



Final Report

US 34 Access Control Plan



May 2003



US 34

ACCESS CONTROL PLAN

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EXECUTIVE SUMMARY

Background

US 34 is an important regional transportation facility in northern Colorado, providing access for Greeley and other surrounding communities as well as connectivity to the City of Loveland. As a major east-west facility from Kersey through Greeley to I-25, US 34 carries a wide range of traffic types: long distance highway traffic, commuter traffic between major cities in the region, inter-community traffic within the corridor, local trips within communities and some agricultural traffic. Furthermore, it has been recognized that development pressures for access will continue to increase as local communities continue to expand their limits and promote development. Given increasing developmental pressures and the wide range of traffic types, it is important to maintain the functional integrity of the corridor.

The purpose of this Access Control Plan effort was to work closely with residents, property owners, local governmental agencies and the Colorado Department of Transportation (CDOT) to develop a detailed interim and ultimate plan for the US 34 corridor. The Plans address how each existing access in the corridor should be modified in both the interim condition and the ultimate condition, and identifies new intersections that will be allowed. The ultimate goal is to develop an Access Control Plan which would be adopted by CDOT and the six cities or towns and the two counties in the corridor through an Inter-Governmental Agreement (IGA).

Study Area

The study area extends from the juncture of US 34 with I-25 on the west end to the intersection of the Weld County Road (WCR) 55 east of Kersey on the east end. Thus, the study area encompasses nearly 25 miles along US 34. However, the interchanges of US 34 with I-25 and US 85 are not addressed in this effort and are expected to be addressed in future feasibility studies.

The corridor is one of varying character. It is urban in nature as it passes through the City of Greeley; in fact, US 34 is an integral part of Greeley's transportation system. However, both east and west of Greeley, US 34 is very rural, primarily agricultural, in character. Traffic volumes range from are over 30,000 vehicles per day west of SH 257 and through the City of Greeley to approximately 10,000 vehicles per day east of Greeley through the Town of Kersey.

There are currently 157 accesses, also quite varied, along the corridor. They are best classified as follows:

- ◆ 5 public road intersections with traffic signals
- ◆ unsignalized public road intersections
- ◆ 130 private driveways



Access Control Plan

The accident history of this corridor reveals that 743 reported accidents occurred in this corridor during the period from March 1st, 1995 through February 29, 2000. Of these, 37 percent (276 accidents) resulted in 443 injuries and 1.6 percent (12 accidents) resulted in 15 fatalities.

Development of the Plan

Throughout the study, the project team maintained close coordination with local staff and officials. A Technical Advisory Committee (TAC) consisting of staff members from all of the local agencies met every three to four weeks. The TAC helped to establish technical guidelines for the plan, developed the interim and ultimate Access Control Plans and provided invaluable knowledge of each community's future planning efforts and conditions.

A Policy Committee (PC) was comprised of elected officials from the communities and the counties. This committee met every six to twelve weeks during the study. The purpose of this group was to review and to comment on information developed by the TAC and, more specifically, to provide input to the study on a broader policy level perspective. One specific task was to assist in the development and review of the IGA, which formalizes the work of the study and the interim and ultimate Access Control Plans.

Another critical element in the development of the plan was public involvement. Public open houses were held at three key stages during the study process. At these open houses, exhibits addressing the access control planning efforts were available, and CDOT and consultant representatives were in attendance to answer questions and to receive comments, concerns and input. A mailing list was maintained for the study and consisted of property owners adjacent to US 34, local officials, attendees of previous open houses, the media and other interested parties.

In addition to the public open houses, there were four property owner workshops and numerous meetings with neighborhood groups, individual property owners and governing bodies in the communities within the corridor. Property owner workshops were held at various locations along the corridor and the intent of these workshops was to allow adjacent property owners an opportunity to express their concerns relative to the future planning along US 34. Also, several meetings were held with property owners and local jurisdiction staff and elected officials between I-25 and LCR 3 to discuss and resolve interchange locations and alternatives that potentially work for the area. Other meetings were held during the planning process with the Greeley Chamber of Commerce, governing bodies of particular city, town or community (City Council, Town Boards and Boards of County Commissioners) and individual property owners.



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Future Land Use and Traffic Projections

The long term planning horizon for this study was identified as 2025. By this time, the population and employment in northern Colorado is expected to approximately double according to land use data used for the North Front Range Travel Demand Model. More specifically, Greeley is also projected to experience a 95 percent increase in population and a 105 percent increase in employment. In addition, the City of Loveland's population is anticipated to grow by 118 percent and the City's employment is expected to increase by 188 percent. This type of growth within the region places increased travel demands on the US 34 corridor.

Year 2025 traffic projections were developed for this study. The traffic projections were primarily based on traffic forecasts from the North Front Range Travel Demand Model tempered by more precise information relative to uses along the US 34 corridor including land use plans, traffic impact studies and the transportation plans of local jurisdictions. In general, traffic volumes between I-25 and SH 257 are anticipated to more than double to over 80,000 vehicles per day at the point of highest demand. Traffic projections east of SH 257, through Greeley to US 85, are anticipated to range between 50,000 and 65,000 vehicles per day. East of US 85, traffic projections drop significantly ranging between 19,000 vehicles per day in the vicinity of US 34 Business to 11,000 vehicles per day east of Kersey.

Access Control Plan

Figure ES-1 provides an overview of the major access improvements included in the US 34 Access Control Plan. Although the detailed plan includes every access in the corridor, this illustration focuses on the major public road intersections.

Because the implementation of the Ultimate Access Control Plan will take many years, and because it is difficult to define funding levels within specific time frames, the Interim Access Control Plan has also been established. The Interim Access Control Plan is the likely step between existing conditions and implementation of the ultimate condition. Significant capital improvements (i.e. interchanges) are involved as part of the Ultimate Access Control Plan and many of the improvements would not be warranted for many years. As such, the Interim Access Control Plan defines access improvements which require significantly less funding (i.e. signalization, turn lanes) to accommodate growing traffic volumes along the corridor.

The section of US 34 between I-25 and SH 257 is within several local jurisdictions and future planned land uses along this segment includes intense office, retail and residential uses. The most intense land use is planned between I-25 and LCR 3. The plan recommends interim traffic signals at LCR 5, LCR 3E, LCR 3, County Line Road (LCR 901/ WCR 13) and WCR 17. Eventually, traffic signals at LCR 5 and LCR 3E would be removed to construct a split diamond interchange. In addition, traffic signals at LCR 3, County Line Road and WCR 17 would be replaced with interchanges.



Access Control Plan

The section of US 34 between SH 257 and US 85 falls primarily within the City of Greeley's jurisdiction. The concept of converting interim traffic signals to interchanges continues between SH 257 and 23rd Avenue. New interim traffic signals are planned at Promontory Parkway and Two Rivers Parkway (83rd Avenue). Existing traffic signals at 65th, 47th, 35th, 17th, 11th and 8th Avenues would all remain in the interim condition. Eventually as traffic warrants and funding is available, interchanges would replace all interim traffic signals except for the traffic signals at 17th, 11th and 8th Avenues which would remain in the ultimate condition. Both the 35th and 47th Avenue interchanges are currently included in the North Front Range 2025 Fiscally Constrained Transportation Plan.

Between the City of Greeley and the Town of Kersey, US 34 is primarily in a rural setting. The interim plan shows that all public road intersections will continue to be stop-sign controlled and full movement, except for the SH 37/1st Street intersection in Kersey which is recommended for signalization when warranted. Since projected traffic volumes are significantly lower in this section compared to other sections of the corridor, the ultimate plan recommends traffic signals at major public road intersections and turn restrictions at all other public road intersections when traffic volumes warrant signalization. Public road intersections recommended for ultimate signalization are US 34 Business, WCR 49, WCR 51, SH 37/1st Street and 9th Street. Other public road intersections such as WCR 45, WCR 47, WCR 47.50 and WCR 49.50 are recommended to be $\frac{3}{4}$ movement intersections. In addition, the ultimate plan recommends closing the existing WCR 56 intersection in Kersey and re-aligning WCR 56 to intersect US 34 at WCR 55.

Interchange Alternative Analysis

A total of nine new interchanges are recommended in the Ultimate Access Control Plan. An interchange alternatives analysis was conducted at each location to compare different interchange configurations based on traffic operations, impact to existing and future development, constructability, right-of-way needs and other criteria specific to each location. This interchange alternative analysis resulted in a split diamond interchange at LCR 5 and LCR 3E, an interchange at LCR 3 with ramps positioned in two quadrants, a partial clover-leaf interchange at 35th Avenue and diamond interchanges at all other locations.

This alternatives analysis does not supercede the CDOT 1601 process but can be used as a starting point for that process. As outlined by the 1601 Policy Directive, any new interchange along the US 34 corridor would be required to prepare system and project level feasibility studies to be approved by the Transportation Commission. In addition, the 1601 process requires environmental studies and appropriate documentation of environmental, social and economic effects of the proposed interchange.



Access Control Plan Highlights

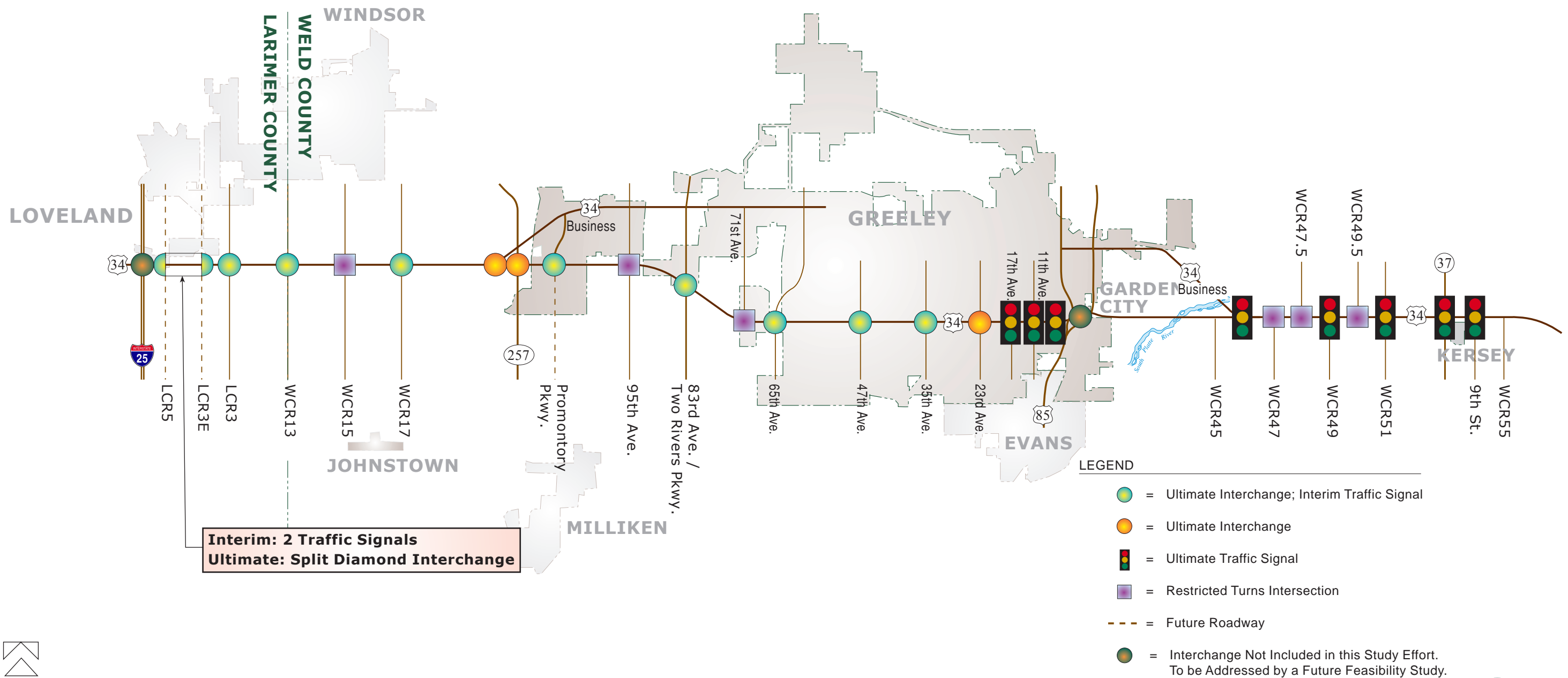


Figure ES-1



Access Control Plan

Planning Level Cost Estimates

Planning level cost estimates were developed for the significant improvements identified in the Ultimate Access Control Plan. These significant improvements, which include grade-separated interchanges (and associated roadway re-alignments) and the US 34 grade-separated crossing of the railroads, are estimated to cost nearly \$190 million (in 2003 dollars). This cost estimate does not include additional right-of-way needed to accommodate the improvement, the reconstruction of the I-25 and US 85 interchanges or any widening of US 34.

Implementation

The improvements recommended in the Ultimate Access Control Plan represent a long range plan and, as such, will be implemented over time as traffic and safety needs arise and as funding allows. In order to ensure that these improvements can be implemented in the future, it is important that the Access Control Plan be adopted by all entities in the corridor and that it be used in all transportation and land use planning which could affect US 34. Therefore, the US 34 Access Control Plan has been adopted through an Inter-Governmental Agreement between CDOT, the towns, the cities and the counties along the corridor.

Because the Access Control Plan is a long range plan and conditions may change over time, a key element of the IGA is a specified process for modifying the plan in the future. This process calls for the creation of an Advisory Committee comprised of one representative from each of the signatories of the IGA. Amendment request will be reviewed by the Committee, and changes can be made only with the affirmative vote of 2/3 or more of the signatories. This process, along with regular meetings with the Advisory Group should ensure continuing coordination between the communities in the corridor.



1.0 INTRODUCTION

1.1 Report Format

This report describes and illustrates the interim and ultimate Access Control Plan for the US 34 corridor. The report is organized into the following sections:

- ◆ **Introduction** – This section describes project location, purpose and public involvement.
- ◆ **Goals and Objectives** – This section outlines goals and objectives that provided direction to the study process.
- ◆ **Existing Conditions** – This section presents current US 34 characteristics such as cross-section elements, number of accesses and existing traffic volumes and operations.
- ◆ **Future Conditions** – This section presents projected 2025 land use along the corridor and 2025 daily and peak hour traffic projections.
- ◆ **Access Control Plan** – This section presents a narrative of the interim and ultimate Access Control Plans while the illustrative plans are contained in the Appendices. In addition, an interchange alternatives analysis and cost estimates for major recommended access improvements are provided in this section.

1.2 Project Background

US 34 is an important regional transportation facility in northern Colorado. It provides access for Greeley and other surrounding communities as well as connectivity to the City of Loveland. As a major east-west facility from Kersey through Greeley to I-25, US 34 carries a wide range of traffic types: long distance highway traffic, commuter traffic between major cities in the region, inter-community traffic within the corridor, local trips within communities and some agricultural traffic. Furthermore, it has been recognized that recent development pressures for access along the corridor will continue to increase as local communities continue to expand their limits and foster development. Given the types of traffic using US 34 and the increasing developmental pressures, it becomes important to maintain the functional integrity of the corridor, especially given that much of the highway is classified as an expressway.

The development of an Access Control Plan (ACP) is a significant step toward preserving the functional integrity of US 34, and it would serve as a tool to guide the future planning of the corridor relative to the ultimate location of public cross-streets and private accesses. An ACP determines the locations for potential signalized intersections, identifies future grade-separated interchanges and their potential configuration (and associated right-of-way needs), and needed highway improvements to support the plan. While the ACP primarily establishes the framework for the long-range time frame, it also identifies near-term improvements and/or actions which could easily be implemented.



Access Control Plan

1.3 Project Location and Study Purpose

The purpose of this effort was to work closely with residents, property owners, local governmental agencies and the Colorado Department of Transportation (CDOT) to develop a detailed interim and ultimate Access Control Plan for the US 34 corridor. The limits of the corridor extend from the juncture of US 34 with I-25 on the west end to the intersection of Weld County Road (WCR) 55 east of Kersey on the east end, as illustrated in Figure 1. The interchanges of US 34 with I-25 and US 85 are not addressed in this effort; those interchanges are expected to be addressed in future feasibility studies. The purpose of this report provides the findings and recommendations of the planning-level studies for both interchanges

1.4 Project Coordination

The US 34 study area includes two counties (Larimer and Weld), six communities (Loveland, Johnstown, Windsor, Evans, Greeley, and Kersey) and two regional planning organizations (the North Front Range Transportation & Air Quality Planning Council [NFRT & AQPC] and the Upper Front Range Transportation Planning Region). The Town of Milliken and Garden City, which currently do not have any frontage along the study corridor, also participated in the study.

Throughout the study, the project team maintained close coordination with local staff and officials. A Technical Advisory Committee (TAC) was assembled consisting of staff members from each of the local agencies; this committee met every three to four weeks. The TAC initiated efforts to develop a statement of objectives and strategies for the ACP and also to develop the recommended elements of the interim and ultimate Access Control Plans. In addition, members of the TAC provided the knowledge of each community's future planning efforts and local conditions, which was essential in assessing the sequence of changes which should occur over time along the corridor.

A Policy Committee (PC) was comprised of elected officials from the communities and the counties. This committee met approximately every six to twelve weeks during the study. The purpose of this group was to review and to comment on information developed by the TAC and, more specifically, to provide input to the study on a broader policy level perspective. One specific task was to assist in the development and review of the Intergovernmental Agreement (IGA), which formalizes the work of the study and the Interim and Ultimate Access Control Plans. It is a legally binding agreement between CDOT and the local agencies relative to access.



US 34 Corridor Study Area

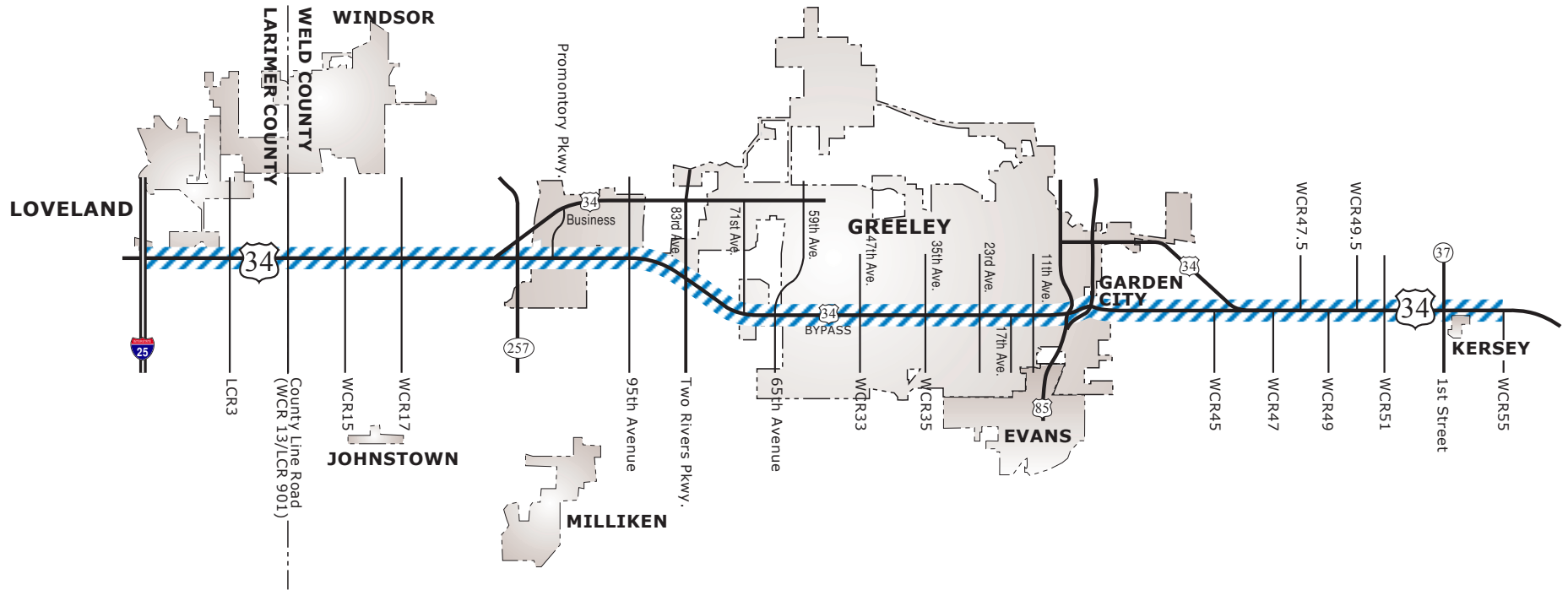


Figure 1





Access Control Plan

1.5 Public Involvement

Another critical element of the coordination effort was public involvement. Public open houses were held at three key stages during the study process. At these open houses, exhibits addressing the access control planning efforts were available, and CDOT and consultant representatives were in attendance to answer questions and to receive comments, concerns and input. Each open house was held at a central location along the corridor. A mailing list was maintained for the study. Using county assessor records, the mailing list consisted of property owners adjacent to US 34 in both the urban and rural areas. The list also consisted of local officials, attendees of previous open houses, the media and other interested parties. Meeting announcements were also placed in the Greeley and Loveland daily newspapers.

The first open house was held in late August 2001 at the Evans Community Center. Approximately 40 people attended this open house. This event was held early in the study effort, before specific access concepts had been developed. The intent was to introduce the study to the public and to become more familiar with operational concerns in the corridor and to identify problem situations and locations.

The second open house was held in mid-November 2001 at the Greeley Chamber of Commerce, with more than 40 in attendance. Preliminary access control improvements, which had been developed in coordination with the TAC and the PC, were exhibited. There was some support for limiting the number of traffic signals and access on the corridor, but at the same time there was other support for traffic signals and more access on the corridor. There were a number of specific comments related to the need for acceleration and deceleration lanes and for the need to signalize unsafe intersections. Other comments included the need to establish a parallel roadway network to take short trips off of US 34, adding turn lane improvements at existing signalized intersections and consideration of farm access to the highway.

Based on input received regarding the preliminary concepts and on additional discussions with the TAC and PC, the access plan was revised and expanded to include more detail about ultimate interchange configurations. The revised Interim and Ultimate Access Control Plans were then presented at the final public open house in mid July 2002 in Greeley, with more than 50 in attendance. There was strong public support for preserving the functional integrity of US 34 through the corridor. Again, there was some resistance to the number of traffic signals illustrated in the interim Access Control Plan. The ultimate plan for the area between I-25 and LCR 3 had not been finalized as the project team was still working with property owners and local jurisdictions over interchange locations and configurations for the area. In addition, the changes in the ultimate plan were still being finalized in the Kersey area.

In addition to the public open houses, there were four property owner workshops held in September and October 2001 at various locations along the corridor. These workshops were specifically oriented toward a particular segment of the corridor – west (I-25 to SH 257), central west (SH 257 to 65th Avenue), central east (65th Avenue to US 34 Business) and east (US 34 Business to WCR 55). The intent of the workshops was to allow adjacent property owners an opportunity to express their concerns relative to the future planning of the highway. Total attendance for all property owner workshops was approximately 40.



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Considerable effort was also expended throughout the study in conducting meetings with neighborhood groups, individual property owners and governing bodies in the communities within the corridor. During the development of the plan, several meetings were held with property owners, local jurisdiction staff, elected officials between I-25 and LCR 3 to discuss and resolve interchange issues in that area. In addition, meetings were occasionally held with the governing body of a particular city, town or community (City Council, Town Boards, and Boards of County Commissioners) in the corridor. The primary purpose of these meetings was to apprise officials about the study, to solicit input on their local needs, and to discuss implementation of the plan through the Inter-governmental Agreement.



2.0 US 34 ACCESS PLAN GOALS AND OBJECTIVES

Early in the development of the Access Control Plan, both the Policy Committee and the Technical Advisory Committee provided important direction to the study process. The TAC developed initial goals and objectives for what access control should accomplish in the US 34 corridor. These goals and objectives were reviewed and refined by the Policy Committee. The resulting goals and objectives for the plan are provided in the following section.

2.1 Adopted Goals

A fundamental aspect in developing an Access Control Plan is to maintain and enhance the functional integrity of US 34 in order to move people and goods in the corridor in the most safe and efficient manner possible. This is accomplished through the following goals:

- ◆ Upgrading to the highest possible roadway standards
- ◆ Improving congested intersections
- ◆ Reducing accidents at hazardous intersections
- ◆ Minimizing the number of signalized intersections
- ◆ Reducing the number of access points
- ◆ Requiring that all new access points comply with the State Highway Access Code
- ◆ Building interchanges, as appropriate
- ◆ Reducing conflict points between the highway and the railroad
- ◆ Identifying future right-of-way needs
- ◆ Developing an access control plan that is harmonious with the existing surroundings and the community resources

2.2 Other Project Objectives

Various objectives were also identified in this effort, designed to achieving the stated goals. These include:

- ◆ Identify locations along the corridor which could be a serious traffic bottleneck in the future and begin to identify mitigation measures.
- ◆ Determine the locations for cross street connections to enhance the local street network.
- ◆ Conduct a preliminary evaluation of interchange alternatives at proposed interchange locations.
- ◆ Establish future right-of-way needs along the corridor to ensure future planning efforts do not hinder the ability to obtain these right-of-way needs.
- ◆ Reduce the reliance of US 34 serving short trips by providing local roadway network alternatives through parallel roadways for local circulation.



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- ◆ Encourage active coordination with current / past planning efforts and agencies relative to US 34 issues.
- ◆ Identify an implementation scheme that allows for logical phasing of the ultimate access control plan including an interim access control plan.
- ◆ Recognize the importance of the US 34 corridor on economic development.



3.0 EXISTING CONDITIONS

3.1 Freeway Designation

US 34 has been designated as a freeway by the Transportation Commission, as allowed by Colorado Freeway Law. In addition, a series of specific Freeway Agreements were established between CDOT and Larimer and Weld Counties in the 1960's and 1970's when roadway projects were being planned. The freeway designation places decision-making power regarding the appropriateness and location of new public street intersections to the highway in the hands of the governor or his designee. The Freeway Agreements set forth the locations of future street intersections. The goal for this freeway is clearly to maintain a high-speed, limited access road that will carry large volumes of traffic and will be maintained as a high mobility facility far into the future. The establishment of an Access Control Plan will expand upon these earlier designations and agreements, and will better formalize future access conditions along the corridor.

3.2 Roadway Physical Characteristics

Typical Section

Between I-25 and the US 85 interchange, the typical cross section for US 34 is comprised of four 12-foot travel lanes, paved outside shoulders, paved inside shoulders and a depressed median. The shoulder and median width vary throughout this segment. Right and left turn deceleration lanes are provided at all public road intersections. Right turn acceleration lanes are commonly provided at both signalized and unsignalized public road intersections, while left turn acceleration lanes are provided at some of the unsignalized intersections.

The typical cross section changes east of the US 34 Business intersection. At this location, US 34 is comprised of four 12-foot travel lanes, paved outside shoulders and a paved median. Right and left turn deceleration lanes are provided at most public road intersections. Right turn acceleration lanes are typically not provided. The left turn acceleration function is generally accommodated via the center median lane.

Right-of-way

Right-of-way widths along the corridor vary significantly. In some areas, the right-of-way is as much as 400 feet while in other areas it is as little as 110 feet. Areas of large right-of-way widths for possible highway expansion exist between SH 257 and 71st Avenue and between the US 85 interchange and the Town on Kersey. The right-of-way is about 400 feet at 71st Avenue but gradually decreases to the east eventually reducing to just 110 feet between 17th and 11th Avenues. Between 23rd and 8th Avenues in Greeley, the lack of sufficient right-of-way widths restricts the ability to expand US 34 or add turn lanes at signalized intersections. Another area where right-of-way may not be sufficient to implement the Ultimate Access Control Plan improvements is the section between I-25 and LCR 3. Table 1 summarizes the variations in right-of-way widths along US 34.



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Table 1. Right-of-Way Widths

Segment	Width and Description
I-25 to US 34 Business Interchange	180' – 270': Gradually Increasing to the East
US 34 Business Interchange to Two Rivers Parkway (83 rd Avenue)	375' – 400'
Two Rivers Parkway (83 rd Ave.) to 23 rd Ave.	170' – 260': 400' Between 71 st and 83 rd
23 rd Ave. to 8 th Avenue	150' East of 17 th to Cemetery, 110' Cemetery to 11 th , 200' East of 11 th .
8 th Avenue to 1 st Avenue	Right-of-Way Varies Through Interchange
1 st Street to WCR 55	150'

Railroad Crossings

Currently, there are two at-grade railroad crossings of US 34 within the corridor, at the following locations:

- ◆ Approximately 850 feet west of LCR 3.
- ◆ Approximately 1,300 feet east of County Line Road (WCR 13)

The railroad crossing west of LCR 3 is owned by the Union Pacific Railroad (UPRR) and averages two trains per day. The crossing east of County Line Road is owned by the Great Western Railroad and also averages two trains per day. Both at-grade crossings are controlled via a traffic signal.

3.3 Roadway Category Descriptions and Summary of Access Points

The State Highway Access Code defines access categories for state highways. The US 34 corridor is primarily classified as an E-X (Expressway). The section of US 34 between I-25 and LCR 3 (1.5 miles) and a section west of Kersey starting a quarter mile east of WCR 51 to 1st Street (0.75 miles) both have a NR-A designation.

The typical spacing of intersecting streets in the E-X category is one mile; one-half mile is permissible when existing city or town streets already intersect the highway and when no other reasonable alternative access exists. Private direct access is not permissible to an Expressway road unless the property has no other reasonable access to the general street system.

The highway category NR-A is not as restrictive. In the NR-A category, the desirable standard for spacing of all intersecting public roadways and other accesses that will be full movement, or have the potential for signalization, is one-half mile. The NR-A category allows one access per parcel, if reasonable access cannot be obtained from a local roadway.

Along the US 34 corridor on both sides is a deeded access control line or A-line. This A-line, purchased by CDOT, gives CDOT the legal right to restrict and control all types of access to



Access Control Plan

US 34. Most of the existing accesses within the corridor were developed prior to the adoption of The State Highway Access Code and the creation of the A-line, and, therefore, have been “grandfathered” into acceptance. Specifically, in the corridor, there are 150 accesses (plus four interchanges) which fall into the following categories:

- ◆ **Public Road Signalized Intersection** – Public road signalized intersections are at-grade, full movement public road intersections with a traffic signal. Signalized public roads are state highways, county roads and city streets. All signalized intersections have acceleration and / or deceleration lanes.
- ◆ **Public Road Unsignalized Intersection** – These types of highway accesses are typically full movement, at-grade, stop-controlled intersections. Unsignalized public roads are state highways, county roads and city streets. Most Unsignalized intersections have acceleration and / or deceleration lanes.
- ◆ **Private Access** – Along the corridor these types of accesses serve many uses. Most private accesses provide direct highway access to adjacent agricultural land, but other private accesses along the corridor provide direct highway access for businesses, private residences, oil and gas wells, and to irrigation canals.

Based on the above classifications of accesses, the 150 accesses along the corridor are distributed as follows:

- ◆ 5 public road intersections with traffic signals (does not include traffic signal at 8th Avenue as it was considered part of the interchange)
- ◆ 22 unsignalized public road intersections
- ◆ 123 private driveways

An inventory of existing accesses by milepost and type is contained in Appendix A.

Along the study corridor interchanges are located at the US 34 Business on the west end of Greeley, SH 257, 23rd Avenue in Greeley and US 85. In addition, nearby frontage roads exist at the following locations:

- ◆ South side of US 34 between LCR 3 and County Line Road (LCR 901/ WCR 13)
- ◆ South side of US 34 approximately ¼ mile west from 71st Avenue
- ◆ North side of US 34 from approximately ½ mile east of 65th Avenue to 71st Avenue
- ◆ North side of US 34 between 35th and 23rd Avenues



3.4 Existing Traffic Conditions

Traffic Volumes

Between August and September of 2001, traffic counts were collected along the US 34 corridor between I-25 and WCR 56 in Kersey. Figure 2 illustrates both daily traffic volumes and peak hour turning movement volumes along the US 34 corridor. As shown, daily traffic volumes are over 30,000 vehicles per day (vpd) west of SH 257 but drop to around 25,000 vpd between SH 257 and 65th Avenue. Within the urbanized area of Greeley between 65th Avenue and the US 85 interchange, daily traffic volumes are approximately 35,000 vpd. East of the US 85 interchange, daily traffic volumes are significantly less at approximately 10,000 vpd.

Figure 2 also illustrates AM and PM peak hour turning movement counts compiled at public road intersections along the US 34 corridor. Peak hour turning movement counts were collected at 20 intersections along the corridor, including all signalized intersections, ramp termini at SH 257, and other key stop-controlled public road intersections. The busier cross streets along the US 34 corridor are all within the urbanized area of Greeley between 65th and 11th Avenues. Between I-25 and SH 257, cross street peak hour turning movement volumes are generally less than 50 vehicles in the peak hour with the only exception at WCR 17. In the eastern section of the US 34 corridor, the busier cross streets are US 34 Business Route, WCR 49, SH 37 / 1st Street and 9th Street in Kersey.

Traffic Operations

Based on the AM and PM peak hour turning movement volumes shown in Figure 2, current traffic operations were evaluated at intersections using the analysis methods documented in the Highway Capacity Manual 2000. Traffic operations are defined by Level of Service (LOS) which is a qualitative measure, ranging from “A” to “F”, that describes the level of average delay for a intersection or for a specific intersection turn movement. LOS A represents the best possible operating conditions, and LOS F represents congested conditions. LOS D or better is generally considered to be acceptable for peak period conditions in urban areas. LOS C is acceptable in rural areas. At signalized intersections, more than 80 seconds of average total delay per vehicle characterizes LOS F conditions and is typically indicative of traffic demand exceeding intersection capacity. At stop-controlled intersections, LOS F is indicative of conditions in which more than 45 seconds of total stopped delay per vehicle takes place. Where the mainline roadway is heavily traveled, it is not uncommon for left turn and through movements from the stop-controlled approach to operate at LOS F even if the left turn and through movement volumes are too low to meet MUTCD signal warrants.

Existing lane geometry, shown in Figure 3, and signal timing information were used to estimate peak hour LOS for each signalized intersection. Currently, signalized intersections only exist along the corridor in Greeley. Operational analyses show that these signalized intersections, generally operate in the “very good” range, with most intersections operating at LOS B or C during both the AM and PM peak hours. During the PM peak hour, 11th, 35th, and 47th Avenue intersections operate near capacity at LOS D, which is still acceptable for peak period conditions in urban areas.



Existing Traffic Volumes (August - November 2001)

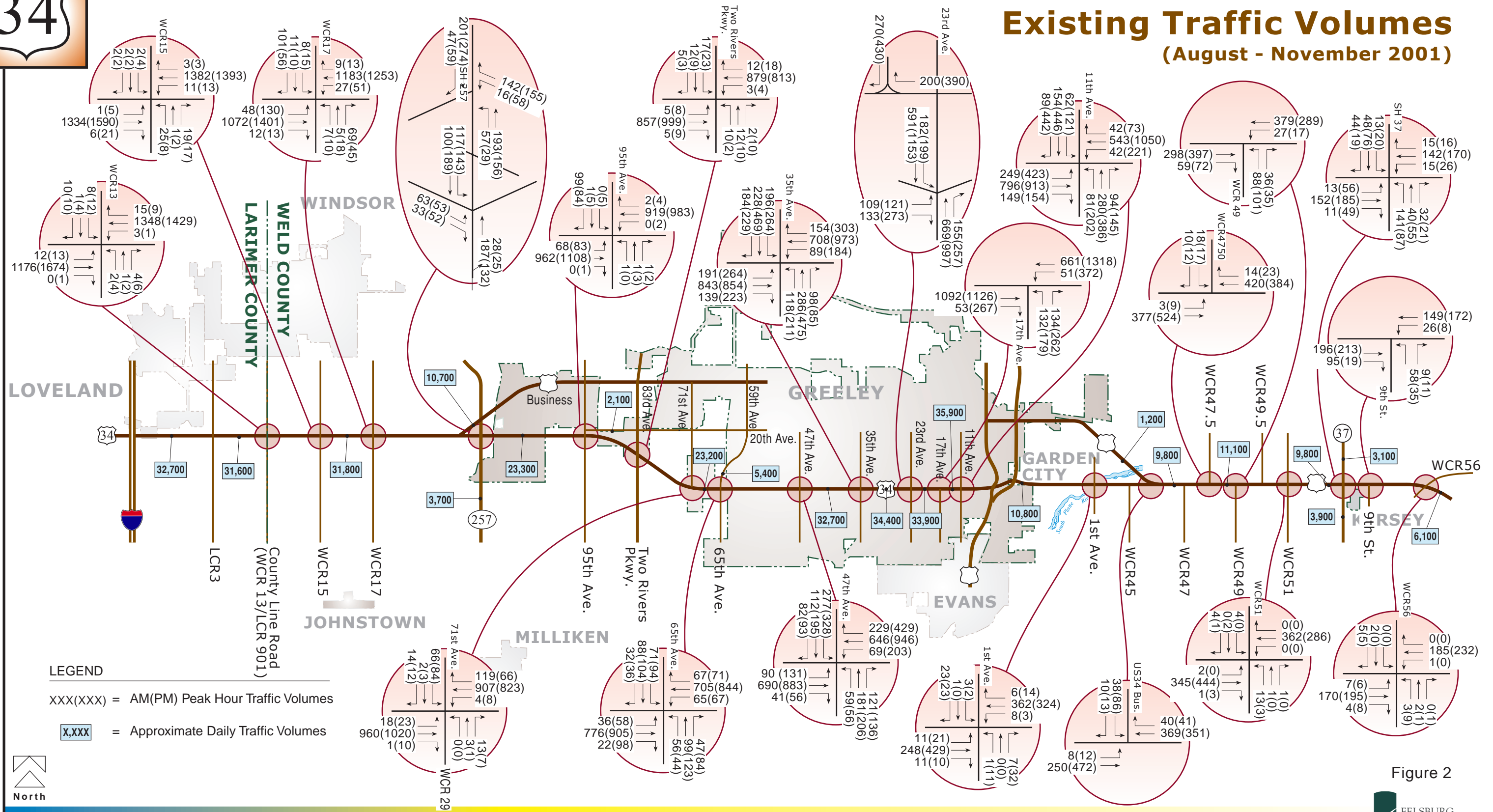
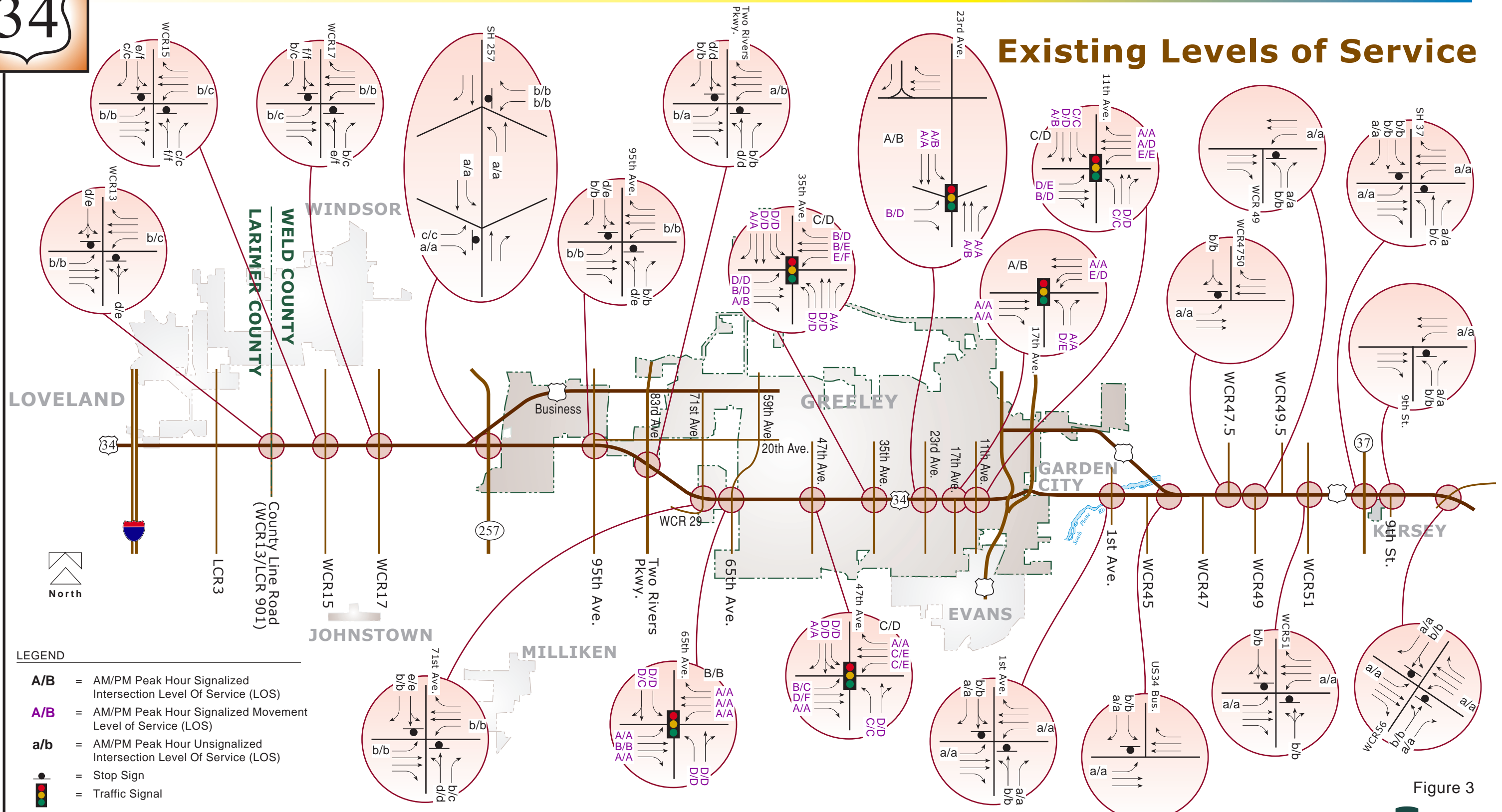


Figure 2





Existing Levels of Service



LEGEND

- A/B** = AM/PM Peak Hour Signalized Intersection Level Of Service (LOS)
- A/B** = AM/PM Peak Hour Signalized Movement Level of Service (LOS)
- a/b** = AM/PM Peak Hour Unsignalized Intersection Level Of Service (LOS)
- = Stop Sign
- = Traffic Signal

Figure 3





Access Control Plan

Between I-25 and SH 257, left turn and through movements from cross streets typically operate at LOS E or F, even though peak hour cross street traffic volumes are very low (less than 50 vehicles per hour). These poor levels of service are attributed to high peak hour traffic volumes along US 34 which prevent left and through movements from entering or crossing. East of SH 257 approaching Greeley, left turn and through movement LOS from the cross street generally improves to LOS D or E since the US 34 peak hour through traffic is less. Between the US 85 interchange and WCR 56 in Kersey, left and through movements from the cross street typically operate at LOS B or C during peak hours.

Travel Times

Travel time between two points is a common measure of the quality of the transportation service provided by the roadway. Travel time is comprised of two elements: over-the-road travel and delay at traffic signals. The over-the-road travel time is a function of posted speed limits, adherence to those limits, and traffic congestion. Currently, congestion to the extent that the imposed speed limit cannot be achieved is not evident in the corridor. Delay at traffic signals is the amount of time in seconds that a driver is stopped at a signalized intersection.

Travel time runs were conducted between I-25 and WCR 55 in August 2001 during the AM and PM peak hours for both the eastbound and westbound directions. Tables 2 and 3 illustrate the signal delay and the overall travel time for each corridor. In general, travel time in either direction during the AM peak hour ranges between 23 and 25 minutes and during the PM peak hour it ranges between 25 and 28 minutes. Also, the average travel time in the westbound direction was about one minute longer in both the AM and PM peak hours.

The delay experienced at the signalized intersections varied significantly between travel time runs. In general, the average traffic signal delay (in either direction) is significantly higher during the PM peak hour than during the AM peak hour. In the eastbound direction, relatively high signal delay was observed at 17th Avenue in the AM peak and at 35th and 47th Avenues in the PM peak. In the westbound direction, relatively high signal delay was observed at 47th Avenue in the AM peak and at 8th, 11th, 35th, and 47th Avenues in the PM peak.

Table 2. Travel Time Runs - Eastbound

Signalized Intersection Locations	AM Peak Hour - Signalized Delay (sec.)				PM Peak Hour - Signalized Delay (sec.)			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
65 th Avenue	0	24	0	8.0	0	29	38	22.3
47 th Avenue	0	0	25	8.3	46	67	64	59.0
35 th Avenue	11	0	0	3.7	91	36	19	48.7
17 th Avenue	22	29	18	23.0	0	25	32	19.0
11 th Avenue	23	0	11	11.3	24	0	15	13.0
8 th Avenue	0	0	0	0	0	0	0	0
Total Signalized Delay	56	53	54	54	161	157	168	162
Total Travel Time (min)	23.5	24.0	23.4	23.6	25.2	26.4	26.3	26.0



Access Control Plan

Table 3. Travel Time Runs - Westbound

Signalized Intersection Locations	AM Peak Hour - Signalized Delay (sec.)				PM Peak Hour - Signalized Delay (sec.)			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
8 th Avenue	5	40	8	17.7	0	52	30	27.3
11 th Avenue	0	5	23	9.3	39	59	35	44.3
17 th Avenue	0	0	0	0	0	0	0	0
35 th Avenue	0	28	0	9.3	37	76	71	61.3
47 th Avenue	0	35	42	25.7	7	30	130	55.7
65 th Avenue	0	11	0	3.7	30	0	0	10.0
Total Signalized Delay	5	119	73	65	113	217	266	199
Total Travel Time (min)	23.3	25.3	25.1	24.6	25.0	28.4	27.8	27.1

The travel time values illustrated above serve as a benchmark to compare against future scenarios to gauge the effectiveness of improvements.

Accidents

In May 2002, a safety assessment was completed for the US 34 corridor between I-25 and WCR 55 in Kersey (Safety Assessment Report, Felsburg Holt & Ullevig, May 2002). The safety assessment was based on accident data compiled for the period, March 1, 1995 through February 29, 2000. In summary, there were 743 reported accidents with 37% (276 accidents) resulting in 443 injuries and approximately 1.6% (12 accidents) resulting in 15 fatalities.

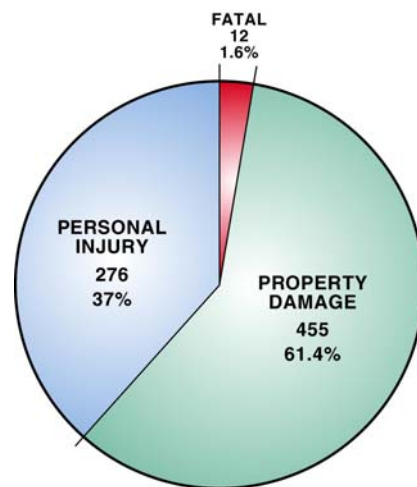


Figure 4. Corridor Accidents By Severity

Based on the safety assessment report, Figure 5 summarizes the five year accident history for the corridor. This figure presents accident rates by highway segment and identifies locations that have experienced a cluster of accidents. Generally, the accident rates by segment are less than one accident per million vehicle miles, except in the urbanized area of the corridor (65th Avenue to the US 85 interchange) where accidents rates are 1.27 and 2.40 accidents per million vehicle-miles of travel. These accident rates in both the rural and urban sections of the corridor are less than the statewide averages when compared with similar facilities.

Figure 5 also identifies twelve locations where accident records showed a cluster of accidents during the five year period. Accident types and issues at some of these locations are described in the following sections.



Five Year Accident Assessment

March 1, 1995 to February 29, 2000

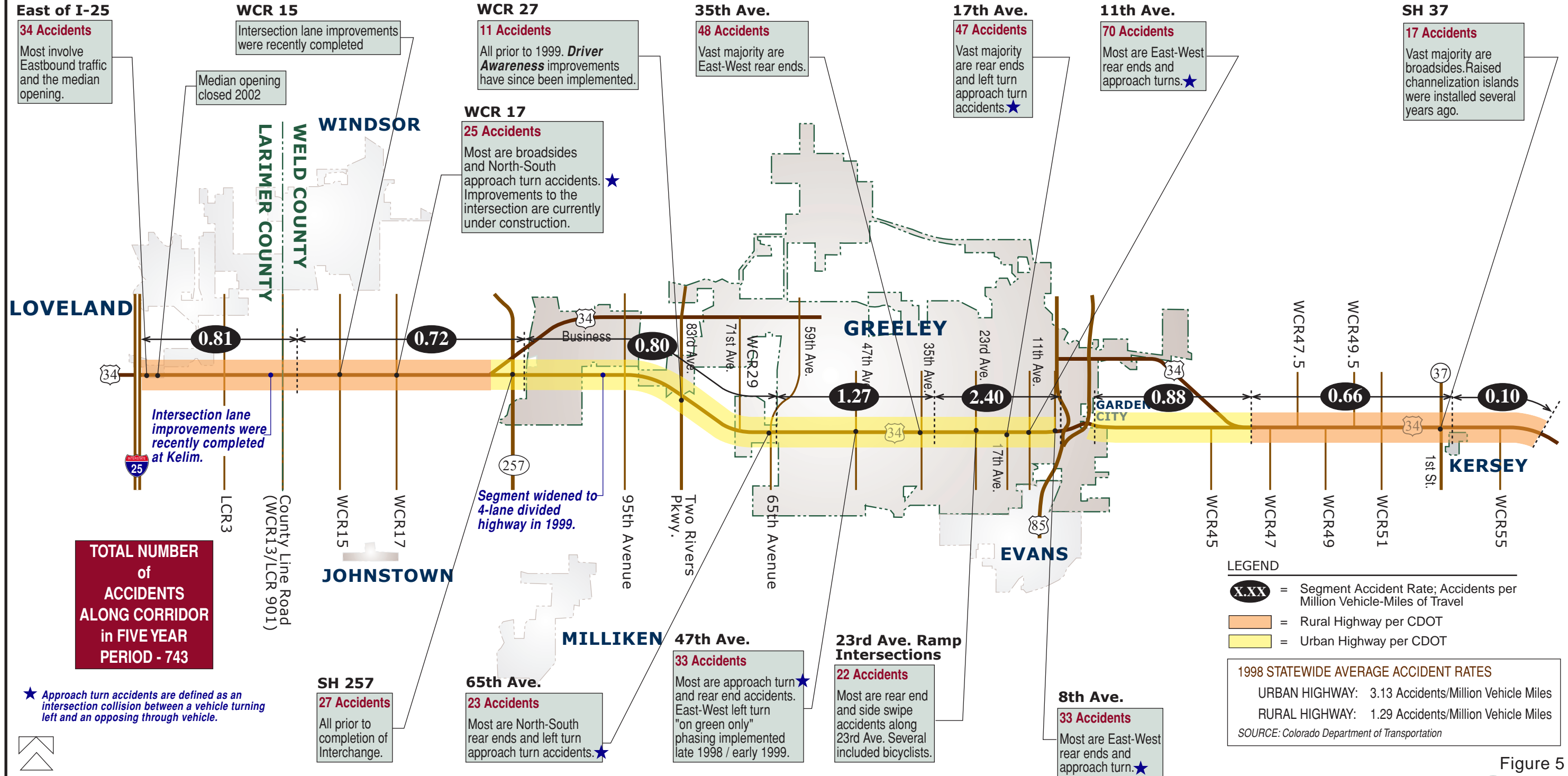


Figure 5





Access Control Plan

- ◆ **Private Accesses Just East of I-25.** At this location there are three private accesses spaced approximately 100 feet apart on the south side of US 34 and a median opening located just east of these private accesses. The accident history shows that a majority of the accidents in this area are concentrated near the median opening involving vehicles making left or right-turns, or illegal u-turns. However, this median opening has been recently closed.
- ◆ **WCR 17.** Of the reported 25 accidents at this location, nearly 85% were either broadside or approach turn accidents. This accident history is likely related to a relatively high level of traffic on WCR 17 as compared to other public road intersections in the area and some sight distance issues related to the left turn lanes along US 34. Signalization, when warranted, would reduce broadside and approach turn accidents but would increase rear-end accidents.
- ◆ **Signalized Intersections in Greeley (65th, 47th, 35th, 17th and 11th).** The predominant accident types are rear-ends and approach turn at these intersections. These types of accidents are common at all signalized intersections. Rear-end accidents can be addressed with improve signal visibility, advanced signing and longer yellow phases. Approach turn accidents can be mitigated with protected-only signal phasing. All of the signalized intersections, except for 65th Avenue, have protected-only signal phasing for left turn movements on US 34. At some locations, the accident history shows a significant decrease in approach turn accidents with the implementation of protected-only signal phasing. On the other hand, protected-only signal phasing will increase overall intersection delay and increase travel time for through traffic on US 34.
- ◆ **SH 37 in Kersey.** Over the five year accident history, 17 accidents were reported at this location with 70 percent of those being broadside accidents. The safety assessment report indicated that the number of broadside accidents is higher than expected for this type of intersection. Improvements have recently been implemented to better define lanes. Signalization, when warranted, would reduce the occurrence of broadside accidents.



4.0 FUTURE CONDITIONS

4.1 Land Use

Year 2025 has been used as the long term planning horizon. By this time, the population and employment in northern Colorado is expected to approximately double according to land use data used for the North Front Range Transportation Demand Model. More specifically, Greeley is also projected to experience a 95 percent increase in population and a 105 percent increase employment. The City of Loveland's population is anticipated to grow by 118 percent and the City's employment is expected to increase by 188 percent. The region, as a whole, is expected to grow significantly placing increased travel demands on the area's transportation facilities.

Specifically along US 34, a mix of commercial and residential developments are anticipated to take place by 2025. Just east of I-25, major commercial development is anticipated along both sides of the highway. The Millennium development is proposed on both sides of I-25 north of US 34 and south of Crossroads Boulevard within Loveland. Various types of commercial uses and residential developments for both single family and multi-family units are planned as part of the Millennium including a strong focus on technology. Up to 1,870 acres of development are anticipated once the Millennium is built out.

Relatively intense development is also possible along the south side of US 34 (just east of I-25) as the Thompson Crossing development within Johnstown. The planning for this development is on-going, but there is the potential for several million square feet of retail and office use to occur at Thompson Crossing. This development is planned to extend south approximately one mile, and land parcels removed from US 34 are planned to be more residential in nature.

Promontory Park, located along the north side of US 34 just east of SH 257, is another area expected to develop with relatively intense uses. Construction is well underway in this area, and approximately two million square feet of office development and nearly 1,500 dwelling units have been approved by the City of Greeley.

The City of Greeley is also growing to its west. Commercial development proposals are either being processed or have been approved by the City for properties located between 35th and 47th Avenues, the southwest corner of US 34 and 65th Avenue, and along the north side of US 34 at Two Rivers Parkway (83rd Avenue). Greeley is expected to continue its westward expansion with primarily non-residential uses along US 34.

East of 35th Avenue, Greeley, Evans, and Garden City are built up to US 34. A mix of retail and residential uses exist along the north side of US 34 whereas retail and other commercial uses exist along the south side of US 34 including the Greeley Mall. East of US 85, the nature of land use is quite different. The area is impacted by the South Platte River, and land uses are not anticipated to be as dense as they are west of US 85. Much of the land is anticipated to remain in an agricultural state through 2025 as far east as the Kersey town limits; however, it is possible that some of this land could develop before 2025. The Town of Kersey's comprehensive plans show the potential for significant growth with the population potential



Access Control Plan

growing by an order of magnitude in the future. Industrial and commercial development is also being contemplated by the Town east of WCR 55.

This general land use information has been considered by the North Front Range Metropolitan Planning Organization (MPO) in development of the regional travel demand model, and employee and household figures have been developed and tabulated for specified Transportation Analysis Zones (TAZ's). The TAZ's along US 34 and the corresponding household and employee figures are shown in Figures 6a, b and c. As shown, the largest concentration of future employees along the corridor is in the first mile and half east of I-25 and at Promontory Park between SH 257 and 95th Avenue. Land use projections also show a large number of employees between 35th and 23rd Avenues. On the other hand, between LCR 3 and SH 257, projected employee numbers are very low. Household figures, as compared to the number of employees, are high between LCR 3 and SH 257 and between 47th and 35th Avenues. Also, household figures between SH 257 and 65th Avenue are significantly higher than the household figures projected for the area between I-25 and LCR 3.

The information shown in Figures 6a, b and c and the North Front Range modeling area as a whole, is the basis for the long term traffic forecasts discussed in the following section.

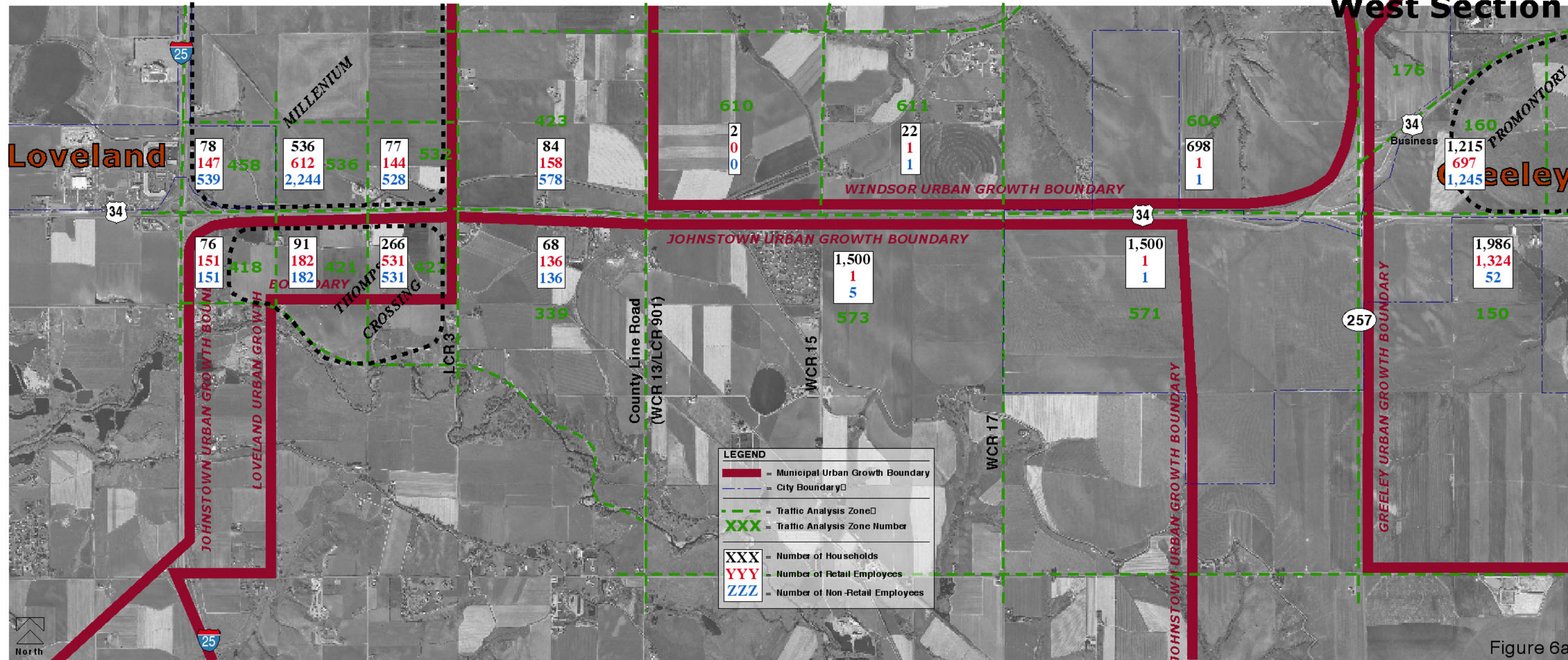
4.2 2025 Traffic Forecasts

As mentioned previously, the year 2025 was used as the long-term planning horizon in evaluating access for US 34. The primary source of the traffic forecasts was the North Front Range Travel Demand Model. Results from the Travel Demand Model were tempered with more precise information relative to uses along the US 34 corridor including land use plans, traffic impact studies, and the transportation plans of local jurisdictions. Daily, AM peak hour, and PM peak hour model results were used and adjustments were made to ensure that flow rates balanced between successive intersections. Figure 7 shows the projected daily, AM peak hour, and PM peak hour traffic volume forecasts along US 34.

In general, the traffic along US 34 is anticipated to more than double between I-25 and the US 34 Business interchange with over 80,000 vehicles per day (vpd) projected just east of I-25. This segment is expected to be the busiest segment along the corridor. East of the US 34 Business interchange to 35th Avenue, daily traffic projections range between 50,000 and 65,000 vpd. Between 35th Avenue and the US 85 interchange, the daily traffic projections drop to around 45,000 vpd. East of the US 85 interchange, daily traffic projections drop significantly ranging to 16,000 and 19,000 vpd and continue to decreasing to around 11,000 vpd east of Kersey.

Windsor 2025 Land Use Quantities

West Section



LEGEND

- = Municipal Urban Growth Boundary
- = City Boundary
- = Traffic Analysis Zone
- XXX** = Traffic Analysis Zone Number
- XXX** = Number of Households
- YYY** = Number of Retail Employees
- ZZZ** = Number of Non-Retail Employees

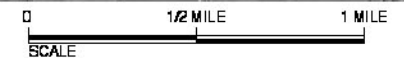


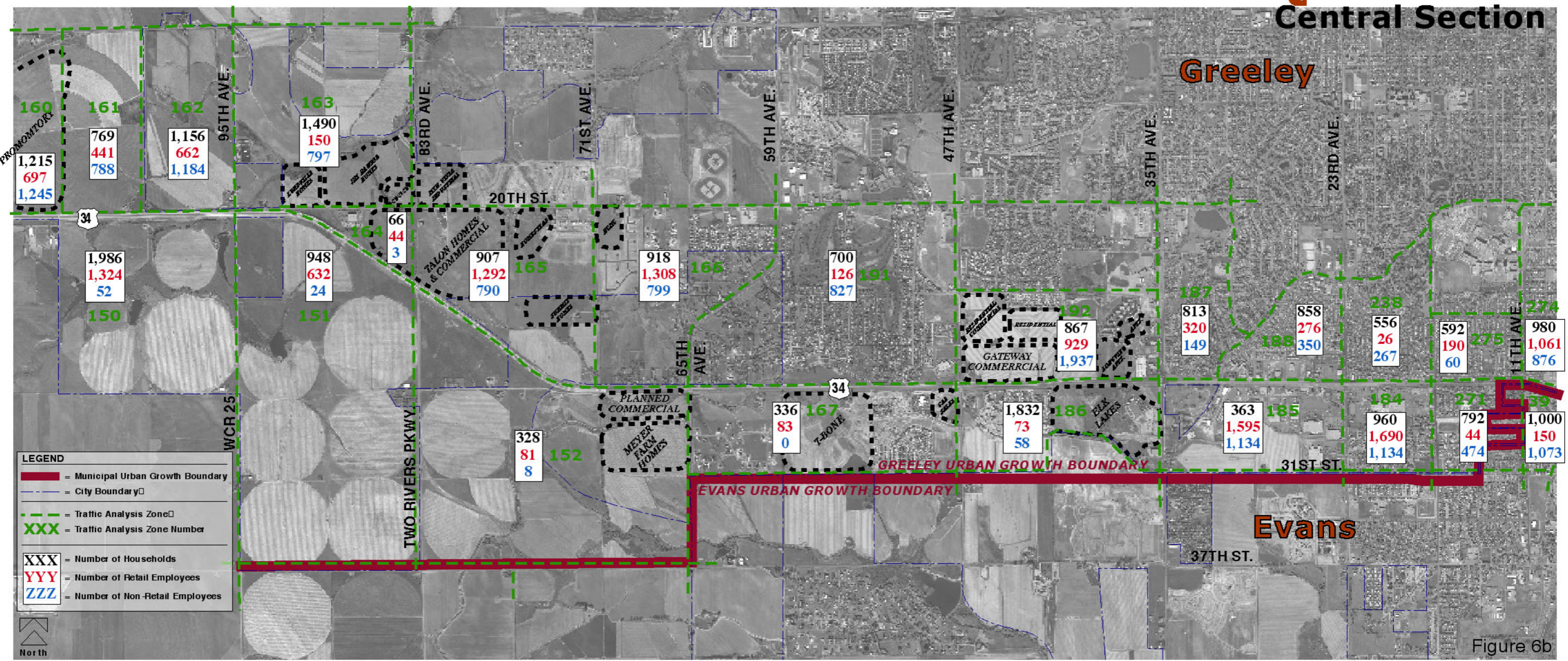
Figure 6a

Transportation Demand Model 2025 Land Use Quantities

Central Section

Greeley

Evans



LEGEND

- = Municipal Urban Growth Boundary
- = City Boundary
- = Traffic Analysis Zone
- XXX** = Traffic Analysis Zone Number
- XXX** = Number of Households
- YYY** = Number of Retail Employees
- ZZZ** = Number of Non-Retail Employees



Figure 6b

Transportation Demand Model 2025 Land Use Quantities

East Section

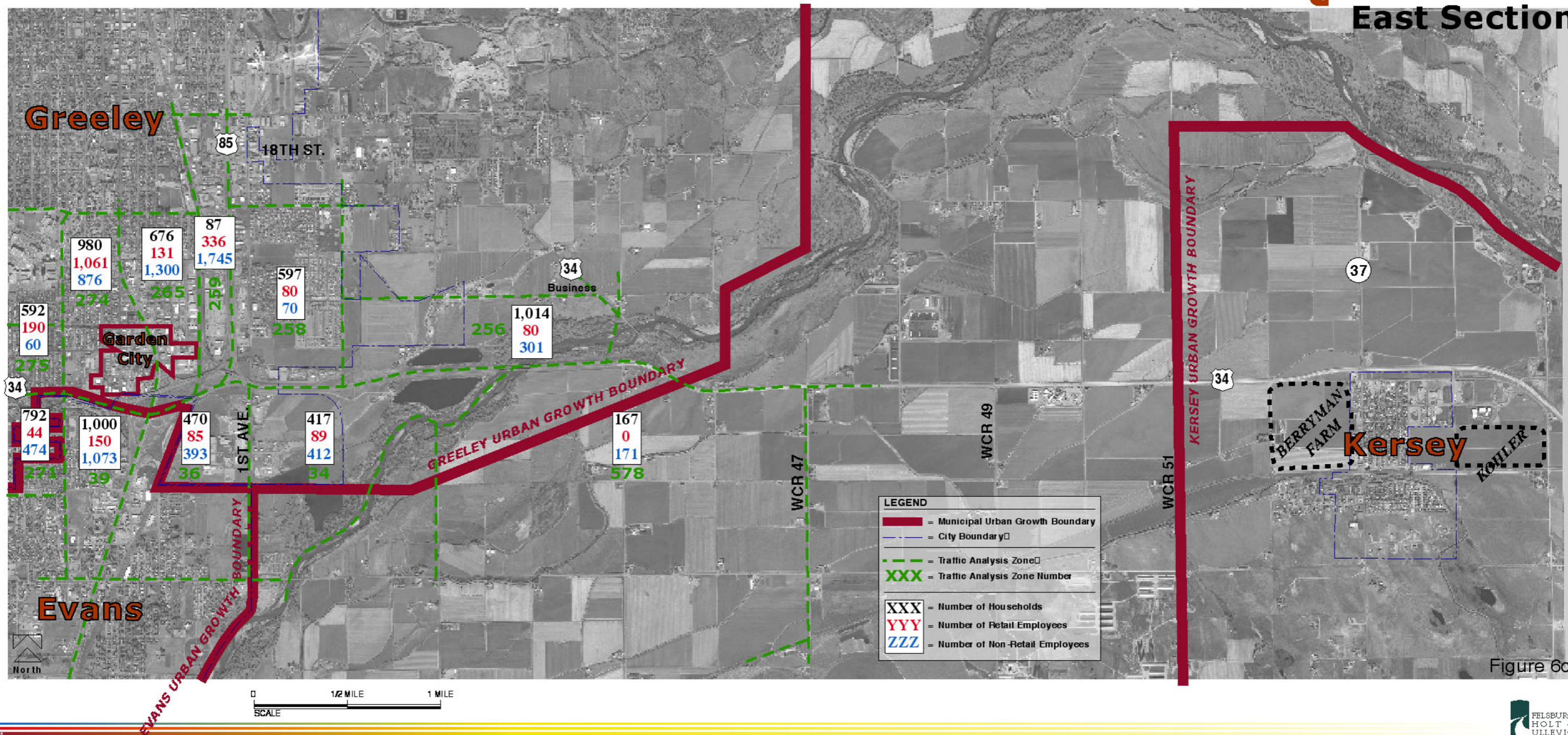


Figure 6c



Year 2025 Traffic Projections

LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

X,XXX = Approximate Daily Traffic Volumes

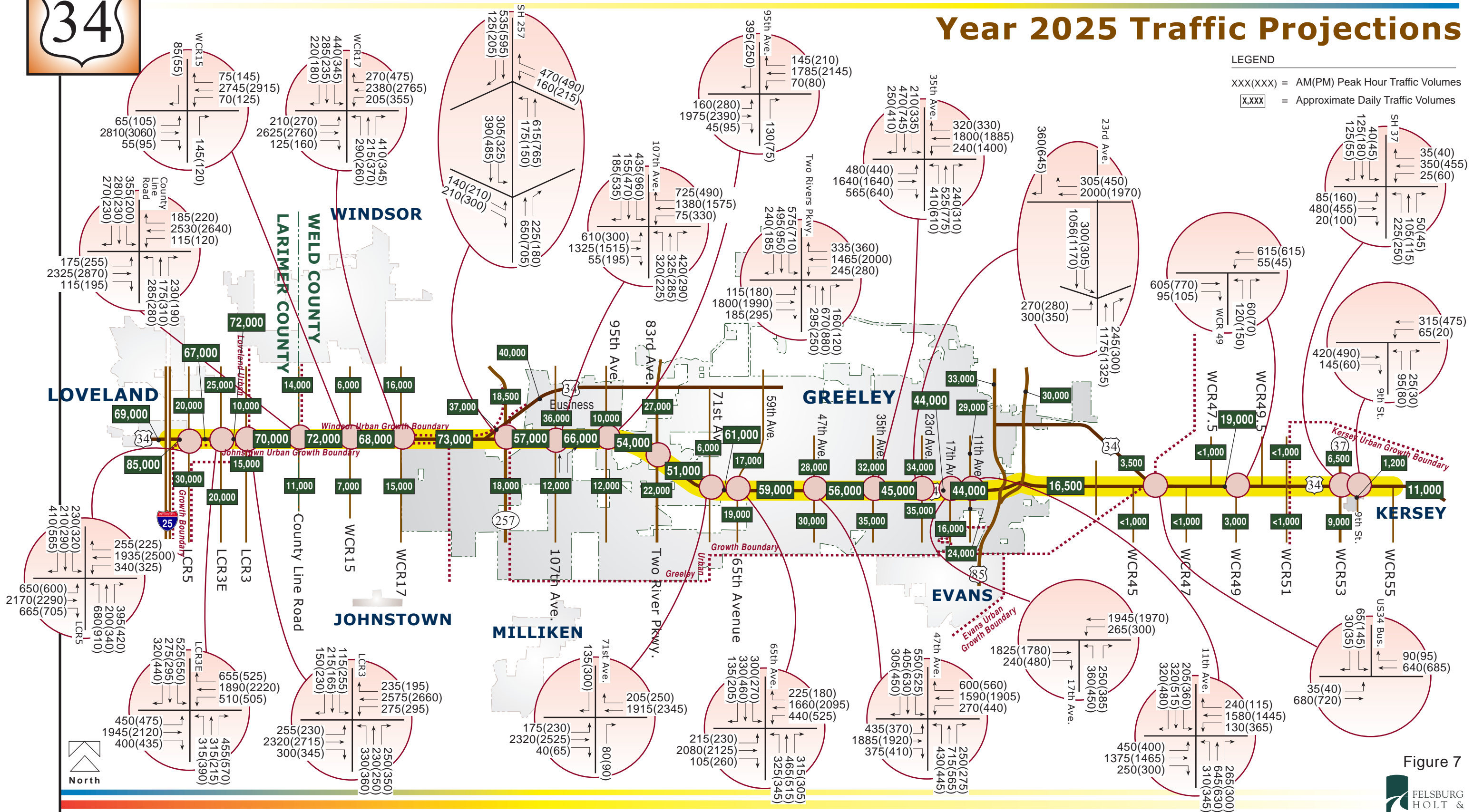


Figure 7





Access Control Plan

Cross-street traffic projections are also shown in Figure 7. There are numerous cross-street facilities that are currently minor two-lane roadways today (some gravel) that are expected to carry a significant amount of traffic in the future. Examples include LCR 5 (which does not exist today), LCR 3E (also does not exist), County Line Road, WCR 17, and Two Rivers Parkway/83rd Avenue. Both LCR 5 and LCR 3E are expected to be some of the more heavily-traveled cross streets in the corridor with projected daily traffic volumes between 20,000 and 30,000 vpd. The heavier-traveled cross-streets today are expected to continue to carry significant traffic loadings; these facilities are within the urbanized area of Greeley and include 47th, 35th, 23rd, and 11th Avenues. For example, 47th, 35th and 23rd Avenues have projected daily traffic volumes exceeding 30,000 vpd. East of US 85 the more heavily-traveled cross streets will be US34 Business, WCR 49 and SH 37 / 1st Street in Kersey.

4.3 Traffic Operations

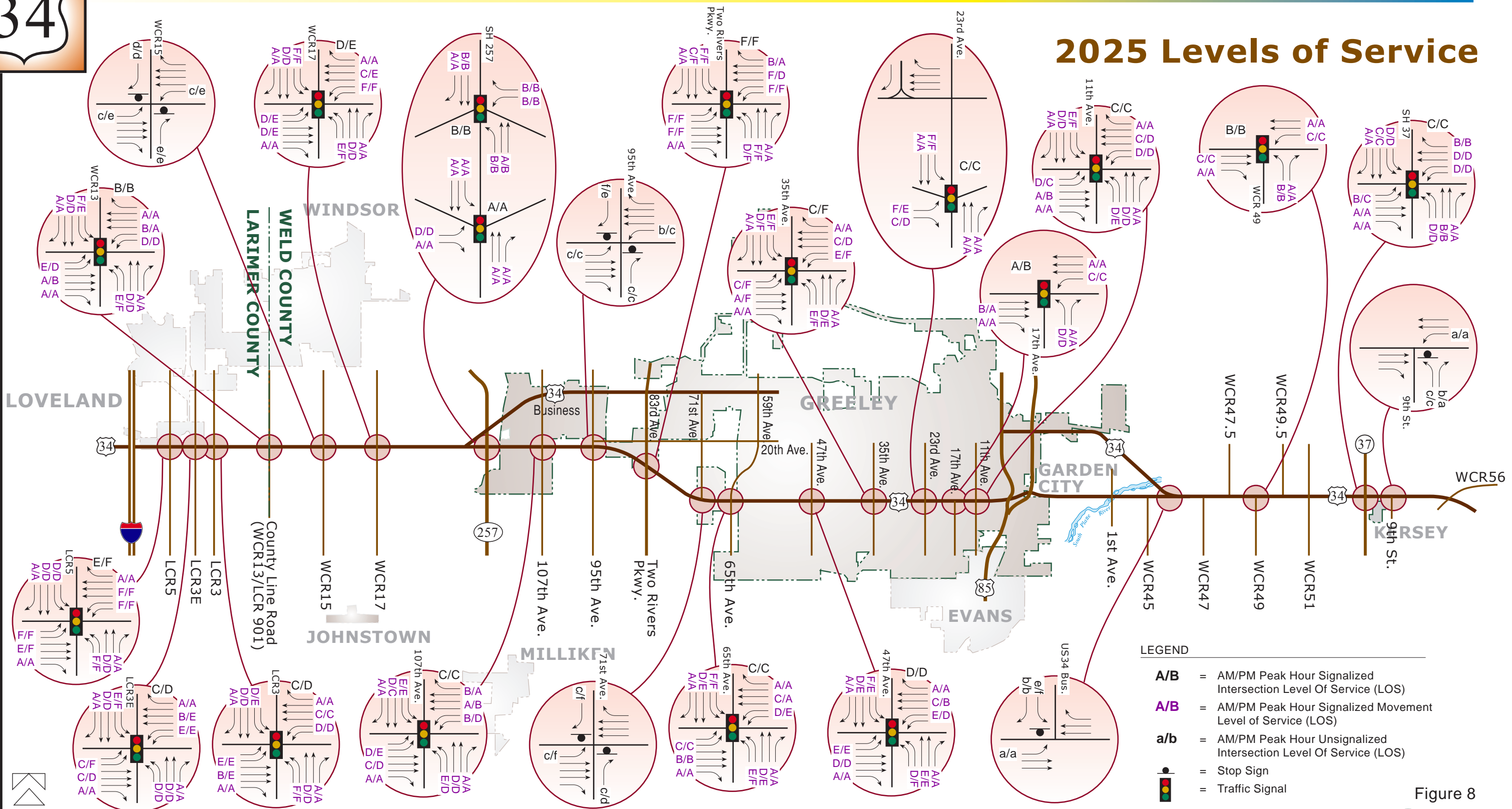
Based on the AM and PM peak hour traffic projections shown in Figure 7, future traffic operations were evaluated at both the signalized and unsignalized intersections. The results of the traffic operations analysis along with the anticipated 2025 roadway laneage are shown in Figure 8. For the analysis, it was assumed intersection geometry consisted of six lanes on US 34 between I-25 and US 85 and dual left turn lanes and exclusive right turn lanes on all approaches at signalized intersections.

It is anticipated given the 2025 projections and the anticipated lane geometry there will be a number of intersections that would operate at LOS E or F during the peak hours. LCR 5, LCR 3E, WCR 17, Two Rivers Parkway and 35th Avenue are all expected to experience LOS E or F conditions. LOS F conditions are expected at LCR 5 (AM and PM peak hour), Two Rivers Parkway (AM and PM peak hour) and 35th Avenue (PM peak hour).

Given the level of through traffic projected to be on US 34, turn movements at unsignalized intersections are also expected to experience poor levels of service. For example, between I-25 and US 85 most left turn movements to and from US 34 are anticipated to operate at LOS E or F during the PM peak hour. Turn movement operations are generally better during the AM peak hour. Between US 34 Business and Kersey, where through traffic on US 34 is lower, turn movements to and from US 34 are mostly LOS D or better.



2025 Levels of Service



LEGEND

- A/B** = AM/PM Peak Hour Signalized Intersection Level Of Service (LOS)
- A/a** = AM/PM Peak Hour Signalized Movement Level of Service (LOS)
- a/b** = AM/PM Peak Hour Unsignalized Intersection Level Of Service (LOS)
- = Stop Sign
- = Traffic Signal

North

01-096 3/3/03

Figure 8
FELSBURG HOLT & ULLEVIG



5.0 ACCESS CONTROL PLAN

This chapter presents the Access Control Plan which has been formulated through the considerable input of the Technical Advisory Committee, the Policy Committee and the public. After considering both existing and future conditions in the corridor, the plan defines how each access should be treated both in the interim and the ultimate time frames, and it provides cost estimates for the major recommended access improvements. The narrative included in this chapter has been divided into four corridor segments and is meant to serve as a summary of the key features of the plan, with particular emphasis on public road intersections. A detailed explanation of every access in the corridor is presented in Exhibit A of the Inter-Governmental Agreement (see Appendix E). The Interim and Ultimate Access Control Plans are also illustrated on aerial photographs in Appendices B and C, respectively.

Because the implementation of the Ultimate Access Control Plan will take many years, and because it is difficult to define funding levels within specific time frames, an Interim Access Control Plan has also been established. The Interim Access Control Plan is the likely step between existing conditions and implementation of the ultimate condition. Significant capital improvements (i.e. interchanges) are involved as part of the Ultimate Access Control Plan and many of the improvements would not be warranted for many years. As such, the Interim Access Control Plan defines access improvements that require significantly less funding (i.e. signalization, turn lanes) to accommodate growing traffic volumes along the corridor.

The Access Control Plan narratives presented in this section assume that auxiliary lane upgrades will be part of all improvements for at-grade intersections, whether they are signalized or not. There are some existing intersections in the corridor that have turn lanes with substandard lengths and widths. The Access Control Plan calls for turn lanes at all public road intersections to be improved to the standards established in the 1998 State Highway Access Code.

5.1 *Planning Horizons*

The development of the access control plan is geared to address access in relation to new developments that may be proposed along the corridor. It is recognized that development proposals will take place for many years. As such, this plan has been developed so as to incorporate (to the extent possible) potential long term conditions beyond the 20 to 25-year typical planning horizon characteristic of the long-term traffic forecasts. This version of the plan is referred to as the Ultimate Access Control Plan.

It is also recognized that certain plan elements cannot realistically be funded in a 20 to 25-year time frame, and that some of the costly access control pieces may need to be mitigated differently until such time that appropriate funding can be secured. These short-to-mid-term measures have been identified in the Interim Access Control Plan version of this effort. The intent is the interim plan elements would be implemented prior to ultimate plan elements, and that a gradual phasing from the interim plan to the ultimate plan would take place as conditions required and as funding became available. Because of the funding limitations, it is very likely



Access Control Plan

that many of the interim plan elements would remain in place for many years before being replaced by ultimate plan elements (where the two plans are different)

5.2 Access Closure Characteristics

In the development of the Access Control Plan, it became evident that existing private accesses could be grouped into the following four characteristics:

- ◆ **Remove When Property Develops** – These accesses will remain in their current state until adjacent land is developed or redeveloped at which time they would be closed.
- ◆ **Remove at First Opportunity** – These accesses will be removed at the first logical opportunity such as a maintenance or construction project or any type of development/redevelopment of the property served by the access. Typically, these accesses serve land that will most likely not redevelop because the land may be a park, open space, undevelopable, alternative access is available or the land is already developed.
- ◆ **Illegal Access** – These accesses should have been removed through prior agreements but for some reason still exists. This type of access will be closed by CDOT immediately.
- ◆ **Emergency Access** – These accesses are necessary for emergency use only. It will continue to serve emergency uses until an alternative emergency access is provided.

5.3 Plan Segment Elements and Issues

I-25 to SH 257

This section of US 34 is within several local jurisdictions. Between I-25 and County Line Road (LCR 901/ WCR 13), adjacent land is either part of Loveland, Johnstown or Larimer County and between County Line Road (LCR 901/ WCR 13) and SH 257 local jurisdictions include Greeley, Johnstown, Windsor and Weld County. Existing development includes businesses in the vicinity of the I-25 frontage road, LCR 3E, the Community of Kelim, a salvage yard west of WCR 17 and a residential development at WCR 15. Undeveloped areas are fallow or used for agricultural purposes.

Future planned land uses along this segment include intense office, retail and residential uses.

- ◆ **I-25 Frontage Road (MP 96.48)** – This is an existing four-legged unsignalized intersection (see Figure B-1 and C-1). In the interim, turn movements will be restricted. Ultimately, the north side would be closed when property is redeveloped and the frontage road is re-aligned to the future LCR 5 alignment. The south side would be closed and the frontage road would be realigned into the proposed Thompson Crossing development.



Access Control Plan

- ♦ **LCR 5 (MP 96.79)** – The Crossroads Boulevard study and current planning in the area has identified a new public road intersecting US 34 at the LCR 5 alignment (one-half mile east of I-25). To the north, LCR 5 swings slightly to the west and ties into Crossroads Boulevard at the re-aligned I-25 frontage road. To the south, LCR 5 will extend into the proposed Thompson Crossing development and tie into the re-aligned I-25 frontage road. The new intersection with US 34 will be constructed in accordance with the current Access Code standards. In the interim, this new intersection will be full movement and signalized. The ultimate access configuration at LCR 5 depends on the reconstruction of the I-25 / US 34 interchange which would likely include fly-over ramps to/from east US 34. These ramps' proximity to LCR 5 would preclude signalization of the US 34 / LCR 5 intersection. However, there is a strong desire by land owners, developers and local jurisdictions to maintain full movement capability at LCR 5 in the ultimate planning horizon. Therefore, in order to ensure full movement capability at LCR 5, the Ultimate Access Control Plan shows a grade-separated interchange (see Figure C-1) planned at LCR 5. This interchange's west ramps will need to be grade-separated or "braided" with the future I-25 ramps. The east ramps will be integrated with the LCR 3E interchange into a "Split Diamond" configuration. Land reservations are necessary to accommodate the "braided ramps" and the one-way collector-distributor "ramp" roads between LCR 5 and LCR 3E.

Due to the proximity of LCR 5 to I-25, a grade-separated interchange at LCR 5 would need to be built prior to or concurrent with the future I-25/US 34 reconstructed interchange. As a result, CDOT, local jurisdictions and developers agreed to add language to the Ultimate Access Control Plan to clarify the potential removal of the interim traffic signal at LCR 5 and that funding sources other than CDOT may be necessary for the LCR 5 interchange.

- ♦ **LCR 3E (MP 97.28)** – The Crossroads Boulevard study and current planning in the area has identified a new public road intersecting US 34 at the LCR 3E alignment (one mile east of I-25). To the north, the LCR 3E alignment would swing west and intersect Crossroads Boulevard at the LCR 5 alignment. To the south, LCR 3E would be integrated into the proposed Thompson Crossing development, where it would connect with an east-west roadway to LCR 3. In the interim, this intersection will be signalized when warranted for capacity or safety reasons. An industrial use is planned on the vacant land in the northwest corner. This development alone will not likely warrant signalization, but future development related to Thompson Crossing on the south side of US 34 could drive the need to signalize LCR 3E even before the LCR 3E roadway is built from US 34 to the north beyond the industrial uses property line. The construction of LCR 3E to the north will require a railroad grade separation which would require the industrial use to reconfigure their access to LCR 3E. As with LCR 5, there is a strong desire to ultimately provide an interchange at LCR 3E given its central location relative to future development between I-25 and LCR 3. Given LCR 3E's proximity to LCR 5, the LCR 3E interchange would be integrated with the LCR 5 interchange into a "Split Diamond" configuration (see Figure C-1). The "Split Diamond" configuration would require land reservations for the ramps at LCR 3E and the one-way collector-distributor "ramp" roads between LCR 3E and LCR 5. Additional land reservations would be needed for ramps to/from the east and would likely require purchasing of property in the northeast corner.



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- ◆ **UP Railroad Crossing (MP 97.64)** – Currently this rail crossing experiences about two trains a day. In the interim this crossing will remain. Ultimately, a grade separation may be provided with US 34 elevated over the railroad. If the railroad classification is not upgraded, this crossing may remain at-grade. If an overpass is constructed, it would eliminate accesses for the properties on the north side of US 34 east of LCR 3E. The only opportunity for alternative access is to the west via LCR 3E, which would require the provision of cross access through the adjacent businesses (see Figure C-1). In the event this overpass is constructed (prior to LCR 3 interchange) serious consideration should be given to also construct the LCR 3 interchange given their close proximity and associated impact to the LCR 3 vertical alignment.
- ◆ **LCR 3 (MP 97.79)** – This four-legged intersection currently functions as a full movement, unsignalized intersection. In the interim, this intersection will be signalized when warranted for safety or traffic reasons (see Figure B-1). Ultimately, LCR 3 will be grade-separated with US 34 and, consequently, the railroad. Right-in/right-out accesses east of LCR 3 and on both sides of US 34 will allow full movement access to/from US 34 (see Figure C-1). If this interchange is constructed land reservations would be required east of LCR 3 to accommodate the right-in/right-out accesses and the connecting roadways to LCR 3. The intersections of the connecting roadways and LCR 3 would be signalized. The ultimate grade-separated interchange should allow for the possibility of a US 34 overpass across the railroad.
- ◆ **County Line Road (LCR 901/WCR 13) (MP 98.83)** – This four-legged intersection is currently full movement and unsignalized. In the interim, it will be signalized when warranted for traffic or safety reasons (see Figure B-2). Also, the frontage road serving Kelim will be re-aligned to the south to provide some stacking distance for vehicles turning onto US 34. County Line Road has significant continuity extending from SH 14 to E-470 (as Colorado Blvd.) in Thornton and has been identified as a Strategic Corridor by Weld County. Therefore, as land develops sufficient right-of-way should be reserved so that a diamond interchange ultimately could be built at this location. Figure C-2 illustrates this interchange which includes at least one grade separation with the Great Western Railroad, one possibly to the south on County Line Road and possibly one to the east on US 34. Also, the frontage road serving Kelim would be shifted to the south to provide sufficient intersection spacing between the ramps and the frontage road along County Line Road.
- ◆ **Great Western Railroad Crossing (MP 99.09)** - Currently this rail crossing experiences about two trains a day. In the interim this crossing will remain. Ultimately, a grade separation may be provided with US 34 elevated over the railroad. If this is constructed, coordination with a potential interchange at County Line Road will be necessary.



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- ◆ **WCR 15 (MP 99.81)** – This four-legged intersection is currently full movement and unsignalized. In the interim, this intersection will continue to function as a full movement, unsignalized intersection (See Figure B-2). Ultimately, this intersection would be modified to function as a $\frac{3}{4}$ movement intersection meaning that left turns from US 34 would be allowed but through and left turns from WCR 15 would be prohibited. The $\frac{3}{4}$ movement restriction would be contingent on establishing cross access between County Line Road and WCR 15 (See Figure C-2).
- ◆ **WCR 17 (MP 100.87)** – This four-legged intersection is currently full movement and unsignalized. It will be signalized when it is warranted for traffic or safety reasons (see Figure B-2). As land develops sufficient right-of-way should be reserved (see Figure 8) so that a diamond interchange ultimately could be built at this location (see Figure C-2).
- ◆ **Private Drive Accesses** – In this section there are 40 private drive accesses that primarily serve as field accesses. Thirty-eight of the 40 private drive accesses will be removed when property redevelops. The two remaining private drive accesses currently serve the Kelim area and will remain open but turn movements will be restricted at these intersections. Also, in this section there are six median openings, of which all will ultimately be closed.

SH 257 to 71st Avenue

This section of US 34 serves currently undeveloped portions of the City of Greeley. Most adjacent land is undeveloped but is planned to eventually develop into commercial and residential uses. In fact, there are several developments on the north side of US 34 that are currently under construction or have been approved by the City of Greeley. Traffic volumes on all intersecting roadways are projected to increase significantly because of continued growth along the US 34 corridor and in the region.

- ◆ **Promontory Parkway/107th Avenue (MP 103.79)** – This “T” intersection is currently full movement and unsignalized. A private drive on the south side of US 34 has access at the intersection. In the interim, this intersection will be signalized when it is warranted for traffic or safety reasons (see Figure B-3). As land develops, sufficient right-of-way should be reserved (see Figure 8) on the north and south sides of US 34 so that ultimately a diamond interchange could be built at this location (see Figure C-3).
- ◆ **95th Avenue (MP 104.77)** – This four-legged intersection is currently full movement and unsignalized. Currently, 20th Street intersects 95th Avenue just north of US 34. As land develops in the northeast corner of 20th Street and 95th Avenue, 20th Street will be re-aligned to intersect 95th Avenue further to the north (see Figure B-3). In the interim, this intersection will continue to be full movement and unsignalized with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems. Ultimately, this intersection will be converted to a $\frac{3}{4}$ configuration in the future (See Figure C-3).



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The conversion of 95th Avenue from full-movement to $\frac{3}{4}$ configuration should not take place until a viable alternatives are available for the minor street left turn movements. 20th Street will provide the necessary alternative service for the southbound to eastbound left turn movement with minimal out-of-direction travel for affected motorists. A new roadway connection along the south side of US 34 will need to be established between Promontory Parkway and 95th Avenue (as the viable alternative) before the northbound to westbound left turn movement restriction should be implemented. This restriction will force these minor left turn movements to either the Promontory Parkway or Two-Rivers Parkway intersections which will be properly designed to accommodate higher volumes of traffic.

- ◆ **Two Rivers Parkway/83rd Avenue (MP 105.91)** – This four-legged intersection is currently full movement and unsignalized. Two Rivers Parkway has been identified by Weld County as a Strategic Corridor and is ultimately planned to be continuous from US 85 to SH 14. Given the significance of Two Rivers Parkway to the North Front Range region, this intersection is expected to be a major intersection in the future. Therefore, in the interim Two Rivers Parkway will be signalized when warranted for traffic or safety reasons (see Figure B-4) along with improvements to left and right turn lanes in accordance with the current Access Code. Ultimately, a diamond interchange is planned at Two Rivers Parkway (see Figure C-4), therefore as land develops, sufficient right-of-way (see Figure 8) should be reserved on the south side of US 34. The City of Greeley is currently working with developers on the north side to reserve land for a future diamond interchange.
- ◆ **71st Avenue/WCR 29 (MP 107.10)** – This four-legged intersection is currently full movement and unsignalized. On the south side a public from the west and a private drive intersect US 34 at the 71st Avenue alignment. Current development plans for the land south of US 34 between 65th and 71st Avenues show a new public road west from 65th Avenue intersecting US 34 at 71st Avenue. With this new public road, the existing public road from the west would likely access the new public road and the private drive would be closed. Also, when constructed the new public road would only be allowed right-in/right access. In the interim, 71st Avenue from the north would be converted to a $\frac{3}{4}$ configuration to address safety and traffic volume problems (see Figure B-4). A $\frac{3}{4}$ configuration for the north side would be maintained in the ultimate condition, but the frontage road intersection on 71st Avenue (just north of US 34) would be converted to a right-in / right-out configuration (see Figure C-4) to address safety and volume problems associated with two closely spaced intersections.

The difference in the access restriction between the north side and south side of the highway is due to the physical nature of the highway and the existing development in the immediate area. The left turn from US 34 to the cross-street will be allowed on the north side but restricted on the south side. This south side restriction is due to the fact that a grade-separated interchange is planned at 65th Avenue one-half mile to the east, and the westbound on-ramp will extend to within approximately one-quarter mile of 71st Avenue. This has the potential of introducing a weave movement along westbound US 34 involving on-ramp traffic at 71st Avenue turning left onto 71st Avenue (if the movement is allowed). This movement would be require three lanes changes within one-quarter of a mile and four lane changes if US 34 is widened to six lanes. Further, concerns have been raised by the



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members of Technical Advisory Committee and the Policy Committee regarding available sight distance that a westbound to southbound left turn movement driver would be provided in light of the curvature of US 34 west of 71st Avenue.

As such, the plan shows only a right-in/right-out along the south side. Motorists would have viable options through using the 65th Avenue or the Two-Rivers Parkway intersection. A roadway connection between 71st Avenue and 65th Avenue along the south side of US 34 will be critical for this configuration to properly function; WCR 56 serves as the southerly connection to Two-Rivers Parkway.

- ◆ **Private Drive Accesses** – In this section, there are a total of 20 private drive access points which primarily serve fields. Four accesses will be removed at the first opportunity while the remaining 16 will be removed when property re-develops.

65th Avenue to US 85 Interchange

This section of US 34 serves the currently developed portions of the City of Greeley. Between 65th and 35th Avenues, there are significant tracts of undeveloped land that are expected to develop with commercial and residential uses. Between 35th Avenue and the US 85 interchange, most of the land is built out and major changes in land use are not expected.

- ◆ **65th Avenue (MP 107.61)** – This four-legged intersection is currently signalized. In the interim, this intersection will remain a signalized intersection (see Figure B-4) with improvements to left and right turn lanes in accordance with the current Access Code to address future capacity and safety problems. Ultimately, a diamond interchange is planned at this intersection (see Figure C-4). Given existing and future development, a tight diamond interchange configuration is necessary to limit the impact to existing development. On the north side of US 34, a number of properties will need to be purchased to accommodate interchange ramps and the re-alignment of the frontage road. In addition, the frontage road on the east side will need to be closed and diverted north into the existing neighborhoods. On the south side of US 34, the developer on the west side of 65th Avenue has agreed to dedicate land for the future interchange ramp while on the east side of 65th Avenue sufficient right-of-way needs to be reserved when the vacant land redevelops.
- ◆ **47th Avenue (MP 109.11)** – This four-legged intersection is currently signalized. In the interim, this intersection will remain a signalized intersection (see Figure B-5) with improvements to left and right turn lanes in accordance with the current Access Code to address future capacity and safety problems. Right-of-way has been reserved on both sides of US 34 for an interchange. Ultimately, a diamond interchange is planned at this intersection (see Figure C-5). This interchange is included in the NFR's 2025 Fiscally Constrained Transportation Plan.



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- ◆ **35th Avenue (MP 110.23)** - This four-legged intersection is currently signalized. In the interim, this intersection will remain a signalized intersection (see Figure B-5) with improvements to left and right turn lanes in accordance with the current Access Code to address future capacity and safety problems. Right-of-way has been reserved on both sides of US 34 for an interchange. Ultimately, a partial cloverleaf interchange is planned at this intersection with the realignment of a frontage road located east of 35th Avenue on the north side of US 34 (see Figure C-5). This interchange is included in the NFR's 2025 Fiscally Constrained Transportation Plan.
- ◆ **23rd Avenue (MP 111.23)** – This is an existing interchange. Both the Interim and the Ultimate Plans identify no improvements to US 34 at the interchange. However, the City of Greeley recently completed a 23rd Avenue corridor study which recommended several improvements related to the interchange (23rd Avenue Corridor Study, Transystems Corporations, February 2000). These improvements include widening of the eastbound off-ramp to accommodate an eastbound right turn lane, provide dual left turn lanes at the eastbound on-ramp, widen 23rd Avenue to accommodate dual left turn lanes at 27th Street and re-stripe 27th Street to accommodate three eastbound approach lanes. These improvements are planned to be gradually implemented as the City of Greeley deems necessary.
- ◆ **17th Avenue (MP 111.74)** – This “T” intersection is currently signalized. In both the Interim and Ultimate Plans (see Figures B-6 and C-6, respectively), this intersection will remain as a signalized “T” with improvements to left and right turn lanes in accordance with the current Access Code to address future capacity and safety problems.
- ◆ **11th Avenue (MP 112.23)** – This four-legged intersection is currently signalized. In both the Interim and Ultimate Plans (see Figures B-6 and C-6, respectively), this intersection will remain signalized with improvements to left and right turn lanes in accordance with the current Access Code to address future capacity and safety problems. However, additional right-of-way is needed to provide any additional turn lanes at this intersection.
- ◆ **Private Drive Accesses** – In this section, there are a total of 20 private drive access points which primarily serve fields but some serve single family residences while others are used for emergency access. Thirteen accesses will be removed when property redevelops, five will be removed at the first opportunity, one will remain to serve a single family residence and one will remain to serve as emergency access. Also, there are six median openings in this section of which four will be closed and two will remain open. The one median opening to remain open is for a single family residence located east of 65th Avenue on the north side of US 34 and the other median opening to remain open is located west of 35th Avenue and is utilized by CDOT maintenance crews as a turn around.



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US 85 Interchange to WCR 55 in Kersey

This is a rural section of US 34 in Weld County between the City of Greeley and the Town of Kersey. The Greeley urban growth boundary extends to about WCR 47. The primary land use is agriculture, with scattered residences to serve this use. In the Town of Kersey, town streets intersect US 34 approximately every ½ mile. Currently, changes in land use are not specifically planned except on the outskirts of Greeley along US 34 Business and in the Town of Kersey where several development additions are expected.

- ♦ **East 27th Street/East 28th Street (MP 113.82)** – This four-legged intersection is full movement and unsignalized. In the future, Balsam Avenue is expected to be extended south to tie into US 34 (see Figure B-6 or C-6). In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems. Ultimately, this intersection will be converted to two ¾ configurations once signalization is warranted.
- ♦ **WCR 45 (MP 115.20)** – This “T” intersection (from the south) is currently full movement and unsignalized. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-7). Ultimately, this intersection will be converted to a right-in / right-out configuration once property redevelops and a connection is provided to access the US 34 Business intersection (see Figure C-7).
- ♦ **US 34 Business Route (MP 115.41)** – This “T” intersection (from the north) is currently full movement and unsignalized. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-7). Ultimately, this intersection will be signalized when warranted for traffic or safety reasons (see Figure C-7). A connection to the south from WCR 45 may be incorporated into the intersection as well.
- ♦ **WCR 45.5 (MP 115.74)** – This “T” intersection is currently full movement and unsignalized. A private drive on the north side of US 34 has access at the intersection. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-7). Ultimately, this intersection will be converted to a ¾ configuration when the property redevelops and cross access is available to either the US 34 Business intersection or to WCR 49 (see Figure C-7). The private drive on the north side will also become a ¾ access.



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- ◆ **WCR 47 (MP 116.25)** – This “T” intersection is currently full movement and unsignalized. A private drive on the north side of US 34 has access at the intersection. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-7). Ultimately, this intersection will be converted to a $\frac{3}{4}$ configuration when the property redevelops and cross access is available to either the US 34 Business intersection or to WCR 49 (see Figure C-7). The private drive on the north side will also become a $\frac{3}{4}$ access.
- ◆ **WCR 47.5 (MP 116.74)** – This “T” intersection is currently full movement and unsignalized. A private drive on the south side of US 34 has access at the intersection. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-7). Ultimately, this intersection will be converted to a $\frac{3}{4}$ configuration when the property redevelops and cross access is available to WCR 49 (see Figure C-7). The private drive on the south side will also become a $\frac{3}{4}$ access.
- ◆ **WCR 49 (MP 117.25)** – This “T” intersection is currently full movement and unsignalized. A private drive on the north side of US 34 has access at the intersection. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-7). Since WCR 49 is a significant roadway in this part of the region (as it is continuous from I-76 to US 34), it will ultimately be signalized when warranted for traffic or safety reasons (see Figure C-7).
- ◆ **WCR 49.5 (MP 117.74)** – This T” is currently full movement and unsignalized. A private drive on the south side of US 34 has access at the intersection. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-7). Ultimately, this intersection will convert to a $\frac{3}{4}$ configuration when the property redevelops and cross access is available to WCR 49 (see Figure C-7). The private drive on the south side will also become a $\frac{3}{4}$ access.
- ◆ **WCR 51 (MP 118.20)** – This four legged intersection is currently full movement and unsignalized. In the interim, the intersection will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-8). WCR 51 is the western edge of the Town of Kersey and this intersection ultimately will be signalized when warranted for traffic or safety reasons (see Figure C-8).
- ◆ **New Public Road (MP 118.44)** – A quarter mile east of WCR 51, a new public road intersection is planned on the south side of US 34. This new road will be constructed in accordance with current Access Code standards and will serve future development on the south side of US 34. In both the Interim and Ultimate Plans, this new public road will be a right-in / right-out only (see Figures B-8 and C-8, respectively).



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- ◆ **Kersey Business Route (MP 118.86)** – This existing public road accesses US 34 on the south side at an oblique angle. This intersection currently functions as a one-way “exit ramp” movement, unsignalized intersection. Improving the “one-way” movement enforcement will be necessary to address safety concerns. In both the Interim and Ultimate Plans, this intersection will continue to function as it does today (see Figures B-8 and C-8, respectively).
- ◆ **SH 37/1st Street (MP 119.17)** – This four-legged intersection is currently full movement and unsignalized. In the interim, this intersection will be signalized when warranted for traffic and safety reasons (see Figure B-8) along with improvements to left and right turn lanes in accordance with the current Access Code. Ultimately, this intersection will remain signalized with necessary turn lane improvements to address traffic and safety issues (see Figure C-8).
- ◆ **9th Street (MP 119.69)** – This “T” intersection is currently full movement and unsignalized. A private drive on the north side of US 34 has access at the intersection. This intersection serves as the primary highway access for a school complex that serves a large area within Weld County. As a result, there is a significant amount of school bus activity at 9th Street and it is the Town’s desire to focus bus activity at 9th Street rather than buses interacting with Town traffic to the west and future industrial traffic to the east. Therefore, in the interim, 9th Street will continue to function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-8). Ultimately, signalization will be allowed once it is warranted for traffic or safety reasons and a connection from the north will also be allowed (see Figure C-8).
- ◆ **WCR 56 / WCR 55 (MP 120.02)** – This four-legged intersection is located on the highway curve and currently is full movement and unsignalized. WCR 56 which runs east-west intersects US 34 at an oblique angle on the north side while WCR 55 intersects US 34 from the south (see Figure B-8). In the interim, this intersection will function as a full movement, unsignalized intersection with improvements to left and right turn lanes in accordance with the current Access Code to address future traffic and safety problems (see Figure B-8). Ultimately, this intersection will be closed and relocated approximately a quarter mile to the east (see Figure C-8).
- ◆ **New WCR 56 / WCR 55 Intersection (MP 120.22)** – In the interim, this new public road intersection does not exist. In the Ultimate Plan (see Figure C-8) this new public road intersection replaces the existing WCR 56 / WCR 55 intersection. This new intersection will be constructed in accordance with current Access Code standards and would be allowed to function as a full movement signalized intersection once it is warranted for traffic or safety reasons. Signalization would be allowed when warranted.
- ◆ **Private Drive Accesses** - In this section, there are a total of 43 private drive accesses which primarily serve fields, residences and agricultural related land uses. Most of these private drive accesses will be closed when properties redevelop. There are six private drive accesses that will be closed at the first opportunity, five that will remain open since they align with a public road intersection, and one that will remain open for emergency purposes only.



5.4 Interchange Alternatives Analysis

Interchange Alternative Analysis

A total of nine interchanges were recommended in the Ultimate Access Control Plan. An interchange alternatives analysis was conducted at each location to compare different interchange configurations based on traffic operations, impact to existing and future development, constructability, right-of-way needs and other criteria specific to each location. However, this alternatives analysis does not supercede the CDOT 1601 process but can be used as a starting point for that process. As outlined by the 1601 Policy Directive, any new interchange along the US 34 corridor would be required to prepare system and project level feasibility studies to be approved by the Transportation Commission. In addition, the 1601 process requires environmental studies and appropriate documentation of environmental, social and economic effects of the proposed interchange.

The following sections describe the alternatives evaluated at the interchange locations and the reasoning behind the selection of the recommended alternatives illustrated in the Ultimate Access Control Plan (Appendix C).

Larimer County Road 5

Currently, this intersection does not exist but previous planning efforts in the area have identified a new roadway intersecting US 34 at the LCR 5 alignment. Planning efforts in this area have assumed that LCR 5 would be a full movement signalized intersection. However, previous planning efforts have not considered that the reconstruction of the I-25 / US 34 interchange and its fly-over ramps could preclude the ability to maintain a full movement signalized intersection at LCR 5. Until an I-25 / US 34 interchange feasibility study is conducted, it is unknown whether LCR 5 would remain a signalized intersection in the future. If the interchange feasibility study shows that signalization of LCR 5 cannot be maintained, then the LCR 5 connection to US 34 would be closed.

Both the local jurisdictions and the development community are opposed to eliminating the LCR 5 connection to US 34 because development plans have been based on ultimately maintaining full movement capability at LCR 5. Therefore, to recognize the possibility that maintaining signalization of LCR 5 in the future may not be possible, an interchange concept was developed for LCR 5. In the Ultimate Access Control Plan, this interchange would be a split diamond configuration with LCR 3E. The east ramps would be at LCR 3E with one-way collector-distributors roads connecting these ramps to LCR 5. The west ramps would be “braided” with the I-25 / US 34 interchange east ramps. The layout of the LCR 5 interchange is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.



Larimer County Road 3E

Currently, this intersection does not exist but previous planning efforts in the area have identified a new roadway intersecting US 34 at the LCR 3E alignment. Interchange configurations were developed with the intent to minimize the impact to existing property on the north side of US 34 while property owners on the south side (i.e. Thompson Crossing) agreed to set aside land for a future interchange at the LCR 3E location. Six interchange alternatives were developed at LCR 3E. These configurations are illustrated in Appendix D and are described as follows:

- ◆ **Alternative 1 – Tight Diamond.** The westbound ramps are shifted south as close to US 34 as possible which minimizes the impact to existing development. Access to north side properties is via driveways on LCR 3E.
- ◆ **Alternative 2 – Single Point Urban.** A variation of the traditional single point urban interchange with all ramps tying into one intersection located on the south side of US 34, which minimizes the impact to existing development.
- ◆ **Alternative 3 – Offset Right-in/Right-out.** LCR 3E is shifted to the west to provide more spacing between the railroad to the north and US 34. The westbound ramps are all west of LCR 3E and access to the properties is shared via one driveway aligned with the ramp intersection.
- ◆ **Alternative 4 – Diamond Offset to the West.** LCR 3E is shifted to the west approximately 500 feet and a traditional diamond interchange is provided at the shifted cross street location. Access to properties is via a shared driveway.
- ◆ **Alternative 5 – Diamond Significant Offset to the West.** LCR 3E is shifted approximately 1,000 feet west of the existing LCR 3E alignment to eliminate most impact to the existing development on the north side of US 34. At the LCR 3E crossing of US 34 a traditional diamond interchange is provided. Access to properties is via a shared driveway. This alternative would preclude the ability to maintain a full movement signalized intersection at LCR 5.
- ◆ **Alternative 6 – Diamond with Roundabout.** The westbound ramps and driveways serving existing property would all tie into a roundabout on the north side of US 34.

Alternative 2 was eliminated due to cost and because it was not consistent with other interchange configurations planned along the corridor. Alternatives 3 and 4 were not further considered because of their significant impact to existing development on the north side of US 34. Alternative 5 was initially the preferred alternative but was eliminated because it would preclude the ability to maintain a full movement signalized intersection at LCR 5 and in the interim there would be inefficient ¼ mile signal spacing between LCR 3E and LCR 5. Alternative 6 was eliminated because operational analyses with 2025 traffic projections indicated that the roundabout would begin to fail.



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Alternative 1 was the preferred configuration and was recommended to be incorporated into a split diamond concept with LCR 5. This split diamond concept is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.

Larimer County Road 3

A Union Pacific railroad line has at-grade crossings on US 34 and on LCR 3 and these crossings limit and complicate interchange configurations at LCR 3. Due to the close proximity of these crossings to the US 34 / LCR 3 intersection, most interchange configurations at LCR 3 need to include a railroad grade separation for each crossing (although the US 34 railroad crossing may remain at-grade if the railroad classification is not upgraded). A total of four interchange configurations were evaluated at LCR 3 with each one involving the re-alignment of the Kelim frontage road to the south. These four configurations are illustrated in Appendix D and are described as follows:

- ◆ **Alternative 1 – Diamond.** A traditional diamond configuration with the eastbound ramps south of the LCR 3 railroad crossing. The potential US 34 grade separation with the railroad would need to accommodate the westbound on-ramp.
- ◆ **Alternative 2 – Compressed Diamond.** A traditional diamond configuration with the eastbound ramps positioned between the railroad and US 34. The potential US 34 grade separation with the railroad would need to accommodate both the westbound on-ramp and the eastbound off-ramp.
- ◆ **Alternative 3 – Partial Single Point Urban.** All but the eastbound off-ramp would be tied into one intersection on the north side of US 34. The potential US 34 grade separation with the railroad would need to accommodate the westbound on-ramp.
- ◆ **Alternative 4 – Diamond Offset to the East.** The alignment of LCR 3 would be shifted to the east to provide a traditional diamond configuration.

LCR 3E and 3 are only ½ mile apart, therefore, a traditional interchange at either location would preclude the ability to provide an interchange at the other location. Based on discussions with the TAC and the PC, along with operational analyses, it was concluded that between LCR 3E and 3 the recommended location for an interchange was LCR 3E. This recommendation essentially eliminates these four interchange alternatives from further consideration, except in the following situation:

- ◆ An interchange at LCR 3E positioned at the significant offset location (alternative 5) would allow for an interchange at LCR 3 if it is offset to the east (alternative 4). Shifting the 3E interchange west and the LCR 3 interchange east creates adequate intersection spacing to allow interchanges at both locations. The benefits of this scenario are the elimination of the traffic signal at LCR 5 and the provision of two means of full movement access to US 34



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between I-25 and LCR 3, which operational analyses show is needed. However, the fatal flaws that eliminate this scenario were $\frac{1}{4}$ mile signal spacing between LCR 5 and 3E in the interim condition and the loss of the ability to ultimately provide full movement access at LCR 5.

After concluding a traditional interchange would not be feasible at LCR 3, alternatives were developed for at-grade access to LCR 3. One factor in any at-grade access at LCR 3 is the US 34 railroad grade separation. If US 34 is ever elevated over the railroad, LCR 3 needs to be shifted east in order for LCR 3 to get back down to the elevation of the LCR 3 railroad crossing. This factor along with the re-alignment of the frontage road from Kelim were considerations in the development of five at-grade alternatives at LCR 3. These alternatives are illustrated in Appendix D and described as follows:

- ◆ **Alternative 5 – $\frac{3}{4}$ Movement Intersection.** The alignment of LCR 3 would be shifted east and left turn movements to US 34 and through movements across US 34 would be restricted.
- ◆ **Alternative 6 – Underpass: No US 34 Access.** LCR 3 is re-aligned to the west and crosses US 34 at the UP railroad grade separation. There would be no access to/from US 34.
- ◆ **Alternative 7 – Signalized Intersection.** The alignment of LCR 3 would be shifted to the east and the LCR 3 intersection would be signalized.
- ◆ **Alternative 8 – Underpass at US 34: Right-in/Right-outs.** LCR 3 is re-aligned to the west and crosses US 34 at the UP railroad grade separation. Right-in/right-out accesses would be provided on either side of US 34 to allow full movement access to/from US 34.
- ◆ **Alternative 9 – LCR 3 Overpass: Right-in/Right-outs.** LCR 3 is kept on its current alignment and grade separated with US 34 and the railroad. Right-in/right-out accesses would be provided on either side of US 34 to allow full movement access to/from US 34.

Alternatives 5 and 6 were eliminated due to turn movements restrictions to/from US 34. Alternative 7 was not recommended, although it allows for full turn movements, because in the Ultimate Access Control Plan this would be the only signalized intersection between I-25 and 17th Avenue in Greeley. Alternatives 8 and 9 are similar in the sense that both allow full movements to/from US 34 via right-in/right-out intersections on US 34.

Alternative 9 was preferred over Alternative 8 for the following reasons: 1) one at-grade railroad crossing, 2) LCR 3 is maintained on a straight alignment, 3) only two out of 4 quadrants affected and 4) interchange can be constructed separate from US 34 railroad grade separation. This concept is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.



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County Line Road

An active railroad line crosses US 34 just east of County Line Road and crosses County Line Road just south of US 34. Due to the close proximity of these railroad crossings to the US 34 / County Line Road intersection loop ramps on the south side of US 34 cannot be part of any interchange alternatives and most interchange alternatives will need to include grade separations with at least one of them on County Line Road and possibly one on US 34. A total of six interchange alternatives were considered at County Line Road and each one involves the re-alignment of the Kelim frontage road to the south. These six alternatives are illustrated in Appendix D and briefly described as follows:

- ◆ **Alternative 1** – A diamond interchange with offset eastbound interchange ramps.
- ◆ **Alternative 2** – A diamond interchange with a roundabout intersection on the south side for the westbound ramps and the frontage road from the west.
- ◆ **Alternative 3** – A diamond interchange with County Line Road shifted to the west so that the eastbound on-ramp could be accommodated between County Line Road and the railroad.
- ◆ **Alternative 4** – An interchange with a diamond configuration for westbound ramps with the eastbound ramps in the southwest quadrant with a roundabout intersection.
- ◆ **Alternative 5** – Identical to alternative 3, except that the frontage road swings south to cross the railroad tracks at-grade.
- ◆ **Alternative 6** – US 34 is shifted north and County Line Road is shifted west so that a diamond interchange can be accommodated and to provide more intersection spacing between the eastbound ramps and the frontage road.

Alternative 1 was eliminated due to the offset eastbound ramps and Alternatives 2 and 4 were eliminated because each would require an elevated roundabout intersection. Alternatives 3, 5 and 6 were also eliminated because each required changing the horizontal alignment of either County Line Road or US 34 or both. However, in meetings with the TAC and PC an Alternative 7 was developed which was a modified version of Alternative 5 that kept County Line Road on its current alignment.

The preferred alternative (Alternative 7) keeps County Line Road on its current alignment, aligns the frontage road along the property boundaries to the west and south and positions the eastbound on-ramp between the railroad and US 34 which will require a wider structure at the railroad crossing (if constructed) to accommodate a long acceleration lane on US 34. This preferred alternative is shown in the Ultimate Access Control Plan (Appendix C) and in Appendix D.



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WCR 17

Two interchange alternatives were considered at WCR 17. These alternatives are illustrated in Appendix D and are described as follows:

- ◆ **Alternative 1 – Diamond.** A traditional diamond interchange configuration.
- ◆ **Alternative 2 – Partial Cloverleaf.** A partial cloverleaf interchange configuration with the eastbound ramps in the southwest quadrant and the westbound ramps in a diamond configuration.

Alternative 2 was developed to avoid impacting the existing land use in the southeast quadrant but was not further considered because the use and value of the existing property in the southeast quadrant did not justify the additional right-of-way and expense of accommodating the loop ramps.

Therefore, the preferred alternative is Alternative 1 (diamond interchange) as it is consistent with other interchange configurations along the corridor. Alternative 1 is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.

Promontory Parkway

Two interchange alternatives were considered at Promontory Parkway. These alternatives are illustrated in Appendix D and are described as follows:

- ◆ **Alternative 1 – Diamond.** A traditional diamond interchange configuration with the eastbound ramps shifted to the north to minimize the impact to existing property in the southwest quadrant.
- ◆ **Alternative 2 – Partial Cloverleaf.** A partial cloverleaf interchange configuration with the eastbound ramps in the southwest quadrant and the westbound ramps in a diamond configuration.

The loop ramp in Alternative 2 was considered given the traffic projections for the southbound to eastbound left turn movement. However, Alternative 2 was eliminated from further consideration given the right-of-way needs of the loop ramp and the significant impact to existing development.



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Alternative 1 is the preferred alternative at Promontory Parkway. Traffic operational analyses show good traffic operations at the ramp intersections and for the southbound to eastbound left turn movement. Also, the westbound ramp intersection could be a roundabout given the nature of future traffic demand and given the potential of maintaining a driveway access at the ramp intersection. The preferred alternative is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.

Two-Rivers Parkway

Four interchange alternatives were evaluated at Two Rivers Parkway which intersects US 34 on a skew. These four alternatives are illustrated in Appendix D and described as follows:

- ◆ **Alternative 1** – Traditional diamond configuration for both eastbound and westbound ramps.
- ◆ **Alternative 2** – Diamond configuration for westbound ramps and a connected right-in/right-out in the southwest quadrant for eastbound ramps.
- ◆ **Alternative 3** – Diamond configuration for westbound ramps and a connected right-in/right-out in the southeast quadrant for eastbound ramps.
- ◆ **Alternative 4** – A partial cloverleaf with loops in the northeast and southwest quadrants.

The TAC recommended that along the US 34 corridor the preferred interchange configuration is a diamond, unless there is a specific right-of-way constraint or some other compelling reason to consider another alternative. At Two Rivers Parkway, land on the north side of US 34 was recently reserved to accommodate future diamond type ramps. In addition, operational analyses for a diamond configuration show acceptable traffic operations given 2025 traffic projections.

The preferred interchange alternative at Two Rivers Parkway is Alternative 1 which is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.



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65th / 71st Avenue

At 65th Avenue low density single family homes north of US 34 and existing development planned in the southwest quadrant were the major constraints in the development of interchange alternatives at 65th Avenue. Most interchange alternatives evaluated required the acquisition of existing developed property and included the removal of a direct access located east of 65th Avenue. Over several meetings with both the TAC and PC a total of ten interchange alternatives were evaluated at 65th Avenue with the recommended alternative consisting of a combination of specific elements of different alternatives. In most of the alternatives the frontage road intersection with 71st Avenue would be a right-in/right-out and the 71st Avenue intersection with US 34 would ultimately be restricted to a $\frac{3}{4}$ movement intersection on the north side and a right-in/right-out intersection on the south side. The first four alternatives are illustrated in Appendix D and described as follows:

- ◆ **Alternative 1 – Tight Diamond.** Westbound ramps are shifted south to avoid impacting developments on the north side. Some of the properties along the frontage road would have direct access to the interchange ramps. At 65th Avenue, the east side frontage road would be terminated into the neighborhood and the west side frontage road would be re-aligned to the north.
- ◆ **Alternative 2 – Single Point Urban.** US 34 would be shifted south so that the westbound ramps would not impact development on the north side of US 34. In this alternative the frontage roads would not have to be reconfigured.
- ◆ **Alternative 3 – One Way Frontage Road.** The frontage road on the north side of US 34 would be converted to one-way (westbound) only operations and the westbound ramps would act as “slip” ramps to/from US 34. Due to the one-way frontage road the intersection with 71st Avenue would have to be a right-out only, rather than right-in/right-out as for all other alternatives.
- ◆ **Alternative 4 – Full Diamond.** This option would require the purchase of developed properties on the north side of US 34 to provide a traditional diamond configuration. At 65th Avenue in the northeast quadrant, the frontage road and a neighborhood street are terminated at the westbound off-ramp while the west side frontage road is re-aligned to the north.

Alternative 1 was eliminated because of the private access allowed to the interchange ramps, alternative 2 was eliminated due to the significant additional right-of-way needed south of US 34, and alternative 3 was eliminated due to the one-way frontage road system with the “slip” ramps. Alternative 4 initially was the recommended alternative, but had to be eliminated because a site plan for a development planned in the southwest quadrant was under review by the City of Greeley. This site plan did not make provisions for a potential interchange ramp and the city initially felt that the project was too far along in the review process to require the developer to set aside land for an interchange ramp. Therefore, alternatives 5 through 10 were developed that explored interchange configurations that did not have any interchange ramps in the southwest quadrant. In each alternative the eastbound ramps are depicted in the southeast



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quadrant as a right-in/right-out access on US 34 that would tie into either 65th Avenue or 29th Street to the south. The ramp and the frontage road configurations north of US 34 differ in each alternative. These alternatives are depicted in Appendix D and are described as follows:

- ◆ **Alternative 5** – Same as alternative 1 on the north side of US 34.
- ◆ **Alternative 6** – Same as alternative 3 on the north side of US 34.
- ◆ **Alternative 7** – Same as alternative 4 on the north side of US 34.
- ◆ **Alternative 8** – The westbound ramps would be in the northeast quadrant and would require the purchase of four properties in that quadrant. The west side frontage road is closed on both ends and a new road is constructed along the backside of properties with a cross connection to the existing frontage road. The frontage road on the east side of 65th Avenue is terminated into the neighborhood.
- ◆ **Alternative 9** – The westbound ramps would be in the northeast quadrant and would require the purchase of at least two properties in that quadrant. The west side frontage road remains full movement at 65th Avenue while the east side frontage road is terminated into the neighborhood.
- ◆ **Alternative 10** – The westbound ramps are in the northwest quadrant and require the acquisition of some property. The west side frontage road would be grade separated with the ramps while the east side frontage road would remain open to 65th Avenue.

While these alternatives were being developed, the City of Greeley negotiated a deal with the developer in the southwest quadrant that would ultimately allow an interchange ramp in the southwest quadrant. Therefore, Alternatives 5 through 10 were all eliminated from further consideration and as a result of several TAC and PC meetings a new interchange alternative (Alternative 11), with the following elements was developed:

- ◆ The realignment of the west side frontage road comprised of different elements of alternatives 1 and 7.
- ◆ Terminating the east side frontage road into the neighborhood as shown in alternatives 1, 5, 8 and 9.
- ◆ A westbound on-ramp from alternative 4 and 7.
- ◆ A westbound off-ramp with a configuration, not shown in any of the alternatives, that allows the east side frontage road to terminate into the neighborhood. In addition, an one-way optional connection between the frontage road and the off-ramp could be provided.
- ◆ Eastbound ramps, not shown in any of the alternatives, that are shifted north in a “tight” diamond configuration.



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Therefore, the preferred interchange alternative, Alternative 11 at 65th Avenue is as described above and is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.

47th Avenue

Existing interchange land reservations assumed that the future interchange at 47th Avenue would have a diamond configuration. However, other interchange configurations were evaluated according to 2025 traffic projections to determine if it made sense to recommend an interchange configuration other than a diamond. These alternatives are illustrated in Appendix D and are described as follows:

- ◆ **Alternative 1 – Diamond.** Utilizing existing land reservations interchange ramps are laid out in a traditional diamond configuration.
- ◆ **Alternative 2 – Loop Ramp In Southwest Quadrant.** The westbound ramps are in a diamond configuration while the eastbound ramps have a loop configuration in the southwest quadrant. Also, there are eastbound on-ramps for northbound and southbound 47th Avenue traffic.
- ◆ **Alternative 3 – Connecting Right-in/Right-out.** The westbound ramps, similar to 23rd Avenue, are west of 47th Avenue at 48th Avenue. The eastbound ramps are in a diamond configuration.

The TAC recommended that along the US 34 corridor the preferred interchange configuration is a diamond, unless there is a specific right-of-way constraint or some other compelling reason to consider other alternatives. Analyses of each of the above alternatives at 47th Avenue suggest there are not any compelling reasons to consider an interchange configuration other than a diamond interchange, especially given that land has been reserved to specifically allow for a future diamond interchange

Therefore, the preferred interchange alternative at 47th Avenue is Alternative 1 which is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D.



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35th Avenue

Existing interchange land reservations and the cemetery located in the southeast quadrant primarily define configurations for interchange alternatives at 35th Avenue. Most interchanges evaluated at 35th Avenue consisted of a traditional diamond configuration for the westbound ramps and a loop ramp configuration, in the southwest quadrant, for the eastbound ramps. Although the type of interchange is limited by the existing conditions, ten interchange alternatives were evaluated for 35th Avenue. The difference in each alternative primarily relates to variations in operations and configurations for the frontage road, located in the northeast quadrant and for the frontage road intersection with 35th Avenue. The following items briefly describe each interchange alternative considered at 35th Avenue while a pictorial representation is provided in Appendix D. Unless otherwise noted, all alternatives consisted of “diamond” ramps for the westbound direction and loops ramps in the southwest quadrant for the eastbound direction.

- ◆ **Alternative 1 – Frontage Road Closure.** Frontage road intersection with 35th Avenue is closed.
- ◆ **Alternative 2 – One-way Frontage Road Merge.** The westbound off-ramp serves as an one-way frontage road with street connections and business access.
- ◆ **Alternative 3 – $\frac{3}{4}$ Movement.** The frontage road remains and the westbound off-ramp is eliminated. Westbound US 34 traffic to 35th Avenue would turn left at the eastbound ramps located in the southwest quadrant, at a $\frac{3}{4}$ movement intersection.
- ◆ **Alternative 4 – Disconnected Frontage Road Merge.** The frontage is discontinued at a cross street to the east and the westbound off-ramp also serves as a one-way frontage road to provide access to businesses.
- ◆ **Alternative 5 – Re-Aligned Frontage Road.** Some of the businesses along the frontage road are purchased and the frontage road is re-aligned to intersect 35th Avenue further north.
- ◆ **Alternative 6 – Roundabout.** A five-legged roundabout, north of US 34, serves both westbound ramps and frontage road traffic.
- ◆ **Alternative 7 – 36th Avenue Right-in/Right-out.** The westbound ramps, similar to 23rd Avenue, are west of 35th Avenue and tie into 36th Avenue and the frontage road intersection remains.
- ◆ **Alternative 8 – Five-Legged Intersection.** A multi-phased traffic signal at the westbound ramps serves the interchange ramps and frontage road turn movements.



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- ◆ **Alternative 9 – Re-aligned Frontage Road with Tight Ramps.** The frontage road is re-aligned, similar to alternative 5, but the westbound ramps are shifted south to provide more spacing between the ramps and the frontage road intersection.
- ◆ **Alternative 10 – Reservoir Road Access.** Turn movements are restricted at the frontage road to right-in/right-out and Reservoir Road is extended to intersect US 34 but only right-out movements are permitted onto westbound US 34.

Alternatives 1,2 and 4 were eliminated because turn movements were restricted at the frontage road intersection with 35th Avenue. Alternative 3 was rejected because level of service analyses showed that there were insufficient gaps in the eastbound traffic to allow left turn movements from US 34. Alternative 6 (the roundabout) was eliminated due to the right-of-way needs, limited amount of excess capacity (a 10 to 20 percent increase in 2025 traffic projections would cause the roundabout to fail) and concerns about local acceptance. The fatal flaws of Alternative 7 were poor traffic operations at the 35th Avenue / 25th Street intersection and significantly more vehicle-miles of travel than other alternatives. Alternative 8 was eliminated because the traffic signal on 35th Avenue at the westbound ramps and at the frontage road limits the green time for good signal progression on 35th Avenue. Also, Alternative 8 had design issues related to accommodating truck movements from the westbound off-ramp to the frontage road. Alternative 9 was eliminated due to the extra cost associated with the need for retaining walls to accommodate the “tight” ramp design. Finally, Alternative 10 was not considered due to the short weave distance between the Reservoir Road access and the westbound off-ramp, the potential to divert short trips to US 34 and the traffic impact to Reservoir Road.

Therefore, the preferred alternative was the re-aligned frontage road option (Alternative 5 which is illustrated in the Ultimate Access Control Plan (Appendix C) and in Appendix D). Alternative 5 allows for full turn movements at the frontage road intersection and creates sufficient signal spacing to allow for good signal progression along 35th Avenue.



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US 34 Business Route

In the Ultimate Access Control Plan, the intersection of US 34 Business with US 34 east of US 85 is recommended for signalization. In addition, existing intersections immediately to the east and west of US 34 Business are ultimately recommended to be $\frac{3}{4}$ movement intersections. Currently, the US 34 Business intersection with US 34 is a T-intersection and with the Ultimate Plan recommending turn restrictions at adjacent intersections, alternatives were explored for ways to tie in a roadway connection from the south. A total of four alternatives were developed which are illustrated in Appendix D as follows:

- ◆ **Alternative 1** – Signalization of the existing US 34 Business intersection with $\frac{3}{4}$ turn movements at adjacent intersections.
- ◆ **Alternative 2** – Re-align US 34 Business to the east to intersect US 34 at the WCR 45.5 alignment. Also, close existing US 34 Business intersection and restrict WCR 45 to $\frac{3}{4}$ movements.
- ◆ **Alternative 3** – Re-align US 34 Business to the west to intersect US 34 at the WCR 45 alignment. Also, close existing US 34 Business intersection and restrict WCR 45.5 to $\frac{3}{4}$ movements.
- ◆ **Alternative 4** – Construct a new roadway south of US 34 that ties into the existing US 34 Business intersection and connects into WCR 45. Restrict turn movements at WCR 45 to right-in/right-out and at WCR 45.5 to $\frac{3}{4}$ movements.

Alternative 4 was eliminated because the land east of WCR 45 is thought to be in the flood plain which would limit future development making it less likely that a private party would construct the new roadway. Alternative 2 was eliminated due to the tight curves needed to re-align US 34 Business west to intersect US 34 at WCR 45.5. Alternative 3 was rejected due to the new roadway construction necessary to re-align US 34 with WCR 45.

Therefore, the preferred alternative is Alternative 1 which is illustrated in the Ultimate Access Control Plan (Appendix C) and Appendix D.



5.5 Interchange Right-of-way Envelopes

The Ultimate Access Control Plan for US 34 shows nine new grade-separated interchanges. The decision to keep the interchange design as consistent as possible was made early-on in the process, and the diamond configuration was the selected configuration. The diamond is a very common interchange configuration in Colorado. Because of this, driver expectancy at diamond interchanges tends to be relatively high as compared to other interchanges. This high level of driver expectancy was the primary reason for using the diamond for US 34 to the extent possible. Ramp intersection capacity analyses were conducted for all of the diamond interchanges to ensure that a diamond would not be problematic in any particular area.

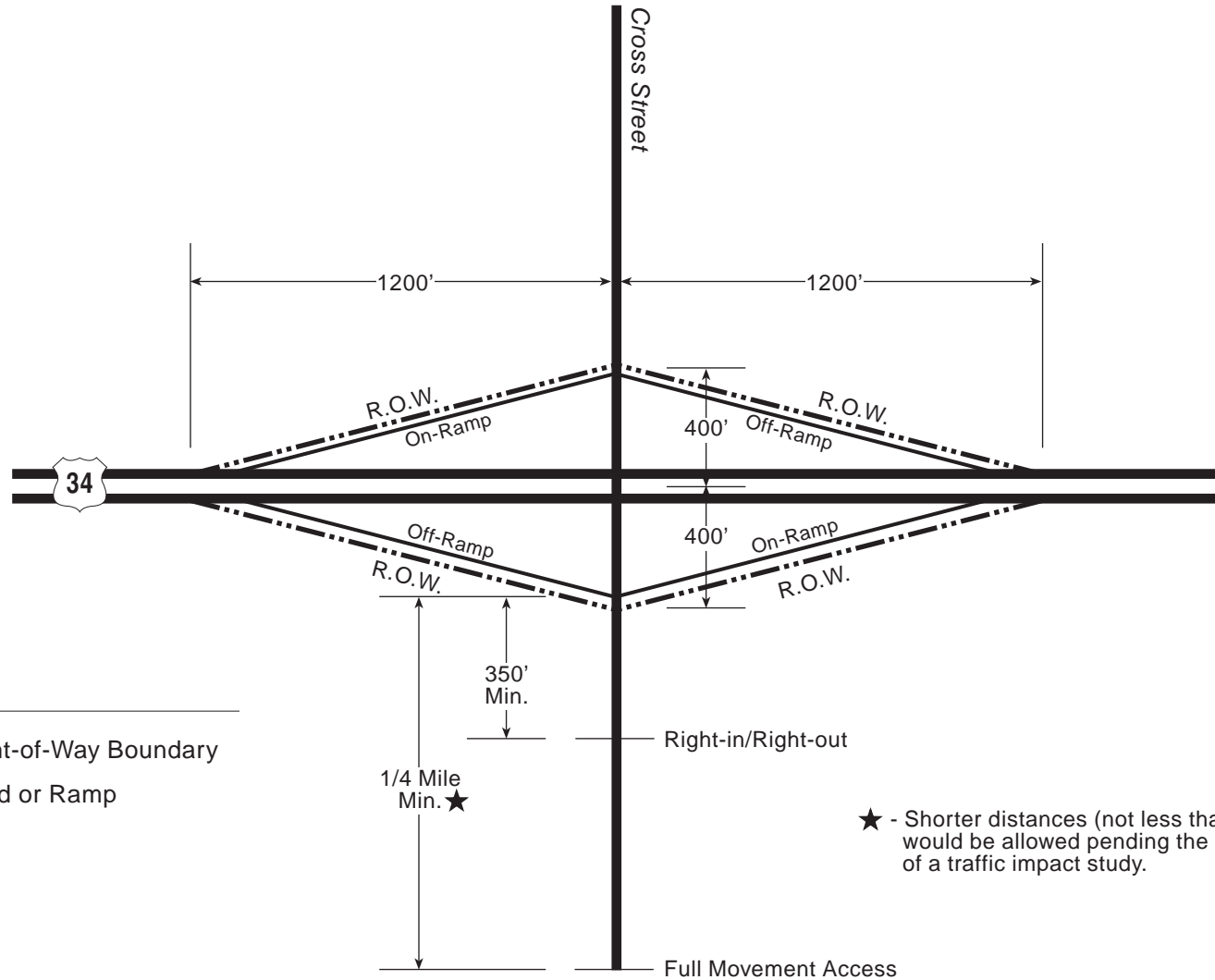
Figure 9 shows the prototypical envelope that each diamond interchange should be planned to meet. As shown, the dimensions include an 800-foot width and a 2,400-foot length from point to point. A good example of this template is the SH 257 interchange is the ideal model for a diamond interchange along US 34. This interchange includes ramps that are approximately 1,200 feet in length and intersect the cross-street at points located 625 feet apart. These dimensions serve as the prototype for all other diamond interchanges along the corridor, and they require a right-of-way envelope that is slightly larger to encompass the extent of the ramps.

Some locations along the corridor will require deviation from the prototypical right-of-way envelope. The depiction presented in Figure 9 illustrates the ideal scenario, but certain conditions may limit the ability to fully acquire that envelope. Where the desired right-of-way envelope cannot be acquired, right-of-way should be based on the ability to establish appropriate spacing of the ramp intersections (along the cross-street) based on future traffic volumes and providing adequate deceleration and acceleration length to/from US 34. It should be noted that the dimensions illustrated in each figure are estimates of the right-of-way needs and should be used as a planning tool for future development. The following sections describe the constraints at each interchange location to achieving the prototypical right-of-way envelope.

- ♦ **I-25/LCR 5/LCR 3E (Figure 10)** – At this location half diamond interchanges are proposed with parallel one-way collector-distributor “ramp” roads connecting the interchanges. Additional right-of-way along US 34 will be needed to accommodate the one-way “ramp” roads. The Greeley-Loveland canal restricts the ability to provide the full envelop on the north side of US 34. Additional right-of-way will be needed between I-25 and LCR 5 to accommodate braided flyover ramps associated with the reconstruction of the I-25 / US 34 interchange.
- ♦ **LCR 3 (Figure 11)** – The railroad crossings of US 34 and LCR 3 restrict the ability to provide interchange ramps west of LCR 3. The land area contained between the ramps, US 34 and LCR 3 is sufficient to accommodate future development.
- ♦ **County Line Road (LCR 901/WCR 13) (Figure 12)** – The railroad crossing of US 34 restricts the ability to provide the full right-of-way for the eastbound on-ramp.



Interchange Prototypical Right-of-Way Envelope



LEGEND

- = Right-of-Way Boundary
- = Road or Ramp

★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.



Figure 9



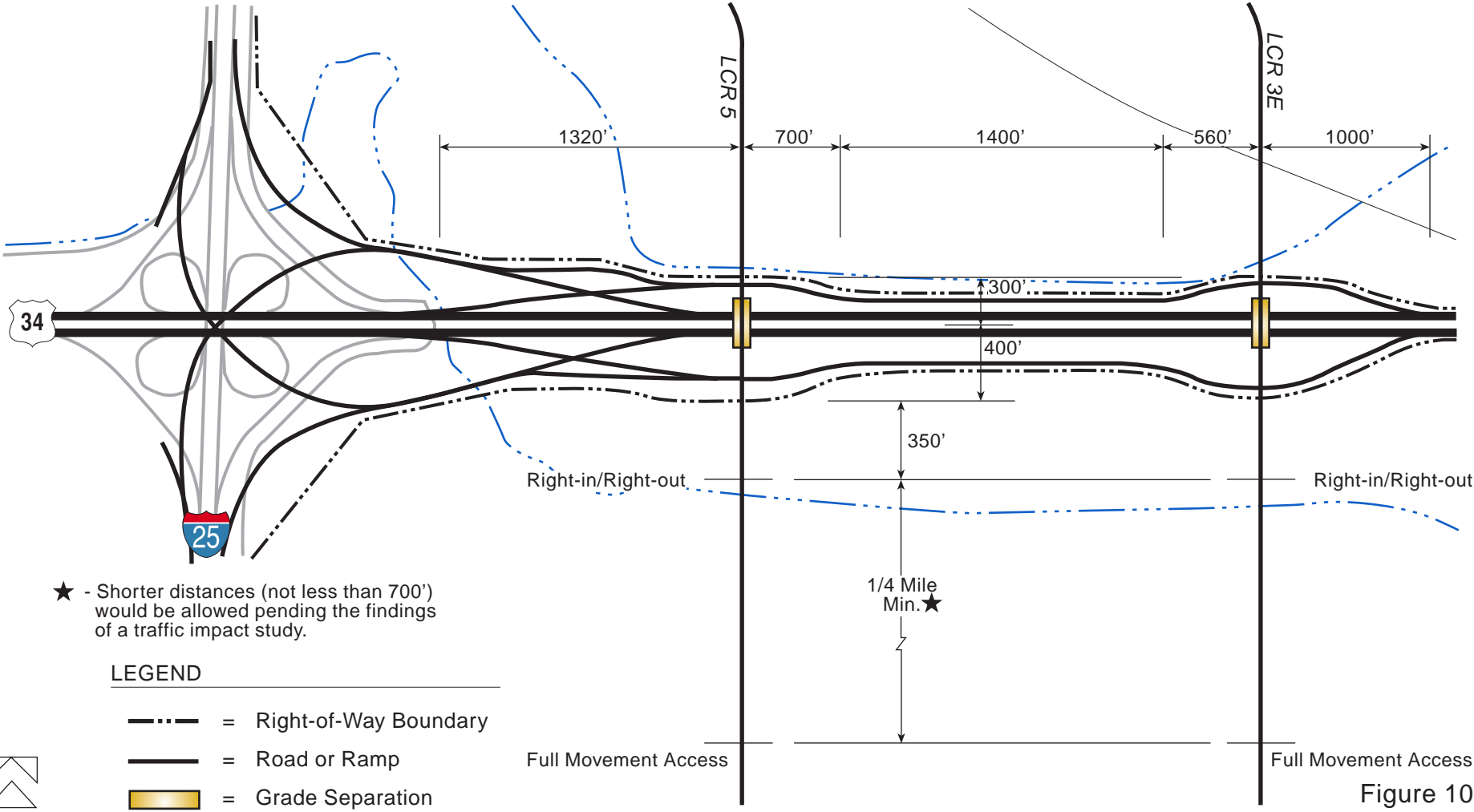
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- ◆ **WCR 17** – The prototypical right-of-way envelope can be provided at this location.
- ◆ **Promontory Parkway (Figure 13)** – A pond and an existing residence / business on the south side restrict the ability to provide the full intersection spacing as provided in the prototypical envelope.
- ◆ **Two Rivers Parkway (Figure 14)** – Right-of-way has currently been reserved in the northeast and northwest corners. In the remaining corners, there are no other constraints restricting the ability to achieving the full right-of-way envelope. It should be noted, however, that Two Rivers Parkway is skewed to US 34.
- ◆ **65th Avenue (Figure 15)** – The full right-of-way envelope cannot be provided primarily due to existing reservations in the southwest corner and to existing residential development north of US 34.
- ◆ **47th Avenue (Figure 16)** – The full right-of-way envelope cannot be provided due to existing right-of-way reservations in all quadrants, which are different than the prototypical, and existing development in all four quadrants. The envelope shown in Figure 15 represents the approximate right-of-way reserved for a future interchange.
- ◆ **35th Avenue (Figure 17)** – The full right-of-way envelope cannot be provided due to existing right-of-way reservations in all quadrants, which are different than the prototypical, and existing development in all four quadrants, including a cemetery in the southeast corner. The envelope shown in Figure 15 represents the approximate right-of-way reserved for a future interchange.

Figures 10 through 17 show the estimated right-of-way needs for each proposed interchange. These estimates are based on currently known restraints which may not be a factor as conditions change along the corridor. In general, the prototypical right-of-way envelope should be provided where possible.



Interchange at I-25/ LCR 5/ LCR 3E Approximate Right-of-Way Envelope



★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.

LEGEND

- = Right-of-Way Boundary
- = Road or Ramp
- = Grade Separation



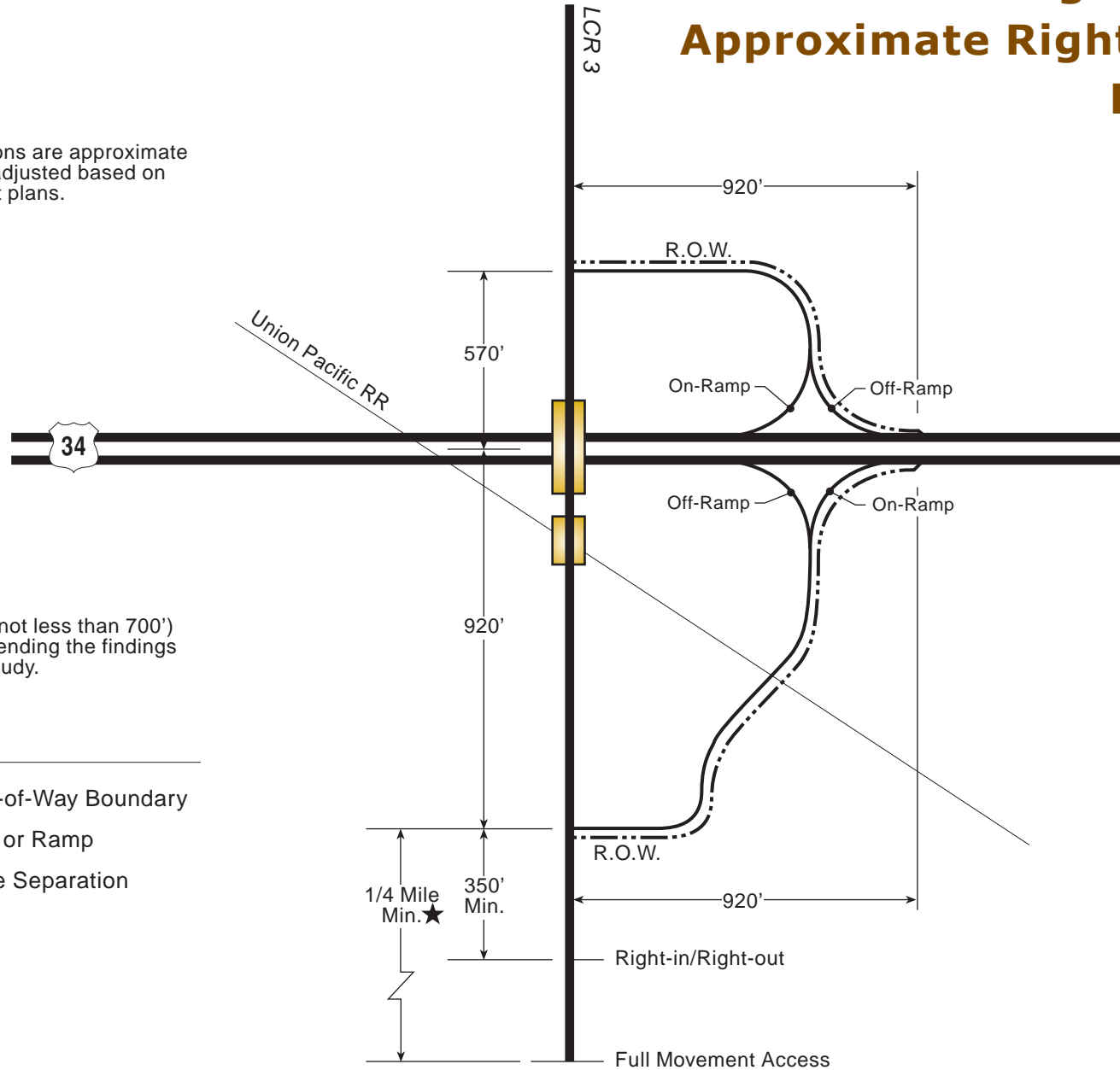
Figure 10





Interchange at LCR 3 Approximate Right-of-Way Envelope

Note: Ramp locations are approximate and can be adjusted based on development plans.



★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.

LEGEND

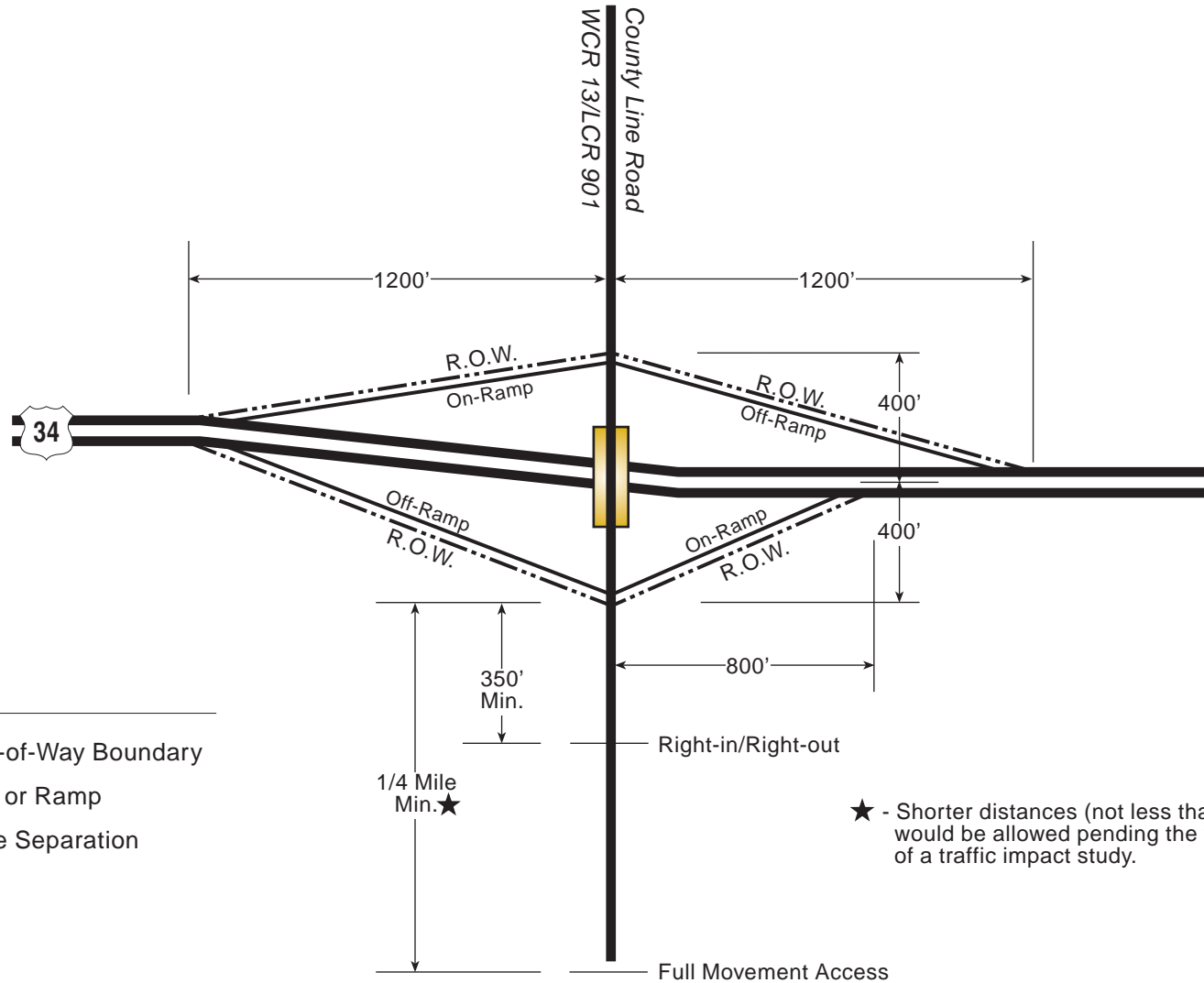
- = Right-of-Way Boundary
- = Road or Ramp
- = Grade Separation



Figure 11



Interchange at County Line Road/LCR 901/WCR 13 Approximate Right-of-Way Envelope



LEGEND

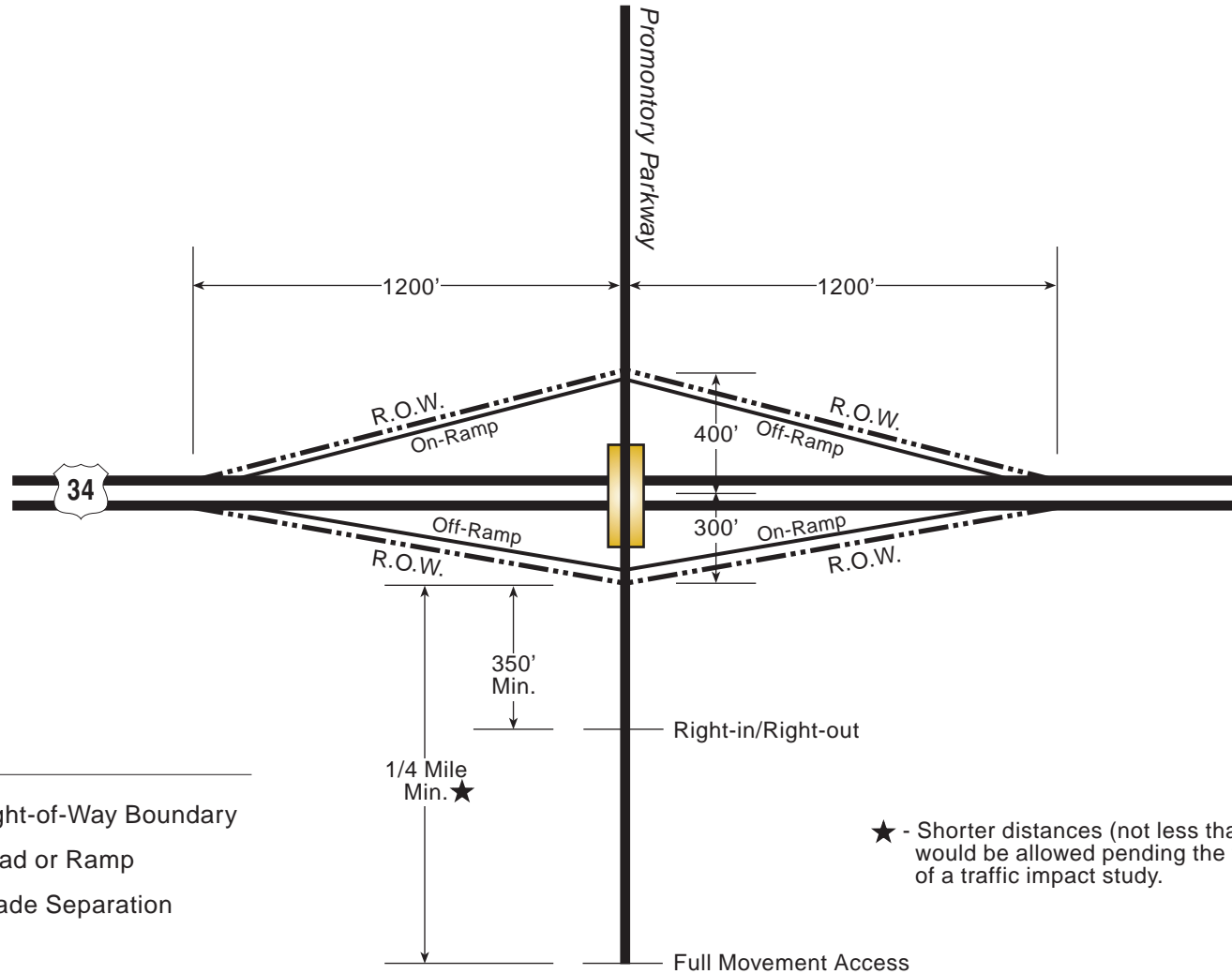
- = Right-of-Way Boundary
- = Road or Ramp
- = Grade Separation

★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.



Figure 12

Interchange at Promontory Pkwy. Approximate Right-of-Way Envelope



LEGEND

- = Right-of-Way Boundary
- = Road or Ramp
- = Grade Separation

★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.

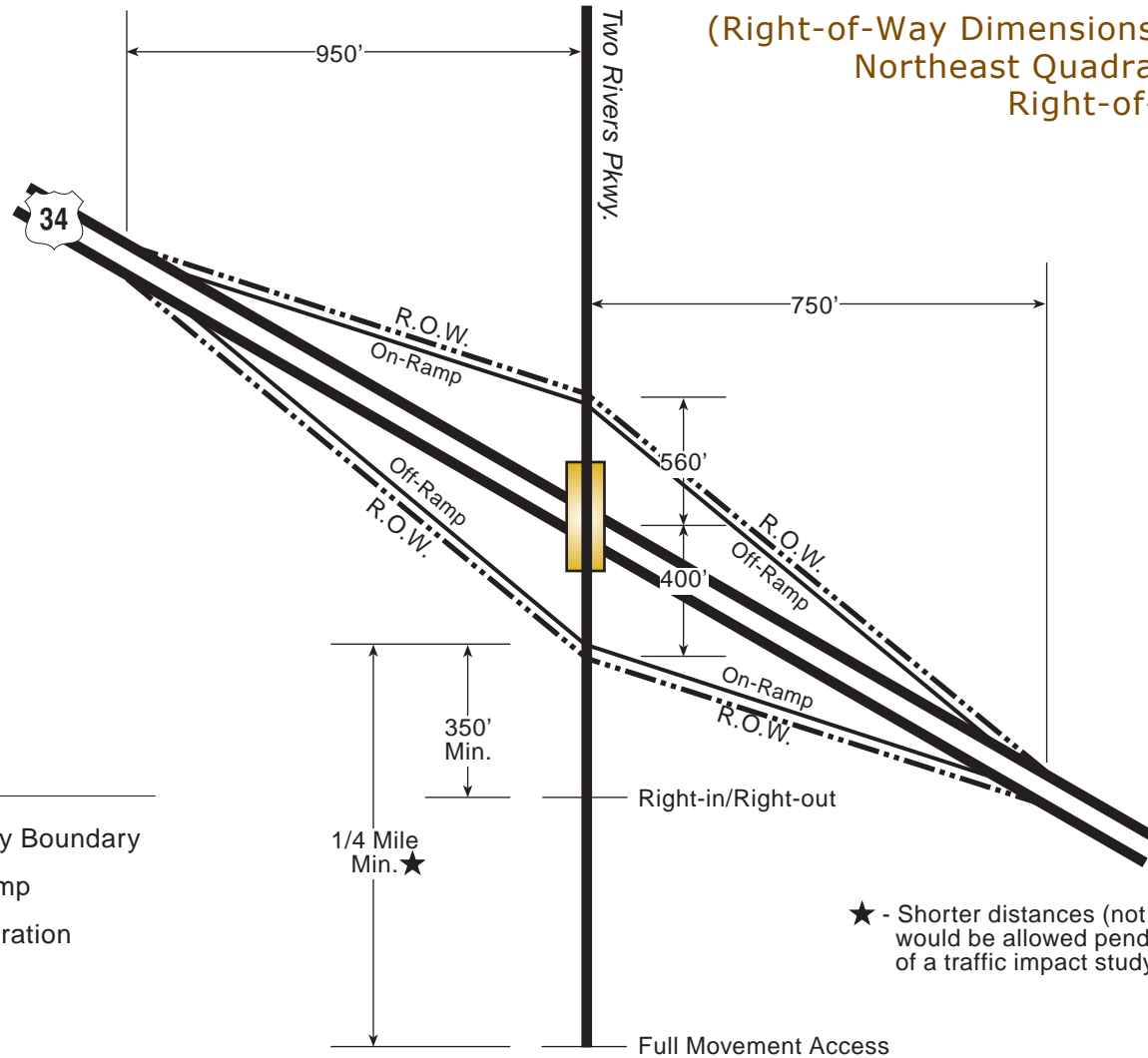


Figure 13



Interchange at Two Rivers Pkwy. (83rd Ave.) Approximate Right-of-Way Envelope

(Right-of-Way Dimensions for Northwest and Northeast Quadrants Depict Existing Right-of-Way Preservation)



LEGEND

- = Right-of-Way Boundary
- = Road or Ramp
- = Grade Separation

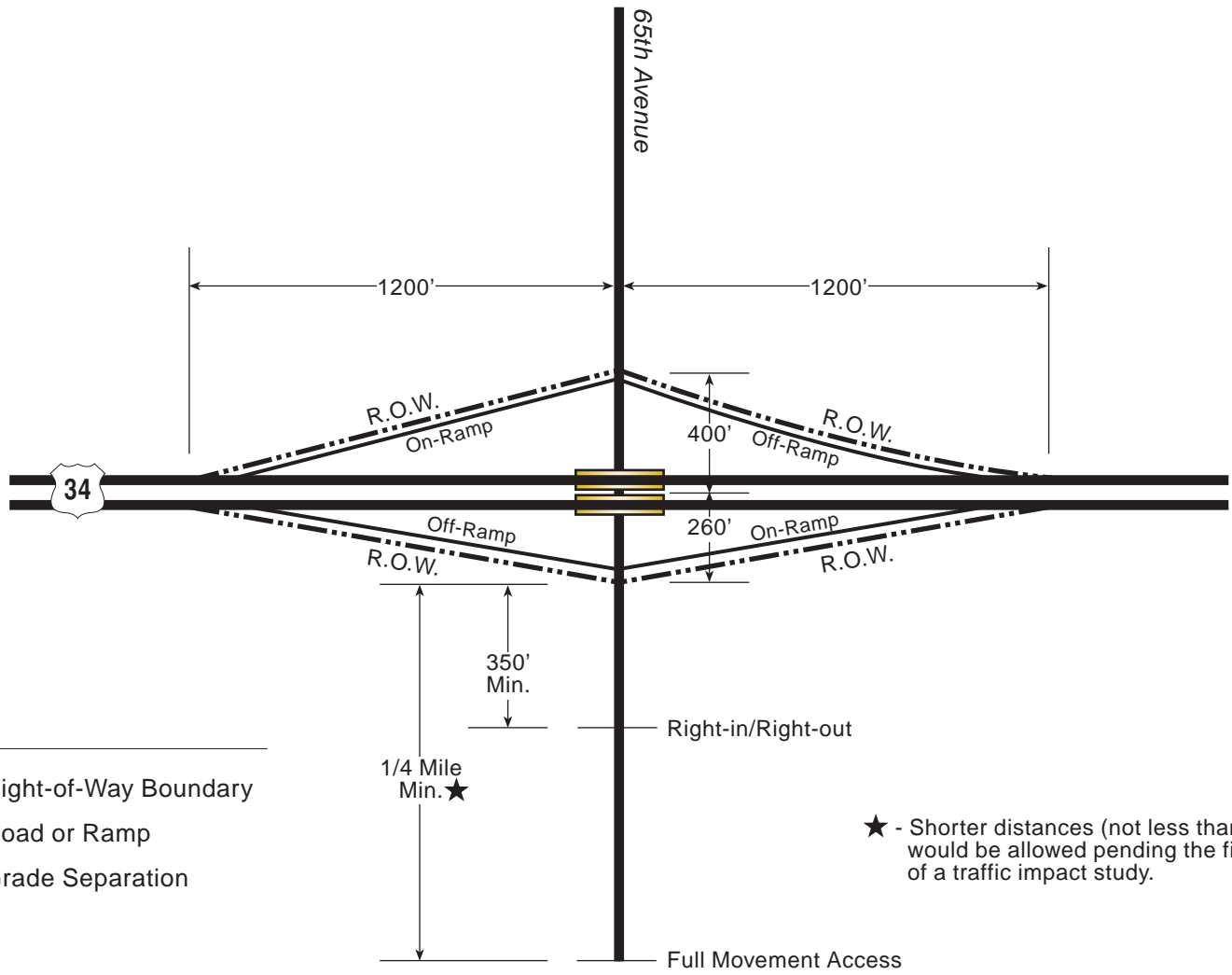
★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.



Figure 14



Interchange at 65th Ave. Approximate Right-of-Way Envelope



LEGEND

- = Right-of-Way Boundary
- = Road or Ramp
- = Grade Separation

★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.

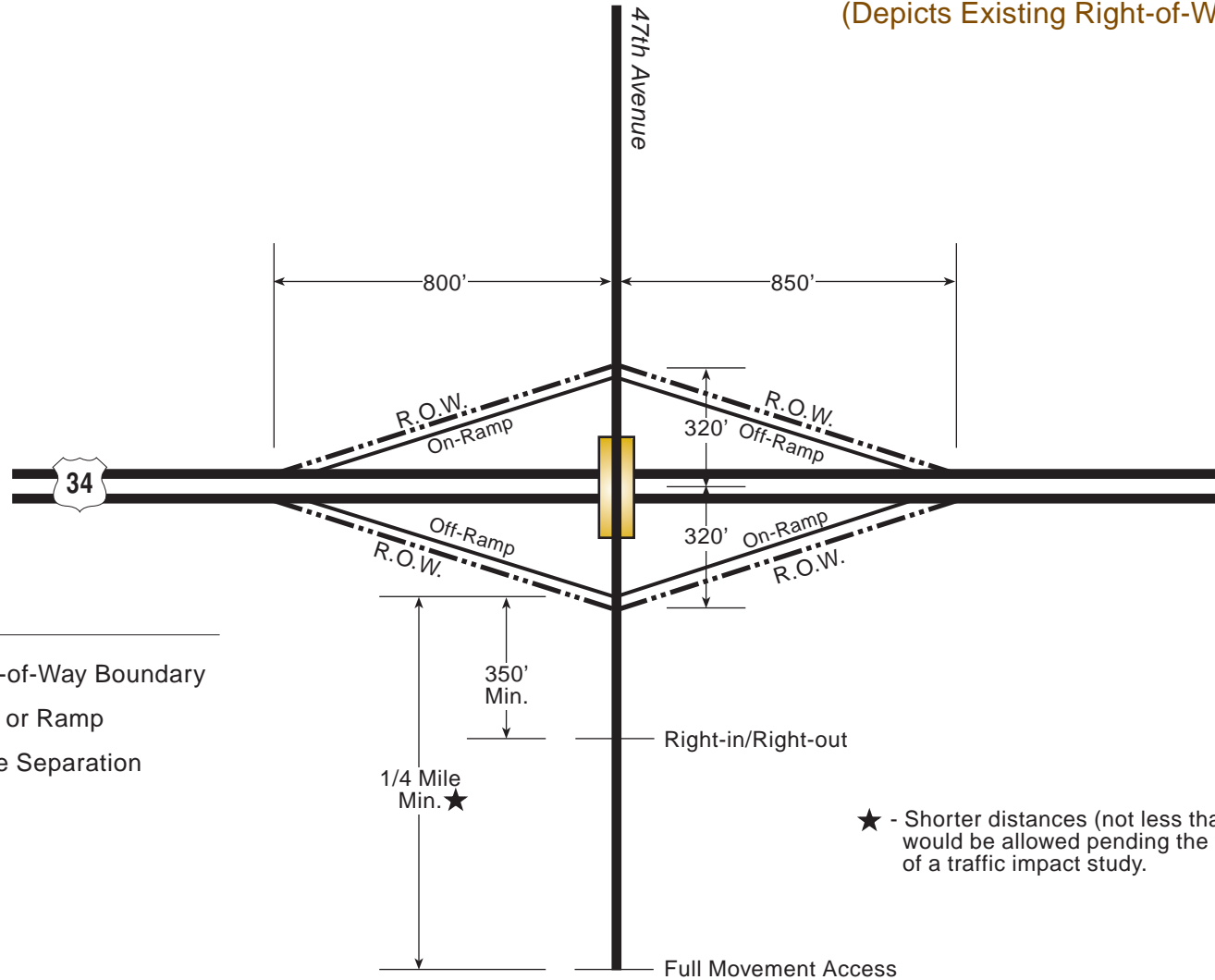


Figure 15






Interchange at 47th Avenue Approximate Right-of-Way Envelope

(Depicts Existing Right-of-Way Preservation)



LEGEND

-  = Right-of-Way Boundary
-  = Road or Ramp
-  = Grade Separation

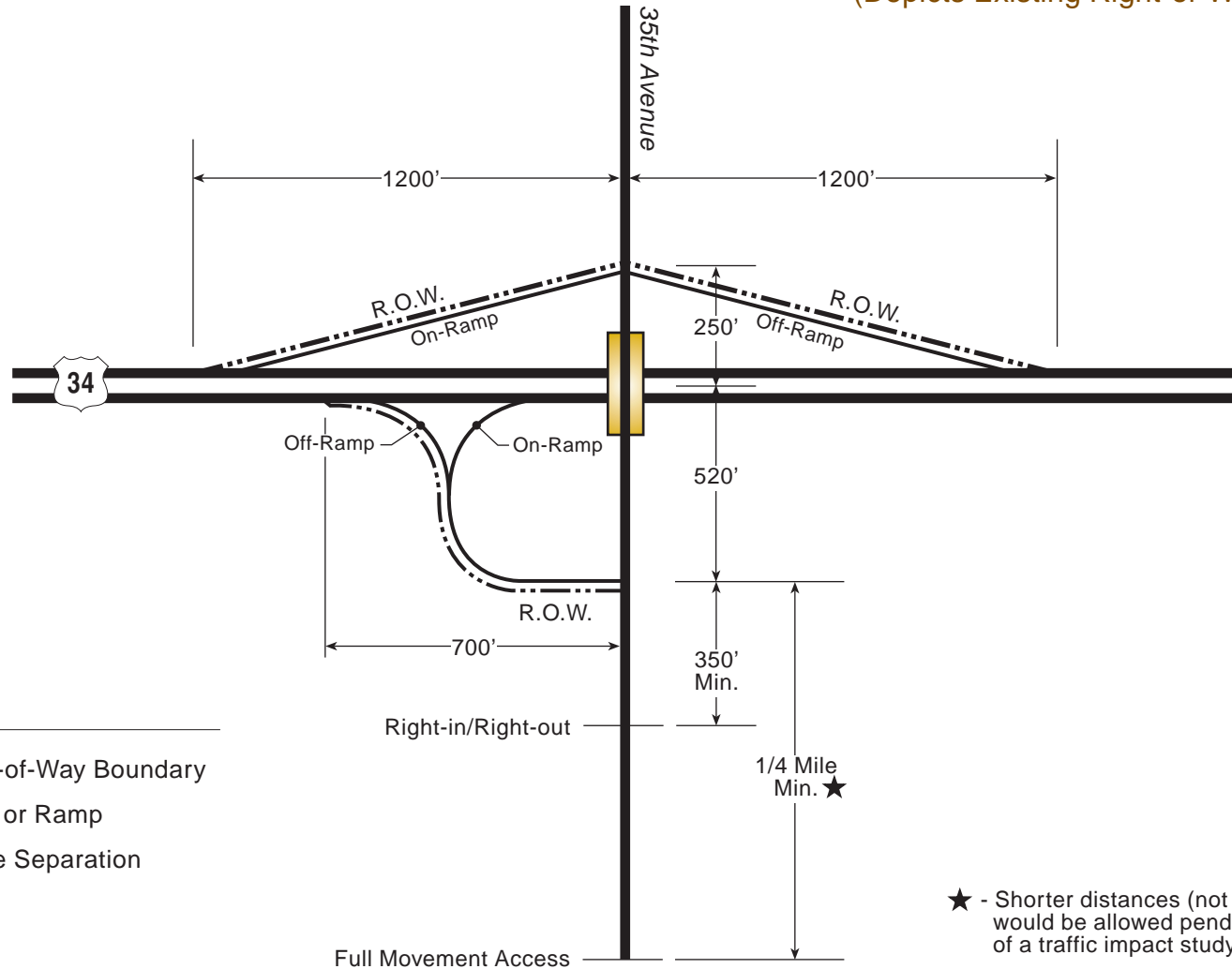
★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.



Figure 16

Interchange at 35th Avenue Approximate Right-of-Way Envelope

(Depicts Existing Right-of-Way Preservation)



LEGEND

- = Right-of-Way Boundary
- = Road or Ramp
- = Grade Separation

★ - Shorter distances (not less than 700') would be allowed pending the findings of a traffic impact study.



Figure 17



5.6 Planning Level Cost Estimates

A significant number of improvements have been identified in the Ultimate Access Control Plan. The Plan’s full implementation will likely take many years. As previously mentioned, the Ultimate Access Control Plan is intended to be a plan for well beyond the typical 20-year planning horizon. The significant improvements identified include the grade-separated interchanges (and associated roadway re-alignments) and the US 34 grade-separated crossing of the railroads.

Table 4 lists the improvement projects and their approximate construction costs. Cost estimate worksheets are included in Appendix E.

Table 4. Planning Level Cost Estimates

Location	Cost (Millions)
LCR 5 Braided Ramps with I-25 and Split Diamond with LCR 3E – US 34 Over Cross Street	\$28.7
LCR 3E Split Diamond Interchange with LCR 5 – US 34 over Cross Street	\$14.6
US 34 Bridges over Union Pacific Railroad at LCR 3	\$14.0
US 34 Bridges over Great Western RR at County Line Road	\$18.6
LCR 3 Overpass: Right-in/Right-outs – US 34 under Cross Street	\$16.7
County Line Road Diamond Interchange – US 34 Under Cross Street	\$15.6
WCR 17 Diamond Interchange – US 34 Over Cross Street	\$12.6
Promontory Parkway Diamond Interchange – US 34 Under Cross Street	\$10.8
Two Rivers Parkway Diamond Interchange – US 34 Under Cross Street	\$13.1
65 th Avenue Diamond Interchange – US 34 Over Cross Street	\$15.3
47 th Avenue Diamond Interchange – US 34 Under Cross Street	\$10.7
35 th Avenue Diamond with Loops Interchange – US 34 Over Cross Street	\$17.8
Total Planning Level Costs	\$188.2

As shown, the combination of projects would total to approximately \$190 million. This does not include the reconstruction of the I-25 interchange nor the reconstruction of the US 85 interchange. Also, these cost estimates do not include right-of-way or relocation costs or any widening of US 34 which is being addressed in a separate Corridor Optimization Study.

5.7 Project Priorities

The implementation of both the Interim and Ultimate Access Control Plans include several major construction projects. A few of these projects are identified in the 2025 North Front Range Regional Transportation Plan, but most of the projects shown do not have any identified funding. The implementation of these projects will take place over time primarily as development along US 34 takes place and/or as growth in regional traffic demands take place. Some of the elements of the plan should be implemented immediately while others are not needed until traffic conditions warrant such action.



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One project that should be implemented immediately is the following:

- ◆ Close access points that CDOT determines are illegal.

Other elements are shown in the plan relative to closing access points at the “first opportunity.” Examples of a first opportunity could include development/redevelopment of the served property. It could also include a highway capital improvement project or a maintenance project that could easily incorporate access closure. Access points and possibly median openings identified as such are deemed unnecessary and are no longer needed due to availability of other access or to land uses that no longer require the access onto the highway. These include:

- ◆ Four driveways between SH 257 and 95th Avenue (north side of US 34)
- ◆ Four driveways between 47th Avenue and 65th Avenue (three on the north side, one on the south)
- ◆ One just east of 47th Avenue (south side)
- ◆ Two “ramp-like” accesses between 11th Avenue and 17th Avenue (south side)
- ◆ Three driveways near the South Platte River (two on the south side, one on the north)
- ◆ Two driveways just east of WCR 49 (one on the north side, one on the south)

The priority of other projects will be driven by regional and local development patterns. If a major development is planned to locate along the corridor, the need to implement the plan elements in the immediate area will take on more urgency. Some of the construction projects cannot be implemented until a cross-street is constructed by a local agency or developer. Other projects within the plan will be justified as regional growth takes place over time.

It is difficult to estimate the timing and nature of development proposals along the corridor, but known development proposals and anticipated regional growth of US 34 traffic suggest that several highway projects in the access control plans should take some priority. Subject to funding, these include the following (in no particular order):

- ◆ Two median openings, one west of WCR 15 (approximate milepost 99.38) and one immediately west of 23rd Avenue (approximate milepost 110.75)
- ◆ 35th Avenue interchange (included in NFR’s 2025 Fiscally Constrained Transportation Plan)
- ◆ 47th Avenue interchange (included in NFR’s 2025 Fiscally Constrained Transportation Plan)
- ◆ Promontory Parkway traffic signal (subject to satisfying MUTCD warrants and the lack of adequate gaps for entry)
- ◆ WCR 17 traffic signal (subject to satisfying MUTCD warrants)



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- ◆ Turn restrictions at 71st Avenue
- ◆ Improvements to the 23rd Avenue interchange
- ◆ Intersection improvements to 11th Avenue (included in NFR's 2025 Fiscally Constrained Transportation Plan)
- ◆ Signalization of SH 37 in Kersey (subject to satisfying MUTCD warrants)

Beyond these projects, it is difficult to accurately estimate priority needs as they will be determined by local and regional growth patterns.

5.8 Overview of Inter-Governmental Agreement

The Ultimate Access Control Plan as well as the Interim Access Control Plan has been documented in an Inter-governmental Agreement (IGA) to be signed by all entities that have jurisdictions along US 34 and CDOT. Specifically, these agencies include the City of Evans, City of Greeley, Town of Johnstown, City of Loveland, Town of Kersey, the Town of Windsor, Larimer County, and Weld County. All of these parties including CDOT participated in the development of the plan, and all of the agencies will also be a signatory of the plan.

A copy of the IGA is presented in Appendix F. In general, the IGA does not specifically financially obligate any agency, but it does require all involved agencies to take necessary action to implement the plan to the extent that the agency's regulations and resources allow. It is recognized that agencies will have varying authority relative to implementing plan elements within their jurisdiction, but the intent is that each agency agrees to implementation to their legal and fiscal limits and discretion.

The IGA also includes a section on plan amendments. It is recognized that conditions along the corridor may not come to fruition as envisioned in this document. As such, legitimate modifications may be necessary at some point. The section of the IGA which addresses this requires any modifications to be proposed only by signatory agencies subject to a meeting of the agencies. A vote on the modification proposal is taken after the meeting, and a two-thirds vote is required to approve any modifications. The details of the amendment process are shown as Exhibit C of the IGA document.



6.0 IMPLEMENTATION

The improvements recommended in the Access Control Plan represent a long range plan and, as such, will be implemented over time as traffic and safety needs arise and as funding allows. However, in order to ensure that these improvements can be implemented in the future, it is important that the Access Control Plan be adopted by all entities in the corridor and that it be used in all transportation and land use planning which could affect US 34.

Therefore, the US 34 Access Control Plan has been adopted through an Intergovernmental Agreement (IGA) between CDOT, the towns, the cities and the counties in the corridor. The IGA is included in Appendix F. The format and content of this IGA were major topics of discussion with the Policy Committee.

Because this Plan is a long range plan and conditions may change over time, a key element of the IGA is a specified process for modifying the plan in the future. This process calls for the creation of an Advisory Group comprised of one representative from each of the signatories of the IGA. Amendment requests will be reviewed by the Committee, and changes can be made only with the affirmative vote of 2/3 or more of the signatories as mentioned in the previous section. This process, along with regular meetings with the Advisory Group should ensure continuing coordination between the communities in the corridor.

Upon the establishment of the Access Control Plan, CDOT will present a request to CDOT's Executive Director to gain approval of the future public road intersection locations as shown in the Plan.



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APPENDIX A EXISTING ACCESS INVENTORY



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**APPENDIX B ILLUSTRATIVE INTERIM ACCESS CONTROL
PLAN**



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**APPENDIX C ILLUSTRATIVE ULTIMATE ACCESS
CONTROL PLAN**



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APPENDIX D INTERCHANGE ALTERNATIVES ANALYSIS



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APPENDIX E COST ESTIMATE WORKSHEETS



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APPENDIX F INTER-GOVERNMENTAL AGREEMENT



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