

Loveland

US Highway 34

Access Control Plan

US 34: M.P. 85.50 to M.P. 96.03
(CR 27 to I-25)



**LOVELAND
US HIGHWAY 34
ACCESS CONTROL PLAN**

**US 34: MP 85.50 to MP 96.03
(CR 27 to I-25)**

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TABLE OF CONTENTS

Executive Summary i

1.0 Introduction..... 1

 1.1 Project Background..... 1

 1.2 Project Coordination 3

 1.3 Public Involvement..... 3

2.0 Access Management – Benefits, Principles & Techniques 5

 2.1 Access Management Benefits..... 5

 2.2 Guiding Principles 6

 2.3 Techniques 7

3.0 Existing Conditions..... 10

 3.1 Land Use Characteristics 10

 3.2 Roadway Characteristics 10

 3.3 Right-of-Way..... 11

 3.4 Access Category..... 12

 3.5 Existing Access Inventory 12

 3.6 Crash History 14

4.0 Existing TRAFFIC CONDITIONS..... 16

 4.1 Existing Traffic Volumes 16

 4.2 Existing Traffic Operations..... 16

5.0 Future TRAFFIC Conditions 20

 5.1 Background Traffic Growth 20

 5.2 Future Traffic Operations 22

6.0 Access Control Plan Development and Evaluation..... 24

 6.1 Process..... 24

 6.1.1 Step One – Methodology & Compatibility Index..... 24

6.1.2 Step Two – Development of the Access Control Plan 24

6.1.3 Step Three – Refine the Access Control Plan..... 24

6.1.4 Step Four – Evaluation 25

6.2 Evaluation Results 25

7.0 Plan Recommendations 26

7.1 Access Control Plan..... 27

7.2 Other Recommended Improvements 52

8.0 Implementation 58

9.0 List of Acronyms 60

10.0 Glossary 61

LIST OF FIGURES

Figure 1. Vicinity Map..... 2

Figure 2A. US 34 Access Exhibit 1 of 18.....29

Figure 2B. US 34 Access Exhibit 2 of 18.....30

Figure 2C. US 34 Access Exhibit 3 of 18.....31

Figure 2D. US 34 Access Exhibit 4 of 18.....32

Figure 2E. US 34 Access Exhibit 5 of 18.....33

Figure 2F. US 34 Access Exhibit 6 of 18.....34

Figure 2G. US 34 Access Exhibit 7 of 1835

Figure 2H. US 34 Access Exhibit 8 of 18.....36

Figure 2I. US 34 Access Exhibit 9 of 1837

Figure 2J. US 34 Access Exhibit 10 of 1838

Figure 2K. US 34 Access Exhibit 11 of 18.....39

Figure 2L. US 34 Access Exhibit 12 of 1840

Figure 2M. US 34 Access Exhibit 13 of 1841

Figure 2N. US 34 Access Exhibit 14 of 18.....42

Figure 2O. US 34 Access Exhibit 15 of 1843

Figure 2P. US 34 Access Exhibit 16 of 18.....44

Figure 2Q. US 34 Access Exhibit 17 of 1845

Figure 2R. US 34 Access Exhibit 18 of 18.....46

Figure 3A. US 34 Alternate Routes Exhibit 1 of 4.....54

Figure 3B. US 34 Alternate Routes Exhibit 2 of 4.....55

Figure 3C. US 34 Alternate Routes Exhibit 3 of 4.....56

Figure 3D. US 34 Alternate Routes Exhibit 4 of 4.....57

LIST OF TABLES

Table 1- 2010 Highway Capacity Manual (HCM) LOS Thresholds17

Table 2- Existing Intersection Delay and LOS18

Table 3- Existing Segment Performance19

Table 4- 2040 No Build (No ACP) Intersection Delay and LOS20

Table 5- 2040 No Build (No ACP) Segment Performance21

Table 6- 2040 Intersection Delay with ACP22

Table 7- 2040 Intersection LOS with ACP23

Table 8-Compatibility Evaluation Summary25

TECHNICAL APPENDIX (Bound Separately)

- APPENDIX A - EXISTING ACCESS INVENTORY
- APPENDIX B - ACCESS PLAN COMPATIBILITY INDEX
- APPENDIX C - ACCESS CONTROL PLAN METHODOLOGY
- APPENDIX D - CRASH HISTORY
- APPENDIX E - TRAFFIC METHODOLOGY, DATA AND ANALYSIS
- APPENDIX F - INTERGOVERNMENTAL AGREEMENT AND ACP TABLE
- APPENDIX G - PUBLIC INVOLVEMENT

EXECUTIVE SUMMARY

Background and Purpose

The U.S. Highway (US) 34 is a critical east-west transportation corridor for northern Colorado's large and growing communities. Sustained and successful economic development along US 34 is increasing travel demand and necessitating the need to improve safety, operations, and reliability. The Colorado Department of Transportation (CDOT) Region 4 working with local communities and the North Front Range Metropolitan Planning Organization (NFRMPO) identified the need to develop a US 34 Planning and Environmental Linkages (PEL) Study assessing various improvement opportunities on US 34. While reviewing local area plans and documents the need to develop an Access Control Plan (ACP) for the west end of US 34 was recognized. The US 34 ACP was developed in conjunction with the US 34 PEL and through partnership between CDOT Region 4, the City of Loveland, and Larimer County.

The North Front Range Metropolitan Planning Organization (NFRMPO) has identified US 34 as a tier 1 regionally significant corridor in the transportation planning region. The major goals of the 2040 Regional Transportation Plan (2040 RTP) are:

1. Foster a transportation system that supports economic development and improves residents' quality of life.
2. Provide a transportation system that moves people and goods safely, efficiently, and reliably.
3. Provide a multi-modal system that improves accessibility and transportation system continuity.
4. Optimize operations of transportation facilities.

In support of the goals and recommendations from combined efforts of CDOT's, City of Loveland's and Larimer County's previous planning efforts and the goals from the 2040 RTP and to address anticipated growth in the area, the City, County and CDOT have partnered to develop an ACP for US 34. The limits of the study area span approximately 10.6 miles of US 34.

Project Goals

The purpose and need of the ACP is in alignment with the US 34 PEL purpose and need that is listed below:

The purpose of highway improvements is to preserve US 34 as a vital east-west regional transportation corridor. Improvements will link and move people, goods, and information reliably and adapt to future travel demands and funding opportunities

The ACP needs are:

- Increase Safety
- Accommodate increased travel and tourism demands to maintain the economic vitality of the region
- Increase reliability of east-west regional travel, while balancing local access, mobility, and freight needs

Study Area

The study area encompasses 10.6 miles of US 34 in the City of Loveland and Larimer County. It extends from approximately CR 27 to I-25 (MP 85.50 - MP 96.03). The segment consists of 7.8 miles within Loveland city limits and 2.8 miles located within unincorporated Larimer County. In general, land use within the city limits is suburban in nature with residential, commercial, and some industrial uses, whereas land use in the county is typically rural in nature with mostly agricultural and residential uses. There are currently 428 access points on US 34 within the study area. A majority of access points are full movement. The access points are classified as follows:

- 16 signalized public road intersections (30 access points)
- 38 unsignalized public road intersections (66 access points)
- 5 unsignalized private road intersection (5 access points)
- 191 business access points
- 94 residential access points
- 42 field access points

Coordination and Public Involvement

The study is a joint partnership between the City of Loveland, Larimer County, and CDOT Region 4. Input from corridor stakeholders, including property owners, tenants, and the general public, was a critical element of the project. Multiple techniques were used to engage stakeholders including: public open houses; emails and phone calls with interested stakeholders, and project information posted on the CDOT's website. Exhibits presenting access management principles, the study process, and the recommended ACP were displayed at open houses and on the CDOT's website. Representatives from the City, County, CDOT, and consultant team were available for questions at public outreach events.

Development of the Plan

In preparation for US 34 PEL and this study, the existing physical and operational characteristics of US 34 were established. The project team also developed a compatibility index to evaluate how the plan met the objectives identified at the beginning of the project. Next, future physical and operational characteristics were projected for the 2040 planning horizon year based on anticipated development in the area. Using this information, a draft ACP was developed and evaluated. The ACP considered access points in logical groupings, State Highway Access Code guidance, and alternative local routes. Based on input from the project team, agency representatives, and the public, the draft plan was refined and evaluated using criteria identified in the compatibility index. Overall, the ACP rates favorably and is compatible with project goals. Plan adoption by the three entities is recommended.

Access Control Plan

Figures 2A-2R found in Section 7 of this report, graphically illustrate the recommended ACP. Technical Appendix F contains the Access Control Plan Table with specific recommendations for each individual access point. In general, the ACP limits full movement access to major intersections. In addition, highway access is reduced to one location per ownership and where feasible, shared between adjacent properties. Where reasonable access can be provided to an alternate route/cross street, access points are relocated to the local street system. To maximize local circulation options, minor public road intersections are identified as $\frac{3}{4}$ movement where

providing the left-turn movement improves operations and/or circulation and where there is adequate space to develop left turn auxiliary lanes. Traffic control measures, including installation of raised medians, may be used to achieve proposed conditions. Out of direction travel was generally limited to a maximum distance of one mile ($\frac{1}{2}$ mile each way). This was achieved by providing full movement intersections at necessary intervals. Major intersections that are identified as full movement intersections with a traffic signal are as follows:

- Cascade Avenue
- Wilson Avenue
- Van Buren Avenue
- Taft Avenue
- Colorado Avenue
- Garfield Avenue
- Cleveland Avenue
- Lincoln Avenue
- Monroe Avenue
- Redwood Drive
- Madison Avenue
- Boise Avenue
- Denver Avenue
- Sculptor Drive
- Boyd Lake Avenue
- Hahns Peak Drive
- Rocky Mountain Avenue

In support of the recommended access modifications, development of several alternative local routes is also recommended. These alternative routes provide additional local connections and internal circulation opportunities that will benefit operations on US 34 by reducing local dependence on the highway, providing alternatives for restricted left-turn movements, and reducing demand at intersections that are already experiencing high demand. Adoption of these routes into the Loveland's and Larimer County's future plans is recommended.

Implementation

The improvements recommended in the Access Study represent a long-range plan that will be implemented over time as traffic and safety needs arise and as funding becomes available. Construction of the recommended improvements may be completed using public and/or private funding. The following cases, or any combination, will trigger construction:

1. A property develops, redevelops or changes use, resulting in an increase in traffic to and from the site of 20% or more. In this case, limited improvements at the specific access point may be required by CDOT. As part of the City's development review process, additional improvements may also be necessary to address traffic-related impacts created by the development / redevelopment. Improvements will be compatible with the ACP. (Private Funding).
2. The City and/or County obtain funding to complete improvements to a segment of the US 34 or a local route. (Public Funding)
3. State and/or Federal Funds are obtained to complete improvements to a segment of the US 34. Typically, a project will be identified in the North Front Range Transportation Metropolitan Planning Organization Transportation Improvement Program (NFRMPO TIP) and Statewide Transportation Improvement Program (STIP) to obtain funding. (Public Funding)
4. A safety or operational issue develops that can be mitigated through the implementation of access management techniques consistent with the ACP. Depending on the extent and type of safety or operational issue, improvements may address a segment of the US 34 corridor or a local route or may be limited to an isolated location or access point. Public

funding from any combination of agencies may be obtained to construct improvements.
(Public Funding)

However, it is important to remember that implementation of improvements recommended in the Access Study will only occur if one of the triggers listed above are met. If a trigger is not met a change to the existing condition will not be made. In short if nothing changes, nothing changes.

1.0 INTRODUCTION

1.1 Project Background

U.S. Highway (US) 34 is a critical east-west transportation corridor for northern Colorado's large and growing communities. Sustained and successful economic development along US 34 is increasing travel demand and necessitating the need to improve safety, operations, and reliability. The Colorado Department of Transportation (CDOT) Region 4 working with local communities and the North Front Range Metropolitan Planning Organization (NFRMPO) identified the need to develop a US 34 Planning and Environmental Linkages (PEL) Study assessing various improvement opportunities on US 34. While reviewing local area plans and documents, the need to develop an ACP (ACP) for the west end of US 34 was recognized. The Loveland US 34 ACP was developed in conjunction with the US 34 PEL and through partnership between CDOT Region 4, the City of Loveland, and Larimer County.

The North Front Range Metropolitan Planning Organization (NFRMPO) has identified US 34 as a tier 1 regionally significant corridor in the transportation planning region. The major goals of the NFRMPO 2040 Regional Transportation Plan (2040 RTP) are:

1. Foster a transportation system that supports economic development and improves residents' quality of life.
2. Provide a transportation system that moves people and goods safely, efficiently, and reliably.
3. Provide a multi-modal system that improves accessibility and transportation system continuity.
4. Optimize operations of transportation facilities.

In support of the goals and recommendations from combined efforts of the CDOT's, City of Loveland's and Larimer County's previous planning efforts and the goals from the NFRMPO 2040 RTP and to address anticipated growth in the area, the City, County and CDOT have partnered to develop an ACP for US 34.

The project study area is located in Larimer County with a large portion of the study area located within the City of Loveland's Growth Management Area boundary. The western project limit begins at MP 85.50 and terminates at MP 96.03 (approximately CR 27 to I-25). The western project limit was identified as a logical western terminus for the US 34 PEL and ACP based on the point where land use changes from urban to rural (both existing and future). The limits of the study area span approximately 10.6 miles of US 34. The study limits are illustrated on the Vicinity Map in Figure 1.

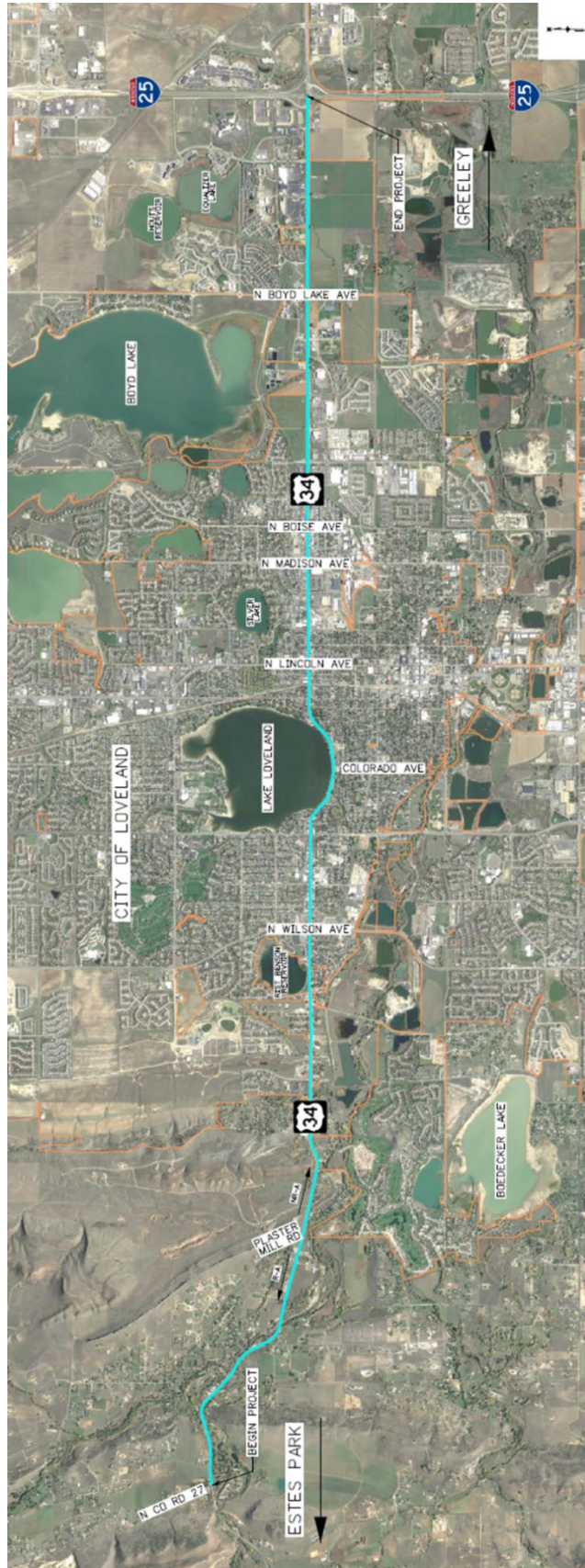


Figure 1. Vicinity Map

The purpose and need for the ACP is the same as the US 34 PEL:

The purpose of highway improvements is to preserve US 34 as a vital east-west regional transportation corridor. Improvements will link and move people, goods, and information reliably and adapt to future travel demands and funding opportunities

The ACP needs are:

- Increase Safety
- Accommodate increased travel and tourism demands to maintain the economic vitality of the region
- Increase reliability of east-west regional travel, while balancing local access, mobility, and freight needs

This report summarizes the study process, analyses, findings, and recommendations for access modifications within the US 34 corridor through Loveland.

1.2 Project Coordination

The project area falls within the boundaries of both the City of Loveland and Larimer County. The majority of the US 34 segment falls within the City's jurisdiction. The study is a joint partnership between the City of Loveland, Larimer County, and CDOT.

The primary project team for development of the ACP consisted of representatives from City Public Works and Community Development, County Engineering, and CDOT – Region 4, South Greeley Residency and Traffic Unit. Input from other departments within the City, County, and CDOT was collected by project team staff representatives and at technical advisory committee meetings, including two staff workshops held on February 6 and 13, 2018. Coordination with local project stakeholders, including property owners, tenants and the general public is described in the next section.

1.3 Public Involvement

Input from corridor stakeholders, including property owners, tenants, and the general public, was a critical element of the project. Multiple techniques were used to engage stakeholders including: advertised public open houses; email communication with interested stakeholders; press releases and project information posted on the CDOT's website.

Six public meetings were held in conjunction with the US 34 PEL for the US 34 ACP. The draft ACP was presented at the last two open houses in May 2018. All property owners adjacent to the US 34 corridor within the project study area were invited to the May 2018 open houses with a post card via first class mail. The following is a list of the meeting dates and locations:

- May 2, 2017 in Loveland
- May 3, 2017 in Evans
- November 8, 2017 in Greeley
- November 15, 2017 in Loveland
- May 23, 2018 in Evans
- May 30, 2018 in Loveland

The public meetings were advertised as project-specific public open houses to present and discuss access management principles and techniques and gather public input on the draft plan. Corridor property owners, local government representatives, and other interested individuals who contacted the project prior to the open houses were invited to the open house by first class mail and e-mail, when provided. In addition, to inform the general public of the open houses, an invitation was included on CDOT's website and social media pages and press releases were issued by CDOT. Exhibits presenting access management principles, the study process, and the recommended draft ACP were displayed at the open houses. The same exhibits were also available for review on CDOT's website. Representatives from the City, County, CDOT, and consultant team were available for questions and discussion at all open houses. Public meeting sign-in sheets, comment documentation, and additional information regarding public involvement can be found in Technical Appendix G.

Public comments were accepted at all public outreach events and via e-mail throughout the project. The project team received public feedback concerning the following topics:

- ACP implementation
- Restricting left-turn movements
- Alternate routes and how they are accomplished
- Shared access and how it is accomplished
- Planning for future traffic needs

The team updated and engaged the City Council and the Larimer Board of County Commissioners (BOCC) on project progress and development at US 34 Coalition and NFRMPO council meetings. All of these meetings were open to the public. Formal presentations will be made to the Loveland City Council and the Larimer County Commissioners at their regularly scheduled meetings through the adoption process. Access Control Plans for State Highways are adopted by CDOT and the local authorities through an intergovernmental agreement (IGA). The approval and adoption of the ACP and associated IGA is anticipated in March 2019.

2.0 ACCESS MANAGEMENT – BENEFITS, PRINCIPLES & TECHNIQUES

As defined by the *Access Management Manual, TRB, Second Edition 2014*, “Access management is the coordinated planning, regulation, and design of access between roadways and land development. It involves the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway.” Access management along Colorado State Highways is generally administered by CDOT on a case by case basis, as prescribed by the *State of Colorado State Highway Access Code, latest edition*. Per Section 2.12 of the Access Code, CDOT or a local authority may develop an Access Control Plan (ACP) for a segment of highway that defines access locations, level of access and traffic control for future conditions. Developing an ACP provides CDOT and the local authorities with the opportunity to develop a single transportation plan that considers multiple access points along a segment of highway as a network rather than as individual access points. Corridor specific issues such as intersection spacing, traffic movements, circulation, land use, topography, alternative access opportunities, and other local planning documents may be considered in developing an ACP. The Plan does not define capacity improvements, off-network improvements, or funding sources for access improvements. However, in combination with the US 34 PEL, these elements were considered in conjunction with the Access Control Plan. The Plan is a long-range planning document that identifies access conditions that will be implemented as highway and land-use characteristics change. Access Control Plans for State Highways are adopted by CDOT and the local authorities through an intergovernmental agreement (IGA).

2.1 Access Management Benefits

Access management provides the means to balance good mobility along the highway with local access needs of businesses and residents. Implementation of access management principles and techniques on State and local transportation networks can provide the following long-term benefits for highway users, communities, and businesses:

- Safety
 - Fewer decision points and potential for conflicts for motorists, cyclists, and pedestrians results in a reduced number of crashes.
 - Safer access to businesses is provided.
- Increased ability to accommodate traffic demands
 - Limiting full movement access within a corridor favors through movements and strategically identifies locations for vehicles to enter and exit the corridor.
 - Reduces congestion, thereby discouraging thru traffic from seeking alternative local routes to avoid congestion.
 - Improved operations on the highway also provides increased opportunities to reduce delay on the local street system.
- Preserves property values and the economic viability of abutting development
 - A more efficient roadway system captures a broader market area.
 - A more predictable and consistent development environment is created.
 - Well-defined driveways with suitable spacing make it easier for customers to enter and exit businesses safely, thereby encouraging customers to patronize corridor businesses.

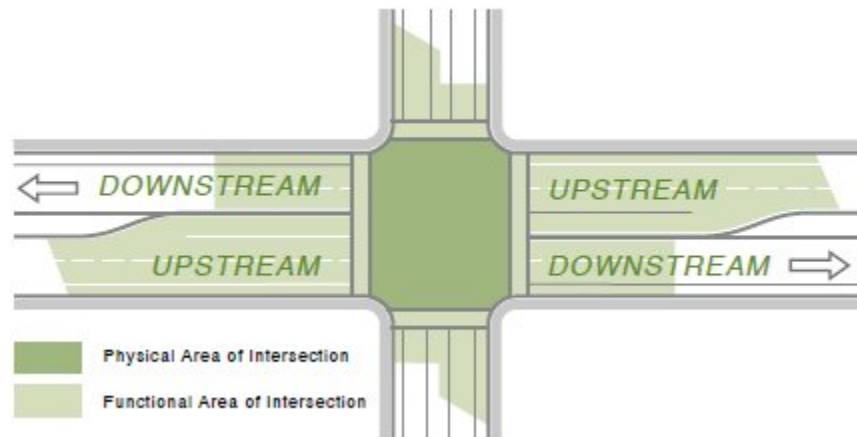
- Encourages use and development of local streets
 - Alternative local routes allow traffic to access local amenities conveniently without using the highway, thereby providing both convenient local access and circulation and reduced volumes on the highway.
- Enhanced Corridor Appearance
 - Businesses are easily located
 - Well-defined access points with suitable spacing provides more opportunities for streetscaping/landscaping.

2.2 Guiding Principles

Access management centers around limiting and consolidating access along major roadways and focusing access for development on a supporting local street network and circulation system. The following guiding principles to access management were applied in the development of the ACP for US 34:

- Limit the number of direct access points to major roadways
- Locate signals and intersections to favor through movements
- Minimize the number of locations where vehicles merge, split, or cross
- Remove turning vehicles from through traffic lanes
- Provide a supporting local street network and circulation system

In addition, functional intersection area was considered in evaluating the spacing between major intersections. *American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets, 2011* and *Access Management Manual, TRB, Second Edition 2014* indicate that separation of access points should not be less than the functional area of the intersection. The functional intersection area extends upstream and downstream from the physical intersection as shown below.



Source: Federal Highway Administration (FHWA) *Access Management in the Vicinity of Intersections Technical Summary*

The upstream distance is a combination of the storage length, deceleration and taper length, and the perception-reaction distance required for the speed of the segment. The downstream distance is measured as either acceleration length or decision sight distance. Providing acceleration length allows vehicles to accelerate to normal speed without conflict. Providing decision sight distance allows drivers to pass through an intersection before considering potential conflicts at the next intersection. Decision sight distance was identified as the

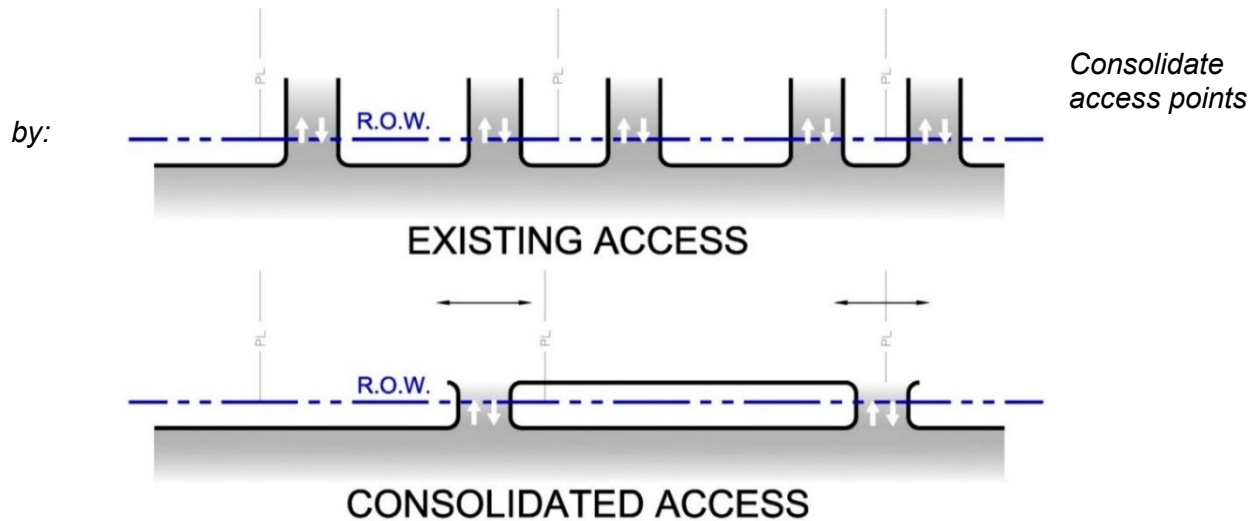
controlling downstream functional intersection distance for this corridor since. The functional intersection area depends on the speed of the segment and the number of projected turning vehicles.

2.3 Techniques

Several access management techniques, illustrated below, may be used to achieve the principles outlined above and to realize the benefits of access management along US 34.

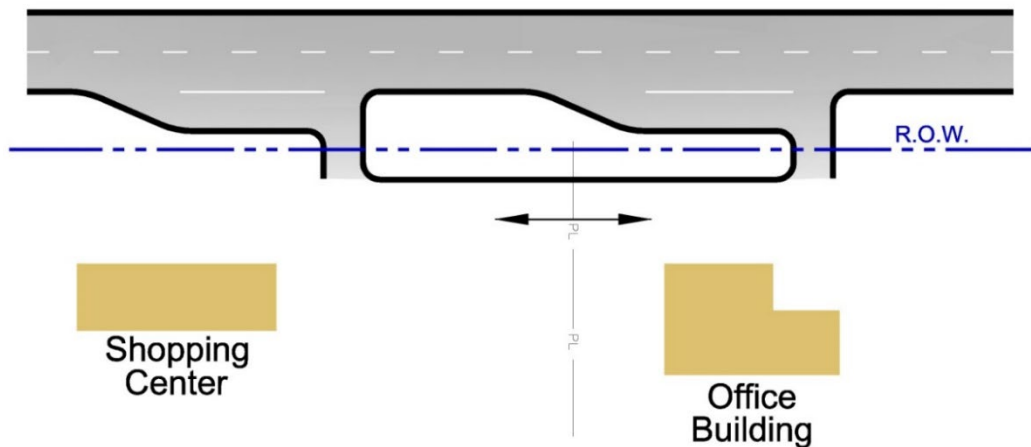
Principle: Limit the number of direct access points to major roadways

Technique: Consolidate Access



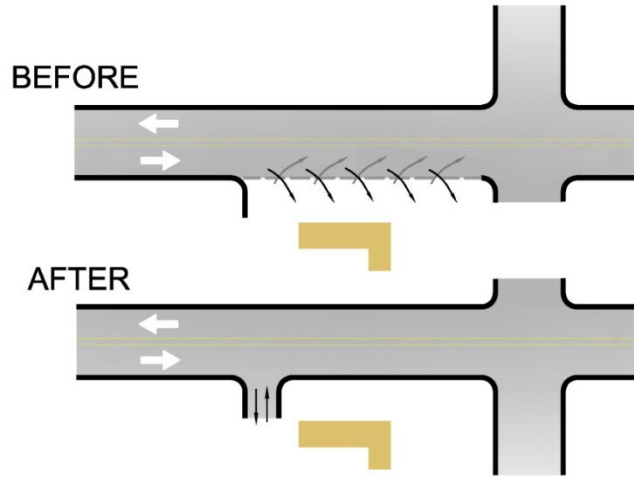
- Reducing the number of access points that serve a single property
- Providing joint access for multiple properties at or near a property line

Technique: Connect Adjacent Properties



Connect adjacent properties to provide circulation between properties and increase access opportunities for multiple properties.

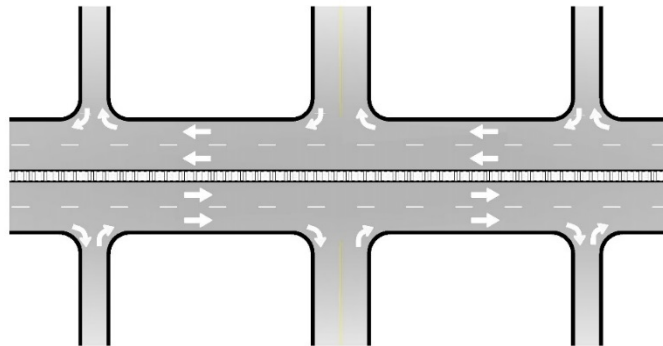
Technique: Define Driveways



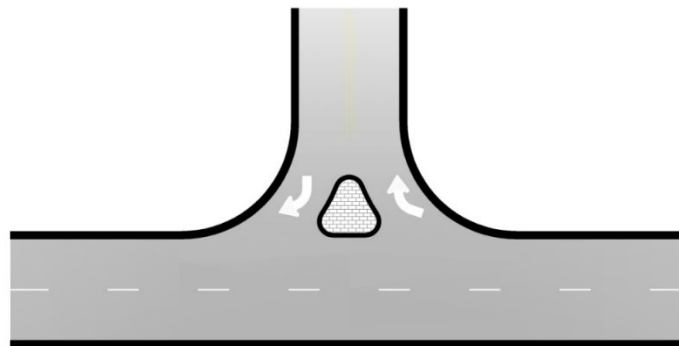
Define driveways to provide clear identification of entrance and exit locations.

Principle: Minimize the number of locations where vehicles merge, split, or cross

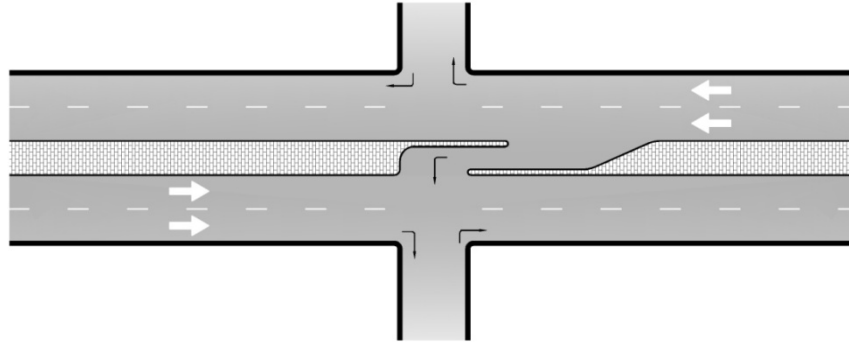
Technique: Install Medians and Islands



Right-in/right-out with raised median eliminates left turn movements between major intersections throughout a corridor.



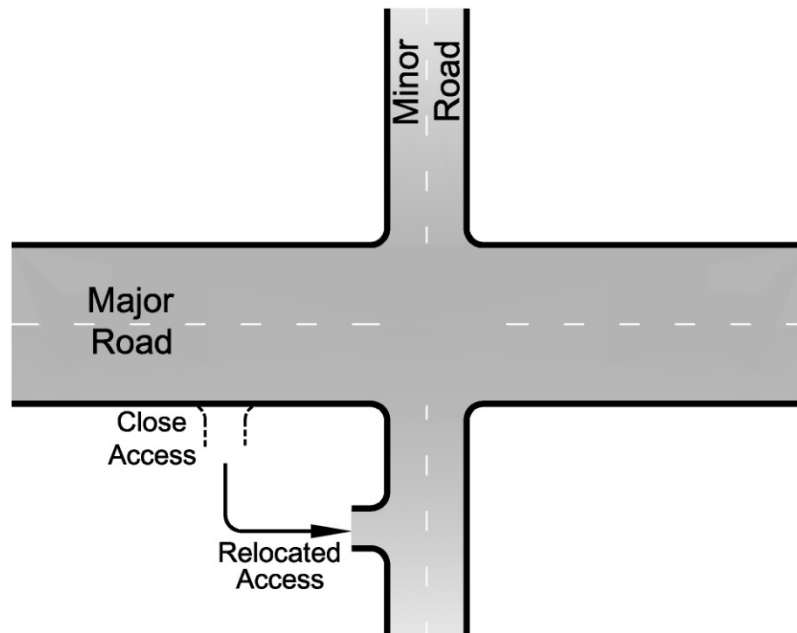
Right-in/right-out with channelizing island eliminates left turn movements at specific locations.



Directional median opening or a $\frac{3}{4}$ movement limits left turn movements to one direction at strategic locations where increased access is beneficial for safety or operational reasons.

Principle: Provide a supporting local street network and circulation system

Technique: Provide Cross Street Access



Relocate access to a side street to:

- *Reduce the number of direct access points to the major roadway.*
- *Provide safe and easy access to a minor roadway intersection with the major roadway.*
- *Provide opportunities to use an alternate local route, thereby avoiding use of the major roadway completely.*

3.0 EXISTING CONDITIONS

3.1 Land Use Characteristics

The study area encompasses 10.6 miles of US 34 in the City of Loveland and Larimer County. It extends from approximately CR 27 to I-25 (MP 85.50 - MP 96.03). The segment consists of 7.8 miles within Loveland city limits and 2.8 miles located within unincorporated Larimer County. The adjacent land uses are generally urban to suburban with arterial characteristics on US 34. Except for the first 2 miles of US 34 beginning at CR 27, the study area is entirely located within the City of Loveland Growth Management Area. The summary of existing land uses is organized geographically from west to east. Given the corridor's length, it was split into sections based on major intersections to organize content and increase readability for this section of the report. The summary of land uses primarily focuses on those parcels immediately adjacent to the US 34.

CR 27 to US 287 (Lincoln Avenue/Cleveland Avenue)

The section of US 34 between CR 27 and US 287 begins in unincorporated Larimer County and covers the western side of Loveland. The land use in the county segment is comprised of open space and low-density residential with a mix of commercial and residential uses. Land uses between the Cascade Avenue and Namaqua Road are predominantly residential in nature, including a vacant lot where 34 residential units are being planned. The area between Namaqua Road and Taft Avenue is dominated by both small and large commercial operations. There is also multifamily residential in this area. Commercial uses are present all along US 34 from Van Buren Avenue to Taft Avenue. East of Taft Avenue there is a mix of single-family and multi-family residential uses. A few office buildings are present near Colorado Avenue. Commercial uses are interspersed closer to the US 34 and US 287 intersection. This major intersection is dominated by fast food/casual dining establishments.

US 287(Lincoln Avenue/Cleveland Avenue) to I-25

The dominant land uses between Lincoln Avenue/Cleveland Avenue (US 287) and I-25 are commercial uses and agricultural land. US 34 from US 287 to Madison Avenue is a mix of commercial operations. The area from Madison Avenue to Boise Avenue is dominated by larger commercial uses. US 34 between Lake Loveland and Monroe Avenue there are residential neighborhoods. From Monroe Avenue to Boyd Lake there are mostly commercial properties and vacant properties. The McKee Medical Center is located just east of Boise Avenue. From Boyd Lake Avenue to I-25 is dominated by regional commercial uses, although multi-family housing and an RV park are present just west of Hahns Peak Drive. The Southside in this area is currently undeveloped agriculture land. The Outlets of Loveland are situated at the northwest corner of the US 34 and I-25 interchange, including the Park and Ride lies just to the west of the south bound I-25 off-ramp.

3.2 Roadway Characteristics

The posted speed limit on US 34 ranges from 35 mph to 55 mph, with the lower speed limits posted in the more urbanized areas. There are five typical sections included in the Plan area. The speed limits currently posted in these typical sections were used to evaluate access configurations. The majority of US 34 was designed as a rural arterial, so the horizontal and

vertical alignments were designed for high speeds. The horizontal alignment is primarily on tangents with small points of intersection at section lines. These points of intersection do not have horizontal curves. Area as-built and ROW plans do not typically specify any superelevation. Unless otherwise mentioned, 8 percent maximum superelevation tables are used. The following are the five typical sections exist on US 34 through Loveland:

Typical Section 1 – CR 27 to Morning Drive: At the west project limit, there is a 2-lane segment approximately 1.9 miles long within Loveland’s growth management area that retains rural, mountainous characteristics, with limited development and the Big Thompson River floodplain to the south. This section is a 2-lane roadway cross section with added or expanded auxiliary lanes at intersections and modifications to shoulders. The posted speeds are 45 to 55 miles per hour (mph), increasing in the westbound direction leaving the urban area and decreasing in the eastbound direction. There is a series of curves between Glade Road and Morning Drive that are posted at 45 mph. These curves have adequate radiuses to meet a 55-mph design speed but do not have the spiral curves and have an unknown superelevation. At 45 mph, spirals are not required.

Typical Section 2 – Morning Drive to 285 Feet West of Taft Avenue: East of the rock formation of Devil’s Backbone, the floodplain no longer affects the highway and the roadway characteristics become more urban in nature. Typical Section 2 has four lanes with a center turn lane to facilitate driveways and closely spaced intersections. There is a raised center median in this section. The posted speed in the westbound direction increases from 35 to 45 mph. The posted speed in the eastbound direction is 35 mph. From Morning Drive to Wilson Avenue, there are five curves with adequate radiuses to meet a 60-mph design. This area has a posted speed of 45 mph. The 4-percent maximum street standards are used to evaluate the alignment. The posted speed is 35 mph. The curve at Prospect Avenue meets a 35-mph design speed with normal crown and a 40-mph design speed with 2.2 percent superelevation.

Typical Section 3 – 285 Feet West of Taft Avenue to Monroe Avenue: Around Lake Loveland, the roadway remains four lanes, with a raised center median. The posted speed is 35 mph in both directions. The series of curves around Lake Loveland require a 3.4-percent superelevation to meet a 40-mph design speed.

Typical Section 4 – Monroe Avenue to 500 Feet East of Denver Avenue: The six-lane section begins at Monroe Avenue. This section is approximately 1.2 miles long and extends almost to Denver Avenue. The posted speed is 40 mph in both directions. The remaining curves to I-25 have design speeds equal to or in excess of the posted speed using the 8-percent superelevation table.

Typical Section 5 – 500 Feet East of Denver Avenue to I-25: Typical Section 5 runs from 500 feet east of Denver Avenue to I-25. It is a 4-lane section with a narrow-divided median. The City of Loveland has preserved ROW to increase the number of lanes from four to six in the future. Currently, the posted speed in both directions is 50 to 55 mph.

3.3 Right-of-Way

The right-of-way (ROW) width within the study area varies throughout. On US 34, the ROW width varies between approximately 80’ and 115’. In the westernmost segment, from CR 27 to Taft Avenue, the ROW is 100’. The narrowest segment is between Taft Avenue and Garfield Avenue where the highway curves near Lake Loveland with a ROW width varying from 80’ to 90’. The widest segment is at the easternmost project limits between Denver Avenue and I-25.

3.4 Access Category

Section Three of the *State of Colorado State Highway Access Code, latest edition*, establishes a system of eight highway categories for the purpose of defining the level of access for a highway segment based on the intended function of that segment. The Colorado Transportation Commission assigns a category to each state highway segment throughout Colorado. US 34 is categorized as Regional Highway (R-A) from CR 27 (MP 85.60) to Hidden Valley Drive/CR 22B (MP 87.69). East of these limits to I-25 (MP 87.69 to MP 96.25), US 34 is categorized as Non-Rural Principal Highway (NR-A). Access category limits are shown on Figure 1.

According to Sections 3.8 and 3.10 of the Access Code, the major access control characteristics of a highway segment under Category R-A and NR-A, respectively, are very similar. These major characteristics are listed below:

- Through traffic movements take precedence over direct access needs;
- Capacity for medium to high speed and medium to high traffic volumes;
- “One access shall be granted per parcel of land if reasonable access cannot be obtained from the local street or road system;”
- One-half mile spacing for full movement intersections or minimum 35% efficiency for signal progression.

3.5 Existing Access Inventory

There are currently 428 access points on US 34 within the study area. A majority of access points are full movement. On US 34, nearly 45% of the access points provide direct business access, approximately 23% provide public/private road access, roughly 10% are field accesses and almost 22% provide residential access.

For the purposes of identifying the location of access points for this plan, all access points are defined by the approximate Department reference point along US 34 based on CDOT Highway Segment Description Milepost for US 287C (Lincoln Avenue), MP 92.01. All access points are located at the approximate centerline of the access (+/- 50 feet). A complete inventory of existing access points is provided in Technical Appendix A.

The following provides a description of the accesses by type:

Public Road Signalized (PRS) – Full movement, signal-controlled intersection providing direct access to a publicly owned roadway. PRS accesses include highway to highway connections, county roads, and city streets. The PRS access points in the study area include:

- | | |
|--------------------|-------------------------|
| • Cascade Avenue | • Redwood Drive |
| • Wilson Avenue | • Madison Avenue |
| • Van Buren Avenue | • Boise Avenue |
| • Taft Avenue | • Denver Avenue |
| • Colorado Avenue | • Sculptor Drive |
| • Garfield Avenue | • Boyd Lake Avenue |
| • Cleveland Avenue | • Hahns Peak Drive |
| • Lincoln Avenue | • Rocky Mountain Avenue |
| • Monroe Avenue | |

Public Road Unsignalized (PRU) – Full movement, stop-controlled intersection providing direct access to a publicly owned roadway. The PRU access points in the study area include:

- CR 27
- Black Crow Lane
- Goodwine Drive
- CR 23H
- Glade Road
- Westridge Drive
- Hidden Valley Drive
- Langston Lane
- Rossum Drive
- Rainbow Plaza
- Butte Road
- River Road
- Morning Drive
- Lucas Avenue
- Dover Avenue
- Village Avenue
- Falls Court
- Namaqua Road
- Kennedy Avenue
- Eckley Court
- Cherry Avenue
- Elm Avenue
- Pine Street
- Walnut Avenue
- Fremont Court
- Milner Avenue
- Estrella Avenue
- Broadmoor Drive
- Prospect Road
- Harlow Lane
- Westshore Drive
- Loch Mount Drive
- West 13th Street
- Lake Drive
- Washington Avenue
- Gorom Avenue
- Cheyenne Avenue
- 6 Public ROW/Alley

Private Road Unsignalized (PVRU) – Full movement, stop-controlled intersection providing direct access to a private property. These roadways are maintained privately. There are 4 PVRU access points on US 34.

Business Access (BA) – Full or partial movement highway access points serving businesses within the study area. These types of access points are typically used multiple times daily by a variety of traffic types. There are a total of 183 BA access points on US 34. A large majority of these access points are within City limits.

Residential Access (R) – Full or partial movement private highway access points used on a regular basis by limited traffic. These types of access points include single-family private driveways. There are 96 R points on US 34.

Field Access (FA) – Full or partial movement access points that provide direct access from the highway to agricultural land. These types of access points are typically not well-defined and are used infrequently. There are 43 FA points on US 34.

According to these classifications, the access points are distributed as follows:

- 16 signalized public road intersections (30 access points)
- 38 unsignalized public road intersections (66 access points)
- 5 unsignalized private road intersection (5 access points)
- 191 business access points
- 94 residential access points
- 42 field access points

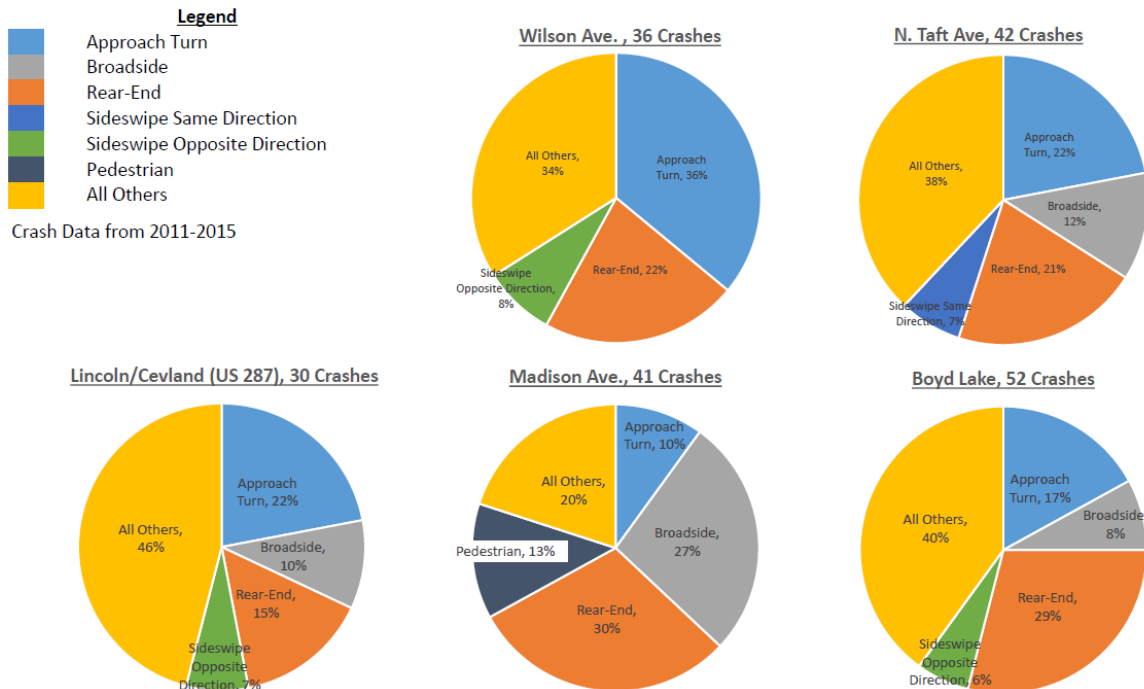
3.6 Crash History

Crash data for a five-year period of from 2011-2015 was reviewed for this report. Within the study area, there were 811 crashes within this period; 69 crashes (8.5%) were access-related.

Of the reported crashes, 433 had at least one injury and two resulted in a fatality. Crashes were reviewed at the following intersections with US 34:

- Butte Road
- Morning Drive
- Cascade Avenue
- Wilson Avenue
- Van Buren Avenue
- Taft Avenue
- Garfield Avenue
- Cleveland Avenue
- Lincoln Avenue
- Washington Avenue
- Monroe Avenue
- Redwood Drive
- Madison Avenue
- Boise Avenue
- Denver Avenue
- Sculptor Drive
- Boyd Lake Avenue
- McWhinney Boulevard
- Hahns Peak Drive
- Fall River Drive
- Rocky Mountain Avenue

The evaluated crash data provided some observations about the crash patterns. The majority of crashes occurred during daylight hours (73%). Approximately 11% of crashes occurred during inclement weather. Over 7% or 61 crashes had a driver with some level of impairment of drugs or alcohol. Five of the major intersections along the corridor were evaluated further by crash type. The high percentage of rear-end crashes is evident from the graphics shown on the next page. It is also notable that there is a higher share of approach-turn crashes at intersections where protected/permitted left turn phasing is allowed at signalized intersections.



Overall, implementing access management techniques will reduce the number of conflict points in the study area. According to the Highway Safety Manual, the reduction of access points along a roadway segment is expected to result in a reduction of crashes. A summary of the crash history is included in Appendix D.

4.0 EXISTING TRAFFIC CONDITIONS

4.1 Existing Traffic Volumes

Existing traffic volumes were collected throughout the study area. Traffic data collection priorities were established based upon roadway functional classification, anticipated level of traffic volume, North Front Range Metropolitan Planning Organization model definition, and potential for access management or alternative analysis being required. The following traffic count data will be collected for the Study:

Weekday AM/PM peak period turning movement counts were taken at the following locations:

- Glade Road
- **Rossum Drive****
- Morning Drive
- Cascade Avenue
- Namaqua Avenue
- Wilson Avenue
- Estrella Avenue
- Van Buren Avenue
- **Taft Avenue****
- **Colorado Avenue****
- Grant Avenue
- Garfield Avenue
- Redwood Drive
- Madison Avenue
- **Boise Avenue****
- Cheyenne Avenue
- Denver avenue
- Sculptor Drive
- **Boyd Lake Avenue****
- Hahns Peak Drive

Forty-eight hour(48-hr) vehicle classifications were taken at the following locations:

- East of Glade Road
- East of Wilson Avenue
- West of Madison Avenue
- West of Larimer/Weld County Line

The above locations marked in bold with a double asterisk (“**”) were also counted on a summer Saturday between the hours of 11:00 a.m. and 1:00 p.m. in order to capture weekend traffic conditions. Other transportation related data collected includes traffic control devices, intersection geometry, speed limits, access locations, and level of access (e.g., full-movement, right-in, right-out only).

4.2 Existing Traffic Operations

The Urban Streets module of Highway Capacity Software (HCS7) was used to identify a number of traffic measures of effectiveness including intersection Level of Service (LOS) and segment LOS. The segment of US-34 was modeled in HCS using the existing geometry and traffic counts. Consistent with HCS methods, signalized locations were modeled as intersections in the HCS models, while the unsignalized intersections with counts were modeled as access points with volumes. Access points that did not have counts taken at them, such as parking lots and driveways, contribute to the “access point density” in the HCS models. The peak hours analyzed were from 7:15-8:15 AM and 4:30-5:30 PM on weekdays. As previously mentioned, peak hour weekend traffic data was also collected. In the majority of cases, however, weekday peak hour traffic volumes were greater than those on the weekend.

Level of Service (LOS) is a measure of the quality of traffic flow and is defined by a letter grade ranging from A (uninterrupted flow) to F (heavily congested conditions). For signalized intersections, LOS is reported for the intersection as a whole. At unsignalized intersections, the

LOS for the worst performing movement is reported. In either of these cases, the LOS is primarily based on seconds of delay experienced per vehicle. Highway segments which span between two signalized intersections are also graded on a similar LOS scale. Segment LOS, however, is based on Percent Free Flow Speed (PFFS) where free flow speed represents the speed at which vehicles could travel between signalized intersections in uninterrupted conditions. Table 1 shows the LOS thresholds for signalized intersections, stop-controlled intersections, and highway segments. In general, LOS D or better is considered an acceptable condition by most communities.

Table 1- 2010 Highway Capacity Manual (HCM) LOS Thresholds

LOS	Signalized Intersections: Control Delay (sec/veh)	Stop-Controlled Intersections: Control Delay (sec/veh)	Highway Segments: Percent Free Flow Speed
A	≤10	≤10	> 80
B	>10 ≤ 20	>10 ≤ 15	> 67 ≤ 80
C	>20 ≤ 35	>15 ≤ 25	> 50 ≤ 67
D	>35 ≤ 55	>25 ≤ 35	> 40 ≤ 50
E	>55 ≤ 80	>35 ≤ 50	> 30 ≤ 40
F	> 80 or v/c > 1.0	> 50 or v/c > 1.0	≤ 30 or v/c > 1.0

Table 2 shows the intersection delay and LOS for the existing conditions. All of the intersections are operating at an acceptable LOS during the AM. In the PM, five of the intersections are operating at LOS E or F, which is considered unacceptable. The intersection of US-34 & Denver Ave is the worst intersection, operating at a LOS F.

Table 2- Existing Intersection Delay and LOS

Intersection	AM		PM	
	Intersection Delay	Intersection LOS	Intersection Delay	Intersection LOS
Cascade Ave	3.6	A	5.6	A
Wilson Ave	35.5	D	37.6	D
Van Buren Ave	14.9	B	18.3	B
Taft Ave	38.1	D	42.5	D
Colorado Ave	12	B	9.1	A
Garfield Ave	21.4	C	32.1	C
Cleveland Ave	32.7	C	35	C
Lincoln Ave	28.7	C	37	D
Monroe Ave	11.3	B	13.6	B
Redwood Dr	11.2	B	18.9	B
Madison Ave	27.2	C	40.7	D
Boise Ave	26.6	C	32.6	C
Denver Ave	23	C	97.2	F
Sculptor Dr	8.6	A	10.4	B
Boyd Lake Ave	38.6	D	71.2	E
Hahns Peak Dr	4.9	A	14.9	B

The travel conditions through the segments of US-34 were also analyzed in the HCS existing conditions models, and were reported as travel speed, percent free flow speed (PFFS), and LOS. The results are shown in Table 3.

Table 3- Existing Segment Performance

Segment	AM						PM					
	Eastbound			Westbound			Eastbound			Westbound		
	Travel Speed MPH	PFFS	LOS	Travel Speed MPH	PFFS	LOS	Travel Speed MPH	PFFS	LOS	Travel Speed MPH	PFFS	LOS
End to Cascade	44.4	98.2	A	48.6	105.6	A	44.0	97.2	A	47.9	104.2	A
Cascade to Wilson	36.3	82.1	A	43.8	99.2	A	34.5	78.1	B	42.2	95.5	A
Wilson to Van Buren	29.2	74.7	B	20.8	47.6	D	27.0	69.1	B	19.7	45.0	D
Van Buren to Taft	19.7	51.3	C	26.8	69.7	B	17.6	45.9	D	25.8	67.1	B
Taft to Colorado	31.3	82.3	A	24.7	65.1	C	34.6	91.1	A	20.9	54.9	C
Colorado to Garfield	28.4	74.8	B	32.1	84.6	A	26.8	70.5	B	31.0	81.7	A
Garfield to Cleveland	13.4	34.8	E	20.0	52.3	C	11.7	30.6	E	12.8	33.4	E
Cleveland to Lincoln	7.5	20.0	F	12.0	31.7	E	6.8	18.0	F	8.2	21.7	F
Lincoln to Monroe	25.0	71.1	B	17.2	48.8	D	23.4	66.6	C	13.7	39.1	E
Monroe to Redwood	30.0	77.9	B	24.9	65.3	C	23.4	60.7	C	22.6	59.2	C
Redwood to Madison	22.2	55.2	C	21.3	56.2	C	15.0	37.4	E	20.2	53.3	C
Madison to Boise	16.3	40.8	D	20.8	52.2	C	14.9	37.4	E	15.8	39.5	E
Boise to Denver	30.7	64.1	C	29.6	68.0	B	8.3	17.4	F	25.3	58.0	C
Denver to Sculptor	37.1	70.2	B	33.9	70.2	B	39.7	75.2	B	26.2	54.3	C
Sculptor to Boyd Lake	31.6	60.3	C	51.5	103.3	A	17.8	33.9	F	45.2	90.7	A
Boyd Lake to Rocky Mountain	49.6	97.1	A	28.2	53.6	C	37.4	71.0	B	24.5	46.4	D

As can be seen in Table 3, most of the segments operate well in the AM. The segments from Garfield to Cleveland and from Cleveland to Lincoln are the exceptions. In the PM, some of the segments on the eastern side of Loveland operate at LOS E and F as a result.

5.0 FUTURE TRAFFIC CONDITIONS

5.1 Background Traffic Growth

The year 2040 background thru traffic volumes on US 34 were forecasted using the existing geometry with projected 2040 traffic volumes attained from travel demand model forecasting. Projects identified in the North Front Range Metropolitan Planning Organization Regional Transportation Plan (2040) were assumed to be completed and model geometry was updated accordingly. The rest of the geometry, however, is the same as in the 2017 models.

Turning movement counts for the signalized intersections were provided based on the expected growth in the area. These projections were directly entered into the HCS models. The volumes for the unsignalized intersections along US-34 had to be estimated. The through movements along US-34 were balanced with the signalized intersections on either side. The side street volumes and the movements turning from US- 34 onto the side streets were increased in accordance with how much the surrounding volumes were projected to increase.

Table 4 shows the delay and LOS for the signalized intersections in the 2040 No Build Scenario. The 2040 No Build Scenario also does not include any improvements to access based upon the Access Control Plan.

Table 4- 2040 No Build (No ACP) Intersection Delay and LOS

Intersection	AM		PM	
	Intersection Delay	Intersection LOS	Intersection Delay	Intersection LOS
Cascade Ave	22.4	C	22.7	C
Wilson Ave	40.8	D	49.2	D
Van Buren Ave	22.0	C	36.0	D
Taft Ave	43.7	D	89.2	F
Colorado Ave	13.5	B	10.9	B
Garfield Ave	29.0	C	47.4	D
Cleveland Ave	33.1	C	193.8	F
Lincoln Ave	33.9	C	90.5	F
Monroe Ave	30.0	C	8.8	A
Redwood Dr	21.8	C	22.7	C
Madison Ave	49.3	D	57.8	E
Boise Ave	142.7	F	120.1	F
Denver Ave	320.0	F	402.9	F
Sculptor Dr	36.1	D	314.3	F
Boyd Lake Ave	311.4	F	404.8	F
Hahns Peak Dr	46.0	D	365.3	F

As can be seen in the table, the delays at most intersections are worse than in the existing conditions scenario. Especially in the PM, many of the intersections are expected to operate at LOS F. The segment from the eastern side of Loveland is the most problematic in terms of

intersection delay. Aside from Taft Ave, the intersections on the western side of Loveland operate acceptably.

The travel conditions through the segments of US-34 were also analyzed in the HCS existing conditions models, and were reported as travel speed, percent free flow speed (PFFS), and LOS. The results are shown in Table 5. Similar to the intersection LOS, many of the segments from the eastern side of Loveland are expected to have very low travel speeds and a LOS of E or F. The segments on the western side of Loveland operate better, however, there are still a couple areas that are LOS E or F.

Table 5- 2040 No Build (No ACP) Segment Performance

Segment	AM						PM					
	Eastbound			Westbound			Eastbound			Westbound		
	Travel Speed MPH	PFFS	LOS	Travel Speed MPH	PFFS	LOS	Travel Speed MPH	PFFS	LOS	Travel Speed MPH	PFFS	LOS
End to Cascade	42.3	93.5	A	47.8	103.9	A	41.0	90.6	A	46.6	101.3	A
Cascade to Wilson	31.9	72.2	B	38.7	87.7	A	28.3	64.0	C	38.2	86.4	A
Wilson to Van Buren	24.9	63.8	C	17.0	38.9	E	21.4	54.8	C	14.3	32.8	E
Van Buren to Taft	15.3	39.9	E	25.2	65.6	C	6.6	17.1	F	20.2	52.5	C
Taft to Colorado	23.8	86.3	A	20.9	55.1	C	30.8	81.1	A	19.8	52.1	C
Colorado to Garfield	24.9	65.7	C	29.3	77.2	B	20.4	53.7	C	31.5	83.0	A
Garfield to Cleveland	12.3	32.1	F	16.3	42.5	F	1.5	3.8	F	9.8	25.6	F
Cleveland to Lincoln	8.9	23.6	F	15.4	40.9	F	4.5	11.9	F	8.1	21.5	F
Lincoln to Monroe	17.1	48.5	F	13.5	38.5	F	28.6	81.3	A	4.0	11.3	F
Monroe to Redwood	21.5	56.0	A	18.0	47.1	F	22.0	57.1	C	26.9	70.7	B
Redwood to Madison	12.3	30.5	C	17.6	46.7	B	9.6	24.0	F	17.7	47.0	D
Madison to Boise	4.5	11.2	F	14.4	36.3	E	2.5	6.3	F	12.0	30.1	E
Boise to Denver	2.8	5.8	F	19.6	45.0	D	2.5	5.2	F	18.9	43.3	F
Denver to Sculptor	44.8	84.6	A	15.6	32.3	E	4.1	7.8	F	8.5	17.6	F
Sculptor to Boyd Lake	4.4	8.3	F	25.4	50.9	C	4.6	8.8	F	7.0	14.0	F
Boyd Lake to Rocky Mountain	33.2	62.9	C	17.2	32.5	F	31.5	59.7	C	3.9	7.5	B

5.2 Future Traffic Operations

The projected volumes for the 2040 Build scenario were generally higher than in the existing volumes. This is because the improvements to US-34 will increase overall capacity, allowing more drivers to use the highway. Several of the intersections between Loveland and I-25 are proposed to be 3/4 movements. The displaced left turn volumes were rerouted to the nearest full movement intersection in the HCS models.

Table 6 shows the predicted delay and LOS for the signalized intersections, there are still several intersections that may operate at LOS E or F. As can be seen in the table, the delays at most intersections are worse than in the existing conditions scenario. Especially in the PM, many of the intersections are expected to operate at LOS F. The segment from the eastern side of Loveland through I-25 has the most intersection delay. Aside from Taft Ave, the intersections on the western side of Loveland and into the foothills operate acceptably.

Table 6- 2040 Intersection Delay with ACP

Intersection	AM		PM	
	Intersection Delay	Intersection LOS	Intersection Delay	Intersection LOS
Cascade Ave	21.2	C	22.7	C
Wilson Ave	42.0	D	49.5	D
Van Buren Ave	23.2	C	36.4	D
Taft Ave	44.0	D	88.8	F
Colorado Ave	13.8	B	10.8	B
Garfield Ave	27.5	C	49.2	D
Cleveland Ave	33.4	C	164.1	F
Lincoln Ave	33.7	C	90.6	F
Monroe Ave	30.0	C	13.0	B
Redwood Dr	21.7	C	25.6	C
Madison Ave	49.0	D	61.8	E
Boise Ave	112.8	F	313.3	F
Denver Ave	328.3	F	419.8	F
Sculptor Dr	30.8	C	281.0	F
Boyd Lake Ave	316.4	F	376.8	F
Hahns Peak Dr	31.6	C	369.3	F

The segments of US-34 are also expected to experience significantly higher delays in 2040 if the existing geometry remains in place. This information can be seen in Table 8. The segments on the western side of Loveland into the foothills operate better, however, there are still a couple areas that are LOS E or F.

Table 7- 2040 Segment LOS with ACP

Segment	AM						PM					
	Eastbound			Westbound			Eastbound			Westbound		
	Travel Speed (mph)	PFFS	LOS	Travel Speed (mph)	PFFS	LOS	Travel Speed (mph)	PFFS	LOS	Travel Speed (mph)	PFFS	LOS
Glade to Cascade	43.0	93.4	A	47.8	100.0	A	41.7	90.5	A	46.6	97.7	A
Cascade to Wilson	31.4	69.7	B	39.9	88.7	A	28.1	62.5	C	38.2	84.8	A
Wilson to Van Buren	24.8	62.3	C	16.8	37.4	E	21.6	54.3	C	14.3	32.1	E
Van Buren to Taft	15.4	38.7	E	24.9	62.5	C	6.7	16.7	F	20.3	50.9	C
Taft to Colorado	33.0	85.5	A	21.0	54.4	C	31.3	81.2	A	20.0	51.8	C
Colorado to Garfield	25.2	65.4	C	29.7	76.9	B	20.6	53.3	C	32.0	82.9	A
Garfield to Cleveland	12.2	31.4	E	16.4	42.2	D	7.6	19.6	F	10.6	27.4	F
Cleveland to Lincoln	9.0	23.3	F	15.5	40.2	D	6.5	16.8	F	7.1	18.5	F
Lincoln to Monroe	17.2	46.3	D	13.7	36.8	E	28.0	75.1	B	3.7	9.9	F
Monroe to Redwood	21.6	55.7	C	18.1	46.9	D	20.5	52.8	C	23.3	60.4	C
Redwood to Madison	12.2	29.9	F	17.9	46.4	D	9.5	23.3	F	16.6	43.1	D
Madison to Boise	4.4	10.8	F	14.7	35.9	E	2.1	5.1	F	11.7	28.7	F
Boise to Denver	2.8	5.7	F	19.2	44.1	D	2.4	4.9	F	17.6	40.3	D
Denver to Sculptor	44.0	83.2	A	16.0	33.2	E	5.3	9.9	F	7.0	14.6	F
Sculptor to Boyd Lake	4.2	7.9	F	29.0	57.6	C	4.5	8.5	F	7.6	15.1	F
Boyd Lake to Rocky Mountain	27.9	52.7	C	15.3	29.0	F	23.3	44.1	D	5.2	9.9	F

Although, the traffic operations are not improved drastically due to the exclusive employment of the ACP. Many of the movements from unsignalized side streets will be restricted, leading to less delay and reduced opportunity for aggressive driving behaviors that lead to increased crash rates. Implementing the Access Control Plans typically result in less delay and improved travel speeds along the highway in the long-term. Traffic operations will be improved with the implementation of the ACP combined with improvements identified in the US 34 PEL alternatives.

6.0 ACCESS CONTROL PLAN DEVELOPMENT AND EVALUATION

Using the traffic volume forecasts, input from the City, County, and CDOT, input from the public outreach program, and guidance from the State Highway Access Code, an Access Control Plan (ACP) was developed for the project. This Plan considers access points in logical groupings, as well as circulation opportunities via the existing and potential future local street system.

6.1 Process

The ACP was developed using a 4-step process:

6.1.1 Step One – Methodology & Compatibility Index

A traffic methodology and ACP methodology were established at the beginning of the project to define the purpose, approach, and assumptions used to develop the Plan. In addition, a compatibility index was developed to provide a logical means for determining whether the ACP meets the established project goals. The index identified a set of evaluation criteria that correspond with each project objective, as listed in Section 1.1. A simple rating system that identifies the plan as favorable, neutral or unfavorable with respect to each criterion was defined. Each of the three ratings under each criterion was then defined to assist in the evaluation. The traffic methodology memo can be found in Technical Appendix E and the ACP methodology memo and compatibility index can be found in Technical Appendix C and Technical Appendix B respectively.

6.1.2 Step Two – Development of the Access Control Plan

The existing inventory of access points was reviewed with existing parcel and ownership information. This review determined which parcels adjacent to US 34 lacked access to the highway, which parcels had multiple accesses to consider for consolidation, and which parcels had access or potential access to an existing or proposed local road. Access solutions were developed by applying access management principles and techniques discussed in Section 2. Major full movement intersections were located based on traffic projections, City and County planning documents, and anticipated growth patterns. Access for each parcel in between major intersections was either limited (right-in/right-out or $\frac{3}{4}$ movement) or provided via a local road. In cases where multiple access points served a single ownership, access was reduced to one per ownership. Shared access between parcels was developed, wherever feasible.

6.1.3 Step Three – Refine the Access Control Plan

A draft ACP was presented to an internal review team consisting of City, County, and CDOT representatives. Based on comments received from the team, the draft plan was refined and presented at the Public Open Houses. Public comment was reviewed, and the Plan was modified at several points throughout the project, as appropriate. Improvements considered cost prohibitive, with unmanageable physical constraints, with significant traffic operational deficiencies, inconsistent with overall community expectations, or not appearing to provide a reasonable level of access, were revised. In some cases, access conditions were defined to allow phased implementation of long-term solutions.

6.1.4 Step Four – Evaluation

Following the public outreach process, the refined ACP was evaluated using the compatibility index described in Step One to determine whether project objectives were met.

6.2 Evaluation Results

The results of the evaluation by objective are listed in Table 9. Overall, the ACP rates favorably and is compatible with project needs. Plan adoption by the three entities is recommended. Details of the Plan evaluation can be found in Technical Appendix B. A graphical representation of the ACP is located in Section 7.

Table 8-Compatibility Evaluation Summary

Project Needs	Evaluation Criteria	Rating
Increase Safety	Intersection Crash Risk	Favorable
	Functional Intersection Area	Favorable
	Conformance with State Highway Access Code Auxiliary Lane Requirements	Favorable
	Number of Access Points	Favorable
Accommodate increased travel and tourism demands to maintain the economic vitality of the region	Intersection Level of Service (LOS)	Neutral
	Corridor Travel Time	Neutral
	Business Market Area	Favorable
	Phasing Opportunities	Favorable
Increase reliability of east-west regional travel, while balancing local access, mobility, and freight needs	Out of Direction Travel Distance	Unfavorable
	Serviceability of Local Routes to Developments and Properties within the Study Area	Favorable
	Multi-modal Access	Favorable

7.0 PLAN RECOMMENDATIONS

This section presents details of the recommended Access Control Plan (ACP) for US 34. The Plan has been developed with considerable participation from the City of Loveland, Larimer County, CDOT, and the public. After evaluating both existing and future conditions, the Plan defines how each access will function in the future. In general, the ACP limits full movement access to major intersections. Functional intersection area was considered in evaluating the spacing between major intersections. While it is ideal to provide the full functional intersection area between full movement intersections, other site-specific considerations were considered in determining intersection spacing. At a minimum, the physical length needed to accommodate storage length, deceleration and taper length is provided between intersections unless otherwise noted.

In addition, highway access is reduced to one location per ownership and where feasible, shared between adjacent properties. Where reasonable access can be provided to an alternate cross street, access points are relocated to the local street system. On US 34 east of Cascade Avenue access for parcels between major intersections is limited. To maximize local circulation options, minor public road intersections are identified long-term as $\frac{3}{4}$ movement where providing the left-turn movement improves operations and/or circulation and where there is adequate space to develop left turn auxiliary lanes. On US 34 between Glade Road and Morning Drive, limited access points were not considered due to the highway characteristics. This segment was examined as part of the US 34 PEL and it was determined that a two-lane undivided section should remain and that there are no plans to expand the section within the study's planning period. Access points between major intersections are identified as conditional full movement intersections that will remain unsignalized. If signals are warranted at these access points or if safety or operational issues develop in the future, limiting access may need to be reconsidered.

For the majority of the study limits, out of direction travel was generally limited to a maximum distance of one mile ($\frac{1}{2}$ mile each way). For the westernmost segment of US 34 categorized as a Regional Highway (R-A), out of direction travel was generally limited to a maximum distance of two miles (1 mile each way). Out-of-direction travel was limited by providing full movement intersections at necessary intervals. Accommodation for U-turns at major intersections is recommended to provide alternatives for restricted left-turn movements. In addition, the City of Loveland's 2035 Transportation Plan, in conjunction with proposed alternate routes from this study, will provide key alternatives for restricted left-turn movements.

Traffic control measures that may be used to achieve proposed conditions include raised or depressed medians, driveway channelizing islands at limited access points, directional median openings at $\frac{3}{4}$ movement access points, and signage and striping. To avoid turn movement violations and potential enforcement issues, eventual installation of a raised or depressed median or other positive traffic control measure is recommended. Based on the existing cross-section with a two-way-left turn lane on US 34, installation of a raised median can likely be achieved with minor widening.

The narratives in this section are intended to serve as a summary of the key features of the ACP. The figures are intended to provide a graphical representation of the ACP. A detailed explanation of each access in the study area, by reference point, is presented in the Draft ACP Table, Exhibit A of the Draft Intergovernmental Agreement (IGA). Reference these exhibits for specific access configurations and conditions.

Recognizing that this plan is a long-term planning document and not a detailed engineering design, reference point designations are intended to be approximate. As more detailed information is available, these designations may be modified (generally within 0.05 miles of the specified reference point designation). The Draft IGA and Draft ACP Table is located in Technical Appendix F.

7.1 Access Control Plan

Key features of the ACP are summarized by major intersection on the following pages and illustrated in Figures 2A-2R. The ACP will reduce the number of access points from 428 to 230. This reduction in access includes the following:

- 5 public road realignments
- 26 field access closures
- 85 consolidated access points
- 74 access relocated to a side street
- 59 shared access points

In addition, there are also 112 right-in/right-out access points and ten $\frac{3}{4}$ movements that will result in a reduction in conflict points through the corridor. Full movement intersections with potential for future signalization or other traffic control have been identified as part of the ACP; however, the type of traffic control is not specified. Auxiliary lanes shall be provided at access points as prescribed by the State Highway Access Code. Traffic control will be evaluated on a case-by-case basis as future conditions warrant. Potential traffic control may include stop signs, traffic signals, roundabouts, interchanges, or other traffic control recognized by the MUTCD. Traffic signals may be implemented at intersections if and when warranted per current MUTCD standards and when funding is available.

CR 27 to Glade Road (Figure 2A, 2B, & 2C)

This section contains four intersections that will remain full movement with potential for signalization, if warranted:

- CR 27
- Goodwine Drive
- CR 23H
- Glade Road

CR 27 will remain a 3-legged intersection due to the proximity and challenges of crossing the Big Thompson River. The other three intersections have the opportunity to develop a 4th leg if development warrants. In addition, the location of the major intersection identified at Goodwine Drive (Access 376.5 and 376) has flexibility to shift east along US 34 based on future growth and development. The major intersection may be located anywhere between Access 376.5 and Access 384. The location is limited to 376.5 on the west due to sight distance concerns at the curve. The location is limited to 384 on the west due to the proximity of the Big Thompson River and the desire to serve both sides of US 34.

Current plans for this section allow for unsignalized full movement access points between major intersections. These accesses shall be reduced to one location per ownership and shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. In addition, access points shall be relocated to align with access points across the highway in several locations to

reduce the potential conflict points on the highway. Access 371.5 is a conditional unsignalized full movement access to realign the existing access 372 (to be closed) with access 371. Access points identified as ditch access points are conditional upon ditch maintenance needs. These access points will remain until alternate ditch access is available or until the ditch is no longer in use or no longer requires maintenance at this location.

Glade Road to Rossum Drive (Figure 2C, 2D & 2E)

This section contains three intersections that will remain full movement with potential for signalization, if warranted:

- Glade Road
- Hidden Valley Drive
- Rossum Drive

Hidden Valley Drive will remain a three-legged intersection due to the topography on the south side of US 34. A fourth leg may be provided at Glade Road and Rossum Drive if development warrants.

Current plans for this section allow for unsignalized full movement access points between major intersections. These accesses shall be reduced to one location per ownership and shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. In addition, access points shall be relocated to align with access points across the highway in several locations to reduce the potential conflict points on the highway. There are numerous properties that have dual frontage along both Wild Lane and US 34. Those access points will be closed and relocated to Wild Lane as redevelopment occurs. Access points for Plaster Mill Road and Langston Lane shall be relocated to improve the intersection skew with the highway.



Legend

Access Point Info	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Close Existing Access Point	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Signalized Full-Movement (Existing)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Proposed)		Parcel Lines	"M" Major Intersection
Unsignalized Full-Movement (Maintain Existing)	Left-in/Right-out (Convert Existing)		Future Potential Roadway	
Unsignalized Full-Movement (Proposed)				

Figure 2A
1 of 18



Legend

Close Existing Access Point	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	Signalized Full-Movement (Existing)	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"C" Conditional Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Proposed)	Future Potential Roadway	Parcel Lines	"D" Ditch Access
Unsignalized Full-Movement (Maintain Existing)	Left-in/Right-out (Convert Existing)			Unsignalized Full-Movement (Proposed)				"E" Emergency Access
								"M" Major Intersection

Figure 2B
2 of 18



Legend

AccessPointInfo	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Close Existing Access Point	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Signalized Full-Movement (Existing)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Proposed)		Parcel Lines	"M" Major Intersection
Unsignalized Full-Movement (Maintain Existing)	Left-in/Right-out (Convert Existing)		Future Potential Roadway	
Unsignalized Full-Movement (Proposed)				

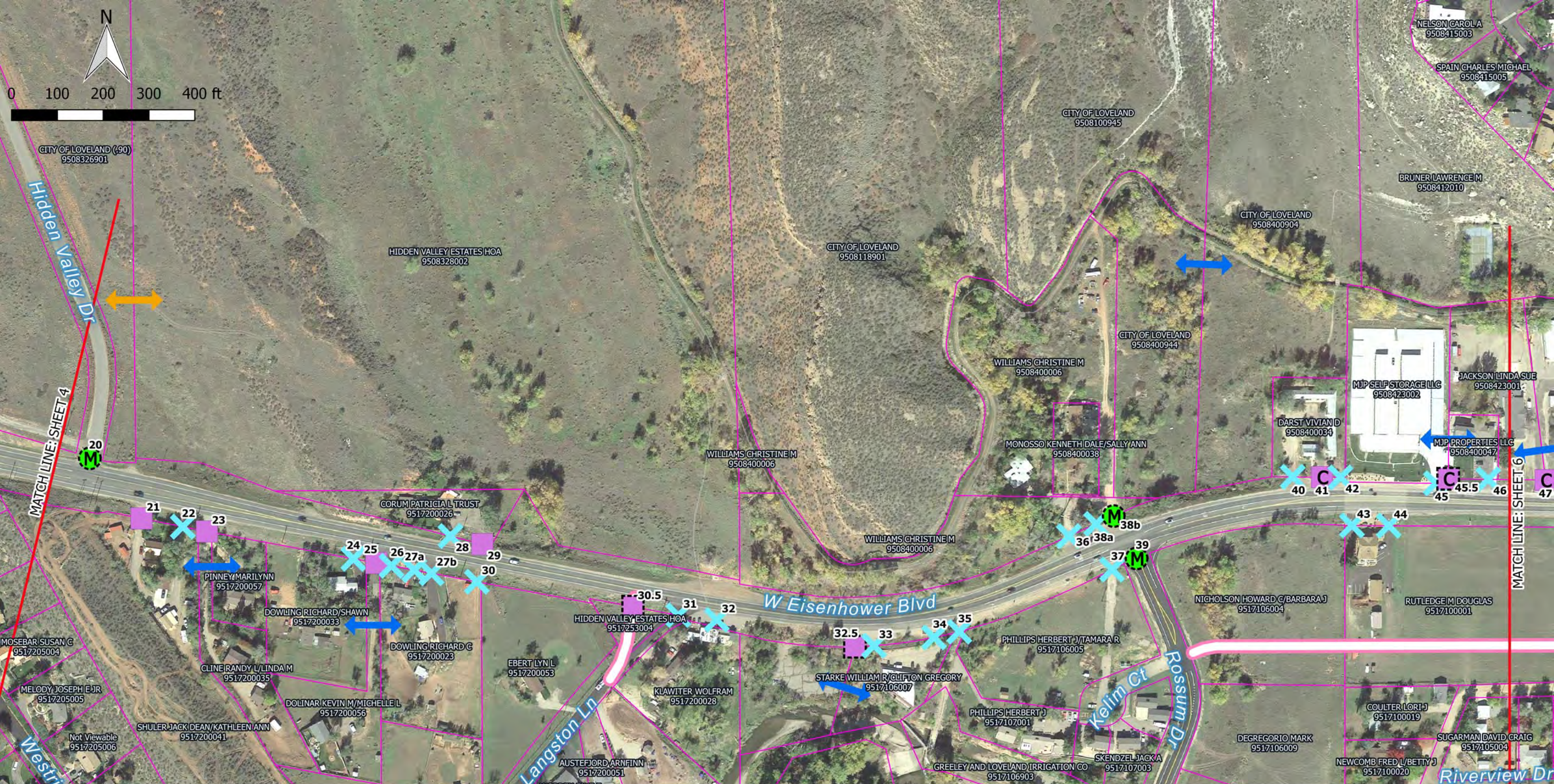
Figure 2C
3 of 18



Legend

AccessPointInfo	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Close Existing Access Point	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Signalized Full-Movement (Existing)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Proposed)		Parcel Lines	"M" Major Intersection
Unsignalized Full-Movement (Maintain Existing)	Left-in/Right-out (Convert Existing)		Future Potential Roadway	
Unsignalized Full-Movement (Proposed)				

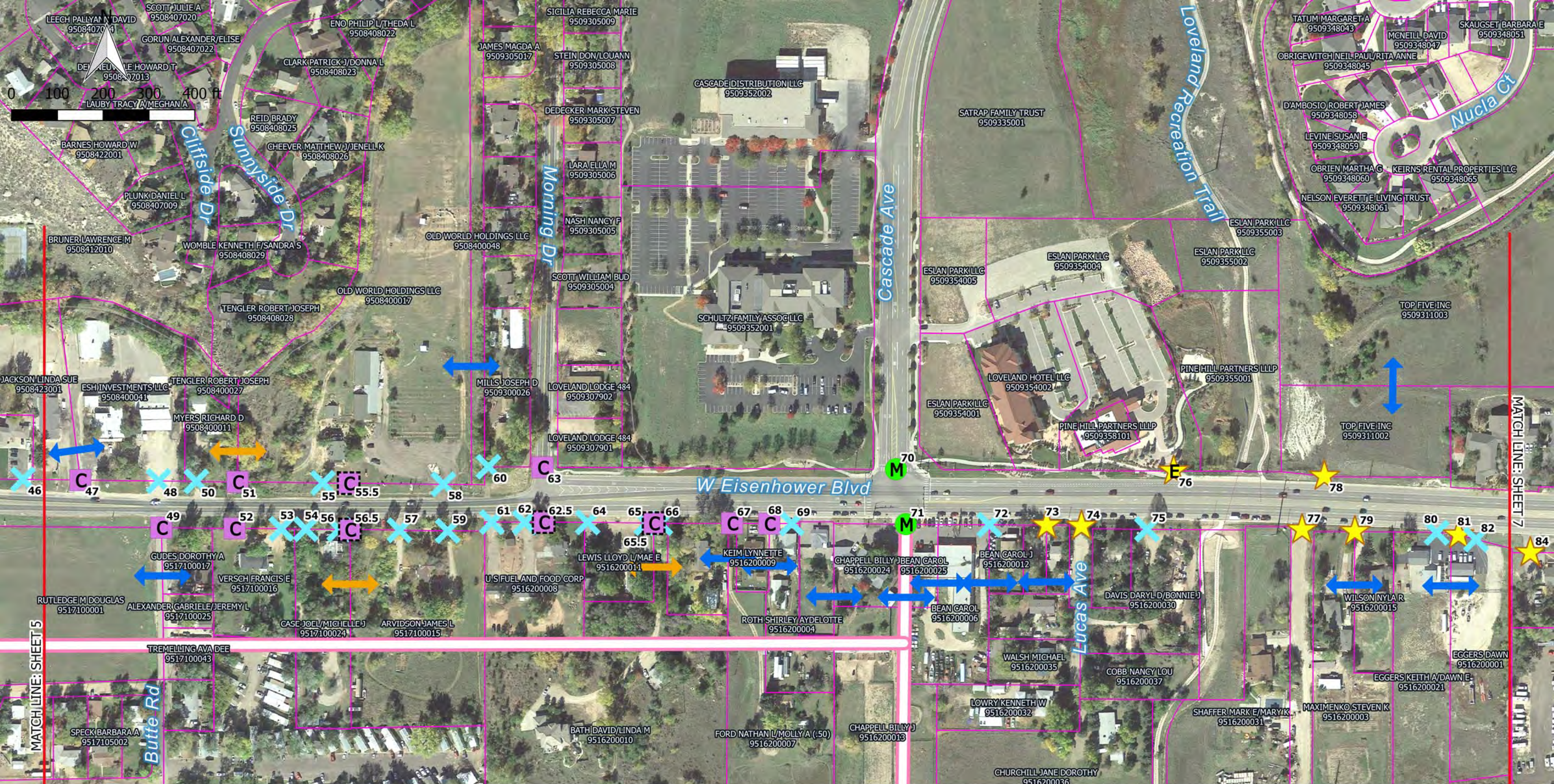
Figure 2D
4 of 18



Legend

	Close Existing Access Point		3/4 Movement (Convert/Maintain Existing)		Right-in only (Convert/Maintain Existing)	Cross Access		"C"	Conditional Access
	Signalized Full-Movement (Existing)		3/4 Movement (Proposed)		Right-in only (Proposed)			"D"	Ditch Access
	Full-Movement with Potential for Signalization (When Warranted)		Right-in/Right-out (Convert/Maintain Existing)		Right-out only (Convert Existing)			"E"	Emergency Access
	Unsignalized Full-Movement (Maintain Existing)		Right-in/Right-out (Proposed)					"M"	Major Intersection
	Unsignalized Full-Movement (Proposed)		Left-in/Right-out (Convert Existing)						Parcel Lines
									Future Potential Roadway

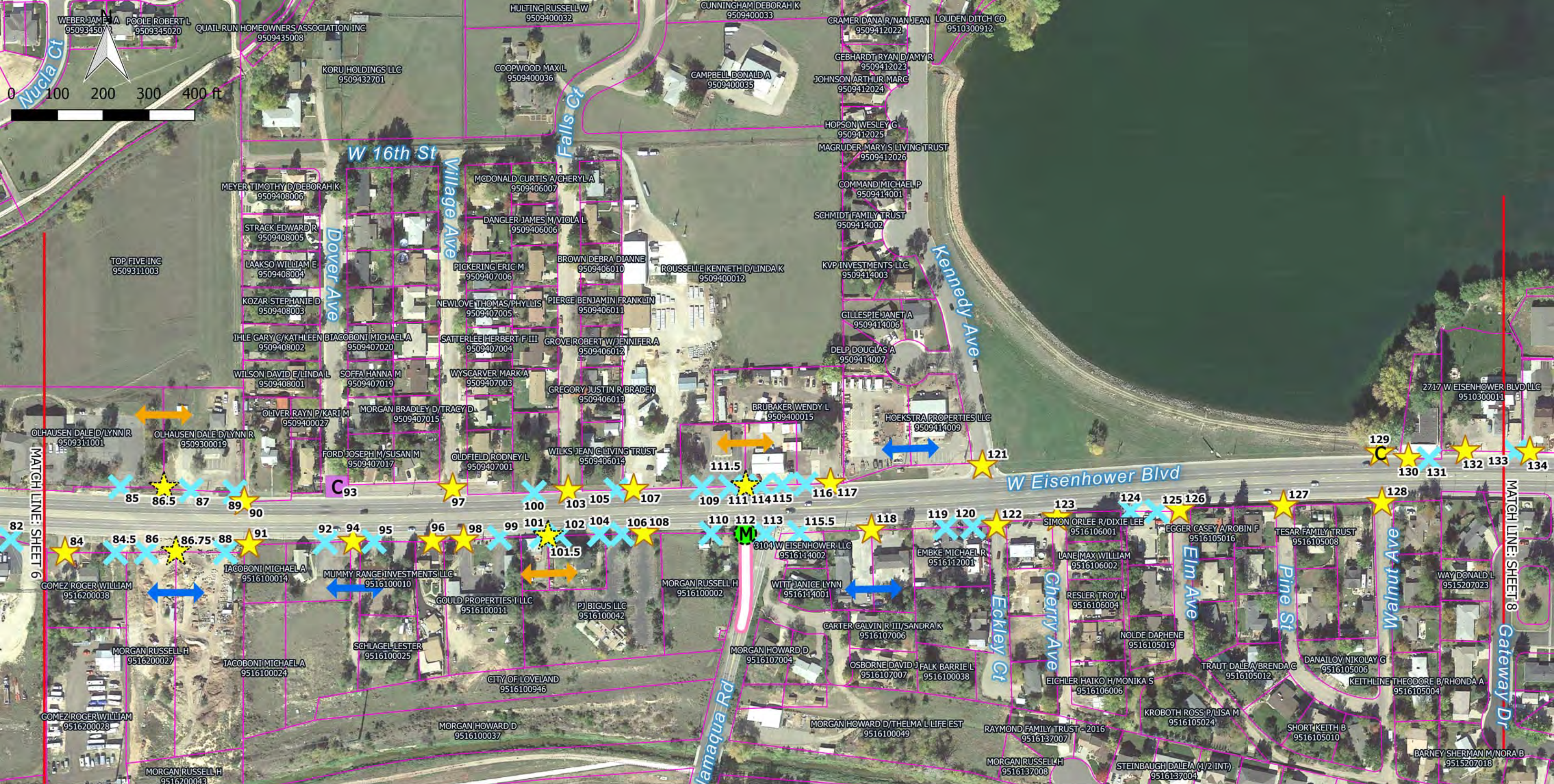
Figure 2E
5 of 18



Legend

	Close Existing Access Point		3/4 Movement (Convert/Maintain Existing)		Right-in only (Convert/Maintain Existing)	Cross Access		Existing Cross Access	"C"	Conditional Access
	Signalized Full-Movement (Existing)		3/4 Movement (Proposed)		Right-in only (Proposed)			Proposed Cross Access	"D"	Ditch Access
	Full-Movement with Potential for Signalization (When Warranted)		Right-in/Right-out (Convert/Maintain Existing)		Right-out only (Convert Existing)			Existing Cross Access	"E"	Emergency Access
	Unsignalized Full-Movement (Maintain Existing)		Right-in/Right-out (Proposed)		Left-in/Right-out (Convert Existing)			Future Potential Roadway	"M"	Major Intersection
	Unsignalized Full-Movement (Proposed)									

Figure 2F
6 of 18



Legend

Close Existing Access Point	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Signalized Full-Movement (Existing)	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Unsignalized Full-Movement (Maintain Existing)	Right-in/Right-out (Proposed)		Future Potential Roadway	"M" Major Intersection
Unsignalized Full-Movement (Proposed)	Left-in/Right-out (Convert Existing)			

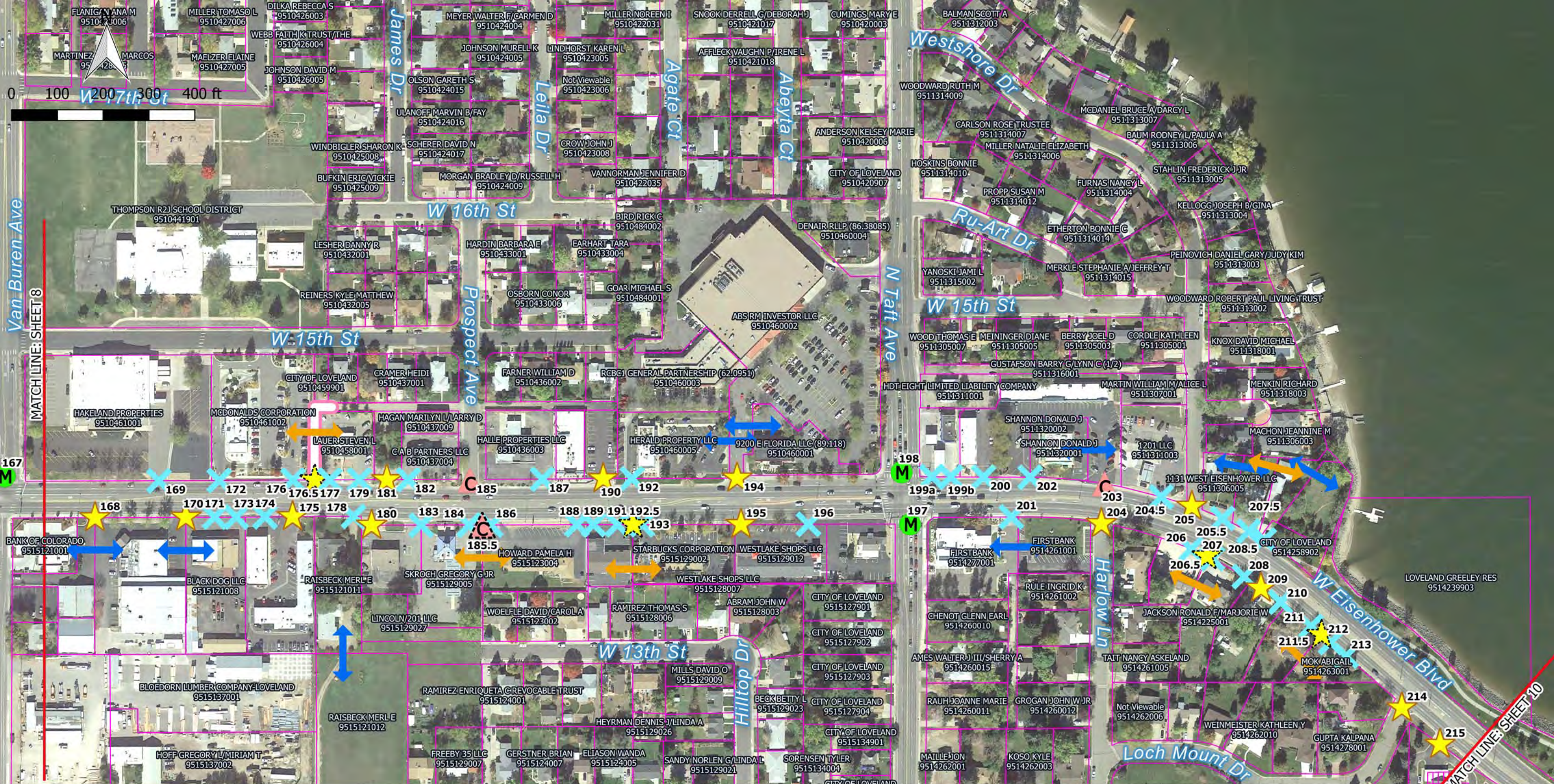
Figure 2G
7 of 18



Legend

	Close Existing Access Point		Signalized Full-Movement (Existing)		Full-Movement with Potential for Signalization (When Warranted)		Unsignalized Full-Movement (Proposed)
	Right-in/Right-out (Convert/Maintain Existing)		Right-in/Right-out (Proposed)		Left-in/Right-out (Convert Existing)		Right-in only (Convert/Maintain Existing)
	Right-in only (Convert/Maintain Existing)		Right-in only (Proposed)		Right-out only (Convert Existing)		Right-out only (Proposed)
	Right-out only (Convert Existing)		Right-out only (Proposed)		Existing Cross Access		Proposed Cross Access
	Conditional Access		Ditch Access		Emergency Access		Major Intersection
	Parcel Lines		Future Potential Roadway				

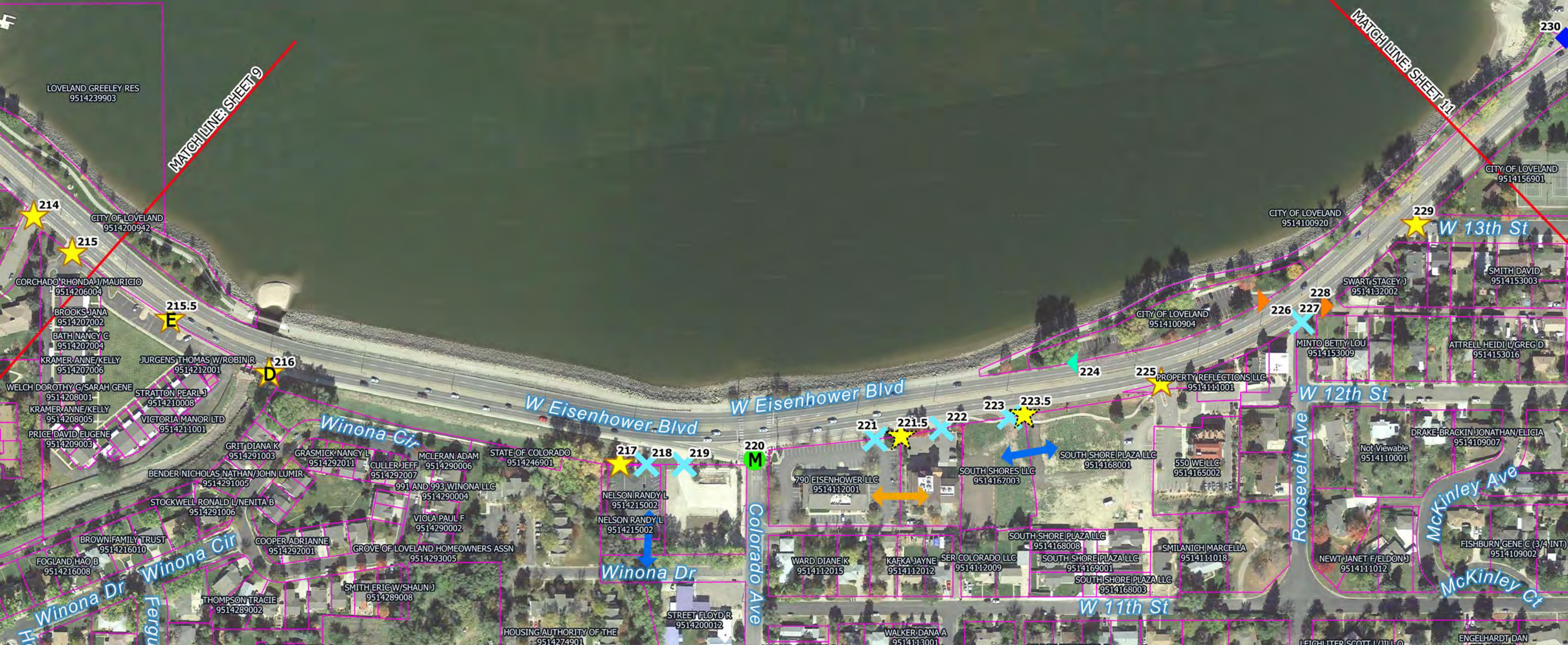
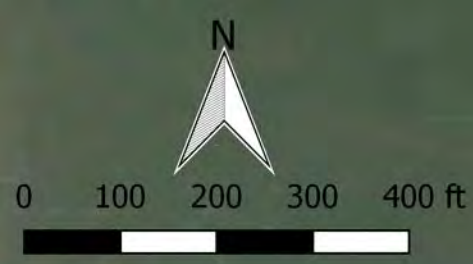
Figure 2H
8 of 18



Legend

Close Existing Access Point	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Signalized Full-Movement (Existing)	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Unsignalized Full-Movement (Maintain Existing)	Right-in/Right-out (Proposed)			"M" Major Intersection
Unsignalized Full-Movement (Proposed)	Left-in/Right-out (Convert Existing)		Future Potential Roadway	
			Parcel Lines	

Figure 2I
9 of 18



Legend

	Close Existing Access Point		3/4 Movement (Convert/Maintain Existing)		Right-in only (Convert/Maintain Existing)		Proposed Cross Access	"C"	Conditional Access
	Signalized Full-Movement (Existing)		3/4 Movement (Proposed)		Right-in/Right-out (Convert/Maintain Existing)		Existing Cross Access	"D"	Ditch Access
	Full-Movement with Potential for Signalization (When Warranted)		Right-in/Right-out (Proposed)		Right-in/Right-out (Proposed)			"E"	Emergency Access
	Unsignalized Full-Movement (Maintain Existing)		Left-in/Right-out (Convert Existing)					"M"	Major Intersection
	Unsignalized Full-Movement (Proposed)								
							Parcel Lines		
							Future Potential Roadway		

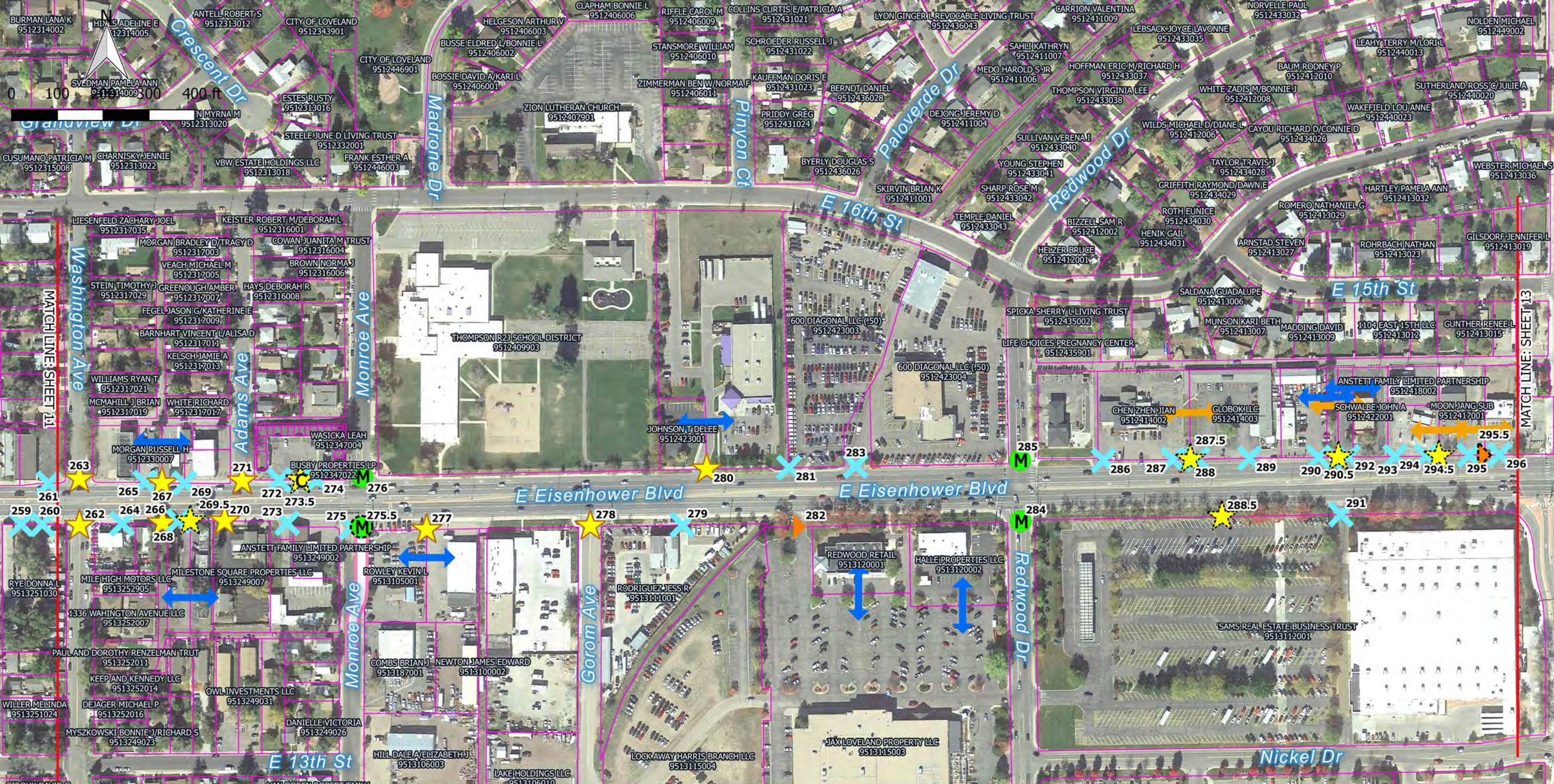
Figure 2J
10 of 18



Legend

AccessPointInfo

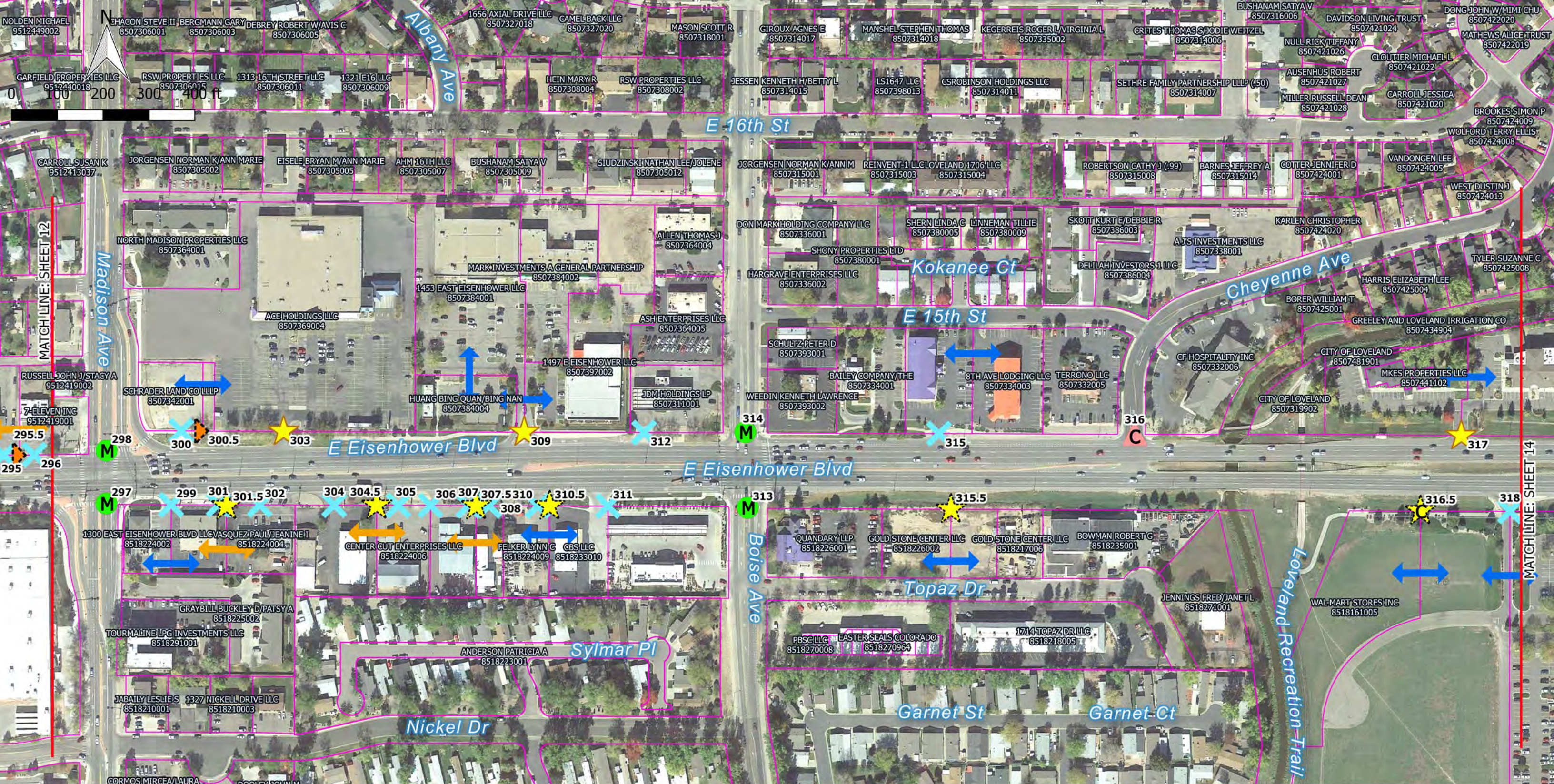
-  Close Existing Access Point
-  Signalized Full-Movement (Existing)
-  Full-Movement with Potential for Signalization (When Warranted)
-  Unsignalized Full-Movement (Maintain Existing)
-  Unsignalized Full-Movement (Proposed)
-  3/4 Movement (Convert/Maintain Existing)
-  3/4 Movement (Proposed)
-  Right-in/Right-out (Convert/Maintain Existing)
-  Right-in/Right-out (Proposed)
-  Left-in/Right-out (Convert Existing)
-  Right-in only (Convert/Maintain Existing)
-  Right-in only (Proposed)
-  Right-out only (Convert Existing)
-  Proposed Cross Access
-  Existing Cross Access
-  Parcel Lines
-  Future Potential Roadway
- "C"** Conditional Access
- "D"** Ditch Access
- "E"** Emergency Access
- "M"** Major Intersection



Legend

Close Existing Access Point	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Signalized Full-Movement (Existing)	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Unsignalized Full-Movement (Maintain Existing)	Right-in/Right-out (Proposed)		Future Potential Roadway	"M" Major Intersection
Unsignalized Full-Movement (Proposed)	Left-in/Right-out (Convert Existing)			

Figure 2L
12 of 18



Legend

AccessPointInfo

- Close Existing Access Point
- Signalized Full-Movement (Existing)
- Full-Movement with Potential for Signalization (When Warranted)
- Unsignalized Full-Movement (Maintain Existing)
- Unsignalized Full-Movement (Proposed)
- 3/4 Movement (Convert/Maintain Existing)
- 3/4 Movement (Proposed)
- Right-in/Right-out (Convert/Maintain Existing)
- Right-in/Right-out (Proposed)
- Left-in/Right-out (Convert Existing)

- Right-in only (Convert/Maintain Existing)
- Right-in only (Proposed)
- Right-out only (Convert Existing)

- Cross Access**
- Proposed Cross Access
 - Existing Cross Access

- "C"** Conditional Access
- "D"** Ditch Access
- "E"** Emergency Access
- "M"** Major Intersection

- Parcel Lines
- Future Potential Roadway

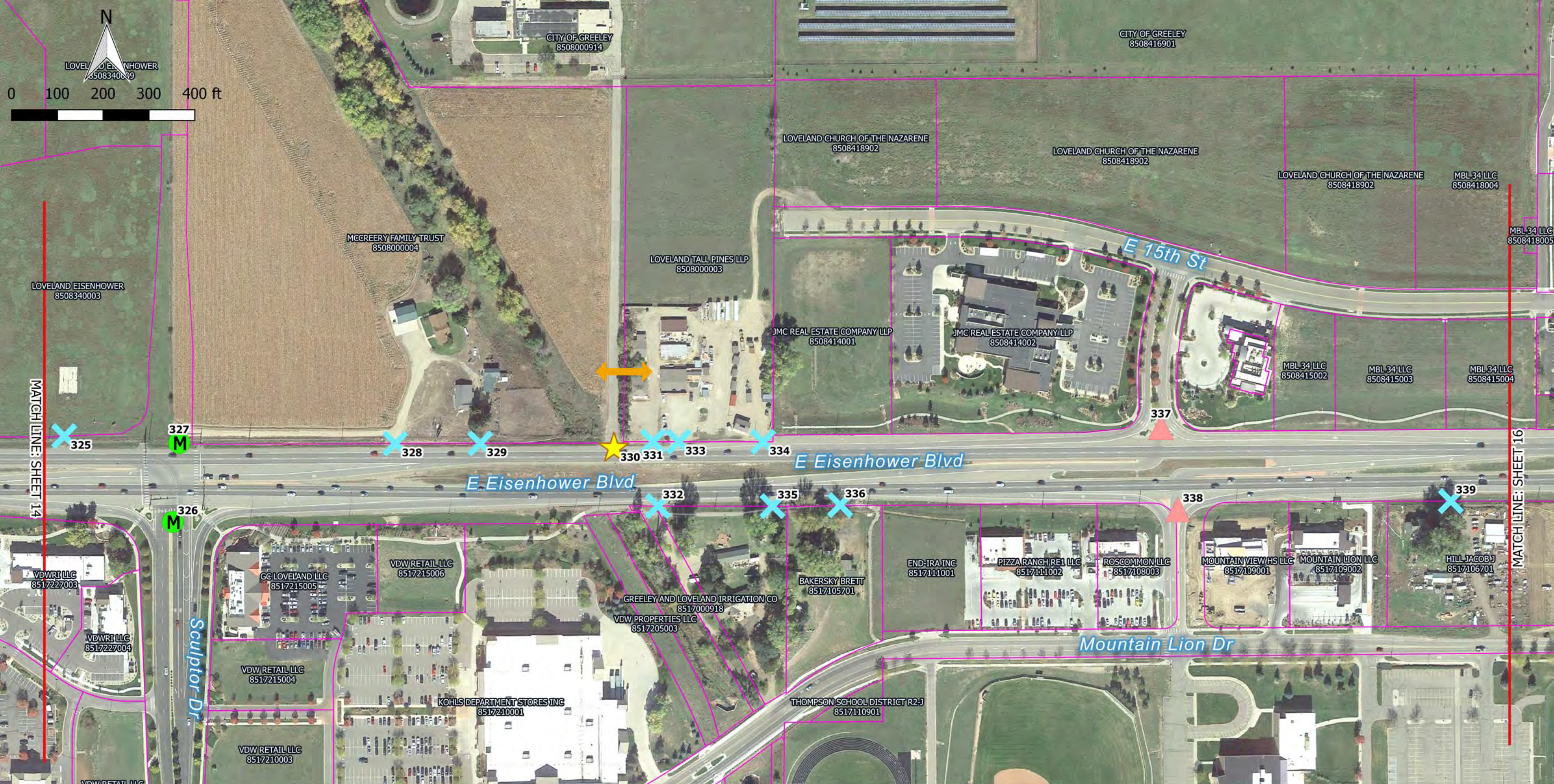
Figure 2M
13 of 18



Legend

	Close Existing Access Point		3/4 Movement (Convert/Maintain Existing)		Right-in only (Convert/Maintain Existing)	Cross Access		"C" Conditional Access
	Signalized Full-Movement (Existing)		3/4 Movement (Proposed)		Right-in only (Proposed)			"D" Ditch Access
	Full-Movement with Potential for Signalization (When Warranted)		Right-in/Right-out (Convert/Maintain Existing)		Right-out only (Convert Existing)			"E" Emergency Access
	Unsignalized Full-Movement (Maintain Existing)		Right-in/Right-out (Proposed)					"M" Major Intersection
	Unsignalized Full-Movement (Proposed)		Left-in/Right-out (Convert Existing)					Parcel Lines
								Future Potential Roadway

Figure 2N
14 of 18



Legend

Close Existing Access Point	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Signalized Full-Movement (Existing)	3/4 Movement (Proposed)	Right-in only (Proposed)		Proposed Cross Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Unsignalized Full-Movement (Maintain Existing)	Right-in/Right-out (Proposed)			"M" Major Intersection
Unsignalized Full-Movement (Proposed)	Left-in/Right-out (Convert Existing)		Parcel Lines	
			Future Potential Roadway	

Figure 20
15 of 18

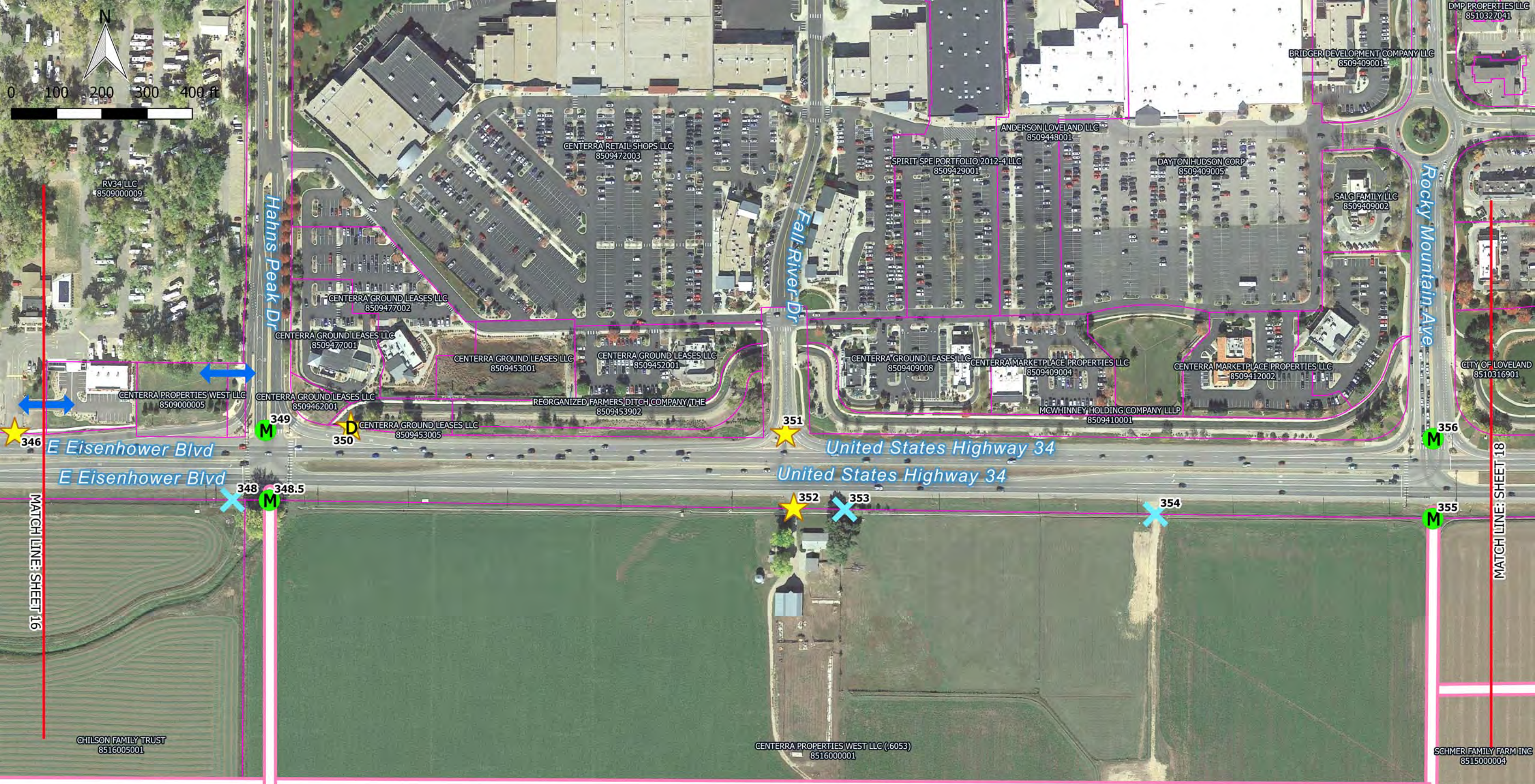


Legend

- | | | | | |
|---|---|---|---|--|
| <p>AccessPointInfo</p> <ul style="list-style-type: none"> Close Existing Access Point Signalized Full-Movement (Existing) Full-Movement with Potential for Signalization (When Warranted) Unsignalized Full-Movement (Maintain Existing) Unsignalized Full-Movement (Proposed) | <ul style="list-style-type: none"> 3/4 Movement (Convert/Maintain Existing) 3/4 Movement (Proposed) Right-in/Right-out (Convert/Maintain Existing) Right-in/Right-out (Proposed) Left-in/Right-out (Convert Existing) | <ul style="list-style-type: none"> Right-in only (Convert/Maintain Existing) Right-in only (Proposed) Right-out only (Convert Existing) | <p>Cross Access</p> <ul style="list-style-type: none"> Proposed Cross Access Existing Cross Access | <ul style="list-style-type: none"> "C" Conditional Access "D" Ditch Access "E" Emergency Access "M" Major Intersection |
|---|---|---|---|--|

Parcel Lines
 Future Potential Roadway

Figure 2P
16 of 18



Legend

Close Existing Access Point	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Signalized Full-Movement (Existing)	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Unsignalized Full-Movement (Maintain Existing)	Right-in/Right-out (Proposed)		Parcel Lines	"M" Major Intersection
Unsignalized Full-Movement (Proposed)	Left-in/Right-out (Convert Existing)		Future Potential Roadway	

Figure 2Q
17 of 18



Legend

Access Point Info	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Close Existing Access Point	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Signalized Full-Movement (Existing)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Proposed)			"M" Major Intersection
Unsignalized Full-Movement (Maintain Existing)	Left-in/Right-out (Convert Existing)		Parcel Lines	
Unsignalized Full-Movement (Proposed)			Future Potential Roadway	

Figure 2R
18 of 18

Rossum Drive to Cascade Avenue (Figure 2E & 2F)

Rossum Drive is full movement with potential for signalization, if warranted. Cascade Avenue is a signalized full movement intersection. Both Rossum Dr. and Cascade Ave. have the potential for a fourth leg if development warrants. Current plans for this section allow for conditional unsignalized full movement access points between Rossum Dr. and Cascade Ave. If safety and operational issues develop at these intermediate access points, movement shall be restricted. These accesses shall be reduced to one location per ownership and shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system.

An alternative local route is proposed from Rossum Drive to Cascade Avenue on the south side of US 34 to provide additional local connections and internal circulation opportunities that will benefit US 34 by reducing access dependence on the highway. Intersection improvements at Cascade are identified as part of the US 34 PEL. Depending on the final approved concept the access points 65.5, 67, and 68 are conditional unsignalized full movement access points that may require movement restrictions in the future to accommodate the necessary traffic movements at Cascade Avenue. Similarly, the US 34 PEL has several potential options for this segment and the intersection at Morning Drive. Further investigation is required to select a preferred option. The conditional full movement access points identified in the ACP provide the flexibility to be compatible with any of the options identified in the US 34 PEL.

Cascade Avenue to Namaqua Road (Figure 2F & 2G)

Cascade Avenue is a signalized full movement intersection with the potential for a fourth leg. Namaqua Road is a three-legged full movement intersection with potential for signalization. The ACP has also identified a realignment of Namaqua Road to improve the skew with US 34. If Access 112 across from Namaqua Road provides private access to the adjacent properties, the access shall be right-in/right-out. If a public road access is proposed at this location in the future, amending the plan could be considered.

Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 93, Dover Avenue, is identified as a conditional unsignalized full movement access point. If future safety or operational issues develop at this location, the access may be limited to a $\frac{3}{4}$ movement or a right-in/right-out movement. There is also an emergency access at Access 76 that may only provide access to emergency vehicles.

Namaqua Road to Wilson Avenue (Figure 2G & 2H)

Namaqua Road is a three-legged full movement intersection with potential for signalization. Wilson Avenue is a signalized full movement intersection. The ACP has also identified a realignment of Namaqua Road to improve the skew with US 34. If Access 112 across from Namaqua Road provides private access to the adjacent properties, the access shall be right-in/right-out. If a public road access is proposed at this location in the future, amending the plan could be considered.

Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 129 is identified as a conditional right-in/right-out movement. If lake maintenance access is still

required upon redevelopment of property, a right-in/right-out gated access will remain. If lake maintenance access is no longer required, access will close and will be provided via Kennedy Ave.

Wilson Avenue to Van Buren Avenue (Figure 2H)

Wilson Avenue and Van Buren Avenue are both four-legged signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 154, W Broadmoor Drive, is identified as a conditional unsignalized $\frac{3}{4}$ movement. If safety or operational issues occur at this location, including the need for additional left-turn storage at Wilson Ave. or Van Buren Ave., the access point may be restricted to a right-in/right-out.

Van Buren Avenue to Taft Avenue (Figure 2I)

Van Buren Avenue and Taft Avenue are both four-legged signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access points 185 and 185.5 are identified as conditional unsignalized $\frac{3}{4}$ movements. If safety or operational issues occur at this location, including the need for additional left-turn storage at Van Buren Avenue or Taft Avenue, the access points may be restricted to right-in/right-out. In order to improve circulation and access options on the north side of US 34, an extension of 15th Street to shared Access 176.5 is recommended upon redevelopment.

Taft Avenue to Colorado Avenue (Figure 2I & 2J)

Taft Avenue and Colorado Avenue are both signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 203 is an existing $\frac{3}{4}$ movement that is close to the functional intersection area it was identified as a conditional unsignalized $\frac{3}{4}$ movement. If safety or operational issues occur at this location, including the need for additional left-turn storage at Taft Avenue, the access point may be restricted to right-in/right-out. Access point 215.5, is an emergency access (conditional right-in/right-out movement). Upon redevelopment of the property, the access point will be gated. If emergency access is no longer required, the access will close. Similarly, Access 216 is identified as a conditional ditch access point. This access will remain until alternate ditch access is available or until the ditch is no longer in use or no longer requires maintenance at this location.

Colorado Avenue to Garfield Avenue (Figure 2J)

Colorado Avenue and Garfield Avenue are both signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 228 is identified as a future right-in only movement when safety or operational issues occur at this

location. Due to the alignment of this access and the curvature of the roadway sight distance is challenging. The project team also reviewed the traffic movements at the parking areas near Lake Loveland. After discussion with City of Loveland staff it is recommended that access movements be restricted at access points 224, 226, and 230, 231a to right-out only, right-in only, left-in/right-out only, and right in only respectively.

Residential access points 231b, 232, 233, 234, 236, 237, 238, and 241 located on the north side of US 34 between Lake Drive and Garfield Avenue are identified as conditional closures. These properties have frontage along an alley to the north. When these properties redevelop, these accesses will be closed. Access will be obtained from Lake Drive or Garfield Avenue to the existing alley.

Garfield Avenue to Cleveland Avenue (Figure 2J)

Garfield Avenue and Cleveland Avenue are both signalized full movement intersections. Access is limited in this section due to the BNSF grade separated railroad crossing. Access 245 is identified as a conditional right-in/right-out movement. If a connection is made between Arthur Avenue and Arthur Drive, this access will close, and the alternative route will be provided via Garfield Avenue. Access 246, Arthur Avenue, will remain as a right-in/right-out movement. Other access points in this section will be relocated to local public streets upon redevelopment.

Cleveland Avenue to Lincoln Avenue (Figure 2K)

Cleveland Avenue and Lincoln Avenue are both signalized full movement intersections. These two roadways are also known as US 287. The US 34 PEL carried multiple options forward for this area that are compatible with the ACP. The access between these roadways is restricted, and properties will gain access via the cross-streets rather than US 34. This is more restrictive access strategy than was presented in the US 34: US 287 to LCR 3 Environmental Assessment and the Colorado State Highway Access Code which allow for right-in/right-out access to properties adjacent to US 34. One of the adjacent properties is currently owned by the City of Loveland and the other has existing and well-established access on Cleveland Avenue.

Lincoln Avenue to Monroe Avenue (Figure 2K & 2L)

Lincoln Avenue and Monroe Avenue are both signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Accesses 262 and 263, Washington Avenue, was identified as a full movement access in the US 34: US 287 to LCR 3 Environmental Assessment. However, after further review it was determined that Washington Avenue was in the functional intersection area of both Monroe Avenue and Lincoln Avenue, two major signalized intersections. For this reason, Washington Avenue was converted to a more restrictive access condition, right-in/right-out movement accesses. If safety or operational issues occur at this location the existing unsignalized full movement access may be restricted to right-in/right-out. A single conditional right-in/right-out is identified for the business park at the northwest corner of Monroe at Access 273.5. If this property significantly redevelops and modifies the building layout, this access will be closed, and access will be provided via local public streets.

Monroe Avenue to Redwood Drive (Figure 2L)

Monroe Avenue and Redwood Drive are both signalized full movement intersections. Access for this section shall be limited to right-in/right-out between the major intersections Monroe Avenue and Redwood Drive. Access points shall be reduced to one location per ownership, relocated to

local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 282 will remain a right-in only access.

Redwood Drive to Madison Avenue (Figure 2L & 2M)

Redwood Drive and Madison Avenue are both signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 295.5 is a new shared access point with a right-in only movement. This access point would be replacing access 291, to allow for improved the access spacing with Madison Avenue. This change would occur as the properties redevelop and cross access agreements are established.

Madison Avenue to Boise Avenue (Figure 2M)

Madison Avenue and Boise Avenue are both signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 300.5 is a new shared right-in only access point to serve the small properties on the northeast corner of Madison Ave. Cross access agreements must be established upon redevelopment to allow shared access.

Boise Avenue to Denver Avenue (Figure 2M & 2N)

Boise Avenue and Denver Avenue are both signalized full movement intersections. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 315.5 is a new shared access point with a right-in only movement as the properties redevelop and cross access agreements are established. Access 316, Cheyenne Avenue, was identified as a full movement access in the US 34: US 287 to LCR 3 Environmental Assessment. However, after further review it was determined that Cheyenne Avenue was in the functional intersection area of Boise Avenue a major signalized intersection. For this reason, Cheyenne Avenue was converted to a more restrictive access condition, a conditional unsignalized $\frac{3}{4}$ movement access. If safety or operational issues occur at this location, including the need for additional left-turn storage at Boise Avenue, the access point may be restricted to right-in/right-out. Access 316.5 is a new shared access point with conditional right-in/right-out movements to be opened when access 318 is closed. This change will occur as the properties redevelop and cross access agreements are established.

Denver Avenue to Sculptor Drive (Figure 2N & 2O)

Denver Avenue and Sculptor Drive are both signalized full movement intersections. Sculptor Drive has the potential for a fourth leg on the north side of US 34 if development warrants. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 321, Mountain Lion Drive, is currently a unsignalized $\frac{3}{4}$ movement. The property served by Access 322 across from Mountain Lion Drive is undeveloped and the access is currently a right-in/right-out. As development occurs in this area, a conditional unsignalized

public $\frac{3}{4}$ movement may be provided at Access 322. This location meets access spacing and functional intersection area. Both Access 321 and 322 are conditional and may be restricted to right-in/right-out if operational or safety issues develop, including warranting a signal or the need for additional left-turn storage at Denver Avenue or Sculptor Drive.

Sculptor Drive to Boyd Lake Avenue (Figure 2O & 2P)

Sculptor Drive and Boyd Lake Avenue are both signalized full movement intersections. Sculptor Drive has the potential for a fourth leg on the north side of US 34 if development warrants. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 337 and 338, Mountain Lion Place, are currently unsignalized $\frac{3}{4}$ movements. This location meets access spacing and functional intersection area. Access 337 and 338 are conditional and may be restricted to right-in/right-out if operational or safety issues develop, including warranting a signal or the need for additional left-turn storage at Sculptor Drive or Boyd Lake Avenue. Access 330 is a shared right-in/right-out to serve the properties on either side. Access to the property on the east may not be closed until alternative legal access is provided.

Boyd Lake Avenue to Hahns Peak Drive (Figure 2P & 2Q)

Boyd Lake Avenue and Hahns Peak Drive are both signalized full movement intersections. Hahns Peak Drive has the potential for a fourth leg on the south side of US 34 if development warrants. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 343, McWhinney Boulevard, is currently an unsignalized $\frac{3}{4}$ movement. This location meets access spacing and functional intersection area. Access 343 is conditional and may be restricted to right-in/right-out if operational or safety issues develop, including warranting a signal or the need for additional left-turn storage at Boyd Lake Avenue. An alternative local route is proposed from Boyd Lake Avenue to Hahns Peak Drive as development occurs. This alternative route will provide additional local connections and internal circulation opportunities that will benefit US 34 by reducing access dependence on the highway.

Hahns Peak Drive to Rocky Mountain Avenue (Figure 2Q)

Hahns Peak Drive and Rocky Mountain Avenue are both three-legged signalized full movement intersections. Both intersections have the potential for a fourth leg on the south side of US 34 if development warrants. Access for this section shall be limited to right-in/right-out between major intersections. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. Access 351, Fall River Drive, is currently an unsignalized $\frac{3}{4}$ movement. When safety or operational issues develop or when a public project is funded, both Access 351 will be converted to a right-in/right-out. Access 352 is identified as a conditional right-in/right-out, this access would align with the existing access 351. When access 353 closes and as the property redevelops and cross access agreements are established. An alternative local route is proposed from Hahns Peak Drive to Rocky Mountain Avenue as development occurs. This alternative route will provide additional local connections and internal circulation opportunities that will benefit US 34 by reducing access dependence on the highway.

Rocky Mountain Avenue to I-25 (Figure 2Q & 2R)

Rocky Mountain Avenue is a three-legged signalized full movement intersection. It has the potential for a fourth leg on the south side of US 34 as development warrants. Access for this section shall be limited to right-in/right-out. Access points shall be reduced to one location per ownership, relocated to local public streets, and/or shared at the property line, where feasible, utilizing cross-access easements as properties redevelop to ensure that all properties are provided access to the public street system. An alternative local route is proposed from Rocky Mountain Avenue to the property furthest east on the south side of US 34. The proposed alternative route would eliminate the need for the business access in this busy section of US 34 and all conditional access points on the south side will close when the alternative route is available. Additionally, the alternative route will provide additional local connections and internal circulation opportunities that will benefit US 34 by reducing access dependence on the highway. The I-25 interchange is under design and construction. The configuration of the entrance/exit ramps and the existing park and ride facility will be reconfigured with this project. The ACP is compatible with the current design and the conditional access points identified on the north side of US 34 will close with the reconstruction of the I-25 interchange.

7.2 Other Recommended Improvements

In addition to recommended access modifications, this study has resulted in recommendations for locations of public roadway realignments, private access roadway alignments, and development of several alternative local routes. These alternative routes provide additional local connections and internal circulation opportunities that will benefit operations on US 34 by reducing local dependence on the highway, providing alternatives that support restricted turning movements on the highways, and reducing demand at intersections that are already experiencing high demand. The routes illustrated in the plan are conceptual in nature and will require detailed engineering to establish exact alignments at the time of implementation. It should be noted that some access improvements require development of alternative routes prior to implementation.

The following is a list of public road intersection realignment recommendations for future City of Loveland and Larimer County planning documents:

- Goodwine Drive
- Hidden Valley Drive
- Langston Lane
- Namaqua Road
- Monroe Avenue

As development occurs the following access roads should be realigned or developed:

- Access Point 372 to align with Access Point 371
- Access Point 382.5 to align with Access Point 383.5
- Access Point 176.5 a new shared access connection to W 15th Street

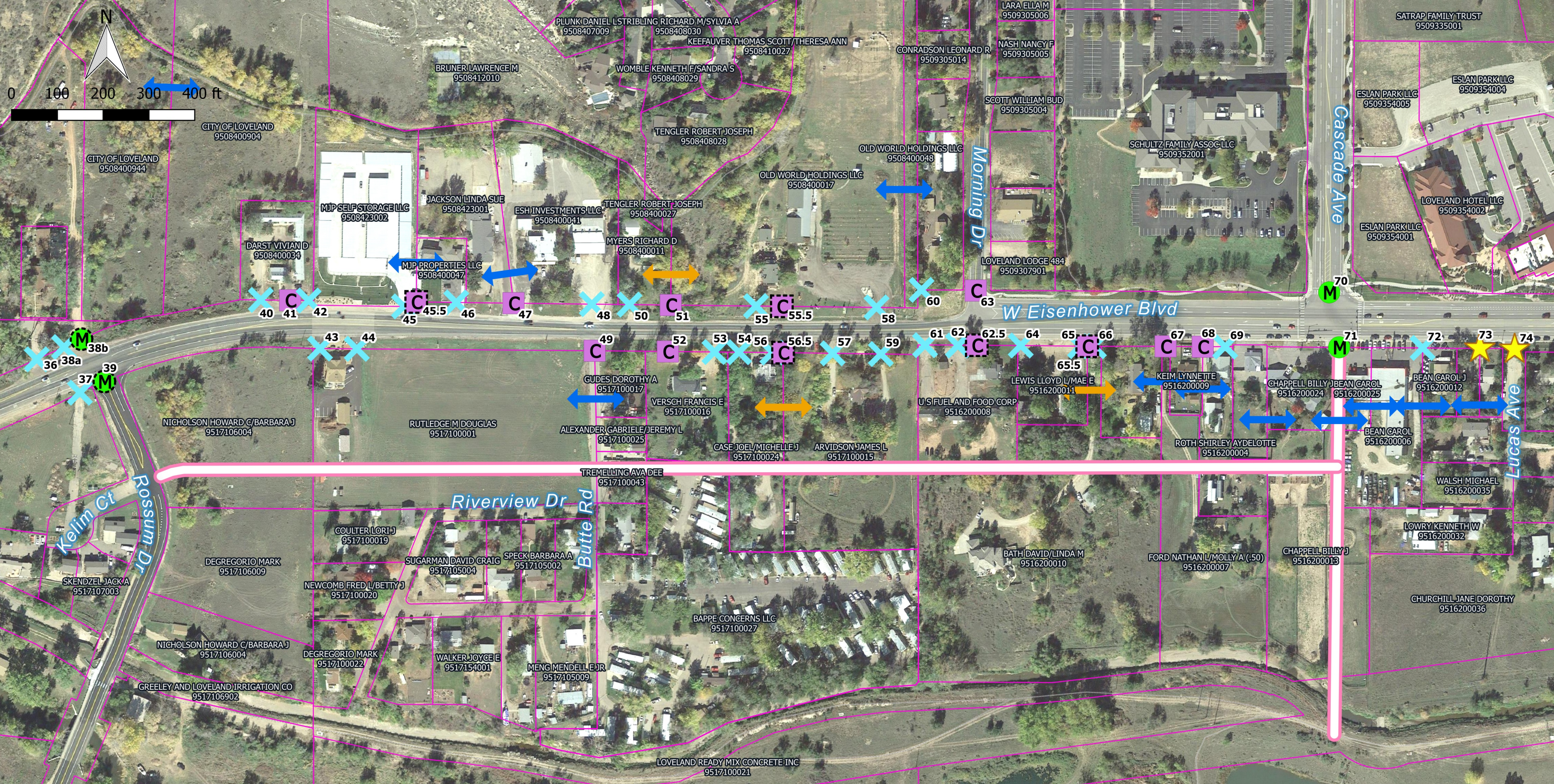
The following is a list of the alternative routes or additional connections have been identified and illustrated in Figures 3A-3D:

- Parallel east-west roadway south of US 34 between Rossum Drive and Cascade Avenue

- Extension of Cascade Avenue to the south
- Parallel east-west roadway south of US 34 between Boyd Lake Avenue and Hahns Peak Drive
- Extension of Hahns Peak Drive to the south
- Parallel east-west roadway south of US 34 between Hahns Peak Dr and Rocky Mountain Avenue
- Extension of Rocky Mountain Avenue to CR 20E
- Parallel east-west roadway south of US 34 between Rocky Mountain Avenue and property furthest to the east before the I-25 ROW

The adoption of these additional road connections into the City of Loveland and Larimer County planning documents is recommended. It is anticipated that the majority of these routes would be accomplished in phases when development or redevelopment occurs.

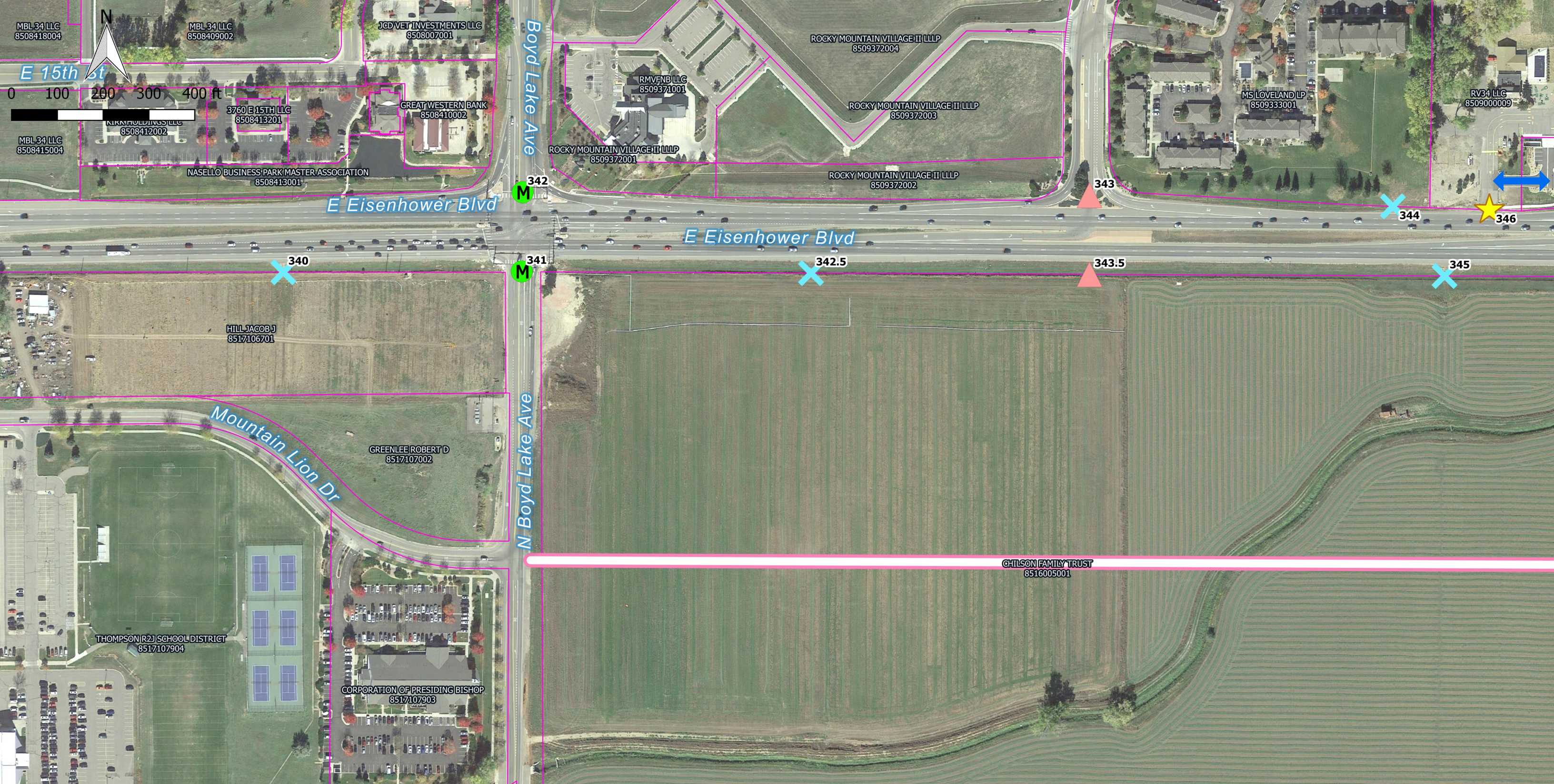
In support of alternate modes, the ACP also considered pedestrian/bicycle access. The ACP supports this policy with the accommodation of pedestrian and bicycle crossings at full movement intersections with potential for signalization throughout the corridor. As intersections are improved and sidewalk is added throughout the corridor, pedestrian crossings should be implemented.



Legend

AccessPointInfo		3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Close Existing Access Point	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access		"D" Ditch Access
Signalized Full-Movement (Existing)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access	
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Proposed)		Parcel Lines	"M" Major Intersection	
Unsignalized Full-Movement (Maintain Existing)	Left-in/Right-out (Convert Existing)		Future Potential Roadway		
Unsignalized Full-Movement (Proposed)					

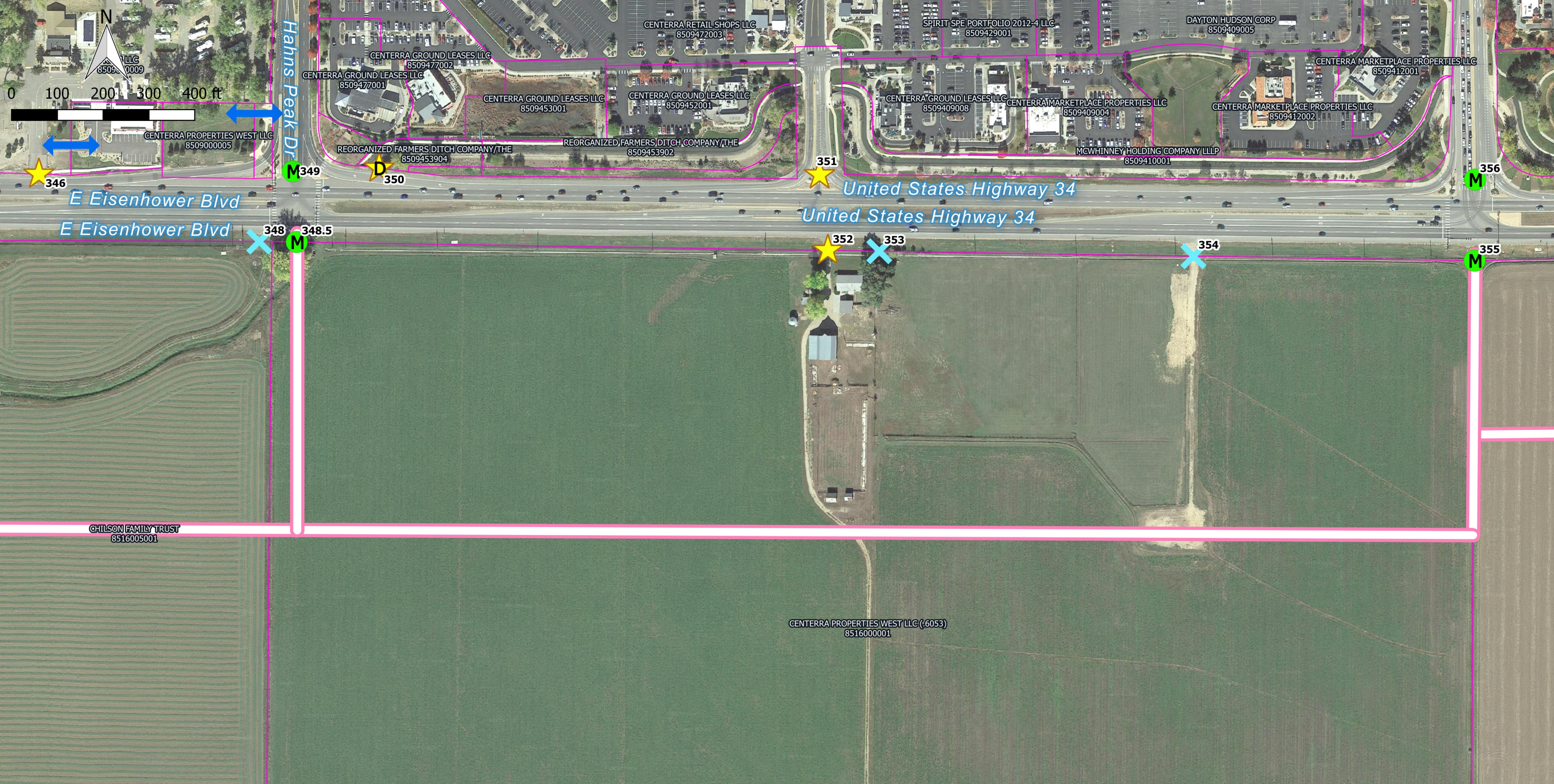
Figure 3A
1 of 4



Legend

AccessPointInfo	3/4 Movement (Convert/Maintain Existing)	Right-in only (Convert/Maintain Existing)	Cross Access	"C" Conditional Access
Close Existing Access Point	3/4 Movement (Proposed)	Right-in only (Proposed)	Proposed Cross Access	"D" Ditch Access
Signalized Full-Movement (Existing)	Right-in/Right-out (Convert/Maintain Existing)	Right-out only (Convert Existing)	Existing Cross Access	"E" Emergency Access
Full-Movement with Potential for Signalization (When Warranted)	Right-in/Right-out (Proposed)			"M" Major Intersection
Unsignalized Full-Movement (Maintain Existing)	Left-in/Right-out (Convert Existing)		Parcel Lines	
Unsignalized Full-Movement (Proposed)			Future Potential Roadway	

Figure 3B
2 of 4



Legend

Access Point Info

- Close Existing Access Point
- Signalized Full-Movement (Existing)
- Full-Movement with Potential for Signalization (When Warranted)
- Unsignalized Full-Movement (Maintain Existing)
- Unsignalized Full-Movement (Proposed)

- 3/4 Movement (Convert/Maintain Existing)
- 3/4 Movement (Proposed)
- Right-in/Right-out (Convert/Maintain Existing)
- Right-in/Right-out (Proposed)
- Left-in/Right-out (Convert Existing)

- Right-in only (Convert/Maintain Existing)
- Right-in only (Proposed)
- Right-out only (Convert Existing)

- Cross Access**
- Proposed Cross Access
 - Existing Cross Access
 - Parcel Lines
 - Future Potential Roadway

- "C"** Conditional Access
- "D"** Ditch Access
- "E"** Emergency Access
- "M"** Major Intersection

Figure 3C
3 of 4



Legend

AccessPointInfo

- Close Existing Access Point
- Signalized Full-Movement (Existing)
- Full-Movement with Potential for Signalization (When Warranted)
- Unsignalized Full-Movement (Maintain Existing)
- Unsignalized Full-Movement (Proposed)

- 3/4 Movement (Convert/Maintain Existing)
- 3/4 Movement (Proposed)
- Right-in/Right-out (Convert/Maintain Existing)
- Right-in/Right-out (Proposed)
- Left-in/Right-out (Convert Existing)

- Right-in only (Convert/Maintain Existing)
- Right-in only (Proposed)
- Right-out only (Convert Existing)

- Cross Access**
- Proposed Cross Access
 - Existing Cross Access
 - Parcel Lines
 - Future Potential Roadway

- "C"** Conditional Access
- "D"** Ditch Access
- "E"** Emergency Access
- "M"** Major Intersection

Figure 3D
4 of 4

8.0 IMPLEMENTATION

The improvements recommended in the Access Study represent a long-range plan to implement over time as traffic and safety needs arise and as funding becomes available. Construction of the improvements recommended may be completed using public and/or private funding. The following cases will trigger construction.

1. A property redevelops or changes use, resulting in an increase in traffic to and from the site of 20% or more. In this case, limited improvements at the specific access point may be required by CDOT. As part of the City's and County's development review process, additional transportation improvements may also be necessary to address specific traffic-related impacts created by the development. These improvements will be compatible with the ACP. In addition, upon redevelopment, the City and County will require property owners to provide legally defined cross-access easements for shared access points, as defined by the ACP. If a property does not redevelop, the property owner will not be required to construct access modifications. (Private Funding).
2. The City and/or County obtain funding to complete improvements to a segment of the US 34 corridor. (Public Funding)
3. State and/or Federal Funding are obtained to complete improvements to a segment of US 34. Typically, a project will be identified in the Statewide Transportation Improvement Program (STIP) to obtain funding. (Public Funding)
4. A safety or operational issue develops that can be mitigated through the implementation of access management techniques consistent with the ACP. Depending on the extent and type of safety or operational issue, improvements may address a segment of the US 34 corridor or may be limited to an isolated location or access point. Public funding from any combination of agencies may be obtained to construct improvements. (Public Funding)
5. Any combination of 1, 2, 3, or 4.

However, it is important to remember that implementation of improvements recommended in the Access Study will only occur if one of the triggers listed above are met. If a trigger is not met a change to the existing condition will not be made. In short if nothing changes, nothing changes.

Under case 1, a property owner must follow the access permit process as defined by Section 2 of the *State of Colorado State Highway Access Code, latest edition*. CDOT will remain the issuing authority for US 34. In short, the process requires property owners to submit an application for an access permit. Once the access permit is issued, construction plans for permitted improvements must be developed and submitted to CDOT for review. A Notice to Proceed will be issued following acceptance of the Construction Documents by CDOT, thereby allowing the applicant to proceed with construction. As determined by the CDOT Permit Unit, access permits may allow for construction of interim conditions and define requirements for future conditions that match the ACP depending upon individual circumstances specific to each permit.

Under case 2, the City and/or County may obtain funds either through local government budgeting, application for grant monies, or other potential funding sources. Once funding is available, the City and/or County will work through the CDOT planning process to develop a

highway improvement project. The project will follow the process and procedures for design, construction, and management detailed in CDOT's Local Agency Manual.

Under case 3, a project receiving State and/or Federal funds must be identified in the STIP. In Colorado, six years of transportation projects and their funding sources must be identified in the STIP. The STIP is updated every four years through a continuing, comprehensive and cooperative process involving the CDOT, FHWA, Federal Transit Administration (FTA), Metropolitan Planning Organizations (MPOs), Transportation Planning Regions (TPRs), and City and County Governments. Projects within the study area in Loveland and Larimer County are established in the STIP by request of the North Front Range MPO. The STIP was most recently updated and adopted in June 2018 but may be amended as needed in accordance with the STIP Amendment Guidelines. Currently, the STIP includes a traffic signal progression improvements project for twelve intersections from Monroe Avenue east to the Centerra area, Variable Message Signs at US 287 & US 34, a US 34 widening project from 4-lanes to 6-lanes between Boise Avenue to I-25. The North Front Range MPO 2040 Regional Transportation Plan, adopted in June 2017, identifies US 34 as a tier one regionally significant corridor. Similar to case 2, once funding is available, a project will follow CDOT's relevant process and procedures.

Under case 4, any agency may identify a safety or operational issue along the corridor through a crash pattern, complaints, observation or other manner. A single agency or partnership of agencies may obtain funding to implement access management techniques that are consistent with the Plan and specifically address the issue. Depending on who the lead agency is for the project, the project may be administered through the local agency process, as described in case 2, or through CDOT's process, as described in case 3.

Detailed engineering drawings of exact roadway alignments and access improvements will be required as project funding is identified. Details related to storm drainage, utilities, landscaping, environmental issues, pedestrian/bicycle facilities, roadway sections, and other topographic features will be considered during this design process. Environmental evaluations appropriate to the size, type, and funding of the project will be completed as part of the design phase.

To provide for continued commitment to the access modifications recommended by this study, the City, County and CDOT have drafted an IGA to adopt this Plan as an Access Control Plan for the segment of US 34: MP 85.60 (CR 27) to MP 96.25 (I-25). The ACP identifies access locations and levels of access by reference point for US 34, within the project limits. In recognition of the plan's long-range nature and the potential for conditions to change over time, a critical element of the IGA is the definition of a process for plan modifications. Exhibit B to the IGA defines this process, which basically requires mutual agreement of the IGA parties on modifications to the plan. For the US 34 corridor, the process for administration of the plan shall be as described in the *State of Colorado State Highway Access Code, latest edition*. The ACP Table and Draft IGA, are presented in Technical Appendices A and F, respective.

9.0 LIST OF ACRONYMS

AASHTO = American Association of State Highway and Transportation Officials

ACP = Access Control Plan

ADT = Average Daily Traffic Volume (vehicles/day)

BA = Business Access

BOCC = Larimer County Board of County Commissioners

CDOT = Colorado Department of Transportation

CR = County Road

FA = Field Access

FHWA = Federal Highway Administration

FTA = Federal Transit Administration

HCM = Highway Capacity Manual

HCS = Highway Capacity Software

IGA = Intergovernmental Agreement

LOS = Level of Service

MP = Milepost

MPO = Metropolitan Planning Organization

mph = Miles Per Hour

MUTCD = Manual on Uniform Traffic Control Devices

NFRMPO = North Front Range Metropolitan Planning Organization

NR-A = Non-Rural Principal Highway

PEL = Planning and Environmental Linkage

PFFS = Percent Free Flow Speed

PRS = Public Road Signalized

PRU = Public Road Unsignalized

PVRU = Private Road Unsignalized

R = Residential Access

R-A = Regional Highway

ROW = Right-of-Way

RTP = Regional Transportation Plan

STIP = Statewide Transportation Improvement Program

TPR = Transportation Planning Region

10.0 GLOSSARY

$\frac{3}{4}$ Movement Access - An access that is configured to accommodate partial movements (i.e. left-turn in or out, right-turn in, and right-turn out)

Access – Any driveway or other point of entry and/or exit such as a street, road or highway that connects to the general street system

Access Category – means one of eight categories described in Section Three of the State Highway Access Code, and determines the degree to which access to a state highway is controlled

Access Control Plan (ACP) – A plan which designates access locations and levels of access for the purpose of bringing those portions of roadway included in the planning area into conformance with the highway functional classification to the extent feasible

Access Management – Systematic control of the location, spacing, design, and operation of driveways, median openings, and street connections to a roadway

Access Permit – Means by which access improvements are reviewed, approved and constructed in accordance with the State Highway Access Code

Driveway – An access that is not a public street, road, or highway

Full Movement Access – An access without turn restrictions

Functional Intersection Area – Area upstream and downstream of an intersection where intersection operation and conflicts influence driver behavior, vehicle operations, or traffic conditions.

Intergovernmental Agreement (IGA) – A legally-binding agreement between two or more governmental agencies

Issuing Authority – The entity responsible for issuing access permits for a segment of state highway. The board of county commissioners, the governing body of a municipality, or the department of transportation may be the Issuing Authority.

Level-of-Service (LOS) – An indication of the quality of traffic flow as measured by vehicle delays or travel speeds. Level-of-service grades range from LOS A (ideal traffic flow) to LOS F (heavily congested conditions). LOS D is typically considered an acceptable traffic condition during peak demand periods in urbanized locations.

Median – That portion of a highway separating opposing traffic flows

Percent Free Flow Speed (PFFS) - Measure of segment LOS where free flow speed represents the speed at which vehicles could travel between signalized intersections in uninterrupted conditions.

Right-in, Right-out – An access that is configured to accommodate only right-turns in and right-turns out

Right-of-way (ROW) – The entire width between the boundary lines of every way publicly maintained when any part thereof is open to the use of the public for purposes of vehicular travel

State Highway Access Code – A manual containing the access regulations that apply to state highways within Colorado

Turning Movement Count – A tally of the number of vehicles turning left, right, or traveling through an intersection