

CAÑON CITY US HIGHWAY 50 ACCESS CONTROL PLAN



MP 279.2 (15th Street) to
MP 280.7 (Holy Cross Abbey Access)

October 2018

CAÑON CITY US HIGHWAY 50 ACCESS CONTROL PLAN

US 50: MP 279.2 (15th Street) to MP 280.7 (Holy Cross Abbey Access)

October 2018

Prepared for:

City of Cañon City
128 Main Street
Cañon City, CO 81212
Adam Lancaster, PE, City Engineer

Colorado Department of Transportation
Region 2 – Traffic and Safety
5615 Wills Boulevard
Pueblo, CO 81008
Valerie Sword, Permits Manager

Prepared by:

Stolfus & Associates, Inc.
5690 DTC Boulevard, Suite 560E
Greenwood Village, Colorado 80111
Michelle Hansen, P.E., Project Manager
SAI Reference No. 1000.006.02

TABLE OF CONTENTS

Executive Summary	i
1.0 Introduction.....	1
1.1 Project Background.....	1
1.2 Public Involvement.....	3
2.0 Access Management – Benefits, Principles & Techniques	4
2.1 Access Management Benefits.....	4
2.2 Guiding Principles	5
2.3 Techniques	6
3.0 Existing Conditions	10
3.1 Land Use Characteristics	10
3.2 Roadway Characteristics	10
3.3 Right-of-Way	12
3.4 Access Category	12
3.5 Existing Access Inventory	13
3.6 Crash History	14
3.6.1 Fremont Drive	14
3.6.2 US-50.....	15
4.0 Existing Traffic Analysis	16
4.1 Existing Traffic Volumes	16
4.2 LOS Criteria	17
4.3 Existing Traffic Operations.....	18
5.0 2040 No Build Traffic Analysis	20
5.1 2040 No Build Traffic Demand.....	20
5.2 2040 No Build Delay and LOS	20
6.0 2040 ACP Traffic Analysis	22

6.1	Traffic Volumes	22
6.2	Trip Rerouting	22
6.3	Traffic Operations	24
6.4	Auxiliary Lanes.....	25
6.5	Summary of 2040 Traffic Operations	26
7.0	Access Plan Development and Evaluation.....	27
7.1	Process	27
7.1.1	Step One – Methodology & Compatibility Index.....	27
7.1.2	Step Two – Development of the Access Plan	27
7.1.3	Step Three – Refine the Access Plan	27
7.1.4	Step Four – Evaluation	27
7.2	Evaluation Results	28
8.0	Plan Recommendations	29
8.1	Access Plan	29
8.2	Other Recommended Improvements	35
8.2.1	Alternative Local Routes	35
8.2.2	Alternate Modes.....	35
8.2.3	Future Use of Frontage Road ROW	35
8.2.4	Design Considerations.....	36
9.0	Implementation	37
9.1	Conditions.....	37
9.2	Phasing.....	39
10.0	List of Acronyms	40
11.0	Glossary	41

LIST OF FIGURES

Figure 1. Vicinity Map.....	2
Figure 2. Functional Intersection Area.....	5
Figure 3. US 50 Corridor Plan East Cañon District Typical Section	12
Figure 4: Level-of-Service (LOS) by Mode for Urban Roadways	17
Figure 5A. US 50 Access Exhibit 1 of 3.....	32
Figure 5B. US 50 Access Exhibit 2 of 3.....	33
Figure 5C. US 50 Access Exhibit 3 of 3.....	34

LIST OF TABLES

Table 1. Eastbound Speed Limits	10
Table 2. Westbound Speed Limits.....	10
Table 3: LOS Criteria	18
Table 4: Existing LOS & Delay	19
Table 5: 2040 No Build LOS & Delay	20
Table 6: Rerouted Side Street Left Turn Movements.....	23
Table 7: Rerouted Access Point Left Turn Movements.....	23
Table 8: 2040 ACP LOS & Delay	24
Table 9: Left Turn Deceleration Lanes	25
Table 10. Compatibility Evaluation Summary	28

TECHNICAL APPENDICES (Bound Separately)

Appendix A - Public Outreach

Appendix B - Existing Access Inventory

Appendix C - Crash History

Appendix D - Traffic Analysis

Appendix E - Access Plan Methodology and Evaluation Process

Appendix F - Intergovernmental Agreement

This page intentionally left blank

EXECUTIVE SUMMARY

Background and Purpose

United States Highway 50 (US 50) is an important regional and local transportation route for Cañon City and the State of Colorado. As one of just few major east-west routes in Colorado, it spans from the Utah border to the Kansas border.

In 2015, Cañon City adopted the US 50 Corridor Plan, outlining their vision to achieve the addition of multi-modal facilities, improved aesthetics, and increased safety to create an all-around better traveling experience throughout the corridor. Their plan defines Cañon City as the “Gateway to the Authentic West”, a term coined in the 2014 Cañon City Vision Report. US 50 is described as the front door leading into this “Gateway”, thus, highlighting the importance of enhancing the US 50 corridor.

This study focuses on the East Cañon District from the US 50 Corridor Plan. One of the key components of the proposed design of the East Cañon District is the removal of Fremont Drive, a frontage road that runs along the north side of US 50. This will affect the local streets and businesses that currently access the frontage road. Since the Colorado Department of Transportation (CDOT) requires an Access Control Plan (ACP) to implement the Corridor Plan, the City and CDOT have partnered to develop an ACP from Milepost (MP) 279.2 (15th Street) to MP 280.7 (Holy Cross Abbey access) that addresses access with the proposed new corridor configuration while remaining compatible with the goals of the Corridor Plan.

Project Goals

This study effort coordinates anticipated development and growth in the area with the roadway network. The goals for the project are as follows:

- Provide effective and efficient through travel for traffic on US 50
- Provide safe, effective, and efficient access to and from US 50 for businesses, residents, and guests
- Maintain compatibility with existing and proposed off-system connections that provide local circulation to support the transportation system
- Provide a plan that is adoptable by all entities and can be implemented in phases
- Support the economic viability of the project area
- Maintain compatibility with previous and ongoing local planning efforts
- Support multi-modal transportation

Study Area

The study area consists of a 1.5-mile-long segment of US 50 through Cañon City between MP 279.2 (15th Street) and 280.7 (Holy Cross Abbey access). A frontage road (Fremont Drive) exists on the north side of US 50 for the entire length of the study area. On the south side of US 50, a frontage road (Rainbow Drive) extends east from 15th Street for approximately one-third mile. The Union Pacific railroad tracks parallel US 50 on the south side of the highway with several at-grade crossings with city streets. As defined by the State Highway Access Code (SHAC), the highway category for this segment of US 50 is Category NR-A or Non-Rural Principal Highway. The frontage roads are assigned Category F-R or Frontage Road.

There are currently 60 total access points within the study area accessing either US 50, Fremont Drive, or Rainbow Drive. The breakdown of access points is as follows:

- US 50 access points: 11
 - Public street access points: 10
 - Business access points: 1
- Fremont Drive access points: 44
 - Public street access points: 7
 - Business access points: 37
- Rainbow Drive access points: 5
 - Public street access points: 1
 - Business access points: 4

Two of the public street access points and the access at the Abbey intersect both US 50 and Fremont Drive, but they were only accounted for in the US 50 access points totals.

Coordination and Public Involvement

The study is a joint partnership between the City of Cañon City and CDOT Region 2. Input from corridor stakeholders, including property owners, tenants, developers, and the general public, was a critical element of the project. Multiple techniques were used to engage stakeholders, including two advertised public open houses, one-on-one meetings/phone calls with interested stakeholders, public presentations with City Council, and project information posted on the City's website. Exhibits presenting access management principles, the study process, and the recommended Access Plan were displayed at open houses, on the City's website, and in the lower lobby of City Hall. Representatives from the City, CDOT, and consultant team were available for questions at public outreach events.

Development of the Plan

In preparation for this study, the existing physical and operational characteristics of US 50 were established as well as the projected future characteristics upon implementation of the City's Corridor Plan. The project team also developed a compatibility index in order to provide a logical means for determining whether the Access Plan meets the established project goals without comparing multiple corridor alternatives. Using this information, a draft Access Plan was developed and evaluated. 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 Access Plan rates favorably and is compatible with project goals. Plan adoption by the City and CDOT is recommended.

Access Plan

Figure 5 found in Section 8.1 of this report, graphically illustrates the recommended Access Plan. ACP Tables included in the Intergovernmental Agreement (IGA) contain the specific recommendations for each individual access point and can be found in Appendix F. The Access Plan limits full-movement access to major intersections approximately one-half mile apart per SHAC requirements. Access to minor public streets is limited to right-in, right-out and three-quarter movement access. The three-quarter movement access points will accommodate left turns from the highway onto the minor streets and U-turns, but will prohibit left turns entering the highway. With the removal of Fremont Drive, the properties along that frontage road will generally rely on the existing local side street access or, in few cases, have a new right-in/right-out direct access point from US 50. Where feasible, access is shared between adjacent properties. In select locations, parking lot extensions or new driveway connections to side streets are proposed within the frontage road right-of-way to provide better circulation where accesses are being consolidated or to eliminate the need for shared access points.

Major intersections that are identified as full movement intersections and will remain signalized are:

- 15th Street
- Orchard Avenue
- Raynolds Avenue

A new full movement intersection with the potential for signalization is identified between the Abbey entrance and Dozier Avenue upon redevelopment. Upon mutual acquisition of private land, public street connections between Greydene Avenue and Barrett Drive and between the City Market access and 16th Street are recommended. A realignment of E Main Street to connect to 15th Street is also recommended. These alternative routes provide additional local connections and internal circulation opportunities.

Implementation

The US 50 Corridor Plan requires adoption and implementation of an ACP. Prior to implementation of the Corridor Plan, access conditions compatible with the ACP will be implemented in the following cases:

1. A property redevelops or changes use, resulting in an increase in traffic to and from the site of 20% or as required by the City's Site Plan Development Process. In this case, there is the possibility of cash-in-lieu in the form of an impact fee at the City's discretion. Any access improvements to the frontage road will be consistent with the ACP. (Private Funding)
2. The City or CDOT obtain funding to complete improvements to a segment of the US 50 corridor or a local route. (Public Funding)
3. A safety or operational issue develops that can be mitigated through the implementation of access management techniques consistent with the Access Plan. Depending on the extent and type of safety or operational issue, improvements may address a segment of the US 50 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)

To provide for continued commitment to the access modifications identified by this study, it is recommended that the City and CDOT execute an IGA to adopt this Plan as an ACP for the segment of US 50 between 15th Street (MP 279.2) and the Holy Cross Abbey (MP 280.7). 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. The Draft IGA, the ACP Table that will serve as Exhibit A, and the amendment process that will serve as Exhibit B are presented in Appendix F.

1.0 INTRODUCTION

1.1 Project Background

US 50 is an important regional and local transportation route for Cañon City and the State of Colorado. As one of a few major east-west routes in Colorado, it spans from the Utah border to the Kansas border across the lower middle portion of the state. It passes through 10 different counties serving larger cities, such as Pueblo and Grand Junction, and smaller cities and towns, including Cañon City. US 50 is used not only by residents for local travel but also by tourists stopping in Cañon City or passing through, bound for one of many other scenic destinations along the highway.

In 2015, Cañon City set forth their US 50 Corridor Plan outlining public realm improvements to the corridor and private realm strategies to support economic vitality, property reinvestment/redevelopment, and the creation of a unique segment of the corridor. The plan's primary goal of improving the traveling experience in Cañon City involves the following components: creating new multi-modal facilities, enhancing the aesthetics of the corridor, establishing a community identity, stimulating economic growth along the corridor, and increasing safety of the traveling public. Their plan defines Cañon City as the "Gateway to the Authentic West", a term coined in the 2014 Cañon City Vision Report. US 50 is described as the front door leading into this "Gateway", thus, highlighting the importance of enhancing the US 50 corridor. The US 50 Corridor Plan was adopted by City Council in August 2015.

Four separate geographical zones are defined in the plan: the Western Gateway District, the Downtown District, the East Cañon District, and the Eastern Gateway District. Each zone has unique characteristics and individualized future design plans. The East Cañon District encompasses the area from 15th Street to Four Mile Creek, a length of approximately 2.3 miles. The plan for this district is to transform the US 50 corridor into a parkway facility with median separated facility on US 50 and shared use paths on either side of the highway. One of the key components needed to achieve this transformation is the removal of Fremont Drive, a frontage road that runs along the north side of US 50. This will affect how the properties that currently access the frontage road will gain access to the public road system.

Fremont Drive is currently under Colorado Department of Transportation (CDOT) ownership and control. To implement the US 50 Corridor Plan, Fremont Drive must be devolved, transferring ownership and control of the frontage road to Cañon City. In order for the CDOT to devolve Fremont Drive to Cañon City, the adoption of an ACP is required to define how properties accessing the existing frontage road will gain access to the public road system when the US 50 Corridor Plan is implemented. The City and CDOT have partnered to develop an ACP from Mile Post (MP) 279.2 (15th Street) to MP 280.7 (Holy Cross Abbey access) that addresses access within the current corridor configuration, while remaining compatible with the goals of the Corridor Plan. To create a point of reference, a control point was established at 15th Street based on the CDOT Highway Segment Description Table. The access point locations are determined based on this control point. The Vicinity Map in Figure 1 shows the study limits.

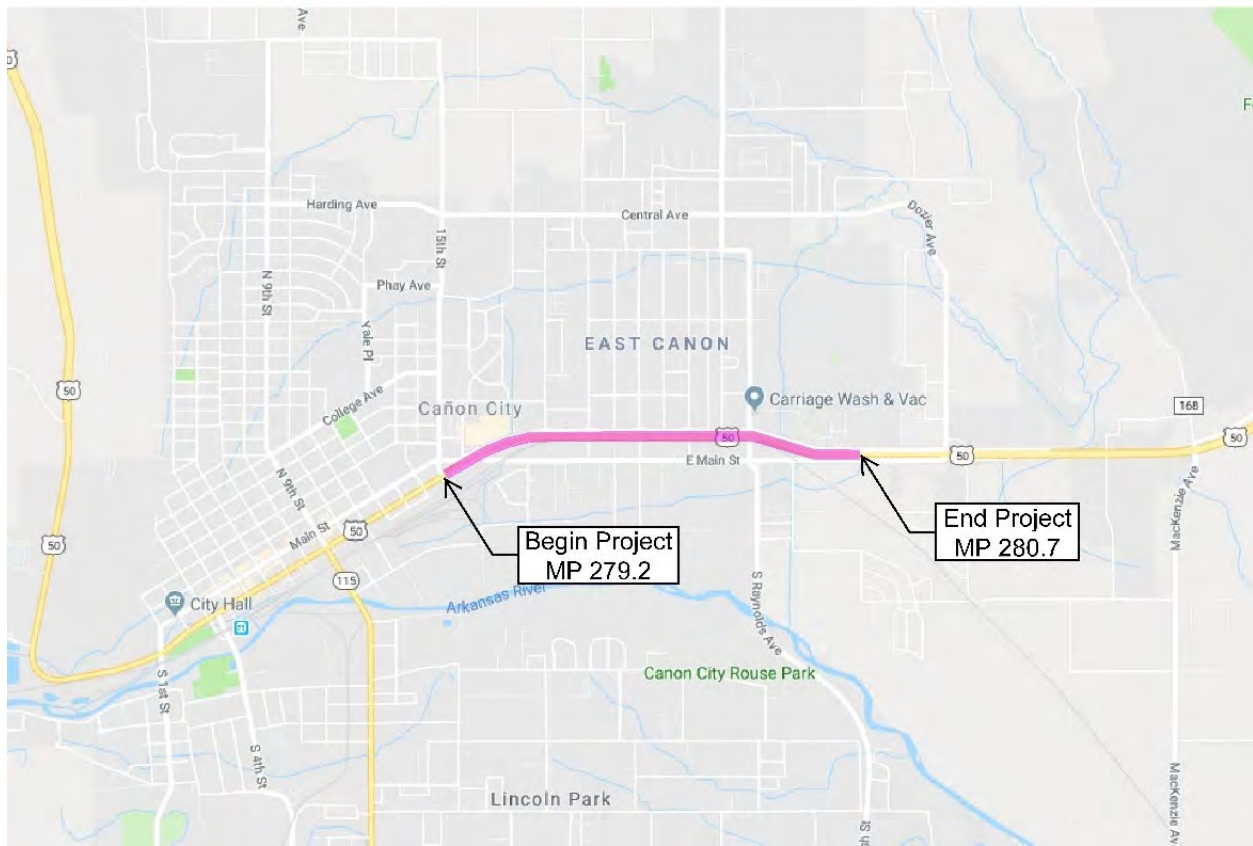


Figure 1. Vicinity Map

This study effort coordinates anticipated growth in the area with the roadway network. In consultation with the project partners, the following project goals were established:

- Provide effective and efficient travel for traffic on US 50.
- Provide safe, effective, and efficient access to and from US 50 for businesses, residents, and guests.
- Maintain compatibility with existing and proposed off-system connections that provide local circulation to support the transportation system.
- Provide a plan that is adoptable by all entities and can be implemented in phases.
- Support the economic viability of the project area.
- Maintain compatibility with previous and ongoing local planning efforts.
- Support multi-modal transportation.

This report summarizes the study process, analyses, findings, and recommendations for access modifications within the US 50 corridor.

1.2 Public Involvement

The study is a joint partnership between the City of Cañon City and CDOT Region 2. Input from corridor stakeholders, including property owners, tenants, developers, and the general public, was a critical element of the project. Multiple techniques were used to engage stakeholders, including two advertised public open houses, one-on-one meetings/phone calls with interested stakeholders, public presentations with City Council, and project information posted on the City's website and in the City Hall lower lobby.

Two advertised project-specific public open houses were held to present and discuss the recommended Draft Access Plan for US 50, review access management principles and techniques, and gather public input on the draft plans. The first meeting was held on April 26, 2018 and the second meeting was held on August 16, 2018, both at City Hall. Corridor property owners and business owners, and local government representatives were invited to the Open House by first class mail or personal delivery.

To inform the general public of the Open Houses, the following notices were provided prior to each:

- an invitation was included on the City's website,
- a legal public notice was posted in the Cañon City Daily Record, the City's legal notice paper, and
- an advertisement was published in the Cañon City Daily Record

Exhibits presenting access management principles, the study process, and the recommended draft Access Plan were displayed at all Public Open Houses. The same exhibits were also available for review on the City's website. Representatives from the City, CDOT, and consultant team were available for questions and discussion at all Open Houses. Fifty-nine (59) people signed in at the April 2018 Open House, and sixty (60) people signed in at the August 2018 Open House.

Following the April 2018 Public Open House, CDOT and City representatives held 26 one-on-one meetings with corridor property owners and other interested parties. Face-to-face meetings were held on May 7, 8, and 9, 2018. Additional meetings were held on May 21st and 22nd. Sign-up for one-on-one meetings was available at the April Open House and directly through City staff. At the August 2018 Public Open House, corridor owners had the opportunity to sign up for a follow-up one-on-one meeting. One meeting was held on August 29th.

Public comments were accepted at all public outreach events and via e-mail throughout the project. Open House sign-in sheets and comment sheets, as well as a list of one-on-one meeting participants, can be found in Appendix A.

City staff updated and engaged the City Council on project progress and development on multiple occasions. A presentation by the project team was also made at the regularly scheduled City Council meeting on March 21, 2018. The final presentation to City Council is anticipated for plan adoption at the scheduled meeting on October 15, 2018.

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 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, although local governments often consider off-network improvements for their communities in conjunction with an ACP. The Plan is a long-range planning document that identifies access conditions that will be implemented as highway and land-use characteristics change. ACPs for State Highways are adopted by CDOT and the local authorities through an 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:

- Improves safety
 - Fewer decision points and less conflict potential for motorists, cyclists, and pedestrians result in a reduced number of crashes.
 - Safe access to businesses is provided.
- Increases 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.
 - Congestion is reduced, lessening travel times and discouraging through 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.
 - Reduced congestion results in less air pollution.
- 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 local traffic to access local amenities without using the highway, thereby providing both convenient local access and circulation and reduced volumes on the highway.
- Enhances corridor appearance
 - Businesses are easily located.
 - Well-defined access points with suitable spacing provide 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 Access Plan for US 50:

- 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 in Figure 2 below.

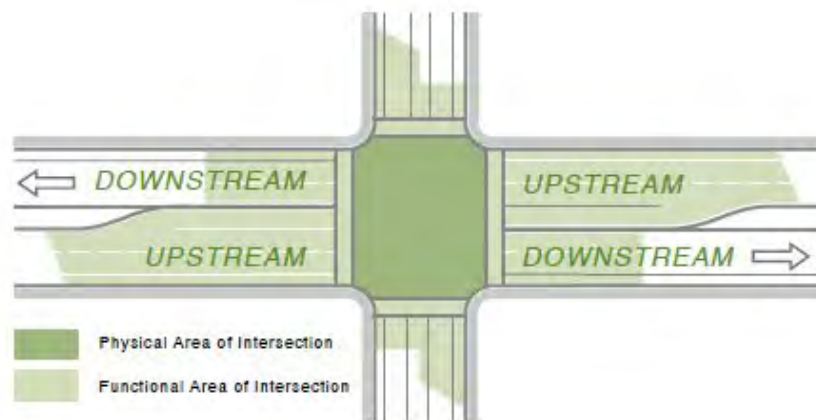


Figure 2. Functional Intersection Area

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. Given the urban character of US 50 through Cañon City, decision sight distance was used for this corridor. Providing decision sight distance allows drivers to pass through an intersection before

considering potential conflicts at the next intersection. The functional intersection area depends on the speed of the segment and the number of projected turning vehicles.

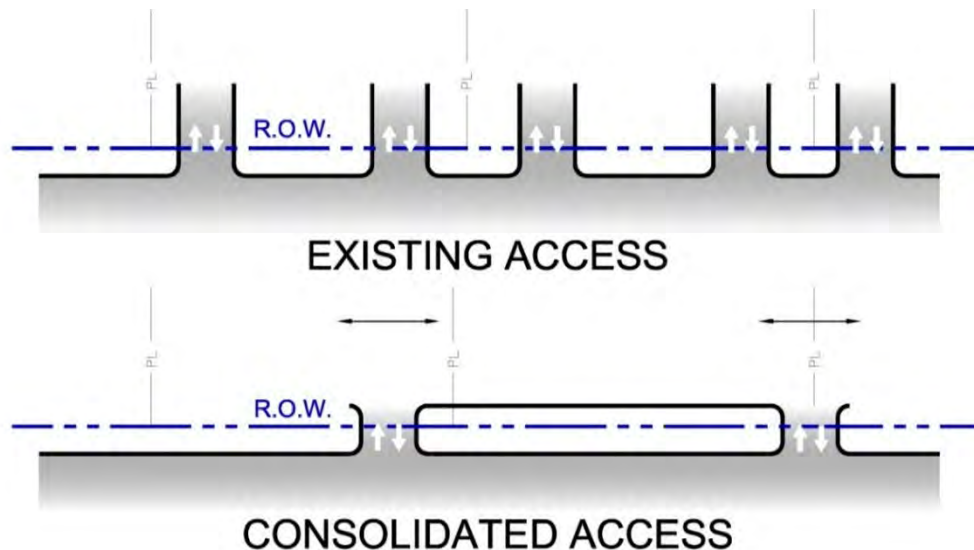
Conflict points exist where vehicles cross, merge, or diverge with one another and reduction of these areas is another primary reason to implement access management. At a standard four-way intersection, 32 vehicle-to-vehicle conflict points exist and each represents a potential collision. Reduction of the conflict points at an intersection limits the complexity of the driving environment, resulting in greater safety.

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 50.

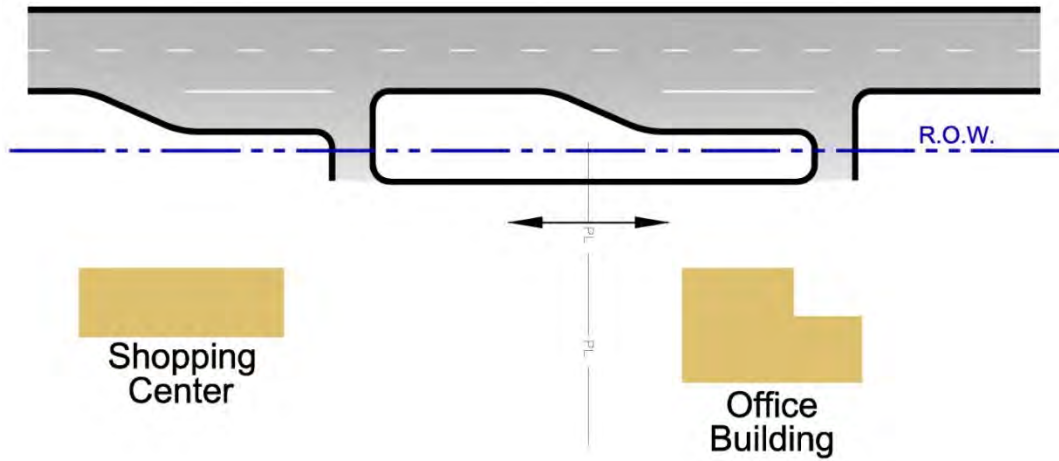
Principle: Limit the number of direct access points to major roadways

Technique: Consolidate Access

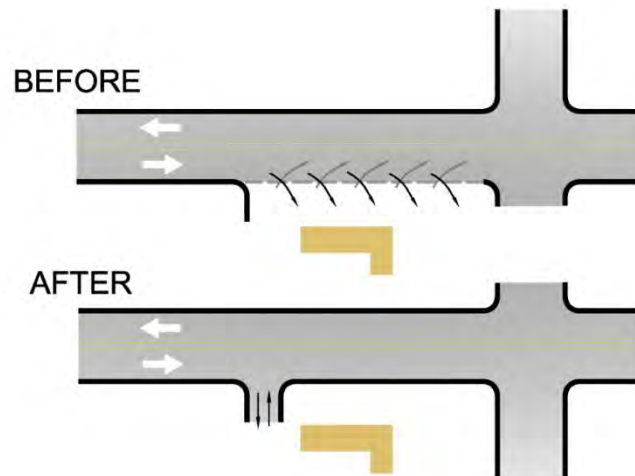


Consolidate access points by:

- *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

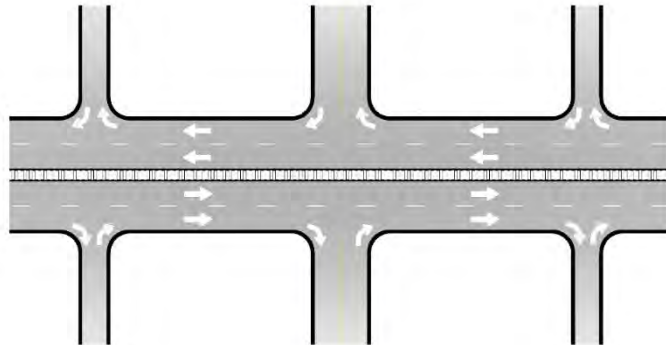
Connect adjacent properties to provide circulation between properties and increase access opportunities for multiple properties.

Technique: Define Driveways

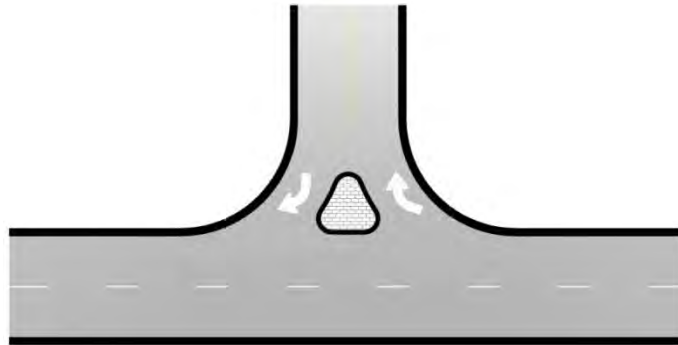
Define driveways to provide clear identification of entrance and exit locations.

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

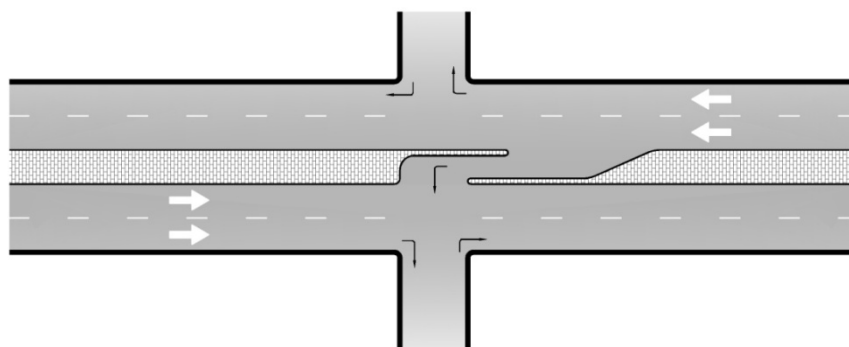
Technique: Install Medians and Islands



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



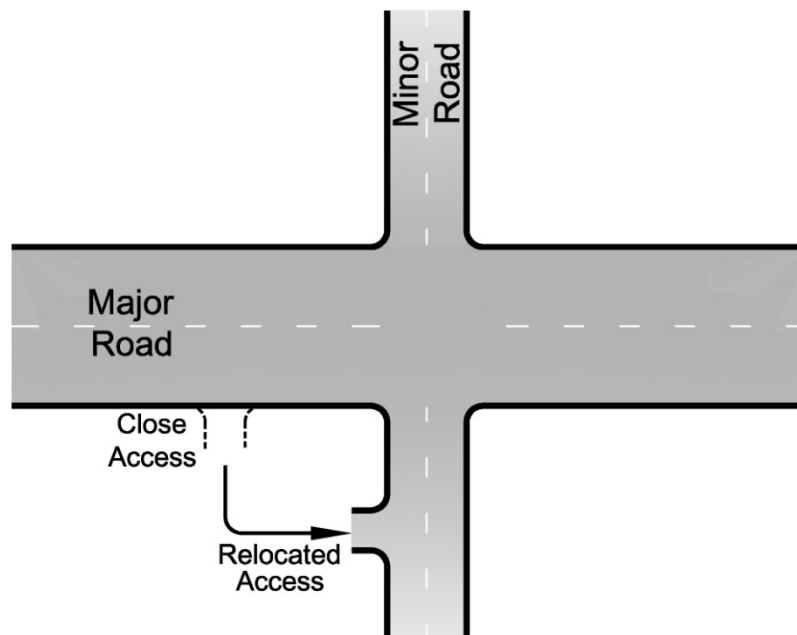
Right-in/right-out with channelizing island eliminates left-turn movements at specific locations.



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 1.5 miles of US 50 within Cañon City, Colorado. In general, land use within the city limits is largely residential. However, within the study area, land use is primarily commercial. This is consistent with the zoning. Out of the 12 zone districts in the city, the study area is fully zoned as C-General Commercial. A handful of larger commercial uses exist on the west side of the corridor including City Market, Walgreens, and a few shopping centers. The majority of the corridor consists of relatively small lots with commercial uses including retail and food establishments. The east end of the corridor has the most undeveloped land adjacent to the Holy Cross Abbey.

South of US 50 through this segment lies the Tennessee Pass railroad tracks currently operated by Union Pacific. The tracks limit public street access between US 50 and E Main Street, but at-grade crossings exist at Orchard Avenue, Cottonwood Avenue, Greydene Avenue, and Raynolds Avenue. All of the crossings include gates to prevent traffic from crossing the tracks when a train is present.

3.2 Roadway Characteristics

The posted speed limit on US 50 within the study area ranges from 30 mph to 45 mph from 15th Street to the Abbey access. The information summarized in Table 1 and Table 2 reflects the speed limits currently posted and used to evaluate access configurations.

TABLE 1. EASTBOUND SPEED LIMITS

Approximate Milepost Limits	Approximate Location	Eastbound Speed Limit (mph)
279.20 - 279.49	15 th St to ¼ mile east of 15 th St	30
279.49 - 280.70	¼ mile east of 15 th St to the Abbey access	45

TABLE 2. WESTBOUND SPEED LIMITS

Approximate Milepost Limits	Approximate Location	Westbound Speed Limit (mph)
280.70 - 279.54	The Abbey access to ¼ mile west of Orchard Ave	45
279.54 - 279.31	¼ mile west of Orchard Ave to 0.1 mile east of 15 th St	35
279.31 - 279.20	0.1 mile east of 15 th St to 15 th St	30

The horizontal alignment of US 50 within the study area runs east/west. The horizontal alignment begins with a curve from 15th Street to 19th Street, leading into a tangent section up to Raynolds Avenue, and ends with a reverse curve from Raynolds Avenue to the Abbey access. The vertical alignment along this segment of US 50 is relatively flat. There are no locations with steep grades.

The roadway cross section on US 50 remains fairly consistent throughout the study area. It includes the following components:

- Two 12-foot through lanes in the eastbound and westbound directions
- Center median (either striped, flush, or raised) varying in width that provides space for left-turn deceleration lanes for:
 - Southbound 15th Street
 - Rainbow Drive
 - Northbound/Southbound Orchard Avenue
 - Southbound Cottonwood Avenue
 - Southbound Greydene Avenue
 - Northbound/Southbound Raynolds Avenue
 - Holy Cross Abbey access
- Right-turn acceleration/deceleration auxiliary lanes in the eastbound and westbound directions
 - Rainbow Drive to the Abbey access
 - A short right-turn deceleration lane for northbound 15th Street
- 2-foot to 4-foot outside shoulders.
 - Curb and gutter exists eastbound from 15th Street to Rainbow Drive and westbound from 15th Street to approximately ¼ mile east of 15th Street
- Frontage road (Fremont Drive) along north side of US 50
 - Typically 24 feet wide
 - Guardrail is placed between US 50 and Fremont Drive from approximately ¼ mile east of 15th Street to Raynolds Avenue
 - Auxiliary lanes at Orchard, Greydene and Raynolds
 - Traffic signals located at Orchard and Raynolds are clustered with US 50 traffic signals
- Frontage road (Rainbow Drive) along the south side of US 50
 - Typically 32 feet wide
 - A raised median separates US 50 and Rainbow Drive
 - Extends approximately 1/3 mile east of 15th Street

The US 50 Corridor Plan for the East Cañon District proposes the following cross-sectional components:

- Two through lanes in the eastbound and westbound directions, one 11-foot wide lane and one 12-foot wide lane
- Raised 28-foot wide center median
- 12-foot wide right-turn acceleration/deceleration auxiliary lanes in the eastbound and westbound directions
- Curb and gutter in the eastbound and westbound directions
- Multi-use path along both sides of US 50
- Elimination of Fremont Drive

Figure 3 below shows the proposed typical section for the US 50 Corridor Plan.



Figure 3. US 50 Corridor Plan East Cañon District Typical Section

3.3 Right-of-Way

The right-of-way (ROW) width within the study area is generally 175 feet and encompasses Fremont Drive, Rainbow Drive, and E Main Street, where adjacent. Where US 50 is adjacent to the Union Pacific railroad, the highway ROW abuts the railroad ROW. The ROW widens to approximately 220'-250' at the City Market parking lot and at some of the public road intersections including 19th Street, Orchard Avenue, Cottonwood Avenue, Greydene Avenue, Raynolds Avenue, and near the Abbey.

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 50 is categorized as Non-Rural Principal Highway (NR-A) for the study length. The frontage roads, Fremont Drive and Rainbow Drive, are categorized as Frontage Road (F-R).

According to Section 3.10 of the Access Code, the major access control characteristics of a highway segment under Category NR-A are as follows:

- Direct access subordinate to through traffic movements
- Capacity for medium to high speeds and medium to high traffic volumes
- One-half mile spacing for full movement intersections or minimum 35% signal progression efficiency
- One access granted per parcel if reasonable access cannot be obtained from local street system
- Three-quarter movements may be permitted if operations at adjacent full-movement intersections are improved and design standards are met

According to Section 3.13 of the Access Code, Category F-R prioritizes access needs over through traffic movements. One access shall be granted to each parcel if it does not create a significant safety problem or degrade operation. Although these requirements allow Category F-R roads to have more access than Category NR-A highways, the ACP was developed to be compatible with the US 50 Corridor Plan. Since the Corridor Plan proposes eliminating Fremont Drive, it is important to establish access that is consistent with the function and access category of US 50.

3.5 Existing Access Inventory

There are currently 60 total access points within the study area accessing US 50, Fremont Drive, and Rainbow Drive. US 50 contains 11 access points, Fremont Drive contains 44 access points, and Rainbow Drive contains 5 access points. Most of the accesses along US 50 are public streets with the exception of the Abbey access. Of the accesses on Fremont Drive, 7 are public streets, and 37 are private driveways. Two of the public street access points and the Abbey access intersect both US 50 and Fremont Drive, but were only accounted for in the US 50 access point totals. Rainbow Drive has one public street access and four driveway accesses.

Six of the access points on US 50 are signalized full movements, and five are unsignalized full movement or three-quarter movement. Fremont Drive consists of primarily unsignalized full movement accesses with the exception of two signalized full movement accesses that provide connections to US 50. All access points along the study corridor are either public streets or business accesses.

For the purposes of identifying the location of access points for this plan, a control point was established at the US 50/15th Street intersection based on the CDOT Highway Segment Description Table. All access points are located at the approximate centerline of the access (+/- 50 feet). A complete inventory of existing access points is provided in Appendix B.

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. Within the study area, PRS accesses are city streets that include the following:

- 15th Street
- Orchard Avenue
- Raynolds Avenue

Public Road Unsignalized (PRU) – Stop-controlled intersection providing direct access to a publicly owned roadway. The study area includes either full movement or three-quarter movement configurations at the following city streets:

- 16th Street
- Rainbow Drive
- 19th Street
- Diamond Avenue
- Cottonwood Avenue
- Del Rey Avenue
- Greydene Avenue
- Barrett Drive
- Field Avenue
- East Main Street

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.

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

US 50

- Public Road Signalized Accesses: 6
- Public Road Unsignalized Accesses: 4
- Business Accesses: 1

Fremont Drive

- Public Road Signalized Accesses: 2
- Public Road Unsignalized Accesses: 7
- Business Accesses: 37

Rainbow Drive

- Public Road Signalized Accesses: 0
- Public Road Unsignalized Accesses: 1
- Business Accesses: 4

3.6 Crash History

Crash data from January 1, 2012 to December 31, 2016 on US 50 and on Fremont Drive from MP 279.25 to 281.10 in Cañon City was reviewed. Crash data can be found in Appendix C.

3.6.1 Fremont Drive

A pattern of frequent (18) non-intersection, at driveway access, and/or parking lot crashes was noticed along an approximate ¼-mile stretch of Fremont Drive from 16th Street to 19th Street. These crashes were primarily eastbound rear end property damage only crashes. This pattern is expected given the current roadway geometry on Fremont Drive, specifically with the number of access points in such a short distance. For comparison, there were 17 relatively sporadically occurring non-intersection, at driveway access, and/or parking lot crashes from 19th Street to Dozier Avenue which is a stretch of highway that is nearly six times as long. To mitigate these

types of crashes, a left turn lane is typically recommended. However, given the physical constraints present along Fremont Drive, a left turn lane is not feasible.

Furthermore, there were 8 crashes in five years related to or at the intersection of Fremont Drive and 19th Street. Half of these crashes resulted in one or more injury, while the other half resulted in property damage only. Southbound traffic along 19th Street at this intersection is controlled by a stop sign, all other movements operate with no traffic control. Given this information, this intersection falls in the Level of Service of Safety (LOSS) IV category when examining both total crashes and injury and fatal only crashes. LOSS IV indicates there is a high potential for crash reduction.

3.6.2 US-50

Based on crash totals, the intersection of US-50 and Orchard Avenue shows a high potential for total crash reduction (LOSS IV) and a moderate to high potential for severe crash reduction (LOSS III). A pattern of frequent rear end crashes was found at this intersection (31 rear end crashes). These crashes were primarily in the eastbound or westbound direction, with a fairly even split between these two directions. It appears that most of these rear end crashes occur with no adverse weather, lighting, or other conditions. Traffic signal timing adjustments and/or coordination may help alleviate this crash pattern.

Similar patterns and conditions exist at the intersection of US-50 and Reynolds Avenue. This intersection shows a high potential for total crash reduction (LOSS IV) but only a low to moderate potential for severe crash reduction (LOSS II). As with US-50 and Orchard Avenue, the intersection of US-50 and Reynolds Avenue displayed a pattern of rear end crashes (26) and could also likely benefit from traffic signal timing adjustments and/or coordination.

4.0 EXISTING TRAFFIC ANALYSIS

The study area consists of 1.5 miles of US 50 in Cañon City, from MP 279.2 to MP 280.7, beginning west of the US 50 intersection with 15th Street and ending east of the Holy Cross Abbey driveway. The catalyst for this ACP is the proposed elimination of the existing frontage road (Fremont Drive) on the north side of US 50. This change would require multiple driveways and public streets, which currently have full-movement access to Fremont Drive, to directly access US 50. The focus of the traffic analyses will be to estimate the impact that full implementation of this change in access would have on US 50 intersection operations. Traffic operations were evaluated for the following three scenarios:

Existing: This scenario will use 2017 traffic volumes and roadway configurations.

2040 No Build: This scenario maintains the roadway configuration from the Existing scenario, but with 2040 projected volumes.

2040 ACP: This scenario analyzes the full build out of the ACP. It will incorporate the access consolidation and intersection configuration recommendations shown in the plan and reroutes the traffic accordingly.

4.1 Existing Traffic Volumes

A 2017 Synchro traffic model of the evening peak period was provided by CDOT. This model was created as part of routine signal re-timing and included information regarding the signal timings, turning movement volumes for the six signalized intersections on US 50 and Fremont Drive, the Rainbow Street/Main Street intersection, and 15th Street/Main Street roundabout. To supplement the peak hour information provided by CDOT, tube counts were collected by City staff over the period of four weekdays in December 2017. This data was collected at 23 locations along the segment, including the City streets and major driveways. A figure showing the exact location of the tube counts has been included in Appendix D.

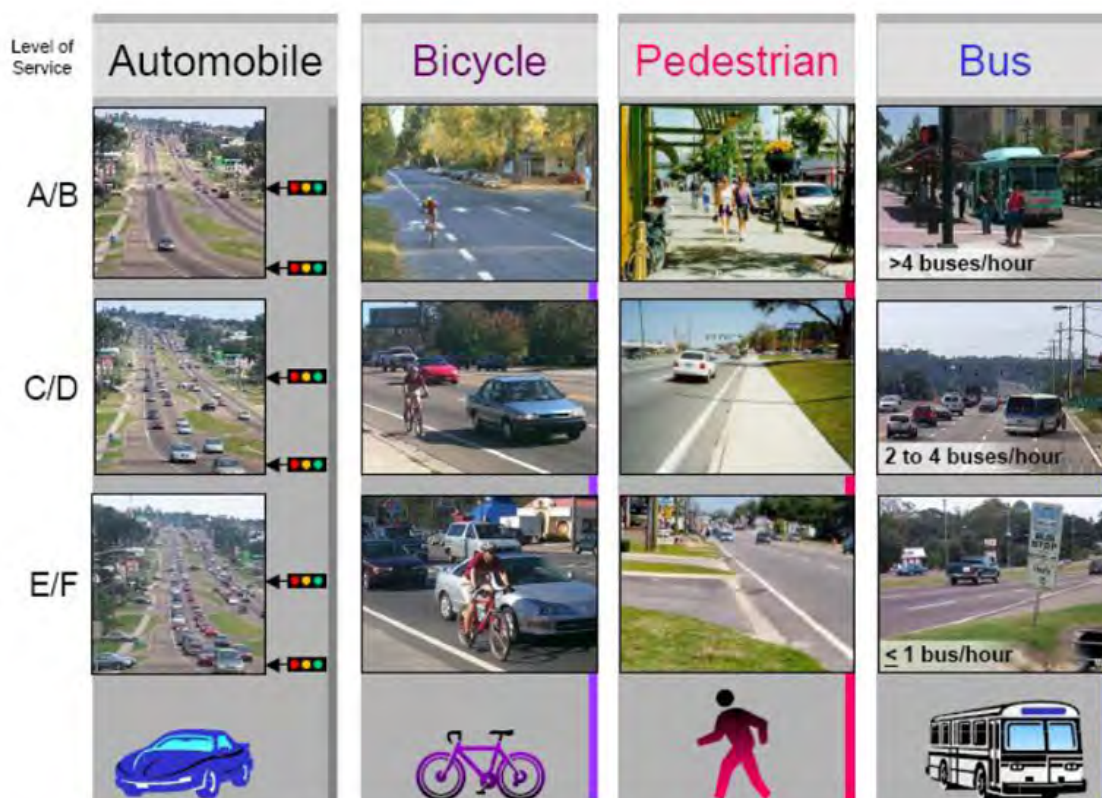
Since the Synchro model provided only gave volumes for the PM peak hour, the AM turning movement volumes were estimated based on the ratio between AM and PM volumes in the tube counts. The summer months in Cañon City typically see the highest traffic volumes, while the winter months typically experience below average volumes. Since the tube counts were taken in December, a seasonal factor was used to increase the volumes to a level more likely to be seen in the summer months.

The tube counts located immediately on either side of the signalized intersections were compared to the turning movement counts provided in the Synchro model. Based on the volume difference, it was determined that the seasonal adjustment factor should be 1.19. The tube counts were inflated by this factor. At the intersections where turning movements were not provided, the distribution between right, straight, and left movements were determined based on the receiving link volumes that had been collected during the tube counts.

The peak hours in the study area were determined to be from 7:30-8:30 AM and 4:15-5:15 PM. The original tube counts and 2017 volume figures are included in Appendix D.

4.2 LOS Criteria

Traffic analyses were conducted in accordance with procedures outlined in the *Highway Capacity Manual* and included intersection Level-of-Service (LOS). LOS is a measure of the quality of traffic flow and ranges from LOS A (nearly ideal traffic conditions with very little delay for motorists) to LOS F (poor traffic conditions with long motorist delays). LOS C is typically considered a “good” traffic condition. LOS D or better conditions are typically desirable during peak traffic periods; however, LOS E conditions are not uncommon. LOS F, although undesirable is also not uncommon for side street traffic movements at full movement, unsignalized intersections with high volume arterial roadways. Figure 4 illustrates examples of LOS for various modes of travel.



Source: FDOT Quality/Level of Service Handbook

Figure 4: Level-of-Service (LOS) by Mode for Urban Roadways

Table 3 provides a summary of the *Highway Capacity Manual's* LOS Criteria. This study area contains both signalized and unsignalized intersections.

TABLE 3: LOS CRITERIA

Level of Service (LOS)	Average Intersection Delay	Worst Movement		Traffic Characteristics
	Signalized Intersection (seconds/vehicle)	Roundabout (seconds/vehicle)	Unsignalized Intersection (seconds/vehicle)	
A	<= 10	<= 10	<= 10	Free Flow / Insignificant Delays
B	> 10 – 20	> 10 - 15	> 10 - 15	Stable Flow / Minimal Delays
C	> 20 – 35	>15 - 25	>15 - 25	Stable Flow / Acceptable Delays
D	> 35 – 55	>25 - 35	>25 - 35	Approaching Unstable / Tolerable Delays
E	> 55 – 80	> 35 - 50	> 35 - 50	Unstable Flow / Significant Delays
F	> 80	> 50	> 50	Forced Flow / Excessive Delays

Where an unsignalized intersection operates at LOS E or F, a volume-to-capacity ratio (v/c) has been reported for the worst-case movement. Where v/c exceeds 1.00, traffic demand during peak periods exceeds the capacity for the movement. This condition will cause queues to grow, potentially filling auxiliary lanes and blocking adjacent traffic lanes until demand decreases.

4.3 Existing Traffic Operations

Existing traffic operations were modelled using 2017 volumes and roadway geometry. The signal timings from the Synchro model provided by CDOT were used for the existing scenario models in this study. Table 4 shows the LOS and delay for the existing Synchro models. Currently, 15th Avenue, Orchard Avenue and Reynolds Avenue each have a clustered intersection with US-50 and Fremont Drive, meaning that the two intersections operate on the same signal controller. These intersections will be combined in the ACP scenario due to the elimination of Fremont Drive. In order to compare the vehicle delay for the cluster intersection to the single intersection in the ACP scenario, weighted average vehicle delay for each cluster intersection was calculated. These results are shown in the bottom three rows of the table.

TABLE 4: EXISTING LOS & DELAY

Unsignalized Intersection	AM		PM	
	Delay (sec)	LOS (v/c)	Delay (sec)	LOS (v/c)
15th St/Main St	9.5	A	37.2	E (.88)
Rainbow Dr/E Main St	12.1	B	12.4	B
US-50/Cottonwood Ave	8.9	A	9.6	A
US-50/Greydene Ave	8.9	A	9.6	A
US-50/Access to Abbey	27.5	D	36.5	E (.072)
16th St/Fremont Dr	13	B	23.7	C
City Market West/Fremont Dr	11.7	B	22.8	C
City Market East/Fremont Dr	10.3	B	13	B
19th St/Fremont Dr	11.5	B	16.5	C
Diamond Ave/Fremont Dr	9.7	A	10.1	B
Cottonwood Ave/Fremont Dr	9.9	A	10.3	B
Del Rey Ave/Fremont Dr	9.7	A	10.4	B
Greydene Ave/Fremont Dr	10.1	B	11.4	B
Barrett Dr/Fremont Dr	9.5	A	10.4	B
Field Ave/Fremont Dr	9.5	A	10.8	B
The Abbey/Fremont Dr	9.2	A	9.6	A
Signalized Intersection	AM		PM	
	Delay (sec)	LOS (v/c)	Delay (sec)	LOS (v/c)
15th St (US-50 & Rainbow Dr)	32.1	C	33.2	C
Orchard Ave (US-50 & Fremont Dr)	26.4	C	19.2	B
Raynolds Ave (US-50 & Fremont Dr)	32.5	C	33.6	C

All but two intersections operate at an acceptable LOS (LOS D or better). The exceptions are the intersections of 15th Street/ Main Street and US 50/ Abbey, which are both operating at LOS E in the PM. The intersection of US 50 & the Abbey access has a low V/C ratio, so its operations are not of concern. The westbound leg at 15th Street & Main Street, however, is approaching a V/C of 1.00, meaning that queuing could start to become a problem. Although several of the signalized intersections operate at LOS D, none of them are of concern in the existing scenario.

5.0 2040 NO BUILD TRAFFIC ANALYSIS

5.1 2040 No Build Traffic Demand

The growth rate for Cañon City was taken from the annual growth rate at the CDOT Online Transportation Information System (OTIS) count station at MP 279.37 on US 50. The growth rate is 0.9% per year, resulting in a growth factor of 1.23 over the period between 2017 and 2040. For the 2040 model, the 2017 volumes were inflated by this 1.23 factor while the heavy vehicle percentage and peak hour factor were kept the same. The volume figures for the 2040 No Build are included in Appendix D.

5.2 2040 No Build Delay and LOS

The roadway geometry in the 2040 No Build Synchro models was kept the same. The cycle lengths were retained, but splits were optimized. The LOS and delay are shown in Table 5.

TABLE 5: 2040 NO BUILD LOS & DELAY

Unsignalized Intersection	AM		PM	
	Delay (sec)	LOS (v/c)	Delay (sec)	LOS (v/c)
15th St/Main St	14.1	B	65.1	F (1.03)
Rainbow Dr/E Main St	13	B	13.6	B
US-50/Cottonwood Ave	9.5	A	10.4	B
US-50/Greydene Ave	9.5	A	10.4	B
US-50/Access to Abbey	40.9	E (.082)	61.1	F (.14)
16th St/Fremont Dr	14.7	B	35.3	E (.20)
City Market West/Fremont Dr	13.3	B	54.8	F (.83)
City Market East/Fremont Dr	10.9	B	15.1	C
19th St/Fremont Dr	12.6	B	21.4	C
Diamond Ave/Fremont Dr	10.1	B	10.7	B
Cottonwood Ave/Fremont Dr	10.4	B	11	B
Del Rey Ave/Fremont Dr	10.1	B	11.1	B
Greydene Ave/Fremont Dr	10.5	B	12.4	B
Barrett Dr/Fremont Dr	9.8	A	11.2	B
Field Ave/Fremont Dr	9.9	A	11.7	B
The Abbey/Fremont Dr	9.3	A	9.9	A
Signalized Intersection	AM		PM	
	Delay (sec)	LOS (v/c)	Delay (sec)	LOS (v/c)
15th St (US-50 & Rainbow Dr)	33.5	C	37.9	D
Orchard Ave (US-50 & Fremont Dr)	26.0	C	19.6	B
Raynolds Ave (US-50 & Fremont Dr)	33.9	C	37.6	D

With no change to the existing conditions, all of the signalized intersections are still expected to operate at LOS D or better in 2040. The delays at the 15th Street/ Main Street and US 50/ Abbey intersections are expected to degrade to LOS F. The V/C of the westbound movement at 15th Street/ Main Street is expected to be over 1.00, meaning that queueing will likely become problematic. The intersections of Fremont Drive with 16th Street and City Market (west driveway) are expected to operate at unacceptable LOS. Since the V/C at 16th Street is low, the need to mitigate traffic operations is unlikely. V/C at the City Market driveway is high and may push drivers to driveways with more capacity, if available.

6.0 2040 ACP TRAFFIC ANALYSIS

6.1 Traffic Volumes

The total number of trips entering and exiting the system will remain the same as in the 2040 No Build scenario. The peak hour factor was assumed to be 0.96. Based on existing heavy vehicle percentages, the heavy vehicle percentage was set to 8% along US 50 and 3% on side streets.

6.2 Trip Rerouting

Major geometric changes in the ACP scenario cause intersections to be reconfigured or eliminated and trips to be rerouted in the Synchro models. These changes and the effects on the trip routes are summarized below.

Removal of Fremont Drive

Fremont Drive will be removed from the entire length of the study area. This means that the vehicles currently accessing side streets or store front parking lots via the frontage road will have to use US 50 to reach their destination. As a result, all of the frontage road trips were initially added to US 50. Once changes are made to the side street intersections and access points, many of the trips rerouted from the frontage road to US 50 will be rerouted onto local streets, as discussed below.

Rerouted Side Street Movements

In the ACP scenario, the majority of the unsignalized side streets will only allow rights in and out. Left-in movements will be allowed in one direction at the Cottonwood Avenue and Greydene Avenue intersections. At those streets and driveways without left turn access, drivers will make a U-turn or circulate around on the local streets.

Eastbound traffic can make U-turns at the Orchard Avenue, Greydene Avenue, and Raynolds Avenue intersections. Westbound traffic can make U-turns at Cottonwood Avenue and Orchard Avenue. The percentage of trips making U-turns rather than circulating on local streets was estimated based on how long each of the routes would take for a vehicle. The farther out of the way a driver is forced to travel to make a U-turn, the more likely that driver will circulate on local streets instead. Table 6 shows how each of the side street left turn movements were rerouted.

TABLE 6: REROUTED SIDE STREET LEFT TURN MOVEMENTS

Side Street	Entering Side Street		Exiting Side Street	
	U-Turn	Circulate	U-Turn	Circulate
16th St	0%	100%	0%	100%
City Market (West)	50%	50%	60%	40%
City Market (East)	50%	50%	60%	40%
19th St	60%	40%	50%	50%
Diamond Ave	30%	70%	50%	50%
Cottonwood Ave	30%	70%	50%	50%
Del Rey Ave	30%	70%	50%	50%
Greydene Ave	70%	30%	70%	30%
Barrett Dr	60%	40%	70%	30%
Field Ave	50%	50%	70%	30%

Westbound traveling vehicles between 16th St and 19th Street are unable to make a U-turn at 15th Street due to space constraints. Instead, those vehicles will use E Main Street, which will be discussed in further detail below.

Restricting Access Points

In the existing conditions, many of the store parking lots have access points along Fremont Drive. With the ACP, most of these properties will access US 50 from adjacent city streets. As a result, the volumes entering and exiting the city streets will increase. Table 7 shows how the left turns in and out of the access points were rerouted.

TABLE 7: REROUTED ACCESS POINT LEFT TURN MOVEMENTS

Access Points Between Side Streets	Entering Access Point		Exiting Access Point	
	U-Turn	Circulate	U-Turn	Circulate
16th St-City Market West	50%	50%	80%	20%
City Market East-19th St	0%	100%	60%	40%
19th St-Orchard Ave	50%	50%	50%	50%
Orchard Ave-Diamond Ave	20%	80%	50%	50%
Diamond Ave-Cottonwood Ave	20%	80%	80%	20%
Cottonwood Ave-Del Rey Ave	30%	70%	80%	20%
Del Rey Ave-Greydene Ave	40%	60%	80%	20%
Greydene Ave-Barrett Dr	70%	30%	90%	10%
Field Ave-Raynolds Ave	80%	20%	20%	80%

Rerouting Rainbow Street

Although westbound traffic is unable to make a U-Turn at 15th Street, Rainbow Drive can serve this traffic in a similar manner by allowing re-entry to US 50 approximately a one-third mile east of 15th Street. With the ACP, Rainbow Drive will be closed with implementation of a new connection to E Main Street on the south side of the railroad tracks. Without Rainbow Drive, all

westbound traffic trying to head east will use the E Main Street connection to travel back to Orchard Avenue for re-entry to US 50.

City Market Parking Lot

There are currently two primary access points between the City Market parking lot and Fremont Drive. These will be combined into a single access point once Fremont Drive is removed. The City Market parking lot access point will be a $\frac{3}{4}$ movement, with the left-outs prohibited. When the private access points to Fremont Drive between 16th Street and 19th Street are closed and alternative legal access is available at the City Market parking access, the majority of vehicles that currently use Fremont Drive for access to these properties will use the City Market parking access. It was assumed that traffic leaving the City Market area for the east would either turn right on US 50 and circulate back to Orchard Avenue via Rainbow Drive or E Main Street, or circulate back to Orchard Avenue using local streets to the north.

6.3 Traffic Operations

The Synchro models incorporated all of the ACP changes, the signals were changed to standard phasing with 120 second cycles, and the splits were optimized. At unsignalized intersections and driveways, it was assumed that right turns would be stop controlled despite the presence of an auxiliary lane that allows free-right turns. The Synchro results are shown in Table 8.

TABLE 8: 2040 ACP LOS & DELAY

Unsignalized Intersection	AM		PM	
	Delay (sec)	LOS (v/c)	Delay (sec)	LOS (v/c)
15th St/Main St	9.9	A	25.1	D
The Abbey/Fremont Dr	8.6	A	8.6	A
US-50/City Market	18.5	C	49.9	E (.90)
US-50/City Market (Free SBR)	12.4	B	22.8	C
US-50/19th St	14.1	B	19.9	C
US-50/Diamond Ave	13	B	16	C
US-50/Cottonwood Ave	20.8	C	47.8	E (.57)
US-50/Del Rey Ave	13.8	B	17.9	C
US-50/Greydene Ave	18.8	C	43.3	E (.49)
US-50/Barrett Dr	12.6	B	14.8	B
US-50/Field Ave	13.5	B	16.7	C
US-50/Access to Abbey	13.8	B	16.1	C
Signalized Intersection	AM		PM	
	Delay (sec)	LOS (v/c)	Delay (sec)	LOS (v/c)
US-50/15th St	25.6	C	42.5	D
US-50/Orchard Ave	19.1	B	38	D
US-50/Raynolds Ave	22.9	C	23.7	C

When modeled as a stop-controlled movement, the right turn out of City Market is expected to operate at a LOS E. However, the intersection LOS improves to acceptable levels if the intersection is modelled as the proposed free right turn movement. Left/u-turn traffic at Cottonwood Avenue and Greydene Avenue is expected to operate at LOS E in the evening peak hour. Gaps created by signal operations and Orchard Avenue and Reynolds Avenue are not included in this model, but will likely improve operations for the turn movements. If delays are too long or if drivers are uncomfortable making u-turns, they may also circulate on city streets back to the signalized intersections where sufficient capacity still exists.

All of the signalized intersections are expected to operate at an acceptable LOS. The roundabout at 15th Street & Main Street, which operated at LOS F in the 2040 No Build scenario, is expected to be at LOS D in the 2040 ACP scenario. To summarize the findings,

6.4 Auxiliary Lanes

Due to the reconfiguring of intersections and increased volumes, it was necessary to reevaluate the lengths of the auxiliary lanes at each intersection. The State Highway Access Code (SHAC) NR-A highways was used to determine which turning movements are forecasted to be high enough in the 2040 project scenario to warrant a turn lane.

At the posted speed limit of 45 mph present through most of the corridor, the SHAC prescribed deceleration length is 435 feet and acceleration length is 550 feet. At the 30-mph speed limit found at the west end of the study area, the deceleration length is 250 feet. Table 9 shows the required length for the left turn deceleration lanes. Given the locations of left turn lanes proposed in the ACP, sufficient length is available for back-to-back left turn lanes of standard length.

TABLE 9: LEFT TURN DECELERATION LANES

US 50 Intersection	Lane	SHAC Decel Length	Recommended Auxiliary Lane Length
15th St	WBL	250	500
City Market	EBL	250	560
Orchard Ave	EBL	435	810
	WBL	435	540
Cottonwood Ave	WBL	435	540
Greydene Ave	EBL	435	510
Reynolds Ave	EBL	435	540
	WBL	435	510

6.5 Summary of 2040 Traffic Operations

A comparison of projected traffic demands in 2040 shows that in both the No Build or ACP scenarios, traffic operations at major intersections will remain at acceptable levels. Some minor intersections/driveways may operate at unacceptable levels, but in most locations, traffic may shift to other routes if delays for a particular turn movement are too long. In the No Build scenario, operations at the 15th Street/Main Street roundabout will degrade below acceptable levels and may begin to impact traffic on US 50 if improvements are not made. The ACP scenario assumes that more local traffic uses City streets to circulate back to full movement intersections. However, none of the intersections in the ACP scenario are expected to require significant improvement to accommodate future traffic demands.

7.0 ACCESS PLAN DEVELOPMENT AND EVALUATION

Using the traffic volume forecasts, input from the City, CDOT, and the public outreach program, and guidance from the SHAC, an Access Plan was developed for the project. This Plan considers access points in logical groupings, as well as circulation opportunities via existing and potential future local streets.

7.1 Process

The Access Plan was developed using a 4-step process:

7.1.1 Step One – Methodology & Compatibility Index

A traffic methodology and access plan 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 Access Plan 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 Appendix D and the access plan methodology memo and compatibility index can be found in Appendix E.

7.1.2 Step Two – Development of the Access Plan

The existing inventory of access points was reviewed with existing parcel and ownership information. This review determined which parcels adjacent to US 50 lacked access to the highway, which parcels access would be affected by eliminating Fremont Drive, which parcels had multiple accesses to consider for consolidation, and which parcels had access or potential access to an existing or proposed local street. 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 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 access per ownership. Shared access between parcels was developed, wherever feasible.

7.1.3 Step Three – Refine the Access Plan

A draft access plan was presented to an internal review team consisting of City and CDOT representatives. Based on comments received from the team, the draft plan was refined and presented to City Council and at the first Public Open House. Public comment was reviewed and the Plan was modified at several points throughout the project, as appropriate. Improvements 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.

7.1.4 Step Four – Evaluation

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

7.2 Evaluation Results

The results of the evaluation by objective are listed in Table 10. Overall, the Access Plan rates favorably and is compatible with project goals. The results show that the ACP will support the implementation of the City's US 50 Corridor Plan without significantly impacting operations on US 50 and will provide safe and effective access and circulation for through and local traffic. Plan adoption by the City and CDOT is recommended. Details of the Plan evaluation can be found in Appendix E. A graphical representation of the Access Plan is located in Section 8.

TABLE 10. COMPATIBILITY EVALUATION SUMMARY

Project Goal	Evaluation Criteria	Rating
Provide effective and efficient through travel for traffic on US 50.	Corridor Travel Time	Neutral
	Functional Intersection Area	Neutral
	Number of Access Points	Unfavorable
Provide safe, effective, and efficient access to and from US 50 for businesses, residents and guests.	Intersection Level of Service (LOS)	Neutral
	Out of Direction Travel Distance	Unfavorable
	Intersection Crash Risk	Favorable
Maintain compatibility with existing and proposed off-system connections that provide local circulation to support the transportation system.	Local Route Connectivity	Favorable
	Local Street Traffic	Neutral
	Serviceability of Local Routes to Developments and Properties within the Study Area	Favorable
Provide a plan that is adoptable by all entities and can be implemented in phases	Public Support	Neutral
	Phasing Opportunities	Neutral
	Physical Constraints	Neutral
	Funding Opportunities	Neutral
Support the economic viability of the project area	Business Market Area	Favorable
Maintain compatibility with previous local planning efforts	Compatibility with Local Planning	Favorable
Support multi-modal transportation	Pedestrian/Bicycle Access	Favorable

8.0 PLAN RECOMMENDATIONS

This section presents details of the recommended ACP for the US 50 corridor in Cañon City's East Cañon District. The Plan has been developed with considerable participation from the City of Cañon City, CDOT, and the public. After evaluating both existing and future conditions, the Plan defines how each access will function in the future. The Plan limits full-movement access to major intersections that are spaced approximately one-half mile apart. This includes the three existing signalized intersections and a proposed intersection at the Abbey. Access to minor public streets is limited to right-in, right-out and three-quarter movements, thereby limiting opportunities to make left turns onto the highway to the signalized intersections. Drivers wanting to turn left onto the highway from minor streets have two alternate options. They can either use city streets to circulate back to signalized intersections or safely make U-turns at the signals or $\frac{3}{4}$ access points. Functional intersection area was considered in evaluating the spacing between major intersections and $\frac{3}{4}$ movements to provide adequate space to develop left turn lanes.

With the removal of Fremont Drive, the majority of properties will have their primary access point on a city street or, in some cases, have a new direct access point from US 50. Access to the highway is limited to one location per ownership. Where feasible, access will be shared between adjacent properties once a cross access easement is executed. Prior to any cross-access agreement, there will be conditional access points to temporarily serve those properties. In select locations, parking lot extensions or new driveway connections to city streets are proposed within existing right-of-way to provide better circulation where accesses are being consolidated or to eliminate the need for shared access points.

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. In support of the US 50 Corridor Plan and to avoid turn movement violations and potential enforcement issues, eventual installation of a raised or depressed median is recommended on US 50. During design, the design of the median should consider accommodation of emergency vehicle movements to minimize emergency response times.

The narratives in this section are intended to serve as a summary of the key features of the Access Plan. The figures are intended to provide a graphical representation of the Access Plan. 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 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 IGAs and Draft ACP Tables are located in Appendix F.

8.1 Access Plan

Key features of the Access Plan are summarized by segments below and illustrated in Figures 5A-5C following the narratives. Per the US 50 Corridor Plan cross section, the outer right lane in each direction of travel is designated as an auxiliary lane and runs continuously throughout the project area. Left-turn deceleration lanes are provided at full-movement and three-quarter access points and meet the criteria prescribed in the SHAC. Full movement intersections with

potential for future signalization or other traffic control have been identified as part of the Access Plan; however, the type of traffic control is not specified. Most of the full movement intersections are already signalized and will likely remain that way within the study period. However, 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 Manual on Uniform Traffic Control Devices (MUTCD). For full movement intersections that are not currently signalized, traffic signals may be implemented if and when warranted per current MUTCD standards and when funding is available.

15th Street to Orchard Avenue

A signalized, full-movement intersection will remain at US 50 and 15th Street. The lengths of the right-turn deceleration lane and left-turn deceleration lane for westbound traffic on US 50 should be increased to meet SHAC standards. Reduced width lanes are needed at the intersection to attain the desired highway section while maintaining alignment with the west side until Rainbow Drive is eliminated. Once Rainbow Drive is eliminated, full lane widths and the eastbound right turn auxiliary lane can be added.

On the north side of US 50 between 15th Street and 19th Street, there will be two private right-in/right-out access points to US 50 at Access 5 and 10. A conditional right-in, right-out access is proposed at Access 5 (Walgreens). This access will include a driveway extending east to Access 6a along the existing frontage road alignment to provide access to the two properties east of Walgreens. A public street, subject to mutual acquisition of private land, is recommended to provide a connection between 16th Street and US 50. It will run through the City Market parking lot to Access 7 along the north side of Walgreens and the adjacent two parcels. Access to US 50 at Access 5 will be eliminated upon the construction of this public street and formalization of access to it from adjacent properties, or upon establishment of legal access easements between City Market and the three properties south of City Market.

Access 7 provides access to the City Market shopping center and will connect to the proposed public street described above. Due to high traffic demand into the shopping center, a three-quarter movement access point was deemed necessary to serve the eastbound traffic on US 50. This also provides eastbound traffic with an opportunity to make a U-turn on US 50.

Orchard Avenue will remain a full-movement, signalized intersection where U-turns are permitted. 19th Street will be a right-in/right-out. Between 19th Street and Orchard Avenue, there will be one right-in, right-out access at Access 20 (America's Best Value Inn & Suites). In order to maintain connectivity between parking areas, a drive aisle must be retained along the property frontage, unless redevelopment occurs. All other access points will be closed and relocated to city streets. In the short-term condition, a driveway connection to 19th Street along the existing frontage road is required to serve Access 17 (Old Mission Mexican Restaurant). When cross access agreements between the Old Mission property and the property to the west (Subway) are established, the drive aisle connection to 19th Street can be eliminated.

On the south side of US 50, establishment of a public street connection between 15th Street and E Main Street will allow for elimination of Rainbow Drive. Until this occurs, a conditional right-out only movement will be provided between Rainbow Drive and US 50, and access to Rainbow Drive from private properties will remain. In this interim condition, Rainbow Drive can serve U-turn movements at 15th Street since the cross-section on US 50 narrows and cannot fully accommodate the U-turn movement. Upon the elimination of Rainbow Drive, the existing E Main Street crossing of the railroad tracks will be eliminated and a right-in, right-out access point serving the properties on both sides of existing E Main Street will be established at Access 65.

Similarly, a shared right-in/right-out is provided at Access 63a to replace Accesses 63 and 64 and a right-in/right out will be provided at Access 66.

Orchard Avenue to Raynolds Avenue

Orchard Avenue and Raynolds Avenue will remain full-movement, signalized intersections where U-turns are permitted. All public road intersections between Orchard Avenue and Raynolds Avenue will be restricted to right-in/right-out access with the exception of Cottonwood Avenue and Greydene Avenue. Cottonwood Avenue will be $\frac{3}{4}$ movement to the south side of US 50 allowing for westbound lefts and U-turns. Greydene Avenue will be $\frac{3}{4}$ movement to the north side of US 50 allowing for eastbound lefts and U-turns.

All private driveways between Orchard Avenue and Raynolds Avenue will be closed and relocated to city streets except for Access 28. Access 28 will be a conditional right-in, right-out to serve the current Check Into Cash and Bunk House Burger, two parcels under the same ownership. Access 28 will remain until a cross access agreement is established with the parcel to the east, in which case the two businesses served by Access 28 will gain access via Diamond Avenue. Access 34 at Jimmy John's will have a conditional driveway along the frontage road connecting to Cottonwood Avenue and providing circulation for the drive-through. The connection to Cottonwood Avenue will be eliminated if a cross access agreement is established with the adjacent property to the east, but the drive-through extension will remain until the property redevelops. The properties currently served by Accesses 39 and 40 have an existing cross access agreement, allowing for a shared access to Del Rey Avenue. The property served by Access 51 will have a conditional city street access until a cross access agreement is established with the adjacent Burger King property, allowing the two properties to share accesses to both Field Avenue and Raynolds Avenue. In order to provide circulation for the Burger King drive-through, a drive aisle will be maintained along the frontage road until redevelopment occurs.

Raynolds Avenue to the Holy Cross Abbey

Raynolds Avenue will remain a full-movement, signalized intersection where U-turns are permitted. Access 59 is currently aligned with on-site Abbey roads and provides full movement access to US 50. Access 59 and the opposing Access 58 on the south side will be closed and a new full-movement intersection potential for signalization will be established at Access 60 and 61 along the east side of the Holy Cross Abbey campus to serve future development. Between this new intersection and Raynolds Avenue, two new right-in, right-out access points to US 50 at Access 57a and 57b are proposed to provide access to private properties. Lindner Chevrolet currently utilizes a portion of the adjacent Carriage Wash & Vac property located on the northeast corner of Raynolds Avenue. Both parcels are owned by the same family. A formalized cross access agreement between the properties on the northeast corner of Raynolds to facilitate access from Lindner Chevrolet to Raynolds Avenue should be established upon redevelopment.

btimbers 1:46:59 PM P:\1000.006.02 CDDT Canon City ACP\CAD\ACP_Canon City ACP_Sheet_01.dgn

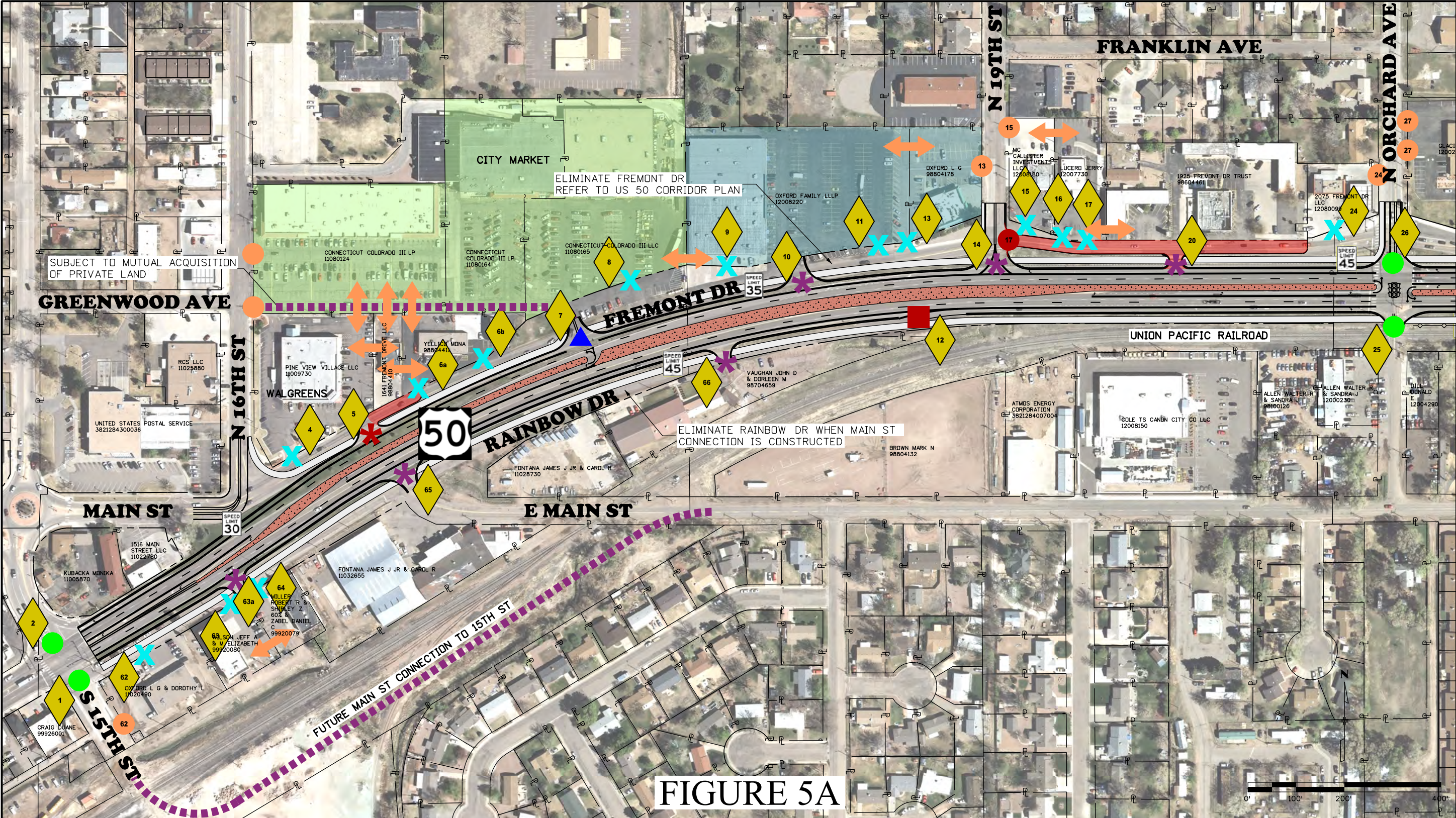


FIGURE 5A

CAÑON CITY US 50 ACCESS PLAN



Legend:

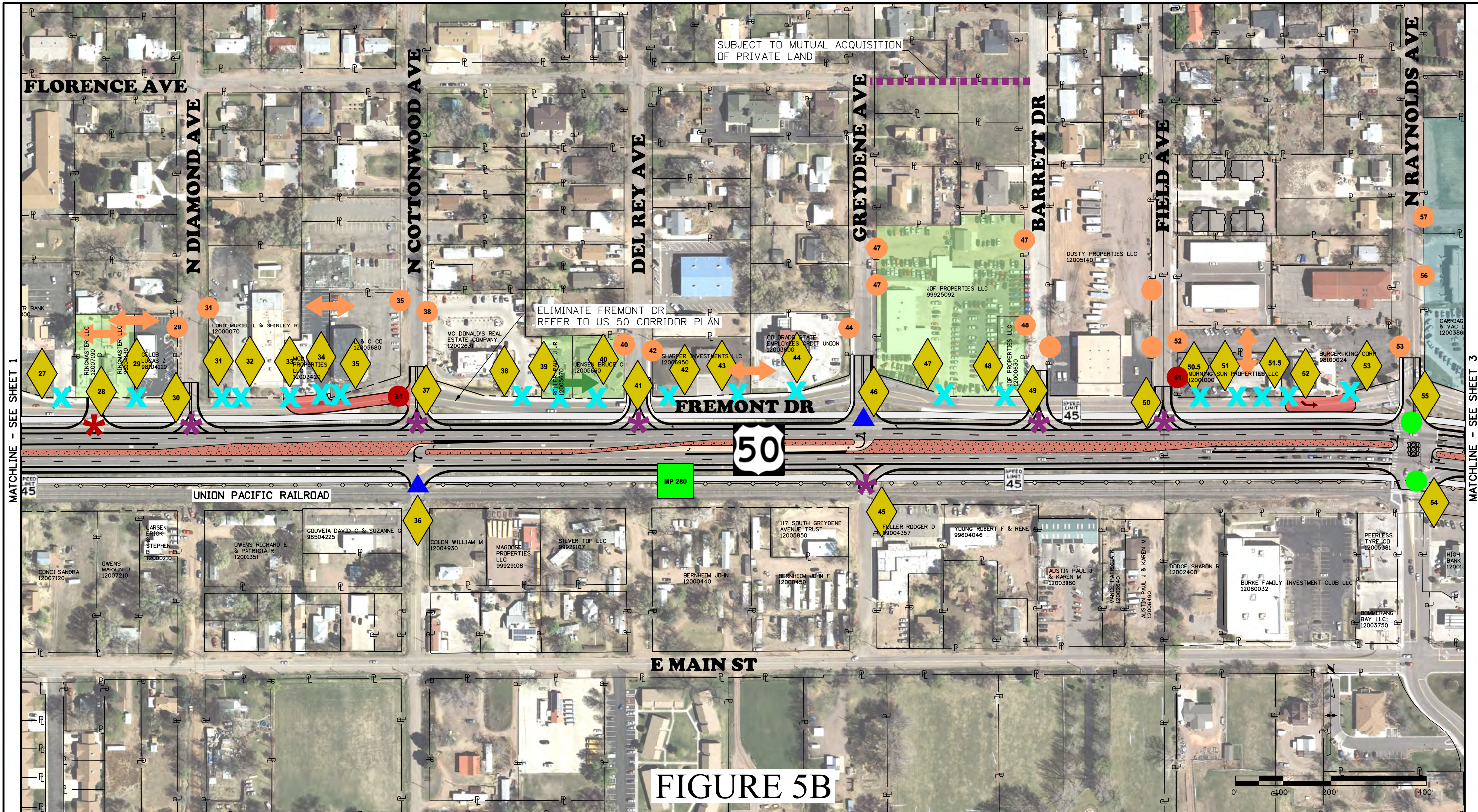
- | | | | |
|-------------------------------------|--|------------------------------|---|
| Access Point Identification Number | Proposed Cross Access for Shared Access Point | Proposed Street | Proposed Driveway/
Parking Lot Extension |
| Milepost | Existing Cross Access Agreement | Highway Right-of-Way | Owned by Same
Person/Company |
| Full Movement Access Point | Proposed Conditional City
Street Access Point | Property Line | Owned by Same
Family |
| City Street Access Point | Proposed Conditional
Right-In, Right-Out Access | Multi-Use Trail | |
| Close Existing Access Point | Proposed Conditional
Right-Out Only Access | Future Raised Median | |
| Proposed Right-In, Right-Out Access | | Left-Turn and U-Turn Allowed | |
| Proposed 3/4 Movement | | | |

MATCHLINE - SEE SHEET 2

btimbers 1:48:58 PM P:\1000.006.02 CDDT Canon City ACP\ACAD\ACP\Canon City ACP_Sheet_02.dgn

MATCHLINE - SEE SHEET 1

MATCHLINE - SEE SHEET 3



CAÑON CITY US 50 ACCESS PLAN



Legend:

- Access Point Identification Number
- Milepost
- Full Movement Access Point
- City Street Access Point
- Close Existing Access Point
- Proposed Right-In, Right-Out Access
- Proposed 3/4 Movement

- Proposed Cross Access for Shared Access Point
- Existing Cross Access Agreement
- Proposed Conditional City Street Access Point
- Proposed Conditional Right-In, Right-Out Access
- Proposed Conditional Right-Out Only Access

- Proposed Street
- Highway Right-of-Way
- Property Line
- Multi-Use Trail
- Future Raised Median
- Left-Turn and U-Turn Allowed

Proposed Driveway/
Parking Lot Extension

Owned by Same
Person/Company

Owned by Same
Family

btimbers 1:50:59 PM P:\1000.006.02 CDDT Canon City ACP\CAD\ACP_Canon City ACP_Sheet_03.dgn

MATCHLINE - SEE SHEET 2



FIGURE 5C

CAÑON CITY US 50 ACCESS PLAN



Legend:

- Access Point Identification Number
- Milepost
- Full Movement Access Point
- City Street Access Point
- Close Existing Access Point
- Proposed Right-In, Right-Out Access
- Proposed $\frac{3}{4}$ Movement

- Proposed Cross Access for Shared Access Point
- Existing Cross Access Agreement
- Proposed Conditional City Street Access Point
- Proposed Conditional Right-In, Right-Out Access
- Proposed Conditional Right-Out Only Access

- Proposed Street
- Highway Right-of-Way
- Property Line
- Multi-Use Trail
- Future Raised Median
- Left-Turn and U-Turn Allowed

Proposed Driveway/
Parking Lot Extension

Owned by Same
Person/Company

Owned by Same
Family

8.2 Other Recommended Improvements

8.2.1 Alternative Local Routes

In support of the recommended access modifications, development of new alternative local routes is recommended. These alternative routes provide additional local connections and allow for elimination of existing frontage roads. The proposed local street connections are illustrated in the Figure 5 in Section 8.1. Detailed engineering will be required to establish exact alignments at the time of implementation.

The following additional routes have been identified in conjunction with the Access Plan:

1. *Extension of E Main Street to 15th Street* (Figure 5A)
This street will allow for elimination of the Rainbow Drive frontage road which currently connects 15th Street to E Main Street. Implementation challenges include acquiring ROW or easement from the railroad and crossing the tracks in two locations. Implementation allows for one existing railroad crossing to be eliminated.
2. *Extension of Greenwood Avenue east of 16th Street* (Figure 5A)
While the connection will exist functionally upon implementation of Access 7, a public street is desirable to serve the three properties sharing Access 5. Upon redevelopment of any of the affected properties that the proposed street serves, the City should consider requiring improvements that support this connection.
3. *Extension of Florence Avenue between Greydene Avenue and Barrett Drive* (Figure 5B)
This street will provide local circulation between Greydene Avenue and Barret Drive, which currently connect ¼ mile to the north at Cherry Street. Existing segments of Florence Avenue may require improvements to accommodate anticipated increases in local traffic.

The adoption of these additional road connections by the City through resolution or incorporation into master planning documents is recommended.

8.2.2 Alternate Modes

This access plan supports implementation of the US 50 Corridor Plan. The Corridor Plan calls for a multi-use path on both sides of the highway in areas where the existing frontage roads will be eliminated. By consolidating access through the corridor, the number of potential conflicts between vehicles and pedestrians and bicycles is reduced. It is noted that, typical of many urban environments, at grade crossing of public streets and driveways by the path will be required. Special treatments of the path crossings may be considered in the design phase.

8.2.3 Future Use of Frontage Road ROW

The US 50 Corridor Plan and ACP calls for the elimination of Fremont Drive and Rainbow Drive. With the frontage roads eliminated, opportunities to utilize this space for other public or private benefit emerge. Several locations have specifically been identified by the Access Plan as proposed driveway/parking lot extensions to provide additional access and circulation for existing land uses. Upon redevelopment, those areas may be repurposed for other uses as deemed appropriate by the City. Once the frontage roads are devolved, the City will obtain ownership of the associated ROW and will work with property owners on an individual basis to

determine the use of the ROW in front of individual properties. The City will have final determination of the future use of the ROW.

8.2.4 Design Considerations

Within the public involvement process, concerns were raised about the impacts of implementing the US 50 Corridor Plan. These concerns were considered and it was concluded that they should be incorporated into future design of the corridor rather than the Access Plan.

As noted in Section 6.2 of this report, it is expected that local traffic volumes will increase on City streets such as Franklin Avenue and Florence Avenue. Improvements to those streets including turn radii and resurfacing may be needed to better accommodate higher traffic demands. Improvements to segments of those City streets should be considered alongside their adjacent highway segments.

As mentioned in Section 8.0, limitations on emergency vehicle access was a concern to the community. Design of the raised median on US 50 should consider these emergency vehicles. Alternative emergency vehicle routes could also be considered.

Drainage structures exist between Fremont Drive and US 50 in several sections of the corridor. These drainage structures conflict with proposed accesses in some places. Design of the corridor will include improvements to the stormwater system that will be compatible with this Access Plan.

Businesses were concerned about delivery truck access with elimination of the frontage road. This issue is common in urban environments and should be considered in the design of individual access points. Delivery trucks may stop on City streets and the City may also establish specific delivery routes and times to accommodate these vehicles without impeding traffic.

9.0 IMPLEMENTATION

9.1 Conditions

Cañon City's US 50 Corridor Plan requires the implementation of an ACP. The improvements recommended in the ACP represent a long-range plan to implement over time in conjunction with the US 50 Corridor Plan. The US 50 Corridor Plan implementation process involves the following steps:

- Develop Corridor Plan
- Develop Access Control Plan
- Devolution of frontage roads
- Design
- ROW acquisition
- Construction.

In order for construction to occur, all previous steps must be completed. However, there is no obligation to move forward after a step is completed. Prior to the construction of the US 50 Corridor Plan, the following cases will trigger implementation of the ACP:

1. A property redevelops or changes use, resulting in an increase in traffic to and from the site of 20% or more or as required by the City's Site Plan Development Process. In this case, there is the possibility of cash-in-lieu in the form of an impact fee at the City's discretion. Any access improvements triggered by redevelopment will be consistent with the ACP. In addition, upon redevelopment, the City will require property owners to provide legally defined cross-access easements for shared access points, as defined by the Access Plan. If a property does not redevelop, the property owner will not be required to construct access modifications. (Private Funding).
2. Cañon City funds improvements to a segment of the US 50 corridor, frontage roads, or a local route. This may include implementation of a portion of the US 50 Corridor Plan. (Public Funding)
3. State and/or Federal Funding are obtained to complete improvements to a segment of the US 50 corridor. 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 on the highway or frontage roads 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 50 corridor, a local route, or an 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.

Under Case 1, a property owner must follow the access permit process as defined by Section 2 of the *SHAC, latest edition*. Cañon City will remain the issuing authority for US 50 with CDOT consent. 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 the City for review. A Notice to Proceed will be issued following acceptance of the Construction Documents by the City, thereby allowing the applicant to

proceed with construction. 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 may obtain funds either through local government budgeting, application for grant monies, or other potential funding sources. Once the ACP has been adopted by both Cañon City and CDOT, the devolution process to transfer frontage road control can begin. Once a segment is under City control and funding is available, the City 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. If a City project is developed off of the State Highway System, for instance, completion of an alternate local route that does not intersect with US 50, CDOT will not be involved in the project. The City will administer the project according to their agency standards and procedures.

Under Case 3, a project receiving State and/or Federal funds must be identified in the STIP. In Colorado, a minimum four years of transportation projects and their funding sources must be identified in the STIP. The STIP is updated at least every four years through a continuing, comprehensive and cooperative process involving 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 Cañon City are established in the STIP by request of the Central Front Range TPR. The STIP was most recently updated and adopted in June 2018, but may be amended as needed in accordance with the STIP Amendment Guidelines. There are currently no projects on US 50 through the study area identified in the STIP. 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 either US 50 or the frontage roads through crash patterns, 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.

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 identified by this study, it is recommended that the City and CDOT execute an IGA to adopt this Plan as an ACP for the segment of US 50 between 15th Street (MP 279.2) and the Holy Cross Abbey (MP 280.7). The ACP identifies access locations and levels of access by reference point for US 50, 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 50 corridor, the process for administration of the plan shall be as described in the SHAC, *latest edition*. The Draft IGA, the ACP Table that will serve as Exhibit A, and the amendment process that will serve as Exhibit B are presented in Appendix F.

9.2 Phasing

Implementation of the US 50 Corridor Plan with the ACP is likely to be constructed in phases, beginning at the west end of the corridor and moving east. Based on required circulation routes, the following phases are required:

1. 15th Street to 19th Street, North Side of US 50 (0.40 miles)

Implementation of the plan on the north side of US 50 is likely to occur before improvements on the south side (Phase 6). This limits options for lane configurations at 15th Street where a continuous westbound right turn lane is necessary to prevent queues from spilling back into through lanes. Fremont Drive will terminate at 19th Street and 19th Street access to US 50 will be restricted with a raised median.

2. 19th Street to Orchard Avenue (0.15 miles)

This relatively short segment may be combined with either Phases 1 or 3. Portions of Fremont Drive are likely to be retained in this segment to serve as driveways for properties where cross access has not been established. With implementation of this phase, Fremont Drive will terminate at Orchard Avenue and require reconfiguration of the traffic signal.

3. Orchard Avenue to Greydene Avenue (0.36 miles)

Splitting this phase at Cottonwood Avenue was considered, but would force eastbound traffic trying to access businesses on to the local streets. Extension of the phase to Greydene Avenue allows for that traffic to make a more convenient U-turn on the highway. In this phase, $\frac{3}{4}$ access to the north side of the highway at Greydene Avenue will be provided, but the south side will be restricted with a raised median to right-in, right-out.

4. Greydene Avenue to Raynolds Avenue (0.22 miles)

This phase may be combined with Phases 3 or 5. A short segment of Fremont Drive may be retained to serve the Burger King drive-thru. With implementation of this phase, Fremont Drive will terminate at Raynolds Avenue and require reconfiguration of the traffic signal.

5. Raynolds Avenue to Access 60/61 (0.36 miles)

Redevelopment of the north side of the frontage road may spur the desire to implement this phase prior to completion of previous phases. With the limited existing access along this segment of Fremont Drive, this is a feasible alternative to carrying out all phases sequentially. If implemented prior to Phase 4, this phase should eliminate the Fremont Drive connection to Raynolds Avenue and require reconfiguration of the traffic signal. At the east end of the phase, the intersection between Fremont Drive and US 50 should be relocated to Access 61, but the frontage road may extend to Access 59 until alternative routes are established.

6. 15th Street to Rainbow Drive, South Side of US 50 (0.40 miles)

Similar to Phase 5, this phase may be implemented independently of other phases listed above. However, this phase requires a new local street connection between E Main Street and 15th Street. With implementation of this phase, additional space is created for achieving proper lane alignments as mentioned in the discussion of Phase 1.

10.0 LIST OF ACRONYMS

AASHTO = American Association of State Highway and Transportation Officials

ACP = Access Control Plan

BA = Business Access

CDOT = Colorado Department of Transportation

FHWA = Federal Highway Administration

F-R = Frontage Road

FTA = Federal Transit Administration

IGA = Intergovernmental Agreement

LOS = Level of Service

LOSS = Level of Service of Safety

MP = Milepost

MPO = Metropolitan Planning Organization

mph = Miles Per Hour

MUTCD = Manual on Uniform Traffic Control Devices

NR-A = Non-Rural Principal Highway

OTIS = Online Transportation Information System

PRS = Public Road Signalized

PRU = Public Road Unsignalized

ROW = Right-of-Way

STIP = Statewide Transportation Improvement Program

SHAC – State Highway Access Code

TPR = Transportation Planning Region

US = United States Highway

11.0 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 Plan, Access Control Plan – 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

Devolution - the transference of a highway or segment of highway from state ownership and control to local government ownership and control

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

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

U-turn – 180-degree rotation to reverse the direction of travel