%	\$6,527.27	2.5%	\$6,690.45	2.25%	\$6,840.99	2.0%	\$6,977.81
TBS9	\$5,621.14	3.75%	\$5,831.94	3.5%	\$6,036.05	3.25%	\$6,232.23	3.0%	\$6,419.19	3.0%	\$6,611.77	3.0%	\$6,810.12	3.0%	\$7,014.43	2.5%	\$7,189.79	2.5%	\$7,369.53	2.25%	\$7,535.35	2.0%	\$7,686.05
TBS10	\$6,191.69	3.75%	\$6,423.88	3.5%	\$6,648.71	3.25%	\$6,864.80	3.0%	\$7,070.74	3.0%	\$7,282.86	3.0%	\$7,501.35	3.0%	\$7,726.39	2.5%	\$7,919.55	2.5%	\$8,117.54	2.25%	\$8,300.18	2.0%	\$8,466.19

BIWEEKLY - ALL JOB FAMILIES

EXECUTIVE

	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$ 3,331.50	3.75%	\$ 3,456.43	3.50%	\$ 3,577.41	3.25%	\$ 3,693.67	3.00%	\$ 3,804.48	3.00%	\$ 3,918.62	3.00%	\$ 4,036.17	3.00%	\$ 4,157.26	2.50%	\$ 4,261.19	2.50%	\$ 4,367.72	2.25%	\$ 4,465.99	2.0%	\$ 4,555.31
EXEC2	\$ 3,600.02	3.75%	\$ 3,735.02	3.50%	\$ 3,865.74	3.25%	\$ 3,991.38	3.00%	\$ 4,111.12	3.00%	\$ 4,234.46	3.00%	\$ 4,361.49	3.00%	\$ 4,492.34	2.50%	\$ 4,604.64	2.50%	\$ 4,719.76	2.25%	\$ 4,825.95	2.0%	\$ 4,922.47
EXEC3	\$ 3,890.18	3.75%	\$ 4,036.06	3.50%	\$ 4,177.32	3.25%	\$ 4,313.09	3.00%	\$ 4,442.48	3.00%	\$ 4,575.75	3.00%	\$ 4,713.03	3.00%	\$ 4,854.42	2.50%	\$ 4,975.78	2.50%	\$ 5,100.17	2.25%	\$ 5,214.93	2.0%	\$ 5,319.22
EXEC4	\$ 4,180.00	3.75%	\$ 4,336.75	3.50%	\$ 4,488.53	3.25%	\$ 4,634.41	3.00%	\$ 4,773.44	3.00%	\$ 4,916.65	3.00%	\$ 5,064.15	3.00%	\$ 5,216.07	2.50%	\$ 5,346.47	2.50%	\$ 5,480.14	2.25%	\$ 5,603.44	2.0%	\$ 5,715.51
EXEC5	\$ 4,541.99	3.75%	\$ 4,712.31	3.50%	\$ 4,877.24	3.25%	\$ 5,035.75	3.00%	\$ 5,186.82	3.00%	\$ 5,342.43	3.00%	\$ 5,502.70	3.00%	\$ 5,667.78	2.50%	\$ 5,809.48	2.50%	\$ 5,954.71	2.25%	\$ 6,088.70	2.0%	\$ 6,210.47
EXEC6	\$ 4,908.07	3.75%	\$ 5,092.12	3.50%	\$ 5,270.35	3.25%	\$ 5,441.63	3.00%	\$ 5,604.88	3.00%	\$ 5,773.03	3.00%	\$ 5,946.22	3.00%	\$ 6,124.61	2.50%	\$ 6,277.72	2.50%	\$ 6,434.66	2.25%	\$ 6,579.44	2.0%	\$ 6,711.03
EXEC7	\$ 5,403.79	3.75%	\$ 5,606.43	3.50%	\$ 5,802.65	3.25%	\$ 5,991.24	3.00%	\$ 6,170.98	3.00%	\$ 6,356.10	3.00%	\$ 6,546.79	3.00%	\$ 6,743.19	2.50%	\$ 6,911.77	2.50%	\$ 7,084.57	2.25%	\$ 7,243.97	2.0%	\$ 7,388.85
EXEC8	\$ 5,700.99	3.75%	\$ 5,914.78	3.50%	\$ 6,121.80	3.25%	\$ 6,320.76	3.00%	\$ 6,510.38	3.00%	\$ 6,705.69	3.00%	\$ 6,906.86	3.00%	\$ 7,114.07	2.50%	\$ 7,291.92	2.50%	\$ 7,474.22	2.25%	\$ 7,642.39	2.0%	\$ 7,795.23
EXEC9	\$ 5,929.03	3.75%	\$ 6,151.37	3.50%	\$ 6,366.67	3.25%	\$ 6,573.59	3.00%	\$ 6,770.79	3.00%	\$ 6,973.92	3.00%	\$ 7,183.14	3.00%	\$ 7,398.63	2.50%	\$ 7,583.60	2.50%	\$ 7,773.19	2.25%	\$ 7,948.08	2.0%	\$ 8,107.04

INFORMATION TECHNOLOGY

	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$ 2,835.80	3.75%	\$ 2,942.14	3.50%	\$ 3,045.12	3.25%	\$ 3,144.09	3.00%	\$ 3,238.41	3.00%	\$ 3,335.56	3.00%	\$ 3,435.63	3.00%	\$ 3,538.70	2.50%	\$ 3,627.16	2.50%	\$ 3,717.84	2.25%	\$ 3,801.49	2.0%	\$ 3,877.52
INFT2	\$ 3,068.34	3.75%	\$ 3,183.40	3.50%	\$ 3,294.82	3.25%	\$ 3,401.90	3.00%	\$ 3,503.96	3.00%	\$ 3,609.08	3.00%	\$ 3,717.35	3.00%	\$ 3,828.87	2.50%	\$ 3,924.59	2.50%	\$ 4,022.71	2.25%	\$ 4,113.22	2.0%	\$ 4,195.48
INFT3	\$ 3,319.94	3.75%	\$ 3,444.44	3.50%	\$ 3,564.99	3.25%	\$ 3,680.86	3.00%	\$ 3,791.28	3.00%	\$ 3,905.02	3.00%	\$ 4,022.17	3.00%	\$ 4,142.84	2.50%	\$ 4,246.41	2.50%	\$ 4,352.57	2.25%	\$ 4,450.50	2.0%	\$ 4,539.51
INFT4	\$ 3,592.18	3.75%	\$ 3,726.88	3.50%	\$ 3,857.32	3.25%	\$ 3,982.69	3.00%	\$ 4,102.17	3.00%	\$ 4,225.23	3.00%	\$ 4,351.99	3.00%	\$ 4,482.55	2.50%	\$ 4,594.61	2.50%	\$ 4,709.48	2.25%	\$ 4,815.44	2.0%	\$ 4,911.75
INFT5	\$ 3,886.73	3.75%	\$ 4,032.49	3.50%	\$ 4,173.62	3.25%	\$ 4,309.27	3.00%	\$ 4,438.54	3.00%	\$ 4,571.70	3.00%	\$ 4,708.85	3.00%	\$ 4,850.12	2.50%	\$ 4,971.37	2.50%	\$ 5,095.66	2.25%	\$ 5,210.31	2.0%	\$ 5,314.51

LABOR, TRADES, CRAFTS AND UTILITIES

	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$ 1,129.69	3.75%	\$ 1,172.05	3.50%	\$ 1,213.07	3.25%	\$ 1,252.50	3.00%	\$ 1,290.07	3.00%	\$ 1,328.78	3.00%	\$ 1,368.64	3.00%	\$ 1,409.70	2.50%	\$ 1,444.94	2.50%	\$ 1,481.06	2.25%	\$ 1,514.39	2.0%	\$ 1,544.68
LTCU2	\$ 1,245.37	3.75%	\$ 1,292.07	3.50%	\$ 1,337.29	3.25%	\$ 1,380.75	3.00%	\$ 1,422.18	3.00%	\$ 1,464.84	3.00%	\$ 1,508.79	3.00%	\$ 1,554.05	2.50%	\$ 1,592.90	2.50%	\$ 1,632.73	2.25%	\$ 1,669.46	2.0%	\$ 1,702.85
LTCU3	\$ 1,372.89	3.75%	\$ 1,424.38	3.50%	\$ 1,474.23	3.25%	\$ 1,522.14	3.00%	\$ 1,567.81	3.00%	\$ 1,614.84	3.00%	\$ 1,663.29	3.00%	\$ 1,713.19	2.50%	\$ 1,756.02	2.50%	\$ 1,799.92	2.25%	\$ 1,840.41	2.0%	\$ 1,877.22
LTCU4	\$ 1,513.48	3.75%	\$ 1,570.23	3.50%	\$ 1,625.19	3.25%	\$ 1,678.01	3.00%	\$ 1,728.35	3.00%	\$ 1,780.20	3.00%	\$ 1,833.61	3.00%	\$ 1,888.62	2.50%	\$ 1,935.83	2.50%	\$ 1,984.23	2.25%	\$ 2,028.87	2.0%	\$ 2,069.45
LTCU5	\$ 1,668.46	3.75%	\$ 1,731.03	3.50%	\$ 1,791.61	3.25%	\$ 1,849.84	3.00%	\$ 1,905.34	3.00%	\$ 1,962.50	3.00%	\$ 2,021.37	3.00%	\$ 2,082.01	2.50%	\$ 2,134.06	2.50%	\$ 2,187.41	2.25%	\$ 2,236.63	2.0%	\$ 2,281.36
LTCU6	\$ 1,839.31	3.75%	\$ 1,908.28	3.50%	\$ 1,975.07	3.25%	\$ 2,039.26	3.00%	\$ 2,100.44	3.00%	\$ 2,163.45	3.00%	\$ 2,228.36	3.00%	\$ 2,295.21	2.50%	\$ 2,352.59	2.50%	\$ 2,411.40	2.25%	\$ 2,465.66	2.0%	\$ 2,514.97
LTCU7	\$ 2,027.65	3.75%	\$ 2,103.69	3.50%	\$ 2,177.32	3.25%	\$ 2,248.08	3.00%	\$ 2,315.53	3.00%	\$ 2,384.99	3.00%	\$ 2,456.54	3.00%	\$ 2,530.24	2.50%	\$ 2,593.49	2.50%	\$ 2,658.33	2.25%	\$ 2,718.14	2.0%	\$ 2,772.51
LTCU8	\$ 2,235.29	3.75%	\$ 2,319.11	3.50%	\$ 2,400.28	3.25%	\$ 2,478.29	3.00%	\$ 2,552.64	3.00%	\$ 2,629.22	3.00%	\$ 2,708.09	3.00%	\$ 2,789.34	2.50%	\$ 2,859.07	2.50%	\$ 2,930.55	2.25%	\$ 2,996.48	2.0%	\$ 3,056.41
LTCU9	\$ 2,464.18	3.75%	\$ 2,556.59	3.50%	\$ 2,646.07	3.25%	\$ 2,732.06	3.00%	\$ 2,814.03	3.00%	\$ 2,898.45	3.00%	\$ 2,985.40	3.00%	\$ 3,074.96	2.50%	\$ 3,151.84	2.50%	\$ 3,230.63	2.25%	\$ 3,303.32	2.0%	\$ 3,369.39

MANAGEMENT

	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$ 2,007.70	3.75%	\$ 2,082.99	3.50%	\$ 2,155.89	3.25%	\$ 2,225.96	3.00%	\$ 2,292.74	3.00%	\$ 2,361.52	3.00%	\$ 2,432.37	3.00%	\$ 2,505.34	2.50%	\$ 2,567.97	2.50%	\$ 2,632.17	2.25%	\$ 2,691.40	2.0%	\$ 2,745.22
MGMT3	\$ 2,213.69	3.75%	\$ 2,296.70	3.50%	\$ 2,377.09	3.25%	\$ 2,454.35	3.00%	\$ 2,527.98	3.00%	\$ 2,603.81	3.00%	\$ 2,681.93	3.00%	\$ 2,762.39	2.50%	\$ 2,831.45	2.50%	\$ 2,902.23	2.25%	\$ 2,967.53	2.0%	\$ 3,026.88
MGMT4	\$ 2,440.82	3.75%	\$ 2,532.35	3.50%	\$ 2,620.98	3.25%	\$ 2,706.16	3.00%	\$ 2,787.35	3.00%	\$ 2,870.97	3.00%	\$ 2,957.10	3.00%	\$ 3,045.81	2.50%	\$ 3,121.95	2.50%	\$ 3,200.00	2.25%	\$ 3,272.00	2.0%	\$ 3,337.44
MGMT5	\$ 2,753.73	3.75%	\$ 2,856.99	3.50%	\$ 2,956.99	3.25%	\$ 3,053.09	3.00%	\$ 3,144.68	3.00%	\$ 3,239.02	3.00%	\$ 3,336.19	3.00%	\$ 3,436.28	2.50%	\$ 3,522.19	2.50%	\$ 3,610.24	2.25%	\$ 3,691.47	2.0%	\$ 3,765.30
MGMT6	\$ 3,036.26	3.75%	\$ 3,150.12	3.50%	\$ 3,260.38	3.25%	\$ 3,366.34	3.00%	\$ 3,467.33	3.00%	\$ 3,571.35	3.00%	\$ 3,678.49	3.00%	\$ 3,788.84	2.50%	\$ 3,883.56	2.50%	\$ 3,980.65	2.25%	\$ 4,070.22	2.0%	\$ 4,151.62
MGMT7	\$ 3,347.78	3.75%	\$ 3,473.32	3.50%	\$ 3,594.89	3.25%	\$ 3,711.72	3.00%	\$ 3,823.08	3.00%	\$ 3,937.77	3.00%	\$ 4,055.90	3.00%	\$ 4,177.58	2.50%	\$ 4,282.02	2.50%	\$ 4,389.07	2.25%	\$ 4,487.82	2.0%	\$ 4,577.58
MGMT8	\$ 3,691.26	3.75%	\$ 3,829.69	3.50%	\$ 3,963.73	3.25%	\$ 4,092.55	3.00%	\$ 4,215.32	3.00%	\$ 4,341.78	3.00%	\$ 4,472.04	3.00%	\$ 4,606.20	2.50%	\$ 4,721.35	2.50%	\$ 4,839.39	2.25%	\$ 4,948.27	2.0%	\$ 5,047.24
MGMT9	\$ 3,977.34	3.75%	\$ 4,126.49	3.50%	\$ 4,270.91	3.25%	\$ 4,409.72	3.00%	\$ 4,542.01	3.00%	\$ 4,678.27	3.00%	\$ 4,818.62	3.00%	\$ 4,963.18	2.50%	\$ 5,087.26	2.50%	\$ 5,214.44	2.25%	\$ 5,331.76	2.0%	\$ 5,438.40
MGMT10	\$ 4,385.41	3.75%	\$ 4,549.87	3.50%	\$ 4,709.11	3.25%	\$ 4,862.16	3.00%	\$ 5,008.02	3.00%	\$ 5,158.26	3.00%	\$ 5,313.01	3.00%	\$ 5,472.40	2.50%	\$ 5,609.21	2.50%	\$ 5,749.44	2.25%	\$ 5,878.80	2.0%	\$ 5,996.38
MGMT11	\$ 4,648.54	3.75%	\$ 4,822.86	3.50%	\$ 4,991.66	3.25%	\$ 5,153.89	3.00%	\$ 5,308.50	3.00%	\$ 5,467.76	3.00%	\$ 5,631.79	3.00%	\$ 5,800.74	2.50%	\$ 5,945.76	2.50%	\$ 6,094.41	2.25%	\$ 6,231.53	2.0%	\$ 6,356.16
MGMT12	\$ 4,927.45	3.75%	\$ 5,112.23	3.50%	\$ 5,291.16	3.25%	\$ 5,463.12	3.00%	\$ 5,627.01	3.00%	\$ 5,795.82	3.00%	\$ 5,969.70	3.00%	\$ 6,148.79	2.50%	\$ 6,302.51	2.50%	\$ 6,460.07	2.25%	\$ 6,605.42	2.0%	\$ 6,737.53
MGMT13	\$ 5,173.82	3.75%	\$ 5,367.84	3.50%	\$ 5,555.71	3.25%	\$ 5,736.28	3.00%	\$ 5,908.36	3.00%	\$ 6,085.61	3.00%	\$ 6,268.18	3.00%	\$ 6,456.23	2.50%	\$ 6,617.63	2.50%	\$ 6,783.07	2.25%	\$ 6,935.69	2.0%	\$ 7,074.41

POLICE SWORN

	1		2		3		4		5														
PD1	\$ 2,860.05	7.00%	\$ 3,060.87	7.00%	\$ 3,275.79	7.00%	\$ 3,505.09	7.00%	\$ 3,750.45														
PDM	\$ 3,920.16																						
PD2	\$ 4,289.05	3.00%	\$ 4,417.72	3.00%	\$ 4,550.25	2.25%	\$ 4,652.63																
PD3	\$ 5,210.94	2.25%	\$ 5,328.19																				
PD4	\$ 5,647.88	2.25%	\$ 5,774.96																				
PD5	\$ 6,376.71	2.25%	\$ 6,520.19																				
PR1	\$ 2,509.42																						
PR2	\$ 2,672.53																						

BIWEEKLY - ALL JOB FAMILIES

PROFESSIONAL

	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$ 1,862.98	3.75%	\$ 1,932.84	3.50%	\$ 2,000.49	3.25%	\$ 2,065.51	3.00%	\$ 2,127.47	3.00%	\$ 2,191.30	3.00%	\$ 2,257.03	3.00%	\$ 2,324.75	2.50%	\$ 2,382.86	2.50%	\$ 2,442.44	2.25%	\$ 2,497.39	2.0%	\$ 2,547.34
PROF4	\$ 2,058.59	3.75%	\$ 2,135.79	3.50%	\$ 2,210.54	3.25%	\$ 2,282.38	3.00%	\$ 2,350.86	3.00%	\$ 2,421.38	3.00%	\$ 2,494.02	3.00%	\$ 2,568.84	2.50%	\$ 2,633.07	2.50%	\$ 2,698.89	2.25%	\$ 2,759.62	2.0%	\$ 2,814.81
PROF5	\$ 2,274.74	3.75%	\$ 2,360.05	3.50%	\$ 2,442.65	3.25%	\$ 2,522.04	3.00%	\$ 2,597.70	3.00%	\$ 2,675.63	3.00%	\$ 2,755.90	3.00%	\$ 2,838.57	2.50%	\$ 2,909.54	2.50%	\$ 2,982.28	2.25%	\$ 3,049.38	2.0%	\$ 3,110.36
PROF6	\$ 2,513.59	3.75%	\$ 2,607.85	3.50%	\$ 2,699.13	3.25%	\$ 2,786.85	3.00%	\$ 2,870.45	3.00%	\$ 2,956.57	3.00%	\$ 3,045.27	3.00%	\$ 3,136.62	2.50%	\$ 3,215.04	2.50%	\$ 3,295.41	2.25%	\$ 3,369.56	2.0%	\$ 3,436.95
PROF7	\$ 2,777.52	3.75%	\$ 2,881.68	3.50%	\$ 2,982.54	3.25%	\$ 3,079.47	3.00%	\$ 3,171.85	3.00%	\$ 3,267.01	3.00%	\$ 3,365.02	3.00%	\$ 3,465.97	2.50%	\$ 3,552.62	2.50%	\$ 3,641.43	2.25%	\$ 3,723.37	2.0%	\$ 3,797.83
PROF8	\$ 3,069.16	3.75%	\$ 3,184.25	3.50%	\$ 3,295.70	3.25%	\$ 3,402.81	3.00%	\$ 3,504.90	3.00%	\$ 3,610.04	3.00%	\$ 3,718.34	3.00%	\$ 3,829.90	2.50%	\$ 3,925.64	2.50%	\$ 4,023.78	2.25%	\$ 4,114.32	2.0%	\$ 4,196.61
PROF9	\$ 3,391.42	3.75%	\$ 3,518.60	3.50%	\$ 3,641.75	3.25%	\$ 3,760.11	3.00%	\$ 3,872.91	3.00%	\$ 3,989.10	3.00%	\$ 4,108.77	3.00%	\$ 4,232.03	2.50%	\$ 4,337.83	2.50%	\$ 4,446.28	2.25%	\$ 4,546.32	2.0%	\$ 4,637.25
PROF10	\$ 3,747.52	3.75%	\$ 3,888.05	3.50%	\$ 4,024.13	3.25%	\$ 4,154.92	3.00%	\$ 4,279.57	3.00%	\$ 4,407.95	3.00%	\$ 4,540.19	3.00%	\$ 4,676.40	2.50%	\$ 4,793.31	2.50%	\$ 4,913.14	2.25%	\$ 5,023.69	2.0%	\$ 5,124.16
PROF11	\$ 4,141.01	3.75%	\$ 4,296.30	3.50%	\$ 4,446.67	3.25%	\$ 4,591.19	3.00%	\$ 4,728.92	3.00%	\$ 4,870.79	3.00%	\$ 5,016.91	3.00%	\$ 5,167.42	2.50%	\$ 5,296.60	2.50%	\$ 5,429.02	2.25%	\$ 5,551.17	2.0%	\$ 5,662.20

TECHNICAL AND BUSINESS SUPPORT

	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$ 1,197.17	3.75%	\$ 1,242.07	3.50%	\$ 1,285.54	3.25%	\$ 1,327.32	3.00%	\$ 1,367.14	3.00%	\$ 1,408.15	3.00%	\$ 1,450.40	3.00%	\$ 1,493.91	2.50%	\$ 1,531.26	2.50%	\$ 1,569.54	2.25%	\$ 1,604.85	2.0%	\$ 1,636.95
TBS2	\$ 1,318.69	3.75%	\$ 1,368.14	3.50%	\$ 1,416.02	3.25%	\$ 1,462.04	3.00%	\$ 1,505.90	3.00%	\$ 1,551.08	3.00%	\$ 1,597.61	3.00%	\$ 1,645.54	2.50%	\$ 1,686.68	2.50%	\$ 1,728.85	2.25%	\$ 1,767.74	2.0%	\$ 1,803.10
TBS3	\$ 1,452.53	3.75%	\$ 1,507.00	3.50%	\$ 1,559.75	3.25%	\$ 1,610.44	3.00%	\$ 1,658.75	3.00%	\$ 1,708.51	3.00%	\$ 1,759.77	3.00%	\$ 1,812.56	2.50%	\$ 1,857.88	2.50%	\$ 1,904.32	2.25%	\$ 1,947.17	2.0%	\$ 1,986.11
TBS4	\$ 1,599.96	3.75%	\$ 1,659.96	3.50%	\$ 1,718.06	3.25%	\$ 1,773.90	3.00%	\$ 1,827.11	3.00%	\$ 1,881.93	3.00%	\$ 1,938.39	3.00%	\$ 1,996.54	2.50%	\$ 2,046.45	2.50%	\$ 2,097.61	2.25%	\$ 2,144.81	2.0%	\$ 2,187.70
TBS5	\$ 1,762.36	3.75%	\$ 1,828.45	3.50%	\$ 1,892.44	3.25%	\$ 1,953.95	3.00%	\$ 2,012.57	3.00%	\$ 2,072.94	3.00%	\$ 2,135.13	3.00%	\$ 2,199.19	2.50%	\$ 2,254.17	2.50%	\$ 2,310.52	2.25%	\$ 2,362.51	2.0%	\$ 2,409.76
TBS6	\$ 1,941.24	3.75%	\$ 2,014.04	3.50%	\$ 2,084.53	3.25%	\$ 2,152.27	3.00%	\$ 2,216.84	3.00%	\$ 2,283.35	3.00%	\$ 2,351.85	3.00%	\$ 2,422.40	2.50%	\$ 2,482.96	2.50%	\$ 2,545.04	2.25%	\$ 2,602.30	2.0%	\$ 2,654.35
TBS7	\$ 2,138.28	3.75%	\$ 2,218.46	3.50%	\$ 2,296.11	3.25%	\$ 2,370.73	3.00%	\$ 2,441.85	3.00%	\$ 2,515.11	3.00%	\$ 2,590.56	3.00%	\$ 2,668.28	2.50%	\$ 2,734.98	2.50%	\$ 2,803.36	2.25%	\$ 2,866.43	2.0%	\$ 2,923.76
TBS8	\$ 2,355.31	3.75%	\$ 2,443.63	3.50%	\$ 2,529.16	3.25%	\$ 2,611.36	3.00%	\$ 2,689.70	3.00%	\$ 2,770.39	3.00%	\$ 2,853.50	3.00%	\$ 2,939.11	2.50%	\$ 3,012.59	2.50%	\$ 3,087.90	2.25%	\$ 3,157.38	2.0%	\$ 3,220.53
TBS9	\$ 2,594.37	3.75%	\$ 2,691.66	3.50%	\$ 2,785.87	3.25%	\$ 2,876.41	3.00%	\$ 2,962.70	3.00%	\$ 3,051.59	3.00%	\$ 3,143.13	3.00%	\$ 3,237.43	2.50%	\$ 3,318.36	2.50%	\$ 3,401.32	2.25%	\$ 3,477.85	2.0%	\$ 3,547.41
TBS10	\$ 2,857.70	3.75%	\$ 2,964.87	3.50%	\$ 3,068.64	3.25%	\$ 3,168.37	3.00%	\$ 3,263.42	3.00%	\$ 3,361.32	3.00%	\$ 3,462.16	3.00%	\$ 3,566.03	2.50%	\$ 3,655.18	2.50%	\$ 3,746.56	2.25%	\$ 3,830.85	2.0%	\$ 3,907.47

HOURLY- ALL JOB FAMILIES																							
EXECUTIVE																							
	1		2		3		4		5		6		7		8		9		10		11		12
EXEC1	\$ 41.64375	3.75%	\$ 43.20539	3.50%	\$ 44.71757	3.25%	\$ 46.17090	3.00%	\$ 47.55602	3.00%	\$ 48.98270	3.00%	\$ 50.45218	3.00%	\$ 51.96575	2.50%	\$ 53.26489	2.50%	\$ 54.59652	2.25%	\$ 55.82494	2.00%	\$ 56.94144
EXEC2	\$ 45.00023	3.75%	\$ 46.68774	3.50%	\$ 48.32181	3.25%	\$ 49.89227	3.00%	\$ 51.38904	3.00%	\$ 52.93071	3.00%	\$ 54.51863	3.00%	\$ 56.15419	2.50%	\$ 57.55804	2.50%	\$ 58.99699	2.25%	\$ 60.32443	2.00%	\$ 61.53092
EXEC3	\$ 48.62725	3.75%	\$ 50.45077	3.50%	\$ 52.21655	3.25%	\$ 53.91359	3.00%	\$ 55.53099	3.00%	\$ 57.19692	3.00%	\$ 58.91283	3.00%	\$ 60.68022	2.50%	\$ 62.19722	2.50%	\$ 63.75215	2.25%	\$ 65.18658	2.00%	\$ 66.49031
EXEC4	\$ 52.24998	3.75%	\$ 54.20935	3.50%	\$ 56.10668	3.25%	\$ 57.93015	3.00%	\$ 59.66805	3.00%	\$ 61.45809	3.00%	\$ 63.30184	3.00%	\$ 65.20089	2.50%	\$ 66.83091	2.50%	\$ 68.50169	2.25%	\$ 70.04298	2.00%	\$ 71.44384
EXEC5	\$ 56.77483	3.75%	\$ 58.90388	3.50%	\$ 60.96552	3.25%	\$ 62.94690	3.00%	\$ 64.83531	3.00%	\$ 66.78037	3.00%	\$ 68.78378	3.00%	\$ 70.84729	2.50%	\$ 72.61847	2.50%	\$ 74.43393	2.25%	\$ 76.10870	2.00%	\$ 77.63087
EXEC6	\$ 61.35088	3.75%	\$ 63.65154	3.50%	\$ 65.87934	3.25%	\$ 68.02042	3.00%	\$ 70.06103	3.00%	\$ 72.16286	3.00%	\$ 74.32775	3.00%	\$ 76.55758	2.50%	\$ 78.47152	2.50%	\$ 80.43331	2.25%	\$ 82.24306	2.00%	\$ 83.88792
EXEC7	\$ 67.54732	3.75%	\$ 70.08034	3.50%	\$ 72.53315	3.25%	\$ 74.89048	3.00%	\$ 77.13720	3.00%	\$ 79.45131	3.00%	\$ 81.83485	3.00%	\$ 84.28990	2.50%	\$ 86.39714	2.50%	\$ 88.55707	2.25%	\$ 90.54961	2.00%	\$ 92.36060
EXEC8	\$ 71.26242	3.75%	\$ 73.93476	3.50%	\$ 76.52248	3.25%	\$ 79.00946	3.00%	\$ 81.37974	3.00%	\$ 83.82113	3.00%	\$ 86.33577	3.00%	\$ 88.92584	2.50%	\$ 91.14899	2.50%	\$ 93.42771	2.25%	\$ 95.52984	2.00%	\$ 97.44043
EXEC9	\$ 74.11292	3.75%	\$ 76.89215	3.50%	\$ 79.58338	3.25%	\$ 82.16984	3.00%	\$ 84.63493	3.00%	\$ 87.17398	3.00%	\$ 89.78920	3.00%	\$ 92.48288	2.50%	\$ 94.79495	2.50%	\$ 97.16482	2.25%	\$ 99.35103	2.00%	\$ 101.33805
INFORMATION TECHNOLOGY																							
	1		2		3		4		5		6		7		8		9		10		11		12
INFT1	\$ 35.44752	3.75%	\$ 36.77680	3.50%	\$ 38.06399	3.25%	\$ 39.30107	3.00%	\$ 40.48810	3.00%	\$ 41.69450	3.00%	\$ 42.94534	3.00%	\$ 44.23370	2.50%	\$ 45.33954	2.50%	\$ 46.47303	2.25%	\$ 47.51867	2.00%	\$ 48.46905
INFT2	\$ 38.35422	3.75%	\$ 39.79250	3.50%	\$ 41.18524	3.25%	\$ 42.52376	3.00%	\$ 43.79947	3.00%	\$ 45.11345	3.00%	\$ 46.46686	3.00%	\$ 47.86086	2.50%	\$ 49.05739	2.50%	\$ 50.28382	2.25%	\$ 51.41521	2.00%	\$ 52.44351
INFT3	\$ 41.49926	3.75%	\$ 43.05548	3.50%	\$ 44.56243	3.25%	\$ 46.01071	3.00%	\$ 47.39103	3.00%	\$ 48.81276	3.00%	\$ 50.27714	3.00%	\$ 51.78545	2.50%	\$ 53.08009	2.50%	\$ 54.40709	2.25%	\$ 55.63125	2.00%	\$ 56.74388
INFT4	\$ 44.90220	3.75%	\$ 46.58603	3.50%	\$ 48.21655	3.25%	\$ 49.78358	3.00%	\$ 51.27709	3.00%	\$ 52.81540	3.00%	\$ 54.39987	3.00%	\$ 56.03186	2.50%	\$ 57.43266	2.50%	\$ 58.86847	2.25%	\$ 60.19302	2.00%	\$ 61.39688
INFT5	\$ 48.58418	3.75%	\$ 50.40609	3.50%	\$ 52.17030	3.25%	\$ 53.86584	3.00%	\$ 55.48181	3.00%	\$ 57.14627	3.00%	\$ 58.86065	3.00%	\$ 60.62647	2.50%	\$ 62.14214	2.50%	\$ 63.69569	2.25%	\$ 65.12884	2.00%	\$ 66.43142
LABOR, TRADES, CRAFTS AND UTILITIES																							
	1		2		3		4		5		6		7		8		9		10		11		12
LTCU1	\$ 14.12111	3.75%	\$ 14.65065	3.50%	\$ 15.16342	3.25%	\$ 15.65624	3.00%	\$ 16.12592	3.00%	\$ 16.60970	3.00%	\$ 17.10799	3.00%	\$ 17.62123	2.50%	\$ 18.06176	2.50%	\$ 18.51331	2.25%	\$ 18.92986	2.00%	\$ 19.30845
LTCU2	\$ 15.56711	3.75%	\$ 16.15088	3.50%	\$ 16.71616	3.25%	\$ 17.25943	3.00%	\$ 17.77722	3.00%	\$ 18.31053	3.00%	\$ 18.85985	3.00%	\$ 19.42565	2.50%	\$ 19.91129	2.50%	\$ 20.40907	2.25%	\$ 20.86827	2.00%	\$ 21.28564
LTCU3	\$ 17.16118	3.75%	\$ 17.80473	3.50%	\$ 18.42789	3.25%	\$ 19.02680	3.00%	\$ 19.59760	3.00%	\$ 20.18553	3.00%	\$ 20.79110	3.00%	\$ 21.41483	2.50%	\$ 21.95020	2.50%	\$ 22.49896	2.25%	\$ 23.00518	2.00%	\$ 23.46529
LTCU4	\$ 18.91849	3.75%	\$ 19.62793	3.50%	\$ 20.31491	3.25%	\$ 20.97515	3.00%	\$ 21.60440	3.00%	\$ 22.25253	3.00%	\$ 22.92011	3.00%	\$ 23.60771	2.50%	\$ 24.19790	2.50%	\$ 24.80285	2.25%	\$ 25.36092	2.00%	\$ 25.86813
LTCU5	\$ 20.85574	3.75%	\$ 21.63783	3.50%	\$ 22.39516	3.25%	\$ 23.12300	3.00%	\$ 23.81669	3.00%	\$ 24.53119	3.00%	\$ 25.26713	3.00%	\$ 26.02514	2.50%	\$ 26.67577	2.50%	\$ 27.34266	2.25%	\$ 27.95787	2.00%	\$ 28.51703
LTCU6	\$ 22.99137	3.75%	\$ 23.85355	3.50%	\$ 24.68842	3.25%	\$ 25.49080	3.00%	\$ 26.25552	3.00%	\$ 27.04318	3.00%	\$ 27.85448	3.00%	\$ 28.69011	2.50%	\$ 29.40737	2.50%	\$ 30.14255	2.25%	\$ 30.82076	2.00%	\$ 31.43717
LTCU7	\$ 25.34569	3.75%	\$ 26.29615	3.50%	\$ 27.21652	3.25%	\$ 28.10105	3.00%	\$ 28.94408	3.00%	\$ 29.81241	3.00%	\$ 30.70678	3.00%	\$ 31.62798	2.50%	\$ 32.41868	2.50%	\$ 33.22915	2.25%	\$ 33.97680	2.00%	\$ 34.65634
LTCU8	\$ 27.94109	3.75%	\$ 28.98888	3.50%	\$ 30.00349	3.25%	\$ 30.97860	3.00%	\$ 31.90796	3.00%	\$ 32.86520	3.00%	\$ 33.85115	3.00%	\$ 34.86669	2.50%	\$ 35.73836	2.50%	\$ 36.63181	2.25%	\$ 37.45603	2.00%	\$ 38.20515
LTCU9	\$ 30.80225	3.75%	\$ 31.95734	3.50%	\$ 33.07584	3.25%	\$ 34.15081	3.00%	\$ 35.17533	3.00%	\$ 36.23059	3.00%	\$ 37.31751	3.00%	\$ 38.43704	2.50%	\$ 39.39796	2.50%	\$ 40.38291	2.25%	\$ 41.29153	2.00%	\$ 42.11736
MANAGEMENT																							
	1		2		3		4		5		6		7		8		9		10		11		12
MGMT2	\$ 25.09627	3.75%	\$ 26.03738	3.50%	\$ 26.94869	3.25%	\$ 27.82452	3.00%	\$ 28.65925	3.00%	\$ 29.51903	3.00%	\$ 30.40460	3.00%	\$ 31.31674	2.50%	\$ 32.09966	2.50%	\$ 32.90215	2.25%	\$ 33.64245	2.00%	\$ 34.31530
MGMT3	\$ 27.67114	3.75%	\$ 28.70881	3.50%	\$ 29.71362	3.25%	\$ 30.67931	3.00%	\$ 31.59969	3.00%	\$ 32.54768	3.00%	\$ 33.52411	3.00%	\$ 34.52984	2.50%	\$ 35.39308	2.50%	\$ 36.27791	2.25%	\$ 37.09416	2.00%	\$ 37.83605
MGMT4	\$ 30.51020	3.75%	\$ 31.65434	3.50%	\$ 32.76224	3.25%	\$ 33.82701	3.00%	\$ 34.84182	3.00%	\$ 35.88708	3.00%	\$ 36.96369	3.00%	\$ 38.07260	2.50%	\$ 39.02441	2.50%	\$ 40.00002	2.25%	\$ 40.90002	2.00%	\$ 41.71803
MGMT5	\$ 34.42161	3.75%	\$ 35.71242	3.50%	\$ 36.96236	3.25%	\$ 38.16363	3.00%	\$ 39.30854	3.00%	\$ 40.48780	3.00%	\$ 41.70243	3.00%	\$ 42.95351	2.50%	\$ 44.02734	2.50%	\$ 45.12803	2.25%	\$ 46.14341	2.00%	\$ 47.06628
MGMT6	\$ 37.95327	3.75%	\$ 39.37652	3.50%	\$ 40.75469	3.25%	\$ 42.07922	3.00%	\$ 43.34160	3.00%	\$ 44.64185	3.00%	\$ 45.98110	3.00%	\$ 47.36054	2.50%	\$ 48.54455	2.50%	\$ 49.75816	2.25%	\$ 50.87772	2.00%	\$ 51.89528
MGMT7	\$ 41.84727	3.75%	\$ 43.41655	3.50%	\$ 44.93613	3.25%	\$ 46.39655	3.00%	\$ 47.78845	3.00%	\$ 49.22210	3.00%	\$ 50.69876	3.00%	\$ 52.21973	2.50%	\$ 53.52522	2.50%	\$ 54.86335	2.25%	\$ 56.09778	2.00%	\$ 57.21973
MGMT8	\$ 46.14080	3.75%	\$ 47.87109	3.50%	\$ 49.54657	3.25%	\$ 51.15684	3.00%	\$ 52.69154	3.00%	\$ 54.27229	3.00%	\$ 55.90046	3.00%	\$ 57.57477	2.50%	\$ 59.01691	2.50%	\$ 60.49233	2.25%	\$ 61.85341	2.00%	\$ 63.09048
MGMT9	\$ 49.71672	3.75%	\$ 51.58109	3.50%	\$ 53.38643	3.25%	\$ 55.12149	3.00%	\$ 56.77514	3.00%	\$ 58.47839	3.00%	\$ 60.23274	3.00%	\$ 62.03972	2.50%	\$ 63.59072	2.50%	\$ 65.18049	2.25%	\$ 66.64705	2.00%	\$ 67.97999
MGMT10	\$ 54.81765	3.75%	\$ 56.87331	3.50%	\$ 58.86388	3.25%	\$ 60.77696	3.00%	\$ 62.60027	3.00%	\$ 64.47827	3.00%	\$ 66.41262	3.00%	\$ 68.40500	2.50%	\$ 70.11513	2.50%	\$ 71.86800	2.25%	\$ 73.48503	2.00%	\$ 74.95473
MGMT11	\$ 58.10671	3.75%	\$ 60.28571	3.50%	\$ 62.39571	3.25%	\$ 64.42357	3.00%	\$ 66.35628	3.00%	\$ 68.34697	3.00%	\$ 70.39738	3.00%	\$ 72.50930	2.50%	\$ 74.32203	2.50%	\$ 76.18008	2.25%	\$ 77.89414	2.00%	\$ 79.45202
MGMT12	\$ 61.59311	3.75%	\$ 63.90286	3.50%	\$ 66.13946	3.25%	\$ 68.28899	3.00%	\$ 70.33766	3.00%	\$ 72.44779	3.00%	\$ 74.62122	3.00%	\$ 76.85986	2.50%	\$ 78.78135	2.50%	\$ 80.75089	2.25%	\$ 82.56778	2.00%	\$ 84.21914
MGMT13	\$ 64.67277	3.75%	\$ 67.09800	3.50%	\$ 69.44643	3.25%	\$ 71.70344	3.00%	\$ 73.85454	3.00%	\$ 76.07018	3.00%	\$ 78.35228	3.00%	\$ 80.70285	2.50%	\$ 82.72042	2.50%	\$ 84.78843	2.25%	\$ 86.69617	2.00%	\$ 88.43010
POLICE SWORN																							
	1		2		3		4		5														
PD1	\$ 35.75064	7.00%	\$ 38.26087	7.00%	\$ 40.94736	7.00%	\$ 43.81368	7.00%	\$ 46.88063														
PDM	\$ 49.00198																						
PD2	\$ 53.61307	3.00%	\$ 55.22146	3.00%	\$ 56.87810	2.25%	\$ 58.15786																
PD3	\$ 65.13680	2.25%	\$ 66.60238																				
PD4	\$ 70.59852	2.25%	\$ 72.18699																				
PD5	\$ 79.70888	2.25%	\$ 81.50233																				
PR1	\$ 31.36770	0.00%																					
PR2	\$ 33.40660	0.00%																					

HOURLY- ALL JOB FAMILIES																							
PROFESSIONAL																							
	1		2		3		4		5		6		7		8		9		10		11		12
PROF3	\$ 23.28724	3.75%	\$ 24.16052	3.50%	\$ 25.00613	3.25%	\$ 25.81883	3.00%	\$ 26.59340	3.00%	\$ 27.39120	3.00%	\$ 28.21294	3.00%	\$ 29.05932	2.50%	\$ 29.78581	2.50%	\$ 30.53045	2.25%	\$ 31.21739	2.00%	\$ 31.84174
PROF4	\$ 25.73240	3.75%	\$ 26.69737	3.50%	\$ 27.63178	3.25%	\$ 28.52981	3.00%	\$ 29.38570	3.00%	\$ 30.26728	3.00%	\$ 31.17529	3.00%	\$ 32.11055	2.50%	\$ 32.91332	2.50%	\$ 33.73615	2.25%	\$ 34.49521	2.00%	\$ 35.18511
PROF5	\$ 28.43431	3.75%	\$ 29.50059	3.50%	\$ 30.53311	3.25%	\$ 31.52544	3.00%	\$ 32.47120	3.00%	\$ 33.44534	3.00%	\$ 34.44870	3.00%	\$ 35.48216	2.50%	\$ 36.36922	2.50%	\$ 37.27845	2.25%	\$ 38.11721	2.00%	\$ 38.87955
PROF6	\$ 31.41991	3.75%	\$ 32.59816	3.50%	\$ 33.73909	3.25%	\$ 34.83561	3.00%	\$ 35.88068	3.00%	\$ 36.95710	3.00%	\$ 38.06581	3.00%	\$ 39.20779	2.50%	\$ 40.18798	2.50%	\$ 41.19268	2.25%	\$ 42.11952	2.00%	\$ 42.96191
PROF7	\$ 34.71900	3.75%	\$ 36.02096	3.50%	\$ 37.28170	3.25%	\$ 38.49335	3.00%	\$ 39.64815	3.00%	\$ 40.83760	3.00%	\$ 42.06272	3.00%	\$ 43.32461	2.50%	\$ 44.40772	2.50%	\$ 45.51791	2.25%	\$ 46.54207	2.00%	\$ 47.47291
PROF8	\$ 38.36449	3.75%	\$ 39.80316	3.50%	\$ 41.19627	3.25%	\$ 42.53515	3.00%	\$ 43.81121	3.00%	\$ 45.12554	3.00%	\$ 46.47931	3.00%	\$ 47.87369	2.50%	\$ 49.07053	2.50%	\$ 50.29729	2.25%	\$ 51.42898	2.00%	\$ 52.45756
PROF9	\$ 42.39277	3.75%	\$ 43.98250	3.50%	\$ 45.52188	3.25%	\$ 47.00134	3.00%	\$ 48.41138	3.00%	\$ 49.86373	3.00%	\$ 51.35964	3.00%	\$ 52.90043	2.50%	\$ 54.22294	2.50%	\$ 55.57851	2.25%	\$ 56.82903	2.00%	\$ 57.96561
PROF10	\$ 46.84401	3.75%	\$ 48.60066	3.50%	\$ 50.30168	3.25%	\$ 51.93649	3.00%	\$ 53.49458	3.00%	\$ 55.09942	3.00%	\$ 56.75240	3.00%	\$ 58.45497	2.50%	\$ 59.91635	2.50%	\$ 61.41425	2.25%	\$ 62.79608	2.00%	\$ 64.05200
PROF11	\$ 51.76263	3.75%	\$ 53.70373	3.50%	\$ 55.58336	3.25%	\$ 57.38982	3.00%	\$ 59.11151	3.00%	\$ 60.88486	3.00%	\$ 62.71140	3.00%	\$ 64.59274	2.50%	\$ 66.20756	2.50%	\$ 67.86275	2.25%	\$ 69.38966	2.00%	\$ 70.77746
TECHNICAL AND BUSINESS SUPPORT																							
	1		2		3		4		5		6		7		8		9		10		11		12
TBS1	\$ 14.96465	3.75%	\$ 15.52583	3.50%	\$ 16.06923	3.25%	\$ 16.59148	3.00%	\$ 17.08923	3.00%	\$ 17.60190	3.00%	\$ 18.12996	3.00%	\$ 18.67386	2.50%	\$ 19.14070	2.50%	\$ 19.61922	2.25%	\$ 20.06065	2.00%	\$ 20.46187
TBS2	\$ 16.48356	3.75%	\$ 17.10170	3.50%	\$ 17.70026	3.25%	\$ 18.27552	3.00%	\$ 18.82378	3.00%	\$ 19.38849	3.00%	\$ 19.97015	3.00%	\$ 20.56925	2.50%	\$ 21.08349	2.50%	\$ 21.61057	2.25%	\$ 22.09681	2.00%	\$ 22.53875
TBS3	\$ 18.15665	3.75%	\$ 18.83752	3.50%	\$ 19.49683	3.25%	\$ 20.13048	3.00%	\$ 20.73440	3.00%	\$ 21.35643	3.00%	\$ 21.99712	3.00%	\$ 22.65703	2.50%	\$ 23.22346	2.50%	\$ 23.80405	2.25%	\$ 24.33964	2.00%	\$ 24.82643
TBS4	\$ 19.99955	3.75%	\$ 20.74953	3.50%	\$ 21.47576	3.25%	\$ 22.17372	3.00%	\$ 22.83894	3.00%	\$ 23.52410	3.00%	\$ 24.22983	3.00%	\$ 24.95672	2.50%	\$ 25.58064	2.50%	\$ 26.22016	2.25%	\$ 26.81011	2.00%	\$ 27.34631
TBS5	\$ 22.02950	3.75%	\$ 22.85561	3.50%	\$ 23.65555	3.25%	\$ 24.42436	3.00%	\$ 25.15709	3.00%	\$ 25.91180	3.00%	\$ 26.68916	3.00%	\$ 27.48983	2.50%	\$ 28.17708	2.50%	\$ 28.88150	2.25%	\$ 29.53134	2.00%	\$ 30.12196
TBS6	\$ 24.26549	3.75%	\$ 25.17545	3.50%	\$ 26.05659	3.25%	\$ 26.90343	3.00%	\$ 27.71053	3.00%	\$ 28.54185	3.00%	\$ 29.39810	3.00%	\$ 30.28005	2.50%	\$ 31.03705	2.50%	\$ 31.81297	2.25%	\$ 32.52877	2.00%	\$ 33.17934
TBS7	\$ 26.72844	3.75%	\$ 27.73076	3.50%	\$ 28.70133	3.25%	\$ 29.63413	3.00%	\$ 30.52315	3.00%	\$ 31.43885	3.00%	\$ 32.38201	3.00%	\$ 33.35347	2.50%	\$ 34.18731	2.50%	\$ 35.04199	2.25%	\$ 35.83044	2.00%	\$ 36.54705
TBS8	\$ 29.44138	3.75%	\$ 30.54543	3.50%	\$ 31.61452	3.25%	\$ 32.64199	3.00%	\$ 33.62125	3.00%	\$ 34.62989	3.00%	\$ 35.66879	3.00%	\$ 36.73885	2.50%	\$ 37.65732	2.50%	\$ 38.59875	2.25%	\$ 39.46723	2.00%	\$ 40.25657
TBS9	\$ 32.42968	3.75%	\$ 33.64579	3.50%	\$ 34.82339	3.25%	\$ 35.95515	3.00%	\$ 37.03381	3.00%	\$ 38.14482	3.00%	\$ 39.28917	3.00%	\$ 40.46784	2.50%	\$ 41.47954	2.50%	\$ 42.51653	2.25%	\$ 43.47315	2.00%	\$ 44.34261
TBS10	\$ 35.72129	3.75%	\$ 37.06084	3.50%	\$ 38.35797	3.25%	\$ 39.60460	3.00%	\$ 40.79274	3.00%	\$ 42.01652	3.00%	\$ 43.27702	3.00%	\$ 44.57533	2.50%	\$ 45.68971	2.50%	\$ 46.83196	2.25%	\$ 47.88567	2.00%	\$ 48.84339



REPORT TO CITY COUNCIL PUBLIC HEARING

AGENDA ITEM
10.H.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: CB21-036 An Ordinance Authorizing The City of Arvada to Enter an Intergovernmental Agreement With Apex Park and Recreation District and Jefferson County School District R-1, for Meyers Pool Replacement Project (Ordinance No. 4783)

Report in Brief

Meyers Pool is owned by the City of Arvada and, through an intergovernmental agreement, managed and operated by the Apex Park and Recreation District. Jeffco Public Schools is one of the largest users of Meyers Pool, which serves as home to five area schools and more than 900 student athletes. Meyers Pool is more than 40 years old, at the end of its useful life, and in need of replacement. A plan has been developed to keep the pool in operation until a new pool opens.

Based on mutually shared interests, elected officials from three agencies have come together to form an intergovernmental partnership to replace Meyers Pool. The partnership includes Jeffco Public Schools, Apex Park and Recreation District (Apex), and, the City of Arvada (Arvada). A steering committee, comprised of representatives from each agency, is leading the effort to replace Meyers Pool. The goal of this project is to build a facility to deliver aquatic services to Jeffco Public Schools boys and girls swimming and diving teams and the Jefferson County and Arvada swimming communities.

A feasibility study examining the projected operational revenues and expenses, staffing structure, market opportunities, and user preferences, including amenities and site for the new pool, has been completed. In addition, a recommended architectural program for the new pool has also been developed, based on extensive input from the aquatics community.

This Intergovernmental Agreement defines the roles and responsibilities of each partner, which are as follows:

City of Arvada:

- Provide land for the project;
- Finance 50% of the project expenses through an annual debt service payment; and
- Fund the majority of the capital maintenance and replacement plan as project owner.

Jeffco Public Schools:

- Provide land for the project (Warder Elementary School property);
- Lead agency in securing project financing;
- Finance 50% of project expenses through an annual debt service payment; and
- As an equity partner, it will not be charged any user fees.

Apex Park and Recreation District:

- Manage and program day-to-day operations; and

- Fund operating deficits (operating deficits are expected).

The Arvada team recommends that the City Council approve CB21-036, An Ordinance Authorizing the City of Arvada to Enter an Intergovernmental Agreement with the Apex Park and Recreation District and Jefferson County School District R-1, for the Meyers Pool Replacement Project, on Final Reading, numbered 4783 and ordered published by title only.

Financial Impact

Preliminary cost estimates for the project are estimated at \$33,000,000-\$35,000,000. Updated project costs will be presented once the facility has been designed. The cost associated with Arvada's contribution to this project is included in the City's 10-year Financial Model and Capital Improvement Plan.

Arvada and Jeffco Public Schools will also enter into a financing agreement which will require City Council and Jeffco Public Schools Board of Education approval.

Background

Based on the findings of the feasibility study and site analysis, efforts are focused on constructing the new facility, approximately 64,000 square feet in size, at the existing Meyers Pool parking lot site. Future parking would be sited where the existing aquatics center is currently located. The existing pool will be kept open while the new pool is under construction.

Implementing this goal requires the development of a “Meyers Pool-Warder Elementary School Campus Master Plan,” which will acknowledge both the needs of the expanded pool and the school. The campus masterplan will be used to guide the project as a portion of the Warder Elementary School Campus is required to support the parking needs of the new facility.

The existing Meyer’s Pool site was recommended for the new 50-meter pool based on the following site characteristics:

- This location has the highest population base of all sites examined, in a two-mile radius;
- The location is well known for aquatics activities;
- The site is on the east side of the service area where there are fewer recreation amenities available;
- The site is located near several schools; and
- The operating plan, which projects estimated revenue and expenses for a new facility, produced conclusions that are acceptable to the Apex Parks and Recreation District.

Jeffco Public Schools and Arvada will develop the “Meyer’s Pool-Warder Elementary School Campus Master Plan.” The campus masterplan will reflect the larger replacement 50-meter pool, including additional parking, while also preserving and enhancing the campus-like feel that currently exists at this location.

Based on information generated by the community and stakeholder engagement efforts, market analysis, project input and demand analysis, the new facility will include:

- A new 50-meter pool with on-deck seating for 300-400;
- A separate warmer water and shallower pool that will support a variety of community uses and programming;
- Spectator seating for 800, locker rooms for men, women and officials, along with universal changing rooms;
- A mechanical room, lobby, and office space; and,
- Support space, including additional parking for a facility that would be approximately 50% larger than the existing facility.

Discussion

This Intergovernmental Agreement further defines the roles and responsibilities of the partners, as follows:

- Jeffco Public Schools will operate as lead in securing project financing, including developing an annual debt service schedule;
- Jeffco Public Schools and Arvada would each be responsible for funding 50% of the total project cost;
- Arvada would operate as lead in soliciting design and construction services, and serve in the project manager role, with Apex and Jeffco Public School operating as co-leads;
- Apex would operate as lead in developing and implementing an operating plan, including a revenue plan, staffing plan, and an annual budget and program of service;
- Arvada will develop a capital maintenance and replacement plan, with the City creating a capital maintenance reserve fund of \$1.5 million over the first five years of the Agreement, or by December 31, 2026; and
- Jeffco Public Schools, Arvada and Apex jointly publish an annual financial and program report and meet quarterly to discuss facility operations.

The conditions associated with the Intergovernmental Agreement described herein reflect seven years of discussions between the three public agencies, comments from user groups and other community stakeholders, and the need to replace an aging community asset that provides highly valued community activities for a wide range of recreational and competitive aquatic participants. Users of all ages, abilities and interests will have the opportunity to utilize the new facility that will be constructed if this proposed Intergovernmental Agreement is approved by the Arvada City Council, Jefferson County School District R-1 Board of Education, and the Apex Park and Recreation District Board of Directors.

Public Contact

Posting of the City Council agenda. In addition, there have been several community meetings conducted by the partner agencies over the last seven years and previous discussions with the Arvada City Council, Jefferson County School District R-1 Board of Education and the Apex Park and Recreation District during public meetings.

Commission Recommendation

N/A

Strategic Alignment

Approval of this ordinance aligns with the Vibrant Community and Neighborhoods Priority Area within the City Council Strategic Plan; specifically, Milestone 3F which states:

By December 2022, replace Meyers Pool with a new 50-meter natatorium.

Alternative Courses of Action

N/A.

Recommendation for Action

The Arvada team recommends that the City Council approve CB21-036, An Ordinance Authorizing the City of Arvada to Enter an Intergovernmental Agreement with the Apex Park and Recreation District and Jefferson County School District R-1, for the Meyers Pool Replacement Project, on Final Reading, numbered 4783 and ordered published by title only.

Suggested Motion:

SUBJECT: CB21-036 An Ordinance Authorizing The City of Arvada to Enter an Intergovernmental Agreement With Apex Park and Recreation District and Jefferson County School District R-1, for Meyers Pool Replacement Project (Ordinance No. 4783)

PAGE: 4
ITEM: 10.H.

I move that CB21-036, An Ordinance Authorizing the City of Arvada to Enter an Intergovernmental Agreement with Apex Park and Recreation District and Jefferson County School District R-1, for Meyers Pool Replacement Project, be (approved on final reading, numbered 4783 and ordered published by title only)(rejected).

Prepared by:
Rosa Kougl, Executive Assistant

Reviewed by:

Approved by:

Gordon Reusink, Director of Vibrant Community and Neighborhoods	9/30/2021
Bryan Archer, Director of Finance	9/30/2021
Gail Walker, Legal Specialist-Contracts	9/30/2021
Kylie Justus, Assistant City Attorney	10/1/2021
Rachel Morris, City Attorney	10/6/2021
Lorie Gillis, Deputy City Manager	10/6/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

COUNCIL BILL NO. 21-036
ORDINANCE NO. 21-4783

AN ORDINANCE AUTHORIZING THE CITY OF ARVADA TO ENTER AN
INTERGOVERNMENTAL AGREEMENT WITH APEX PARK AND RECREATION
DISTRICT AND JEFFERSON COUNTY SCHOOL DISTRICT R-1, FOR MEYERS POOL
REPLACEMENT PROJECT

WHEREAS, Article XIV, Section 18(2) of the Constitution of the State of Colorado encourages and authorizes intergovernmental agreements; and

WHEREAS, C.R.S. §29-1-203 permits local governments to make the most efficient and effective use of their powers and responsibilities by cooperating and contracting with other local governments in order to provide any lawfully authorized function, service, or facility; and

WHEREAS, the George J. Meyers Swimming Center was built in 1979 and is in need of replacement; and

WHEREAS, Jefferson County School District, the City of Arvada , and Apex Parks and Recreation District have agreed to replace Meyers Pool; and

WHEREAS, a feasibility study examining the operational costs, staffing structure, market opportunities, and user preferences, including amenities and site for the new pool, has been completed as of June 2019 and presented to the governing bodies of each of the Parties; and

WHEREAS, the recommended architectural program for the new pool has also been developed, based on extensive input from the aquatics community; and

WHEREAS, the Parties have a common and compelling interest to work together on constructing, financing, and operating the new natatorium/aquatics center.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ARVADA, COLORADO:

Section 1. Pursuant to the provisions of Section 13.5 of the Home Rule Charter, and Chapter 2, Sec. 2-2 of the City Code of Ordinances, the Mayor or Mayor Pro Tem is authorized to sign and the City Clerk to attest, in form approved by the City Attorney, an Intergovernmental Agreement by and between Apex Park and Recreation District, Jefferson County School District R-1, and the City of Arvada for the Meyers Pool Replacement Project, which is in substantially the same form as that attached hereto.

Section 2. This ordinance shall be effective five days after publication following final passage.

INTRODUCED, READ AND ORDERED PUBLISHED IN FULL this 4th day of October,

2021.

APPROVED AND ADOPTED this 18th day of October, 2021.

Marc Williams, Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:
Rachel A. Morris, City Attorney

By: _____

Publication Dates: October 7, 2021
 October 21, 2021

**INTERGOVERNMENTAL AGREEMENT BY AND BETWEEN
APEX PARK AND RECREATION DISTRICT, JEFFERSON
COUNTY SCHOOL DISTRICT R-1, AND THE CITY OF ARVADA
FOR MEYERS POOL REPLACEMENT PROJECT**

1.0 PARTIES. The parties to this Intergovernmental Agreement by and between Apex Park And Recreation District, Jefferson County School District R-1 and the City of Arvada for Meyers Pool Replacement Project (“Agreement”) are the Apex Park and Recreation District, a Colorado political subdivision and quasi-municipal corporation organized pursuant to Title 32, C.R.S., 13150 W. 72nd Ave., Arvada, CO 80005 (“Apex”), Jefferson County School District R-1, 1829 Denver West Drive, Bldg. 27, Golden, CO 80401 (JCSD), and the City of Arvada, a Colorado home rule municipal corporation, 8101 Ralston Road, Arvada, CO 80001 (“Arvada”), referred to individually as a “Party” and collectively referred to as “Parties.” The Parties agree as follows.

2.0 RECITALS.

- 2.1** Article XIV, Section 18(2) of the Constitution of the State of Colorado encourages and authorizes intergovernmental agreements.
- 2.2** C.R.S. §29-1-203 permits local governments to make the most efficient and effective use of their powers and responsibilities by cooperating and contracting with other local governments in order to provide any lawfully authorized function, service, or facility.
- 2.3** Apex is a political subdivision of the State of Colorado and a duly organized and existing special district pursuant to Title 32, C.R.S. JCSD is a public school district and political subdivision of the State of Colorado. Arvada is a Colorado home rule municipal corporation.
- 2.4** Arvada owns the George J. Meyers Swimming Center (Meyers Pool), a 50-meter aquatics facility operated and maintained by Apex for a variety of users, including JCSD high school swim teams.
- 2.5** Meyers Pool was built in 1979 and is at the end of its useful life. Arvada, Apex, and JCSD desire to partner together in financing and constructing a replacement facility.
- 2.6** In furtherance of this partnership, Arvada, Apex and JCSD convened a steering committee, comprising representatives from each agency, to lead the effort to replace Meyers Pool.
- 2.7** A feasibility study (the “Feasibility Study”) examining the operational costs, staffing structure, market opportunities, and user preferences, including amenities and site for the new pool, has been completed as of June, 2019 and presented to the governing bodies of each of the Parties.
- 2.8** The recommended architectural program for the new pool has also been developed, based on extensive input from the aquatics community.
- 2.9** Based on the findings of the Feasibility Study and site analysis, the Parties’ efforts are focused on constructing the new facility at the existing site. The goal is to keep the existing pool open while the new pool is constructed where the parking lot exists today. This goal requires the development of a “Meyers Pool-Warder Elementary School Campus Master Plan,” which will be prepared as part of the Design Phase and which acknowledge both the needs of the pool users and the school and which will be used to guide the Meyers Pool Replacement Project (hereafter referred to as the “Project”).

- 2.10** The Parties have a common and compelling interest to work together on the Project.
- 2.11** The Parties agree that it is in the best interests of the Parties to join in, promote and collaborate in building, using, and maintaining the facility that is the subject of the Project.
- 2.12** The Parties are desirous of affecting a cooperative relationship, which will achieve maximum community benefits while avoiding duplication of services, expenses, and efforts wherever possible as more fully set forth below.
- 2.13** The foregoing recitals are hereby incorporated into and made a part of the Agreement, including all defined terms referenced therein.
- 3.0 EXHIBITS.** Exhibit A, Feasibility Study, referenced herein, is attached and incorporated into this Agreement. In the event of a conflict or inconsistency between this Agreement and Exhibit A, this Agreement shall control.
- 4.0 PURPOSE.** It is the mutual intent of Apex, JCSD, and Arvada that the Parties enter into this Agreement for the purpose of defining roles and responsibilities of each Party during the design and construction phase, as well as during the operating phase of the Meyers Pool once constructed.
- 5.0 TERM, TERMINATION, AND AMENDMENT.** The term of this Agreement is 25 years from the date of execution unless this Agreement is terminated sooner as provided by **Sec. 5.1** and/or **Sec. 15.10**.
- 5.1 Withdrawal.**
- 5.1.1** Any Party may request to withdraw from this Agreement and its participation in the Project for good cause shown by notifying the remaining Parties in writing at least 1 year in advance of its desired date to withdraw. The non-withdrawing Parties must unanimously approve of the withdrawal from this Agreement; provided, however, that approval by any Party shall not be unreasonably withheld. No such withdrawal shall be effective until and unless satisfactory provisions have been made to discharge all of the obligations of the withdrawing Party under this Agreement.
- 5.1.2** Upon receipt of notice of intent to withdraw, the remaining Parties shall set a meeting to confer and discuss what provisions would be required for the withdrawing Party to satisfy and discharge its obligations. The Parties will also discuss whether and how to amend this Agreement.
- 5.2 Amendment.** The term and terms of this Agreement may be amended as needed upon written mutual agreement by the Parties.
- 6.0 PROJECT FINANCING PHASE AND OWNERSHIP.** The Parties having ownership interests in and responsible for the Project Financing Phase are JCSD and Arvada.
- 6.1 Ownership.**
- 6.1.1** The Parties agree that Arvada will own the Meyers Pool building.
- 6.1.2** Arvada will retain fee simple ownership over the land owned by Arvada.
- 6.1.3** JCSD will retain fee simple ownership over the land owned by JCSD.

- 6.2 JCSD shall take the lead in securing project financing, including developing an annual debt service schedule.
- 6.3 JCSD and Arvada shall equally divide the cost of funding 100% of the total project cost. Arvada will fund 50% of the total project cost. JCSD will fund 50% of the total project cost. Arvada agrees to enter into an agreement with JCSD to equally divide payment of debt service.
- 6.4 Arvada agrees to enter into a financing agreement with JCSD to facilitate the financing of the Project.
- 6.5 JCSD enter into the necessary agreements to allow Arvada and Apex to use JCSD's owned land.

7.0 OWNER'S REPRESENTATIVE. As part of the total project cost, the Parties will hire an owner's representative for the design and construction phases of the Project. The Parties responsible for the owner's representative are: Apex, JCSD, and Arvada. Arvada shall operate as the lead in soliciting bids for and hiring an owner's representative, with Apex and JCSD operating as co-leads.

8.0 DESIGN PHASE.

- 8.1 Arvada shall operate as the lead in soliciting design services and serve as project manager, with Apex and JCSD operating as co-leads.
- 8.2 The Parties shall:
 - 8.2.1 Determine the type of facility. By way of example and not limitation, types may include competitive, instruction, community serving, and revenue generating.
 - 8.2.2 Define members of the following: Design Committee and Professional Staff Program Team.
 - 8.2.3 Further develop and refine the "Meyers Pool-Warder Elementary School Campus Master Plan," which shall be reduced in writing and executed by the Parties prior to the start of construction. A portion of JCSD's property at Warder Elementary School will be dedicated to the Project.

9.0 CONSTRUCTION PHASE.

- 9.1 Arvada shall operate as the lead in managing the construction process, with Apex and JCSD operating as co-leads.
- 9.2 The Parties shall determine an appropriate project delivery method.

10.0 ON-GOING OPERATIONS.

- 10.1 Apex shall operate as the lead in managing on-going operations, costs, and setting program fees, with Arvada and JCSD operating as co-leads and participating in capital repairs according to the terms of any financing agreement(s), capital maintenance reserve funding commitment, and annual capital maintenance plan made by and between the Parties or set forth in this Agreement.

10.2 Annual Review. Representatives for each Party will meet annually to discuss Program Fees set for the following fiscal year by the Apex Board of Directors, annual Operating and Capital Maintenance Plans for the following fiscal year and the Annual Financial Statements from the current year.

10.3 On-Going Operations shall include, without limitation:

10.3.1 Program Fees. Apex shall determine user fees based on assumptions of the June 2019 Feasibility Study, with an assumed inflationary escalator above the baseline set by the 2019 Feasibility Study and each year thereafter of a minimum of 2.5% per year and a maximum of 5% per year, which serves as the basis for total fees which are eligible to be waived for JCSD Priority Users. Thereafter, user fees for JCSD Priority Users will be charged at the rate set by the Board of Directors for high school lane rentals. A monthly accounting statement of user fees utilized shall be provided to the Parties within a reasonable time following the last date of the prior month. If, during the design phase, the design of the Project changes such that it affects the assumptions underlying the Feasibility Study, the Parties may agree to re-assess and re-visit the findings of the Feasibility Study or order a new feasibility study as they see fit and agree upon

10.3.2 Operating Plan. The Parties shall create an Operating Plan that includes, without limitation:

10.3.2.1 Partner Use Priority. The Operating Plan shall state the use priority of partners in relation to JCSD Priority Users, outside groups, Apex program users, and contractual users (fee based).

10.3.2.1.1 Definition of “JCSD Priority User.” Priority User is defined as a JeffCo Public Schools sports team as defined by the Colorado High School Activities Association (“CHSAA”) which is operating during a CHSAA recognized season. Priority User does not include any individual participant or outside user groups, or sports team operating outside of the CHSAA recognized season.

10.3.3 Staffing plans. The Operating Plan shall outline plans for staffing the facility. Apex will be the lead in preparing and managing the staffing plan as the primary agency performing day-to-day operation of the Meyers Pool.

11.0 CAPITAL MAINTENANCE, REPLACEMENT, AND REPAIRS.

11.1 Prior to operations commencing, the Parties shall create a Capital Maintenance Plan that includes, but is not limited to, identifying the Parties responsible for facility maintenance (both short and long term), assets required, repairs, replacements, sources of funding (short and long term), etc.

11.1.1 The Capital Maintenance Plan should also identify and include, without limitation, the definitions and responsible Parties for the following:

11.1.1.1 Daily Maintenance as identified in the Feasibility Study; and

11.1.1.2 Annual (planned) Capital Maintenance (repairs, replacements, modifications, expansions, and investments); and

11.1.1.3 Emergency (unplanned) Maintenance; and

11.1.1.4 Annual Facility Condition Assessment recommendations; and

11.2 Emergency Capital Repairs and Purchases.

- 11.2.1** The Parties agree that each Party will be informed of an emergency as soon as practicable. As the lead Party responsible for operations, Apex will have the primary responsibility for providing notice and identifying necessary repairs or purchases caused by an emergency. “Emergency” shall be defined as any capital repair and/or purchase that has an estimated purchase price in excess of \$25,000 to complete, and further that is deemed necessary to keep the Meyers Pool operational and is not identified in Sec. 11.1 as part of the Capital Maintenance Plan or for expenditure as defined in Sec. 11.3.
- 11.2.2** The Parties agree that each Party will have the ability to vote on any emergency maintenance, repair, or purchase provided that the Party submits its vote within 48 hours of being informed of the emergency. The affirmative vote of the majority of the Parties is required to authorize an emergency maintenance, repair, or purchase.
- 11.2.3** For the purposes of this section, a vote may be carried out by any authorized representative of a Party and may be done in person or via email.

11.3 Capital Purchases and Reserve Fund.

- 11.3.1** The Parties agree that for the purposes of this Agreement, the Project, and the Capital Maintenance Plan that “Capital” is defined as an expenditure related to an asset in amount greater than \$25,000.00 and excludes consumable product purchases needed for daily operations.
- 11.3.2** Apex agrees to pay for all consumable product purchases needed for daily operations.
- 11.3.3** Apex agrees to fund non-consumable purchases, replacements, and repairs that cost \$25,000.00 or less. In the event Apex’s non-consumable purchase, repair, or replacement costs exceed \$25,000.00 per year, the Parties agree to meet, confer, and decide how to pay for the excess amount. The affirmative vote of the majority of the Parties will decide how to proceed on payment for such expenses.
- 11.3.4** The Parties agree that each Party will be informed of and have the ability to vote on all Capital purchases, following the maintenance standards provided by the architect and any construction contract or financing obligation of the Parties governing the Meyers Pool. The affirmative vote of the majority of the Parties is required to authorize a Capital purchase.
- 11.3.5** Arvada agrees as the owner of the Meyers Pool Building to take on the responsibility of creating a capital replacement and reserve fund as the primary source of capital repair funding. Arvada agrees to fund the capital replacement and reserve fund in the amount of 1.5 million dollars by December 31, 2026.
- 11.3.6** For the purposes of this section, a vote may be carried out by any authorized representative of a Party and may be done in person, via mail, or via email.

11.4 Annual Financial Statement. The Parties shall cause to be performed Annual Financial Statement that includes, without limitation:

11.4.1 Report on annual income and expenses of the facility; and

11.4.2 Audit requirements per financing standards.

12.0 COMMUNICATIONS/MEETINGS. The Parties shall hold periodic meetings at mutually agreeable times to discuss the matters related to this Agreement, but at minimum, quarterly.

13.0 NOTICES. Any notice required or permitted by this Agreement shall be in writing and shall be deemed to have been sufficiently given for all purposes if sent by certified mail or registered mail, postage and fees prepaid, or by email with read receipt requested, addressed to the parties as follows:

If to Apex: Lauri Dannemiller, Executive Director
Apex Park and Recreation District
13150 W. 72nd Avenue
Arvada, CO 80005
laurid@apexprd.org

If to JCSD: Tim Reed, Executive Director, Facilities
Jefferson County School District R-1
1829 Denver West Drive, Bldg. 27
Golden, CO 80401
Tim.Reed@jeffco.k12.co.us

If to Arvada: Mark G. Deven, City Manager
City of Arvada
8101 Ralston Road
Arvada, CO 80001
mdeven@arvada.org

With a copy to:

Rachel A. Morris, City Attorney
City of Arvada
8101 Ralston Road
Arvada, CO 80001
rmorris@arvada.org

Such notice shall be deemed to have been given when deposited in the United States mail or when sent via email.

14.0 INSURANCE.

14.1 Each Party to this Agreement agrees to, at its own expense, keep in full force and effect during the term of this Agreement, and during the term of any extension or amendment of the same, insurance or self-insurance reasonably sufficient to insure against the liability assumed by that Party pursuant to the provisions of this Agreement and any financing agreement related to the Project cost.

14.2 WORKERS' COMPENSATION. The Parties shall at their own respective expense keep in full force and effect during the term of this Agreement statutory workers' compensation insurance suitable to cover each Party's respective employees. At no time shall any Party bear responsibility for accidental injury to the employee of another Party performing services pursuant to this Agreement.

15.0 MISCELLANEOUS.

15.1 ENTIRE AGREEMENT. This Agreement contains the entire understanding between the Parties hereto relating to the subject matter contained herein and supersedes any and all prior agreements, arrangements, communications, or representations, whether oral or written.

15.2 ADDITIONAL DOCUMENTS OR ACTION. The Parties agree to execute any additional documents or take any additional action that is necessary to carry out this Agreement.

15.3 SEVERABILITY. If any term, section or other provision of this Agreement shall, for any reason, be held to be invalid or unenforceable, the invalidity or un-enforceability of such term, section or other provision shall not affect any of the remaining provisions of this Agreement, and to this end, each term, section and other provision of this Agreement shall be severable and continue in full force and effect.

15.4 AMENDMENTS. Unless otherwise provided for herein, this Agreement may be amended only by a written document approved by formal authority of the governing bodies of all of the Parties. Course of conduct, no matter how long, shall not constitute an amendment to this Agreement.

15.5 RELATIONSHIP OF PARTIES. This Agreement does not create a partnership, joint venture or agency relationship between the Parties. None of the Parties shall have any authority to bind any other Party to any agreement, understanding or other instrument, in any manner whatsoever.

15.6 NO THIRD PARTY BENEFICIARIES. Nothing in this Agreement shall be deemed to create any third party benefits or beneficiaries, or create a right or cause of action for the enforcement of its terms, in any entity or person not a Party to this Agreement.

15.7 SUBCONTRACTORS. A Party may subcontract any task it is required to perform under the terms of this Agreement without the prior written consent of the other Parties.

15.8 EMPLOYEES OF PARTIES. Employees, agents, contractors, and volunteers of each Party will remain so of that Party. Nothing in this Agreement requires any Party to fund the activities of another Party.

15.9 ASSIGNMENT. Neither party shall assign this Agreement without the prior written consent of the other party.

15.10 AVAILABILITY OF FUNDS AND CONSTITUTIONAL LIMITATIONS ON DEBT.

- 15.10.1** The Parties agree to enter into this Agreement pursuant to Colo. Rev. Stat. § 29-1-203. The financial obligations of any one Party payable after the current Municipal Fiscal Year or District Fiscal Year are contingent upon funds for that purpose being appropriated, budgeted, or otherwise made available. A Party may also rely on state or federal funding to satisfy its payment obligations under the Agreement. The Parties' payment obligations under the Agreement are subject to and conditioned upon the continuing availability of all funding for the purposes set forth in the Agreement.
- 15.10.2** In the event funds are not appropriated, budgeted or otherwise made available, in the event of non-appropriation pursuant to Section 15.10.1, the non-appropriating Party shall notify the other Parties in writing of the non-appropriation within 3 business days. The remaining Parties have the first right to cover and assume the non-appropriating Party's obligations for the upcoming fiscal year. If the Parties elect to cover, the non-appropriating Party's obligations shall resume the following year. If the Parties do not elect to cover, the non-appropriating Party may seek to withdraw pursuant to Section 5.0 or reach another satisfactory agreement unanimously consented to by all Parties.
- 15.10.3** No provision of this Agreement shall be construed to pledge or to create a lien on any class or source of the Parties' monies. No provision of this Agreement shall be construed to restrict the future issuance of any bonds or obligations of the Parties payable from any class or source of the Parties' moneys.
- 15.11 GOVERNMENTAL IMMUNITY.** This Agreement is not intended, and shall not be construed, as a waiver of the limitations on damages or any of the privileges, immunities, or defenses provided to, or enjoyed by, the Parties, and their past and present directors, officers, employees and volunteers, under federal or state constitutional, statutory or common law, including but not limited to the Colorado Governmental Immunity Act, Section 24-10-101, C.R.S., *et seq.*, as may be amended.
- 15.12 COOPERATION BY THE PARTIES.** Each Party will use its best efforts to cooperate in the fulfillment of the Project.
- 15.13 COMPLIANCE WITH LAWS.** The Parties shall comply with all laws that apply to performance under the Agreement, including any limitations imposed in financing agreements related to ongoing operation and maintenance of the Project.
- 15.14 WORKER WITHOUT AUTHORIZATION AND CRIMINAL RECORD CERTIFICATION.** Where required by law, the Parties, and their respective subcontractors, agents, and employees, shall complete criminal records checks. No individual who has been convicted of, pled nolo contendere to, or received a deferred sentence or deferred prosecution for a felony, or a misdemeanor crime involving unlawful sexual behavior or unlawful behavior involving children shall be allowed to work on JCSD property. In accordance with State law regarding contracts for services provided to certain units of local government, any contractor or subcontractor performing work on behalf the Parties must certify in any contract entered in to with such contracting agent that such agent will comply with the E-Verify certification process and will ensure that all personnel performing work pursuant to contract is lawfully present in the United States.

- 15.15 DEFAULT AND REMEDIES.** Time is of the essence. If any condition, obligation, or duty is not timely made, tendered or performed by any Party, then the Party(ies) who is(are) not in default may choose to do any of the following:
- 15.15.1** Terminate this Agreement; or
 - 15.15.2** Elect to treat this Agreement as being in full force and effect; or
 - 15.15.3** Recover such damages as may be proper; or
 - 15.15.4** Substitute the defaulting Party with another entity capable of assuming the defaulting Party's obligations; and/or
 - 15.15.5** Seek any other remedy permitted in law or equity, including specific performance.
- 15.16 WAIVER.** Any waiver by any Party hereto of a breach of any provision of this Agreement shall not operate as or be construed to be a waiver of any other breach of such provision or of any breach of any other provision of this Agreement. To be effective, any waiver must be in writing. Failure by any Party hereto to insist upon strict adherence to any term of this Agreement on one or more occasions shall not be considered a waiver or deprive such Party of the right thereafter to insist upon strict adherence to that term or any other term of this Agreement.
- 15.17 FORCE MAJEURE.** No Party will be liable for any failure or delay in performing an obligation under this Agreement that is due to any of the following causes (which events and/or circumstances are hereinafter referred to as "Force Majeure"), to the extent beyond its reasonable control: acts of God, accident, riots, war, terrorist act, epidemic, pandemic, quarantine, civil commotion, breakdown of communication facilities, breakdown of web host, breakdown of internet service provider, natural catastrophes, governmental acts or omissions, changes in laws or regulations, national strikes, fire, explosion, and generalized lack of availability of raw materials or energy.
- 15.18 GOVERNING LAW AND VENUE.** The laws of the State of Colorado shall govern this Agreement. Venue for any action arising under this Agreement or for the enforcement of this Agreement shall be in the appropriate court for Jefferson County, Colorado.
- 15.19 PARAGRAPH CAPTIONS.** The captions of the paragraphs are set forth only for convenience and reference and are not intended in any way to define, limit or describe the scope or intent of this Agreement.
- 15.20 EXECUTION.** This Agreement may be executed in several counterparts, and by electronic PDF, each of which will be an original, and all of which together will constitute one and the same instrument.
- 16.0 BINDING EFFECT AND AUTHORITY.** This Agreement shall inure to the benefit of, and be binding upon, the Parties, their respective legal representatives, successors, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise expressly authorized herein. The undersigned to this Agreement warrant that each has the authority to execute and enter into this Agreement, that their signatures are authorized and binding, and that all actions and approvals necessary for the

execution and delivery of the Agreement have been properly taken by their respective governing boards.

17.0 EFFECTIVE DATE. This Agreement shall be effective on the date of execution, below.

DONE this _____ day of _____, 2021.

[Signatures begin on next page].

APEX PARK AND RECREATION DISTRICT

Vicki Pyne, Apex President and
Chairman of the Board of Directors

ATTEST:

Ken Harrell, Apex Secretary/Treasurer

JEFFERSON COUNTY SCHOOL DISTRICT R-1

Susan Harmon, JCSD President,
Board of Education
1829 Denver West Drive, Bldg. 27
Golden CO 80401

ATTEST:

Stephanie Schooley

JCSD Secretary, Board of Education

[Signatures continue on next page.]

CITY OF ARVADA, a Colorado home rule municipal Corporation

Marc Williams, Arvada Mayor

ATTEST:

City Clerk

APPROVED AS TO FORM:

Rachel A. Morris, Arvada City Attorney

By: _____



REPORT FROM CITY COUNCIL

AGENDA ITEM
12.A.

DATE: October 18, 2021

SUBJECT: Council Committee Reports

Report in Brief

City Council members are appointed to various committees and boards as set out on the attached listing. As meetings are held, individual council members will report back to the full City Council any relevant discussions and issues that occurred.

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Enclosure, exhibits & attachments required to support the report

Council Member	Committee
Marc Williams	Arvada Urban Renewal Authority E-470 Authority (alternate) Jefferson Parkway Public Highway Authority Northwest Parkway Authority (Associate Member) (alternate) Urban Drainage and Flood Control District West Connect Coalition *Metro Mayors Caucus
Dot Miller	Adams County Economic Development Association Arvada Municipal Court/Judicial Committee CML Policy Committee Jefferson County Community Corrections Board (alternate) Smart City Advisory Committee
Bob Fifer	Apex Coordinating Committee Arvada Fire Protection District Coordinating Committee Arvada Transportation Committee Denver Regional Council of Governments Jefferson County R-1 Schools Coordinating Committee Jeffco Transportation Action & Advisory Group (JEFFTAAG) Smart City Advisory Committee
Nancy Ford	Arvada Center for the Arts and Humanities Arvada Sustainability Advisory Committee Arvada Visitors Center Committee (alternate) Rocky Flats Stewardship Council
David Jones	E-470 Authority (alternate) Jefferson County Community Corrections Board Jefferson County R-1 Schools Coordinating Committee Jefferson Economic Development Council (JEDC) Jefferson Parkway Public Highway Authority Northwest Parkway Authority (Associate Member) (alternate) West Connect Coalition (alternate)
John Marriott	Adams County Economic Development Association (alternate) Apex Coordinating Committee Arvada Audit Committee Arvada Economic Development Association Board Arvada Municipal Court/Judicial Committee CML Policy Committee Denver Regional Council of Governments (alternate) Jeffco Transportation Action & Advisory Group (JEFFTAAG) (alternate) Olde Town Business Improvement (BID) District Rocky Mountain Metropolitan Airport Community Noise Roundtable
Lauren Simpson	Arvada Audit Committee Arvada Fire Protection District Coordinating Committee Arvada Visitors Center Committee Smart City Advisory Committee

*Asterisked committees are not appointed by Council



REPORT TO CITY COUNCIL

AGENDA ITEM
13.A.

TO: THE HONORABLE CITY COUNCIL

DATE: October 18, 2021

SUBJECT: Review of Future Workshops and Presentations

Report in Brief

The City Manager's Office maintains a list of upcoming workshops and presentations to be scheduled for City Council meetings. During City Manager Reports, at the end of City Council business meetings, City Manager, Mark Deven, will review with City Council the tentative schedule and make any adjustments necessary.

Prepared by:
Chris Koch, CCO Admin

Reviewed by:

Approved by:

Rachel Morris, City Attorney	9/29/2021
Lorie Gillis, Deputy City Manager	10/4/2021
Mark Deven, City Manager	10/6/2021

Enclosure, exhibits & attachments required to support the report

2021 CITY COUNCIL WORKSHOPS, PRESENTATIONS AND RETREATS (TENTATIVE)

WORKSHOPS	Date	Lead
Communications Update	Oct 25	CMO
ARPA funds presentation	Oct 25	Finance
May be Cancelled	Nov 22	
Bond Project Update	Dec 13	PW
LDC Update	Dec 13	CED
2022		
Master Plan Update on Storm and Wastewater	Jan 10	PW
TBD's		
CIP Update	TBD	Finance
Council Retreat Update	TBD	CMO
Pocket Neighborhoods	TBD	
Meyers Pool	TBD	CMO
City Marketing Plan	TBD	CMO
Traffic Violation Fee	TBD	PW
Financial Scenarios for Street Maintenance Deficit/Options for Increasing Maintenance Funds Engage City Council in a discussion around the current street maintenance needs and how the City might fund them. This will include revenue enhancements, future allocations and expenditure realignments.	TBD	PW/Fin/ CMO
Fiber Master Plan The Fiber Master Plan which is also called Arvada Fiber Optic Network (AFON), was first presented to City Council 4/10/2017. City Councils had set a strategic goal to build a fiber network to enable high speed/real-time connectivity to city facilities and assets in order to enhance city operations. This workshop is intended to brief City Council as to the progress of the AFON build out. Updates are intended to cover conduit installation progress, fiber installation progress, current collocate opportunities, IGA member updates, and connections to current assets (city buildings, traffic, signals, utilities, radio, etc.).	TBD	PW
Community Survey Update The purpose of this item is to continue a discussion with Council about the Community Survey results and what the City team is doing to apply what is learned. Discussion will include an update on action plans targeting key drivers of the City's 5-star rating as well as how Worksystems are targeting specific measures.	TBD	CMO
Problem Properties	TBD	P.D.
Water Storage – Plan B (include with master plan presentation)	TBD	Utilities
Activation of Historical Assets	TBD	VCN
N.W. Arvada	TBD	CED
Body Worn Cameras	TBD	PD
Customer Service Philosophy	TBD	CMO
Ask Arvada Update	TBD	CMO
Diversity and Equity Committee	TBD	CMO
COUNCIL JOINT MEETINGS/DINNERS:		

Denver Water Board Apex Board AURA Board Arvada Center Board—Per Coop Agreement - Annually after October 1 of each year Jefferson Parkway Meeting with Jeffco and Broomfield Council Annual Retreat	May 14	
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