



Final Report

US 34 Corridor Optimization Plan

March 2003



US 34

CORRIDOR OPTIMIZATION PLAN

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EXECUTIVE SUMMARY

Corridor Optimization is a relatively new procedure developed by the Colorado Department of Transportation (CDOT) to identify basic needs for selected highway corridors. The intent of the process is to conduct cursory-level analyses to determine the most effective means of serving future travel demands. The process was developed when the Major Investment Study process was eliminated as part of the Transportation Equity Act for the 21st Century (TEA-21). The procedure provides CDOT a method of evaluating corridors without the large financial commitment of a Major Investment Study to establish CDOT's vision of a corridor for purposes of planning.

The Corridor Optimization process was applied to a 25-mile segment of US 34 extending from I-25 east through the Town of Kersey. A separate and overlapping effort included the development of an Interim and Ultimate Access Control Plan (ACP) for the corridor which is also a significant step toward optimizing the operation of a or this particular corridor.

The development of the ACP began prior to that of the COP, but there was significant overlap in these efforts, which was beneficial to both plans. This close coordination allowed the results and findings of one effort to be considered in the development of the other. For details on the ACP, one should refer to the separate report documenting that specific process dated April 2003.

The development of the US 34 COP was a collaborative effort involving all of the local jurisdictions along or near the 25-mile segment of the highway. These included the City of Loveland, The Town of Johnstown, The Town of Windsor, Larimer County, the Town of Milliken, the City of Greeley, the City of Evans, the Town of Kersey, and Weld County.

The primary steps taken in conducting the US 34 COP were as follows:

- ◆ Identify the future transportation problem/issues along US34,
- ◆ Develop improvement alternatives and measures to address the problems/issues,
- ◆ Evaluate the effectiveness of each alternative relative to its cost and select preferred improvements and measure for inclusion in the COP, and
- ◆ Assemble the COP and develop a business plan.

The following Vision Statement was adopted to guide this effort:

Highway US 34 is the major east-west transportation facility within Northern Colorado. The corridor serves as an expressway connection between Kersey, I-25, Greeley, and Loveland as well as other adjacent communities. Much of the highway has been designed for high-speed traffic. However, historic and on-going growth within the region will continue to place increasing travel demand along the corridor. The Corridor Optimization Plan is a new effort to maintain proper planning to ensure that US 34 continues to function as a high-level expressway to maintain existing and future east-west mobility within the region.



Several aspects of this planning should be explored including interchange locations, capacity improvements, alternative modes of transportation, travel demand management measures, appropriate Intelligent Transportation Systems (ITS) techniques, parallel facilities (arterial roads and service roads) and adjacent land uses. The US 34 Access Control Plan will be considered in this planning effort and incorporated into the final optimization plan. The Corridor Optimization planning will also identify the associated right-of-way needs for US 34. Each aspect has a potential role to ensure that the US 34 corridor continues to provide a high level of mobility while recognizing the environmental and social needs of the surrounding area.

Extensive analysis was conducted on the US 34 corridor. Between I-25 and US 85, traffic volumes along US 34 currently range from 21,000 vehicles per day (vpd) to 35,000 vpd. Year 2025 traffic projections indicate that these volumes would approximately double; more than 80,000 vpd are projected just east of I-25. The 20-year traffic forecasts will exceed the highway's capacity between I-25 and US 85 but not east of US 85. As such, there is no need to optimize the segment east of the US 85 interchange. Much of the traffic making use of US 34 will be commuter traffic between Greeley and Loveland as well as Greeley and Fort Collins. Within Greeley, the predominant highway user will be comprised of trips internal to the Greeley/Evans area.

An inventory of the existing transportation services and facilities shows the following:

- ◆ Local transit service within the Greeley/Evans area,
- ◆ Parallel roads to US 34 that could potentially be major arterial facilities in the future,
- ◆ A significant width of right-of-way (ROW) along most of the US 34 corridor.

A total of 17 alternatives were considered including:

- ◆ Widening US 34 to six lanes from I-25 to US 85,
- ◆ Widening US 34 to six lanes from I-25 to Business 34 (west end near SH 257),
- ◆ Establishing Crossroads Boulevard/"O" Street Connection as a major parallel facility (north of US 34),
- ◆ Establishing LCR 18/WCR 54 as a major parallel facility (south of US 34),
- ◆ Building parallel Collector/Service Roads,
- ◆ Building north-South connection via Two Rivers Parkway/Harmony Road,
- ◆ Building HOV Lanes
- ◆ Building north-South connection via WCR 13,
- ◆ Implementing advanced Signal Timing System for US 34,
- ◆ Constructing Interchanges at major cross-streets,
- ◆ Incorporating a bicycle facility along US 34,
- ◆ Providing Inter-City bus service between Greeley and Loveland as well as between Greeley and Fort Collins,
- ◆ Implementing employer Travel Demand Management measures,
- ◆ Providing Intra-Regional rail service along US 34,



- ◆ Expanding the Van Pool Program,
- ◆ Expanding Greeley's public bus system,
- ◆ Reducing land use densities for adjacent development.

Each of these alternatives were evaluated relative to their effectiveness in either reducing traffic demand along US 34 or increasing the highway's capacity. Further, the effectiveness was compared against the estimated cost to ascertain the relative value of each alternative. The results of the analysis provided the major elements of the US 34 Corridor Optimization Plan. These are shown in Figure ES-1.

The US 34 COP also recognizes other measures that should will have a positive impact on US 34 travel and are supported by this plan. They include the following:

- ◆ Inter-City Transit Service
- ◆ Local Transit Service
- ◆ Employer Travel Demand Management
- ◆ Van pool services
- ◆ Land Use Decisions; reduced densities along US 34.

The implementation of the US 34 COP will require action from all involved jurisdictions. CDOT will not be able to implement all of the plan's elements since many are "off system." A business plan was developed to identify the appropriate lead agencies for each of the major components, their estimated costs, and potential funding sources.

The ultimate cross-section identified for US 34 includes six through lanes, a median wide enough to accommodate dual left turn lanes at intersections, auxiliary right-turn acceleration/deceleration lanes, and shoulders. A 185-foot ROW envelope should be preserved along the US 34 to accommodate these elements.

Preliminary environmental research was conducted. The following highlights resulted from this effort:

- ◆ Threatened and Endangered species may existing along some of the corridors considered for improvements.
- ◆ Surface waters systems (Big Thompson River and the Cache La Poudre River) must be considered; avoidance and mitigation measures will need to be explored.
- ◆ Oil and gas tanks/pumping stations will need to be investigated as to possible spills.
- ◆ Environmental Justice issues may be a concern in certain areas.
- ◆ Noise investigations may be necessary where there are improvements.
- ◆ Appropriate Storm Water Improvements are necessary.
- ◆ Historical buildings and irrigation canals need to be avoided.



Major Components

- LEGEND**
- = Signalize and Construct Dual Left Turn Lanes and a Right Turn Lane Along All Four Approaches and Implement Advanced Signal Timing (CDOT and All Local Agencies Lead)
 - = Signalize and Construct Dual Left Turn Lanes and a Right Turn Lane Along All Four Approaches and Implement Advanced Signal Timing **Ultimately build grade-separated interchange per Access Control Plan dependent upon funding.** (CDOT and All Local Agencies Lead)

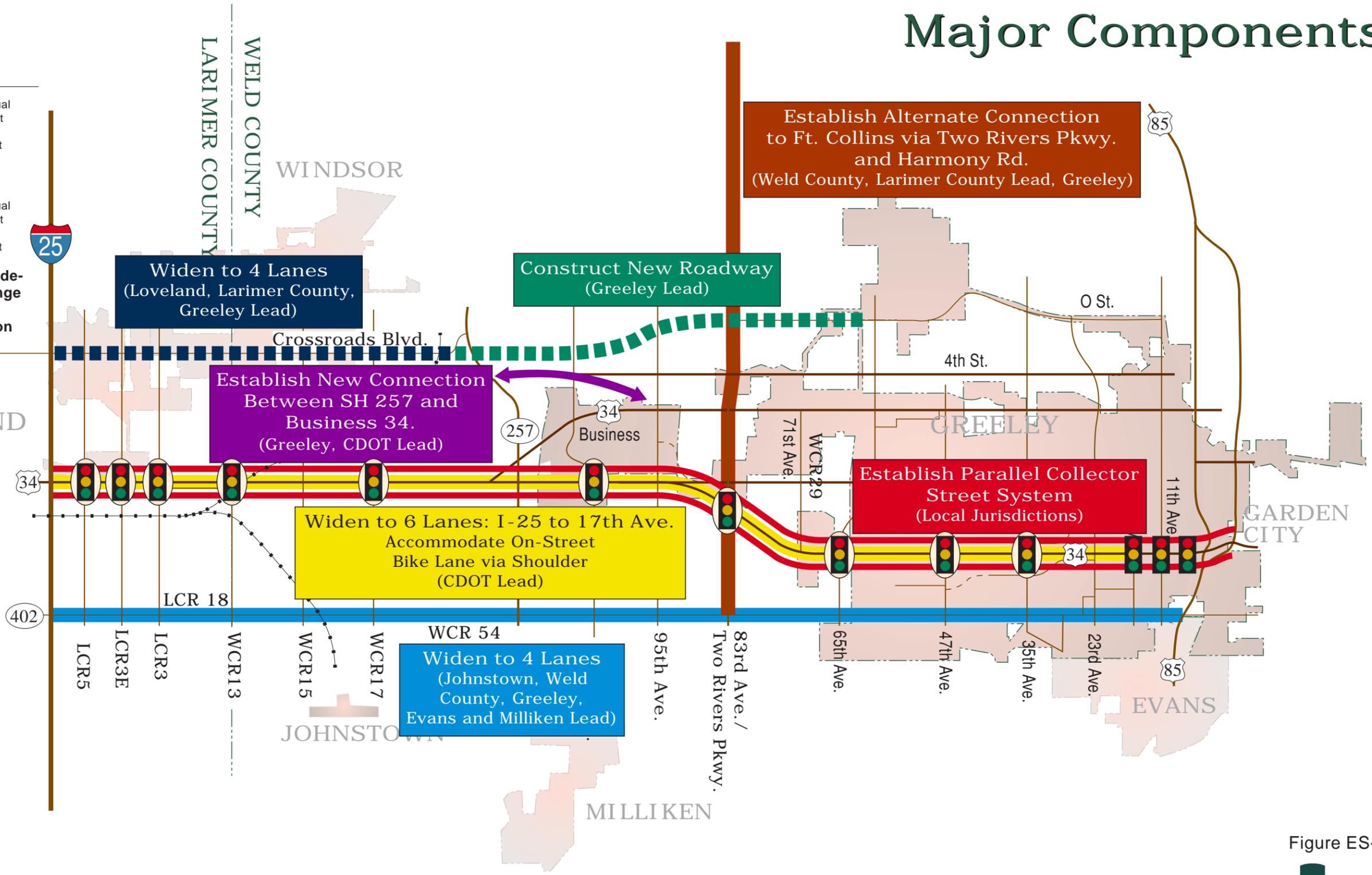


Figure ES-1





1.0 INTRODUCTION

Corridor Optimization is a relatively new procedure developed by the Colorado Department of Transportation (CDOT) to identify basic needs for selected highway corridors. The intent of the process is to conduct cursory-level analyses to determine the most effective means of serving future travel demands. The process was developed when the Major Investment Study process was eliminated as part of the Transportation Equity Act for the 21st Century (TEA-21). The procedure provides CDOT a method of evaluating corridors without the large financial commitment of a Major Investment Study to establish CDOT's vision of a corridor for purposes of planning.

Corridor Optimization is basically an assessment of how to best meet travel demands in a given corridor. It is intended as an initial step to the traditional transportation planning process. Results of the corridor optimization process could be project considerations for the North Front Range (NFR) Regional Transportation Plan. The subsequent transportation planning process includes developing the State Transportation Improvement Program (STIP) and the project development phase including National Environmental Policy Act (NEPA) requirements. The corridor optimization process does not include any public involvement as this process will be conducted at later stages of the transportation planning process.

The Corridor Optimization process was applied to a 25-mile segment of US 34 extending from I-25 east through the Town of Kersey. A separate and overlapping effort included the development of an Interim and Ultimate Access Control Plan (ACP) for the corridor which is also a significant step toward optimizing the operation of particular corridor. US 34 was selected for a corridor optimization analysis given its current expressway nature and the desire amongst CDOT and the local jurisdictions to maintain its mobility in light of development pressures and increasing traffic volumes. This is the first Corridor Optimization Plan (COP) prepared in the State. It will provide direction for the future planning of the US 34 corridor.

The development of the ACP began prior to that of the COP, but there was significant overlap in these efforts, which was beneficial to both plans. The ACP effort is intended to be adopted by the local agencies and formalized by signing a common Inter-Governmental Agreement (IGA). The COP is not subject to an IGA, but the results of the COP and the ACP were linked through the on-going cooperative process with all the parties. This close coordination allowed the results and findings of one effort to be considered in the development of the other. The ACP is included in Appendix A of this report. For details on the ACP, one should refer to the separate report documenting that specific process dated April 2003.



2.0 OPTIMIZATION PLAN PROCESS

2.1 *Agency Involvement*

The development of the US 34 COP was a collaborative effort involving all of the local jurisdictions along or near the 25-mile segment of the highway. These included the City of Loveland, The Town of Johnstown, The Town of Windsor, Larimer County, the Town of Milliken, the City of Greeley, the City of Evans, the Town of Kersey, and Weld County. The coordination process used in developing the US 34 ACP was also used in developing the COP. This included a Technical Advisory Committee (TAC) comprised of planning and engineering staff from each jurisdiction and a Policy Committee (PC) comprised of an elected official from each jurisdiction. The TAC met approximately once a month while the PC met approximately every three months. Presentations of the COP were also made to the NFR Technical Advisory Committee and to the NFR Council for consideration and comment.

2.2 *Primary Steps*

The basic steps in preparing the COP are shown in Figure 1. The first key step in the plan's development includes first "identifying the problem" relative to US 34 travel. This step focuses on understanding the travel markets that will make use of the highway such as origin/destination information and the types of trips served by US 34. In addition, this step considers basic capacity questions of the highway in regards to the facility's ability to accommodate future traffic demands given its existing condition. The result of the first step is a Problem or Vision Statement that guides the remainder of the process.

The second key step in the COP process is to develop all possible alternatives that might address travel issues along the highway. Traditional highway improvements such as general lane widening and turn lane additions are among the alternatives considered in addition to non-traditional alternatives such as parallel roadway facilities, transit considerations, Travel Demand Management (TDM) measures, possible land uses planning alterations, and Intelligent Transportation Systems (ITS) measures.

The third key step is to evaluate each of the alternatives as to their relative capacity/demand effectiveness and associated cost. This step also involves reviewing whether a particular alternative is recognized in any agency's transportation plan. Alternatives being considered to address US 34 need to also be viewed within a regional context as well as corridor context. The effectiveness was determined, in part, with the assistance of the NFR Travel Demand Model. Engineering judgment also played a significant role in estimating the effectiveness of each alternative based on available data.

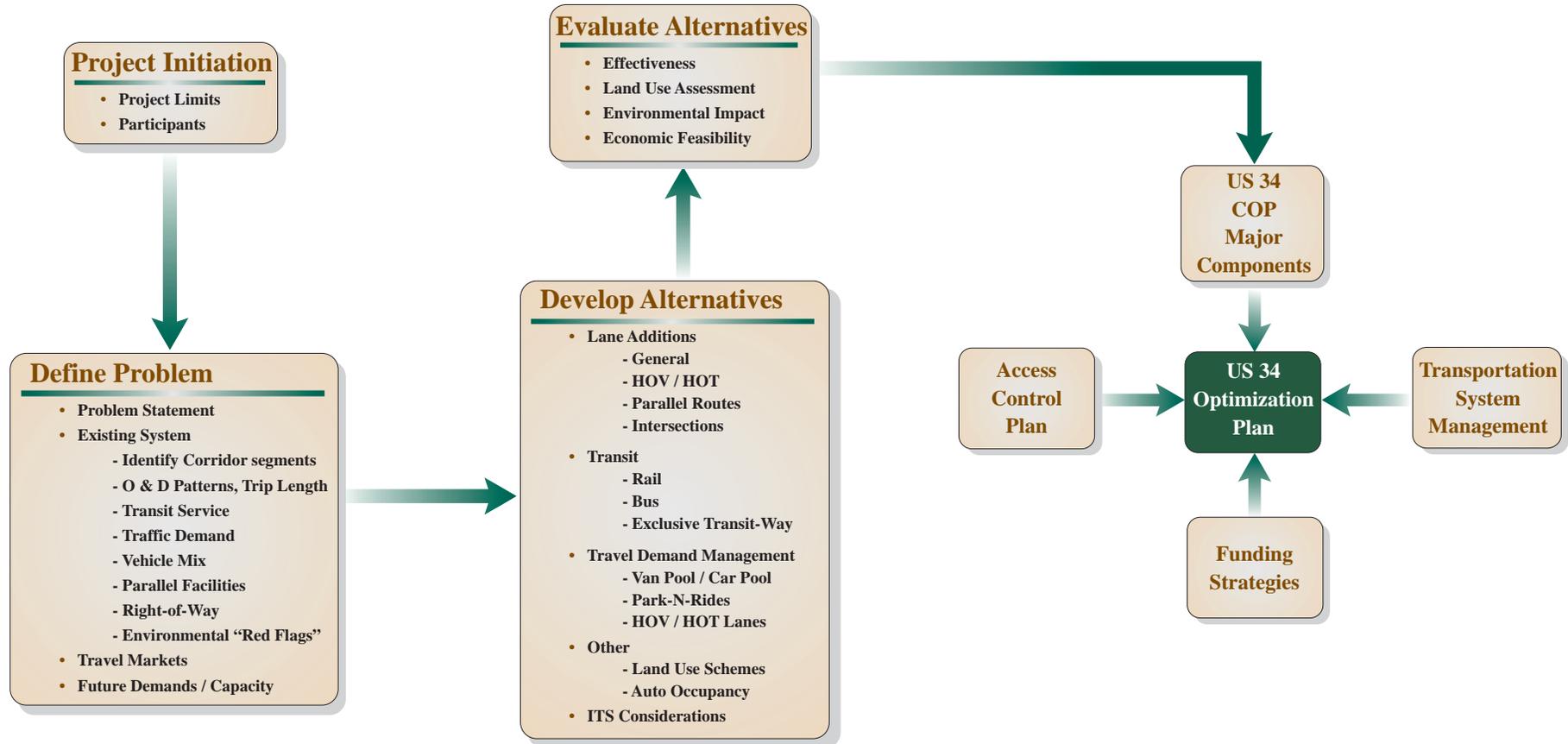


Figure 1



The fourth, and final, key step is then to assemble the COP. This result will identify the major roadway improvements that should be planned as well as the role of other transportation measures. A financing/business plan has also been developed in general terms to identify agency responsibilities and potential funding sources to bring the plan, or key elements of the plan, to fruition. The final result then serves as CDOT's "vision" of the corridor, and it will serve as a planning tool to guide the long-term improvements along US 34.



3.0 PROJECT DEVELOPMENT

A key step in the corridor optimization process is “defining the problem” relative to travel demands and capacities. This is conducted through the development of a problem statement based upon analysis of the transportation system and an understanding of existing and projected conditions along the corridor. As such, a significant amount of research and analysis has been conducted to better understand US 34’s physical conditions and the nature of its future travel demands.

3.1 *Project Vision Statement*

Based on the subsequent analysis and from discussions with the TAC, a Vision Statement was developed as follows:

Highway US 34 is the major east-west transportation facility within Northern Colorado. The corridor serves as an expressway connection between Kersey, I-25, Greeley, and Loveland as well as other adjacent communities. Much of the highway has been designed for high-speed traffic. However, historic and on-going growth within the region will continue to place increasing travel demand along the corridor. The Corridor Optimization Plan is a new effort to maintain proper planning to ensure that US 34 continues to function as a high-level expressway to maintain existing and future east-west mobility within the region.

Several aspects of this planning should be explored including interchange locations, capacity improvements, alternative modes of transportation, travel demand management measures, appropriate Intelligent Transportation Systems (ITS) techniques, parallel facilities (arterial roads and service roads) and adjacent land uses. The US 34 Access Control Plan will be considered in this planning effort and incorporated into the final optimization plan. The Corridor Optimization planning will also identify the associated right-of-way needs for US 34. Each aspect has a potential role to ensure that the US 34 corridor continues to provide a high level of mobility while recognizing the environmental and social needs of the surrounding area.

The key consideration of the vision statement is the fact that it recognizes the significance of US 34 in serving current and future east-west travel demands within the North Front Range region. This is an important position to have established and agreed upon with involved parties as this philosophy sets the stage for the long term vision of the highway.



3.2 Traffic Volumes

In preparation of the Access Control Plan, existing traffic data were collected along the corridor including mainline traffic counts and numerous intersection turning movements. Figure 2 shows the existing traffic along the entire 25-mile corridor. Currently, US 34 carries 32,000 vehicles per day (vpd) between I-25 and Business 34. The traffic volumes drop between Business 34 and 71st Avenue to 21,000 vpd, but it increases within the urbanized areas of Greeley to approximately 34,000 vpd. East of US 85, the traffic volume drops significantly to approximately 11,000 vpd just east of Business 34 and 6,000 vpd east of Kersey.

The busier cross-streets are within Greeley including 11th Avenue, 23rd Avenue, 35th Avenue, and 47th Avenue each carrying an estimated 13,000 vpd (47th Avenue) to 26,000 vpd (23rd Avenue). These are all currently signalized intersections except for 23rd Avenue which is a grade-separated interchange. West of SH 257 and east of US 85, the magnitude of cross-street traffic is much less.

The year 2025 traffic projections are shown in Figure 3 and were derived through the use of the NFR Travel Demand Model. These projections are from the access control plan effort (2003), and their derivation is explained in that report. Traffic along US 34 is expected to increase significantly with more than 80,000 vpd just east of I-25; more than double the current traffic demand. Within Greeley, the traffic volume is projected to increase to 50,000 to 66,000 vehicles per day dropping to 44,000 vpd just west of US 85. East of US 85, the 2025 traffic will be significantly less than west of US 85 as occurs today. Long term traffic forecasts indicate 19,000 vpd east of Business 34.

Given the existing four-lane expressway facility and the potential for additional interim traffic signals, US 34 has an approximate daily traffic capacity of 30,000 to 40,000 vpd. Compared with the 2025 daily traffic demands, it can be seen that US 34 will be well over its capacity (Level of Service F) between I-25 and US 85 within the next 20 years. East of US 85, the long-term traffic forecasts are well within the highway's capacity. As such, there is little need to evaluate the segment of US 34 east of US 85 relative to optimization, and this segment was omitted from further analysis. It should also be noted that the US 34/US 85 interchange was not specifically addressed in this effort.



US 34 Corridor Optimization Plan

Existing Traffic Volumes (August - November 2001)

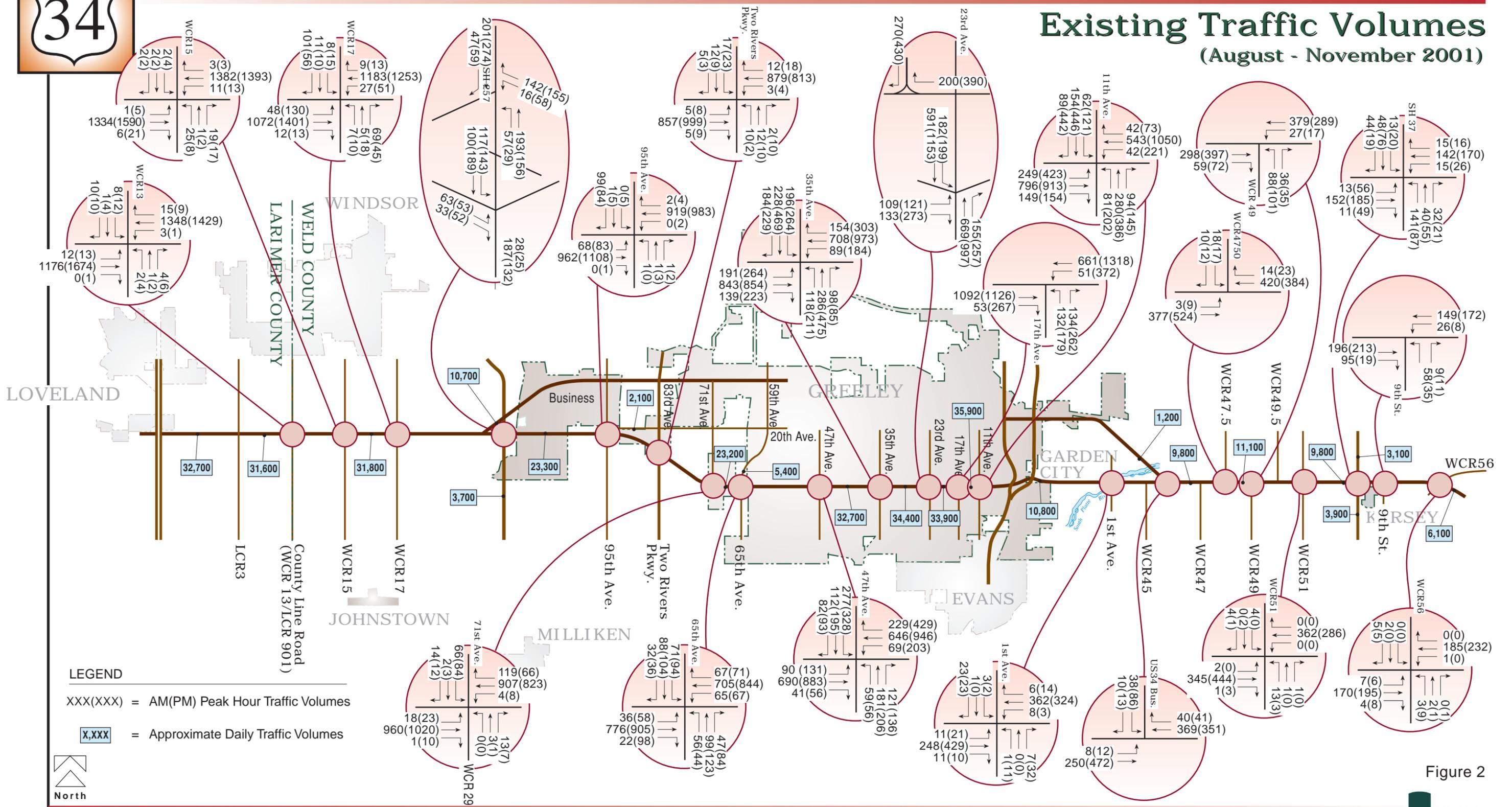


Figure 2





3.3 Travel Markets

The previous section of the report identified the volume of traffic that US 34 is projected to carry; this section presents information on the nature of the travel market that US 34 will serve. Specifically, information is presented regarding the predominant origin and destination patterns of trips projected to use US 34. In addition, the type of traffic has been quantified for consideration.

Very few trips are known to make use of alternative modes. The automobile is the primary means of travel along the US 34 corridor. As such, traffic volumes are the major concern relative to US 34 travel.

This analysis was conducted again making use of the 2025 NFR Regional Travel Demand Model. The corridor was divided into four segments (not including the US 34/US 85 interchange) for analysis purposes as follows:

- ◆ Segment 1 - I-25 to Business 34
- ◆ Segment 2 - Business 34 to Two Rivers Parkway (83rd Avenue)
- ◆ Segment 3 - Two Rivers Parkway to 17th Avenue
- ◆ Segment 4 - 17th Avenue to US 85.

A select link analysis was conducted for each of the segments to identify the major trip interaction patterns. Appendix B presents a series of figures that show the predominant origin/destination trip patterns for each segment. In general, Segment 1 (the heaviest traveled segment) is characterized by a relatively heavy Loveland-Greeley trip interaction pattern. Including western Greeley and the Evans area, 40 to 45 percent of the US 34 traffic along Segment 1 is projected to be of this nature. Segment 1 is also characterized by a relatively heavy Fort Collins-Greeley trip interaction pattern. As much as 25 percent of the traffic along Segment 1 is projected to have a trip end in the Fort Collins area. The regional travel demand model identified a significant lower trip pattern associated with Greeley-Denver traffic that would make use of Segment 1; this will not be a dominant pattern of Segment 1 trips. US 85 may take on a more prominent role in serving this particular pattern (Greeley-Denver).

Table 1 shows a summary of the origin/destination data for the four segments. As shown, the composition of Loveland and Fort Collins traffic (to/from the Greeley/Evans area) lessens as one moves east. This component makes up only 14 percent of the total 2025 traffic projection along Segment 4 (Loveland and Fort Collins traffic combined). It can also be seen that intra-Greeley/Evans trips would make up approximately one-half of the US 34 traffic along segments 3 and 4.



Table 1. Year 2025 US 34 Origin/Destination Data

US 34 Segment	Greeley/Evans to/from Loveland	Greeley/Evans to/from Fort Collins	Intra Greeley/Evans Trips	Other
Segment 1	40%	25%	0%	35%
Segment 2	26%	17%	22%	35%
Segment 3	18%	9%	49%	24%
Segment 4	6%	8%	52%	34%

Other “market” information was also extracted from the NFR Regional Travel Demand Model. This included trip type information and trip length information tabulated by segment. Appendix B also shows data for each segment which is summarized in Table 2. From the table and the data shown in Appendix B, Segment 1 is characterized by a higher commuter percentage and longer trip usage than the other segments. Within Greeley, commuter trips along US 34 are not as significant a pattern as they are along Segment 1. Further, the trips tend to be shorter along Segment 3 and Segment 4. In general, US 34 between the major North Front Range cities is expected to experience longer commuter-related trips. Within Greeley, US 34 traffic tends to be dominated by shorter, errand-related and shopping trips.

Table 2. US 34 Trip Type Data by Segment – Year 2025

US 34 Segment/ Selected O-D Pattern	Home-Based Work Trip Composition	Home-Based University Trip Composition	All Other Trips ¹
<i>Segment 1</i>	40%	6%	54%
Loveland-Greeley	40%	6%	54%
Fort Collins-Greeley	59%	24%	17%
<i>Segment 2</i>	31%	7%	62%
Loveland-Greeley	35%	13%	52%
Loveland-Evans	36%	0%	64%
<i>Segment 3</i>	22%	1%	77%
Loveland-Greeley	35%	9%	56%
West Greeley-Greeley	25%	11%	64%
Evans-Greeley	22%	1%	77%
<i>Segment 4</i>	22%	3%	75%
Greeley-East Greeley	25%	15%	60%
Evans-East Greeley	16%	0%	84%

¹ This includes home-based shopping, home-based other, work-based other, and other-based other trips per the NFR Regional Model.



3.4 *Transportation Inventory*

Understanding the existing inventory as well as planned improvements is also a key consideration in “defining the problem.” Several aspects to this have been investigated including transit services, other roadways, planned facilities (per agency transportation plans), and right-of-way (ROW) along US 34.

Transit Services

Currently, the City of Greeley operates The Bus, the only transit service within the corridor area. Numerous routes are operated throughout the City, but the service along US 34 (the Bypass route or nearby parallel roadways) is relatively limited east of 35th Avenue. Along 10th Street (Business 34), the service extends as far west as 59th Avenue. According to Greeley’s 2020 Transportation Plan, the service could be extended further west to the Promontory Park area along 10th Street.

Other long-term transit service in the area is a possibility as well. These include intercity bus service that would serve ridership demand between Greeley and Loveland as well as Greeley and Fort Collins. Also, the Transportation Alternatives Feasibility Study (TAFS) identified the possibility of feeder bus service between Greeley and I-25 to provide service to a future rail line to Denver. Currently, neither of these services is included in the NFR 2025 Fiscally Constrained Transportation Plan, but these are transit projects that have been considered and will likely be considered in future planning.

Other Roadways

Other key roadways within the corridor study area were investigated as to their current status and potential use in the future; two roadways which are potentially beneficial to US 34 include Crossroads Boulevard and LCR 18/WCR 54. Both facilities parallel US 34 to the north and to the south, respectively, and have the potential of also serving east-west travel demands within the North Front Range region. Transportation planning efforts in the area have identified both facilities as being major roadway facilities in future.

Currently, Crossroads Boulevard is a two-lane road that extends as far east as WCR 17. LCR 18/WCR 54 is also a paved two lane road from I-25 to US 85. Within Evans (where it is known as 37th Street), sections of the roadway have been widened to include turn lanes. West of Evans, sections of the roadway are located along a series of vertical curves, and traffic is subject to stop-sign control at the major north-south roadways.



Parallel collector roads and frontage roads also exist along portions of the US 34 corridor. Some of these parallel collector roads are proposed to be extended as part of new development construction. The US 34 ACP shows that the major public cross streets will be the only access points onto US 34, and therefore, parallel collector streets will be necessary to provide accessibility for new development to these cross-streets and hence to US 34. These parallel collectors will also take on the dual role of serving short east-west trips, thus offering some relief to US 34.

Several north-south roadways in the area have regional significance. These include the future LCR 5, the future LCR 3E, LCR 3, County Line Road (LCR 901/WCR 13), WCR 17, SH 257, Two Rivers Parkway (83rd Avenue), 65th Avenue, 47th Avenue, 35th Avenue, and 23rd Avenue. The US 34 ACP identifies these cross-streets to ultimately be grade-separated interchanges. However, until funding is available, these cross-streets will likely function under signalized control.

Existing US 34 ROW

Roadway construction plans and other available records were researched to compile ROW information along US 34. The existing ROW along US 34 was researched to ascertain constraints or potential issues in providing capacity improvements. Figure 4 shows a summary of the ROW along the corridor by segment. In general, a significant amount of ROW exists along much of the highway. Several US 34 sections have a ROW width as wide as 400 feet. The narrower sections of the highway ROW include the following:

- ◆ Segment 1, just east of I-25 in which 180 feet exists. The ROW gradually increases to the east reaching approximately 270 feet at Business 34 (near SH 257).
- ◆ Segment 3, in the proximity of 35th Avenue, only 170 feet of ROW exists.
- ◆ Segment 4, between 17th Avenue and 11th Avenue in which the ROW narrows to only 110 feet at its narrowest point.



Existing US 34 Right-of-Way Widths

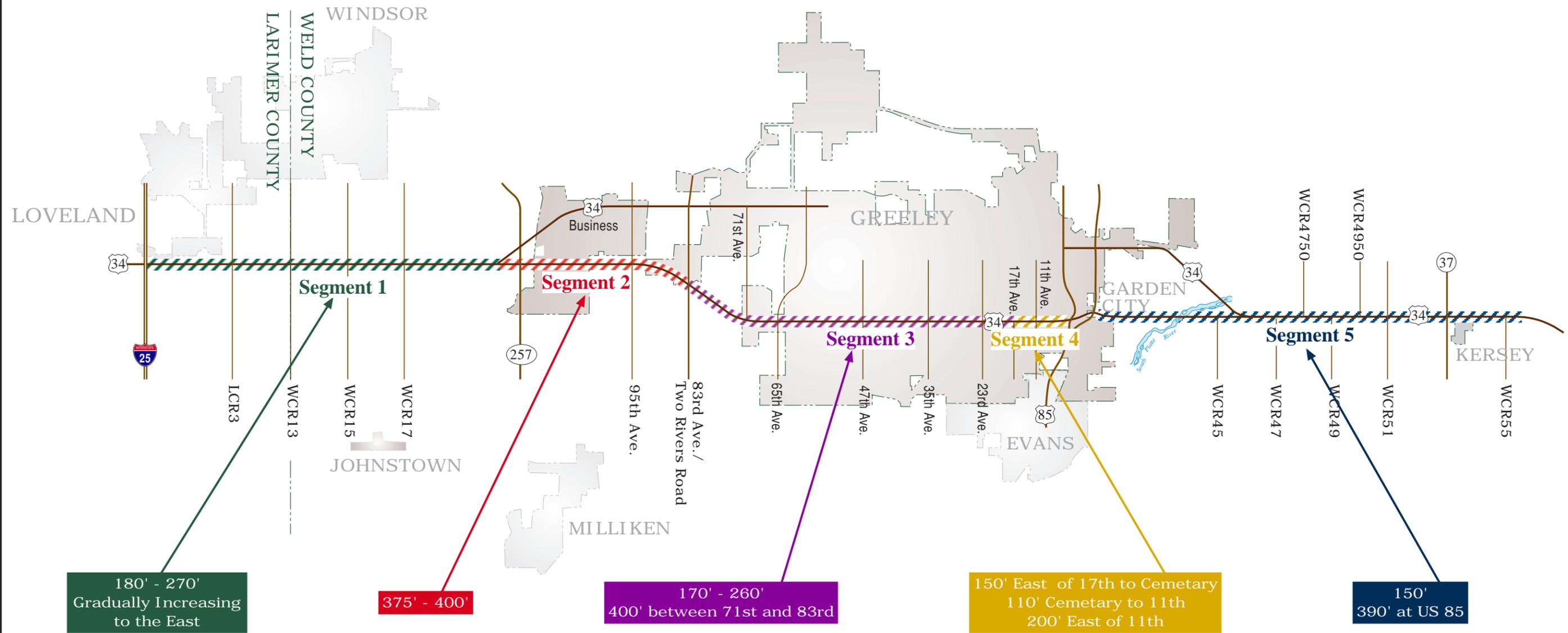


Figure 4





4.0 ALTERNATIVES DEVELOPMENT

As was presented in the previous section of this report, projected traffic volumes along US 34 will exceed the highway's capacity. As traffic signals are added to the highway, mobility will be a greater issue in light of increased travel demand. Many of the signalized intersections will operate at LOS F during peak hour of the day. As such, this section of the report explores various improvements and measures that might be effective in addressing this issue.

Alternatives considered were developed from a variety of sources including discussions with the TAC, discussions with the NFR staff, and the reviewing of projects considered for the NFR regional transportation plan. From these efforts, the following list of alternative considerations was developed.

1. **Widening US 34 to Six-Lanes – I-25 to US 85** – This improvement is recognized in the Greeley Comprehensive Transportation Plan, Mobility 2020 and would be a significant capacity improvement to US 34. One of the considerations in measuring this improvement's effectiveness is the issue of increased use of US 34 in light of the increased capacity. The NFR Regional Travel Demand Model indicates that a 25 to 35 percent increase in traffic could result with this alternative; increased capacity will encourage increased demand.
2. **Widening US 34 to Six-Lanes to Business 34 (West End Near SH 257)** – This alternative is geared toward providing the widening along the heaviest traveled section of US 34. Like alternative 1 above, this alternative has the potential of attracting more traffic onto US 34.
3. **Widen Crossroads Boulevard to 4 Lanes with Connection to "O" Street** – This alternative is recognized in the Greeley Comprehensive Transportation Plan, Mobility 2020 and would include widening Crossroads Boulevard to a 4 lane arterial road and establishing its continuity through a connection across the Poudre River and tying into "O" street in northern Greeley. "O" Street is far removed from the US 34 Bypass east of 71st Avenue, so this alternative would also need a connection between SH 257 and Business 34 (10th Street) to maintain a relatively close parallel arterial north of US 34.
4. **Widen LCR 18/WCR 54 to a 4-Lane Arterial from I-25 to US 85** – This alternative includes establishing a parallel 4-lane arterial roadway from I-25 to US 85 south of US 34. This improvement is recognized in the Greeley Comprehensive Transportation Plan, Mobility 2020, and the City of Evans Transportation Plan identifies this roadway to be an arterial facility (as 37th Street). Further, this roadway has been identified by the NFR as a regionally significant corridor, and establishing this improvement would be in line with this finding.



5. **Parallel Collector/Service Roads** – This alternative would establish parallel collector-type roadways along both sides of US 34 within approximately one-half mile of the highway. Exact alignments would be established in conjunction with development proposals. The key is to provide a means of serving the shorter trips along US 34 and attempt to maintain US 34 for the longer trips.
6. **North-South Connection via Two Rivers Parkway and Harmony Road** – This alternative is designed to provide an alternative route to serve the Fort Collins to Greeley travel demand. It includes establishing Two Rivers Parkway (83rd Avenue) as a major north-south arterial road as far north as Harmony Road, and then establishing Harmony Road as a major arterial road west to Fort Collins. It is already established as such west of I-25. Weld County and Greeley have both identified Two Rivers Parkway has a major future roadway facility.
7. **Widen US 34 to include High Occupancy Vehicle Lanes** - This alternative is similar to Alternative 1 in that it includes widening US 34 from four lanes to six lanes. However, the new lanes would be restricted to high-occupancy vehicles and buses only. Potentially, the HOV use would be restricted to only the peak hours during the day.
8. **North-South Connections via WCR 13** - This alternative is similar to Alternative 6 in that it would provide an alternative north-south connection to I-25. Like Alternative 6, this alternative is intended to provide an alternate route for the Fort Collins-to-Greeley traffic that is projected to use US 34, particularly along the higher-traffic segment of US 34 (I-25 to Business 34).
9. **Advanced Signal Timing System** - This alternative is in response to the fact that additional traffic signals are inevitable along US 34 as traffic volumes grow realizing that this highway is unlikely to be a full freeway in the near term. Ultimately, interchanges are planned to be installed in the extreme long term planning horizon, but it is likely that funding limitations will necessitate signalized intersections in the near term for most intersections. This alternative is designed to establish a single entity to coordinate the signal timing along the corridor and to implement a highly sophisticated coordination scheme to minimize delays. This would likely include a flexible timing scheme that could change in response to traffic demand/pattern fluctuations.
10. **Build the Planned Interchanges** - This alternative includes the construction of the 10 new interchanges that are identified in the Ultimate Access Control Plan. Their construction would significantly increase the capacity of US 34 operating more as a freeway facility than an expressway. Because of the increased capacity, US 34 would experience greater traffic demand (similar to Alternative 1) which would partially erode the benefit of the added capacity.
11. **Bicycle Facility in the US 34 ROW** - This alternative would incorporate a separate 10-foot wide paved trail designed specifically for bicyclists. The trail would be incorporated within the US 34 ROW under this alternative.



12. **Inter-City Bus Service** - Bus service between Greeley and Loveland as well as between Greeley and Fort Collins has been considered by the NFR but is currently not in the NFR's Fiscally Constrained Transportation Plan. A similar service was considered and incorporated into the recommendations of the TAFS effort, although it was considered more as a feeder system to a future rail line along I-25 (or other alternative transportation mode to be determined). Potentially, intercity bus service could be provided in concert with the future I-25 rail feeder bus system.
13. **Employer Travel Demand Management (TDM) Measures** - This alternative would include targeting major employers along the corridor who generate a significant amount of traffic onto US 34, and establish programs such as staggered work hours, car-pool matching, or transit pass discounts. The intent is to remove trips from US 34 and/or spread out the concentrated loading of trips.
14. **Intra-Regional Rail Service** - This alternative includes establishing a rail line along US 34 and ensuring that adequate ROW is reserved to accommodate a rail alignment. Other efforts, such as TAFS, have considered using existing rail line ROW for east-west rail service between I-25 and Greeley. This specific alternative instead considers a rail line along US 34 incorporating the necessary ROW along the highway. Potentially, this rail line would connect with a future I-25 rail line per TAFS and therefore serve the same areas as identified in the TAFS recommendations.
15. **Van Pool Program Expansion** - The NFR has one of the most successful van-pool programs in the state. The program services numerous trips between the NFR region and the Denver area. This alternative would be intended to encourage vanpool use for east-west travel within the NFR region. Trips between Greeley and Loveland as well as between Greeley and Fort Collins would be targeted by this alternative.
16. **Expand Greeley's Bus Service** - Greeley's transportation plan identifies extending their bus service further west as the City grows. The Promontory Park area is the prime area that the service would focus relative to western destinations. This alternative is designed to explore the effectiveness of expanding this service in reducing the US 34 traffic volume.
17. **Land Use Density Reductions** - Regional growth and development of the adjacent properties will generate significant traffic demand along US 34. This alternative is designed to evaluate land use density reductions relative to the land use identified in the NFR regional travel demand model. Potentially, this could be one piece of the solution in accommodating travel demand along the corridor.

This list of alternatives was reviewed and discussed by the US 34 TAC. Each was analyzed relative to their benefit and cost which is discussed in the following section.



5.0 ALTERNATIVES ANALYSIS

A total of 17 alternatives were developed for consideration in the development of the US 34 Corridor Optimization Plan. All 17 were reviewed and evaluated from the perspective of their effectiveness to either reduce traffic demand along US 34 and/or increase the highway’s capacity .

This analysis was conducted on a segment-by-segment basis (segments as previously defined). The various alternatives will have varying effects on different segments, so a method was developed to gauge each alternative’s effectiveness by segment and for the entire corridor. The initial analytical step involved determining the highway’s capacity and contrasting it with the projected traffic demand. The PM peak hour of traffic was considered in this analysis since this is when US 34 traffic flow is greatest. Specifically, the peak direction of the PM peak hour was analyzed (although the directional orientation of peak hour demand traffic is fairly balanced along US 34). Based on the NFR Regional Travel Demand Model documentation, a LOS C is indicative of 1100 vehicles per hour per lane (vphpl) for an expressway facility. Based on additional data from the Highway Capacity Manual, a LOS D and a LOS E (which is theoretically the highway’s capacity) represent peak hour flows of 1275 vphpl and 1450 vphpl, respectively.

Table 3 shows the generalized segment capacities for each of the LOS’s and the anticipated traffic demand for each segment (1 through 4). As shown, Segment 1 is anticipated to experience the greatest amount of peak hour traffic demand. Projected peak hour traffic flows are 50 percent greater than the LOS C threshold. Segment 2 and Segment 3 traffic demand will be considerably less, but both segments would operate at LOS E given a four-lane US 34 with traffic signals (characteristic to an expressway). Segment 4 is anticipated to operate within the LOS D parameters given PM peak hour traffic projections.

Table 3. US 34 Segment Capacity and Demand (As 4-Lane Expressway)

Peak Hour Directional Traffic	Segment 1 (vph)	Segment 2 (vph)	Segment 3 (vph)	Segment 4 (vph)
Projected Traffic Demand	3,300	2,800	2,800	2,400
LOS C - Threshold ¹	2,200	2,200	2,200	2,200
LOS D - Threshold ¹	2,550	2,550	2,550	2,550
LOS E - Threshold ¹	2,900	2,900	2,900	2,900

¹ LOS’s represent general arterial LOS thresholds for one direction with two lanes.

Table 4 then shows the effectiveness and approximate costs for each of the alternatives. This table is key toward determining the alternatives that are to be adopted as part of the US 34 Corridor Optimization Plan. As mentioned, the TAC and the PC discussed the merits of each alternative and collectively decided the disposition of each alternative. The following is a summary for each proposed alternative.



Table 4. Alternatives Assessment Matrix

	Segment 1 I-25 to US 34 Business (6.0 Miles)	Segment 2 US 34 Business to Two Rivers (3.0 Miles)	Segment 3 Two Rivers to 17th Avenue (5.5 Miles)	Segment 4 17th Avenue to US 85 (1.0 Mile)	Estimated Cost	Cost Effectiveness¹ (Vehicle Per Hour Reduction per Million\$)
Projected Peak Hour Traffic Deficit (Peak Direction for LOS D)	750 VPH	250 VPH	250 VPH	0 VPH		
Alternatives	Deficit Reduction ² (vph)	Deficit Reduction ² (vph)	Deficit Reduction ² (vph)	Deficit Reduction ² (vph)		
1. 6-Lane US 34; I-25 to US 85	300 (net)	400 (net)	500 (net)	800 (net)	\$30-40M	12.1
2. 6-lane US 34; I-25 to US 34 Bus. (West)	450 (net)	-150 (net)	-150 (net)	-75 (net)	\$12-15M	2.5
3. 4-Lane Cross Roads Blvd. w/ Connection to "O" Street	200	125	100	25	\$35-40M	3.7
4. 4-Lane LCR 18/WCR 54 from I-25 to US 85	200	200	150	50-100	\$35-40M	4.6
5. Parallel Collector/Service Roads	100-400	100-400	100-400	100-400	\$50-70M	4.2
6. North-South Connection via Two Rivers Parkway and Harmony Rd.	150-200	200-300	-(50-100)	-(25-50)	\$35-45M	2.2
7. HOV Lanes	100	150	200	300	\$30-40M	4.5
8. North-South Connection via WCR 13	25-50	-25	-25	0	\$20-25M	0.1
9. Advanced Signal Timing System	200-300	200-300	200-300	150-250	\$2-5M	70.5
10. Build Planned Interchanges	300-400 (net)	400-500 (net)	500-600 (net)	0	\$150-200M	2.2
11. Bicycle Facility in US 34 ROW	10-20	10-20	10-20	10-20	\$2-3M	6.0
12. Inter-City Bus Service	50-100	25-75	25-50	25	\$7-10M	6.3
13. Employer TDM Measures	25-50	25	5-10	5-10	Varies	
14. Intra-Regional Rail Service	100-150	50-100	50-100	25-50	\$450M	0.2
15. Van Pool Program Expansion	25	10-20	10-20	5-10	\$2-3M	7.4
16. Expand Greeley's Bus Service	0	25-50	25	5-10	\$2-3M	6.7
17. Land Use Density Reductions	Varies	Varies	Varies	Varies	N/A	

¹ Column shows the average capacity-supply deficit reduction for the entire corridor weighted by segment length. For example the analysis of Alternative 1 results in a reduction of 12.1 vehicles per hour per million dollars spent in implementing the alternative. The higher the measure, the better.

² Values show the capacity increase or demand decrease in vehicles per hour.



- ◆ **Alternative 1: Widen US 34 to Six Lanes (I-25 to US 85)** - While this alternative would clearly increase the capacity of US 34, it is anticipated that latent travel demand would be created and partially offset the capacity benefit. Separate travel demand model runs were conducted to test this alternative, and raw traffic demands along US 34 were found to increase 25 to 35 percent with the higher percentage east of Two Rivers Parkway and the lower percentage west of Two Rivers Parkway. Only a 10 percent increase was observed from the model near 11th Avenue.

Widening the first mile and a half east of I-25 is already included in the NFR Fiscally Constrained Transportation Plan, and the highway widening along its entire length is shown in Greeley Comprehensive Transportation Plan, Mobility 2020. Most of the US 34 corridor already has adequate ROW to accommodate a six-lane highway, so there would be minimal additional ROW width needed for widening to six lanes. Just east of I-25, a much wider width of ROW may ultimately be needed depending on the ultimate configuration of the I-25/US 34 interchange. Within one-half mile of US 85 (17th and 11th Avenue), the ROW narrows considerable, but the need to widen the highway will not be as critical since this segment will carry less traffic than the other segments to the west. Table 4 shows that this alternative has the second highest cost effectiveness measure of any alternative. **Final Disposition: Include in US 34 COP between I-25 and 17th Avenue.**

- ◆ **Alternative 2: Widen US 34 to Six Lanes to Business 34 (West End Near SH 257)** - A separate model run was also conducted for this alternative as well. The raw results indicated that there would be some latent demand generated onto US 34 with this alternative, but not as much as that associated with Alternative 1. Because additional traffic demand would be realized, this alternative would have a negative impact on Segments 2, 3 and 4 since no capacity increase would take place along these segments. While this alternative would be beneficial for the critical Segment 1 (given the same capacity increase and less latent demand as Alternative 1), the detriment to Segments 2, 3, and 4 resulted in a much lower cost-effectiveness measure. **Final Disposition: Discard.**
- ◆ **Alternative 3: Widen Crossroads Boulevard to 4 lanes with Connection to “O” Street** - A separate model run showed that this alternative would be very effective in reducing travel demand along the more critical Segment 1. As Table 4 shows, this alternative’s effectiveness diminishes further east along Segments 2, 3, and 4 since “O” Street is significantly removed from these US 34 segments. A connection between SH 257 and 10th Street (Business 34) would be beneficial as part of this alternative to maintain a closer parallel arterial facility. This route would serve as a viable alternative to accommodate the Greeley-to-Fort Collins trip interaction. This alternative is shown in the Greeley Comprehensive Transportation Plan, Mobility 2020. As Table 4 shows, this alternative would be effective in reducing travel demand along Segment 1 (the heaviest traveled segment) **Final Disposition: Include in US 34 COP.**



- ◆ **Alternative 4: Widen LCR 18/WCR 54 to a 4-lane arterial from I-25 to US 85** - This alternative would also relieve US 34 in a similar fashion as Alternative 3. However, this alternative would have a greater effect on Segments 2, 3, and 4 given its relative close proximity to these segments. This parallel corridor, located south of US 34, as been identified by the North Front Range as a regionally significant facility. This facility would serve as a viable alternative for the Loveland-to-Greeley trip interaction. Like the other alternatives mentioned, this is recognized in the Greeley Comprehensive Transportation Plan, Mobility 2020. **Final Disposition: Include in US 34 COP.**
- ◆ **Alternative 5: Parallel Collector/Service Roads** - In light of the highway's Access Control Plan, this alternative will be absolutely necessary. The Access Control Plan grants very little access onto US 34, so adjacent development will need to establish an internal collector road system to access the US 34 cross-streets. The collector/service road system will provide a convenient means for the shorter trips otherwise making use of US 34 and reducing reliance on the highway, thus allowing the highway to better serve regional traffic needs as intended (for an expressway classification). Within Greeley, there are built up areas which do not easily lend themselves to this alternative, but these parallel facilities should always be considered with new development or any redevelopment of adjacent highway land. Its cost effectiveness measure (Table 4) is higher than most other alternatives being considered. **Final Disposition: Include in US 34 COP.**
- ◆ **Alternative 6: North-South Connection via Two Rivers Parkway and Harmony Road** - A separate travel demand model run was also conducted for this alternative, and the results indicated that significant benefit could be realized for Segments 1 and 2. This alternative would provide a viable route alternative for the Fort Collins-to-Greeley trips. Segments 3 and 4 would not benefit from this alternative and might actually experience a slight increase in traffic due to the additional "attractiveness" associated with this alternative. Two-Rivers Parkway (83rd Avenue) is recognized as a major roadway facility in Weld County's and Greeley's planning efforts. Because this alternative benefit's the critical Segment 1 with only minimal negative impacts to the lower-demand segments of 3 and 4, this alternative was included in the US 34 COP. **Final Disposition: Include in US 34 COP.**
- ◆ **Alternative 7: Widen US 34 to include High Occupancy Vehicles (HOV) Lanes** - Research shows that HOV lanes have the greatest probability of being successful when:
 - They exist within an urban area with a population of at least one million
 - They serve an employment center of at least 100,000
 - Congestion is predominant along the general purpose lanes
 - There are very few at-grade intersections (requiring short-distance use of an HOV lane for deceleration/acceleration purposes)

The TAFS effort recommended HOV lanes along I-25 as far north as SH 66 ending approximately 15 miles south of US 34. An HOV lane along US 34 would not be connected with this future I-25 HOV lane. The fact that Alternative 1 has been included in the COP allows for the possibility of implementing HOV lanes if deemed appropriate in the future by



designating the additional lanes to HOV use. At this time, HOV lanes are thought to not add enough capacity to US 34 to be effective compared to adding general purpose lanes, and therefore this option was discarded for now. As shown in Table 4, general widening to six lanes would be more cost effective than HOV lanes. **Final Disposition: Not appropriate at this time; reevaluate in the future.**

- ◆ **Alternative 8: North-South Connection via WCR 13** - Weld County has identified WCR 13 as a major corridor. As a parallel facility to I-25 (2.5 miles to its east), this roadway could also serve as an alternative route for Greeley-to-Fort Collins trips. Separate model runs to test this alternative revealed that this alternative would have minimal impact on US 34. There are other benefits that this roadway facility would provide, but US 34 will not realize significant benefit from this alternative. The model indicated that this roadway's close proximity to I-25 would result in trips favoring I-25 over WCR 13 due to the interstate's higher speed and lack of traffic signals. **Final Disposition: Discard.**
- ◆ **Alternative 9: Advanced Signal Timing System** - As mentioned, the US 34 Access Control Plan will include numerous traffic signals which will eventually be converted to grade-separated interchanges. However, many intersections could remain under signalized control for many years due to funding constraints. As such, a highly sophisticated signal timing system is absolutely critical to the movement of traffic along the corridor. CDOT would be the most appropriate agency to lead the effort. The establishment of a Traffic Operations Center would allow a central means of managing the system. This alternative will provide a significant benefit to US 34 as traffic signals are added to the highway. As Table 4 shows, this alternative has the highest cost effectiveness measure of all alternatives considered. **Final Disposition: Include in US 34 COP.**
- ◆ **Alternative 10: Build the Planned Interchanges** - This would be a significant enhancement to the corridor, but it would be extremely costly as Table 4 shows. If funding mechanisms can be developed, this alternative would be significant to the facility's capacity and safety. Increased traffic demand is likely to occur with increased highway capacity as indicated by a specific model run to test this alternative. The increase in capacity would significantly outweigh the increase in demand. Two of the interchanges are included in the NFR Fiscally constrained transportation plan including one at 47th Avenue and one at 35th Avenue. While this alternative would be expensive, it is already adopted as part of the Access Control Plan. As a vision for the corridor, planning for ultimate interchanges at major cross-streets should be incorporated into the COP. **Final Disposition: Include in US 34 COP.**
- ◆ **Alternative 11: Bicycle Facility in the US 34 ROW** - Both Greeley's and Loveland's transportation plan identify an "on-street" bike trail along US 34. These documents already suggest that a separate trail is not planned along the highway. However, bicycle accommodation should still be considered. As such, bicycle accommodation will be provided through the provision of a 10-shoulder. A dedicated bike lane would not be provided. Table 4 shows that this alternative would have a higher than average cost effectiveness measure. **Final Disposition: Include in US 34 COP via shoulder.**



- ◆ **Alternative 12: Intercity Bus Service** - This alternative was considered for the NFR 2025 Regional Transportation Plan, but it did not score high enough to make the fiscally constrained plan. Reviewing the application details of this alternative, it was found that ridership was not projected to be significant. However, it is recognized that this alternative would remove a few trips from US 34 and that it would also be necessary in support of rail service along I-25 as recommended by TAFS. As such, this alternative is recognized and supported by the US 34 COP, but it is not an alternative that is considered as an absolute necessity for the good of the corridor. **Final Disposition: US 34 COP will recognize and support this alternative.**
- ◆ **Alternative 13: Employer Travel Demand Management (TDM) Measures** - There are a few larger than average employers near the corridor and within Greeley such as State Farm, University of Northern Colorado, Aims Community College, and Hewlett Packard. Some benefit to US 34 is indeed possible with a proactive TDM program with these employers. Like Alternative 12, this is not foreseen as having a major impact on demand specifically along US 34. However, it is recognized that a major employer could be established along US 34 in the future, and TDM measures would be a more critical consideration for the good of US 34. As such, this alternative is recognized and supported by the US 34 COP, but it is not necessarily an alternative that is considered as an absolute necessity for the good of the corridor at this time. **Final Disposition: US 34 COP will recognize and support this alternative.**
- ◆ **Alternative 14: Intra-Regional Rail Service** - This alternative specifically considered a rail line along the US 34 corridor. The TAFS effort identified two other possible rail alignments between I-25 and Greeley; neither included placing rail along US 34. In fact, both rail line alignments are shown to make use of existing rail corridors. Also considering the expense as compared to the benefit as shown in Table 4, this alternative (of incorporating a rail line with the US 34 ROW) was discarded. **Final Disposition: Discard.**
- ◆ **Alternative 15: Van Pool Program Expansion** - The NFR operates one of the most successful van pool programs in the state. Much of its success stems from the demand of trips between the NFR region and the Denver area. The program has not been as successful in terms of serving trips within the NFR region. Discussions with the NFR staff indicate that van pool programs are most successful if they serve long-distance trips. As such, there is limited expectation in serving a heavy Loveland-to-Greeley or Fort Collins-to-Greeley travel demand with a van pool program. None-the-less, it is recognized that van pools have the potential of removing some trips from US 34. As such, this alternative is recognized and supported by the US 34 COP, but it is not an alternative that is considered as an absolute necessity for the good of the corridor at this time. **Final Disposition: US 34 COP will recognize and support this alternative.**



- ◆ **Alternative 16: Expand Greeley's Bus Service** - The Greeley Comprehensive Transportation Plan, Mobility 2020 identifies the expansion of The Bus system to the Promontory Park area along 10th Street (34 Business). This has the potential of removing some traffic from Segments 2 and 3. However, this alternative may have only limited benefit for the highway. As such, this alternative is recognized and supported by the US 34 COP, but it is not an alternative that is considered as an absolute necessity for the good of the corridor at this time. **Final Disposition: US 34 COP will recognize and support this alternative.**
- ◆ **Alternative 17: Land Use Density Reductions** - Land use considerations have been evaluated from two perspectives. One perspective considers the traffic impact benefit on US 34 if adjacent land uses are developed at a lesser density than assumed in the NFR model. Another perspective is the implementation of the COP and its impact on land use decisions. The access control plan and its limitation of access (which included extensive involvement of the local agencies) has a significant bearing on land use decisions. It will be absolutely essential to plan future development with these access restrictions. Because the local jurisdictions recognize the need to maintain US 34 as an expressway-type of facility, they also realize that land use decisions will need to be made in recognition of maintaining this classification.

Relative to exploring less density along the US 34 corridor, separate model runs were made with a 20 percent and a 40 percent reduction in employment and households along US 34 between I-25 and 65th Avenue. Given a 20 percent reduction, the model indicated a less than 5 percent reduction in the 2025 raw traffic volume estimates. With a 40 percent reduction in adjacent land uses, the regional model indicates that only 5 to 10 percent reduction in US 34 traffic would result. Having less traffic demand generated by the adjacent land uses leaves some unused capacity along the highway. According to the model, other latent traffic demand makes use of the freed up capacity resulting in a minimal overall reduction in US 34 traffic demand. Therefore, land use reduction should be recognized and supported in the plan as there are benefits, but analysis indicates that there are limitations to this alternative. There would be significant traffic reduction along the cross-streets serving the subject land uses, and this would result in a more favorable signal operation condition at the major cross-streets. **Final Disposition: US 34 COP will recognize and support this alternative.**

The alternatives with the final disposition regarding their inclusion in the plan were assembled and are presented in the following section.



6.0 US 34 CORRIDOR OPTIMIZATION PLAN

Based on the preceding analysis, assessment, and discussions with the TAC and PC, the primary elements of the US 34 Corridor Optimization Plan were assembled and are shown in Figure 5. This represents CDOT's vision of the corridor. Figure 5 also shows the various agencies who need to take the lead, or co-lead, in implementing the improvements. A critical point in realizing the implementation of this plan is the fact that CDOT cannot be the lone agency to carry it forward. Many items on the plan are "off-system," and they will need the local jurisdictions to also take the lead for certain elements.

In addition to the major components of Figure 5, the US 34 Corridor Optimization Plan identifies other key measures that will enhance travel along US 34 and throughout the NFR region. These include the following:

- ◆ Inter-City transit service
- ◆ Local transit service
- ◆ Employer Travel Demand Management measures
- ◆ Encouragement of van pool services
- ◆ Land use decisions; reduced densities

Intelligent Transportation Systems (ITS) were also considered in the development of the US 34 COP. Numerous ITS measures were considered and analyzed using SCRITS software. CDOT had hoped that a planned ITS Architecture Study would have been completed prior to this COP. This study would have considered ITS items for US 34 from a regional perspective. At this time, this study effort is just beginning and findings are not available. From discussion with the TAC, it was felt that hard recommendations relative to ITS measures for US 34 should be deferred until the Architecture Study is complete. US 34 should be assessed as part of the North Front Range region and not as a stand alone corridor.

Some preliminary analysis using SCRITS software indicated that several measures may hold some promise in a regional ITS plan. These include variable messages signs and highway advisory radio. Again, whether these measures make sense will hopefully be determined in the region-wide ITS Architecture Study.



Major Components

LEGEND

- = Signalize and Construct Dual Left Turn Lanes and a Right Turn Lane Along All Four Approaches and Implement Advanced Signal Timing (CDOT and All Local Agencies Lead)
- = Signalize and Construct Dual Left Turn Lanes and a Right Turn Lane Along All Four Approaches and Implement Advanced Signal Timing **Ultimately build grade-separated interchange per Access Control Plan dependent upon funding.** (CDOT and All Local Agencies Lead)

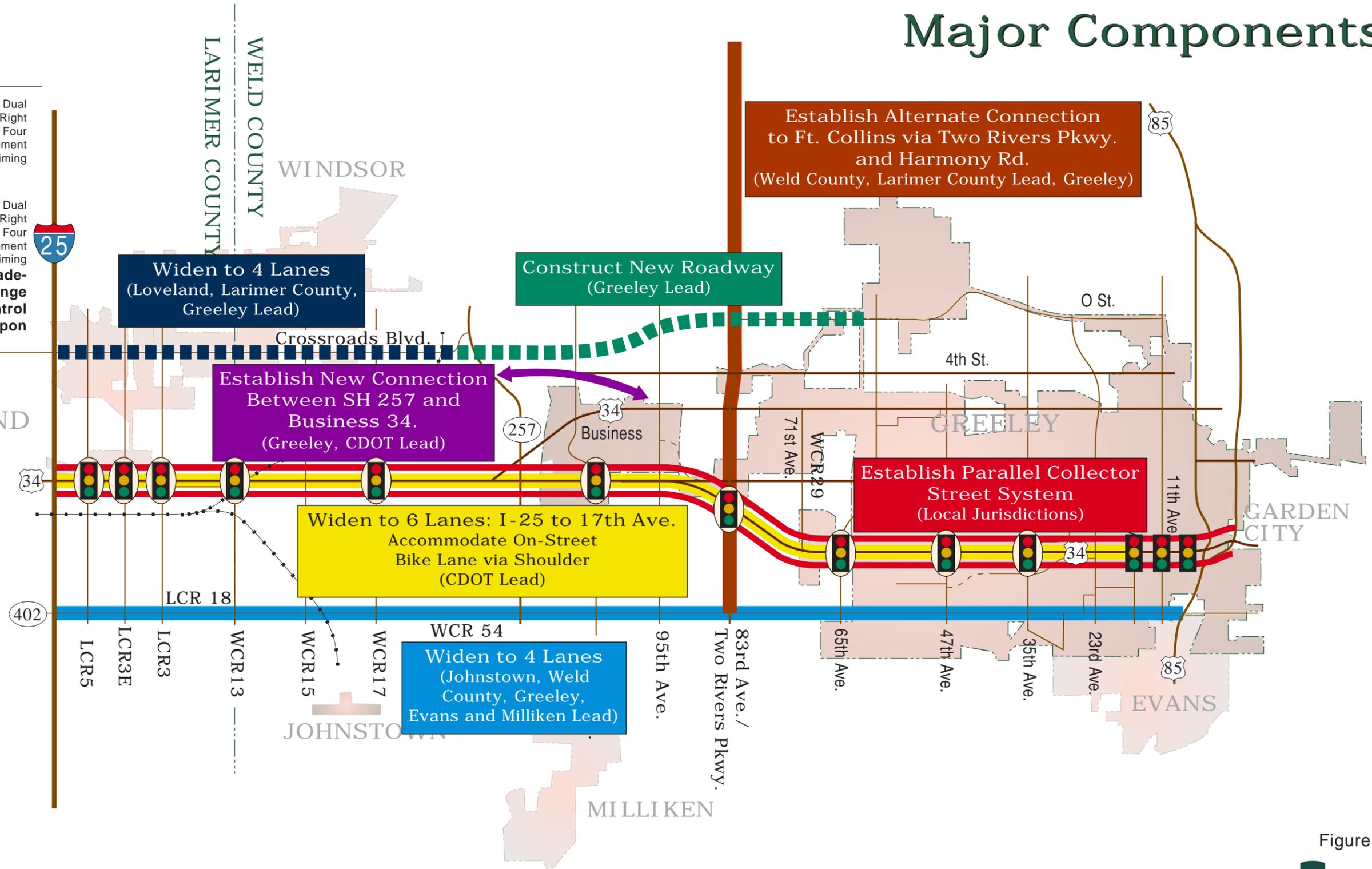


Figure 5





6.1 Project Prioritization

The prioritization of individual COP projects is not a necessary task of the process. Improvement projects, such as roadway widening and interchange construction, are subject to the transportation planning process through the NFR. This will also involve a public process and appropriate effort to satisfy NEPA requirements. At this time there appears to be only one priority consideration. This includes establishing a signal coordination system with the existing traffic signals. The system should be planned to allow for significant expansion in light of the numerous traffic signals that will eventually be added to the corridor.

Regional growth patterns will have a significant role in establishing project priorities beyond the advanced signal timing project.

6.2 Business Plan

As mentioned, the plan's realization will require the action of numerous agencies other than just CDOT. The information shown in Figure 5 has been incorporated into a basic business plan which is presented in Table 5.

The table shows each of the plan's major elements, the lead agency (or agencies), the approximate cost of the element, and potential funding sources that should be pursued. The funding sources include the possibility of CDOT's Strategic Corridor funding, as well as, the possibility of a future Regional Transportation Authority. The Business Plan is intended to provide general guidance as to which agencies should be encouraged to take action on plan elements and how that agency may be able to identify funding. Many of the plan's elements will require large expenditures, and their implementation will also be subject to the transportation planning process through the NFR.



Table 5. US 34 COP Business Plan

Optimization Plan Element	Estimated Cost 2003\$	Lead Agency (ies)	Potential Funding Sources *
Widen US 34 (I-25 to 17 th Avenue)	\$35-45M	CDOT	Possible CDOT Strategic Corridor Funding Federal and State Funds RTA
Signals/Intersection Improvements	\$10-12M	CDOT and all Local Agencies	Federal Development Local CIP RTA
Advanced Signal Timing	\$2-3M	CDOT	Federal and State Funds RTA
Crossroads Blvd./ "O" Street	\$40-45M	Larimer County Greeley Weld County Windsor	Adjacent Development Local CIP RTA
LCR 18/WCR 54	\$40-45M	Johnstown Milliken Weld County Greeley Evans	Adjacent Development Local CIP Federal and State Funds RTA
Two Rivers/Harmony Roadway Connection	\$40-45m	Greeley Weld County Larimer County	Adjacent Development RTA
Construct Parallel Collector Roads	\$35-40M	All Local Agencies	Development
Construct Interchanges	\$15-25M Each	CDOT and Local Agencies	Possible CDOT Strategic Corridor Funding Federal and State Funds Development RTA Local CIP (For Individual Interchanges)
Abbreviations: RTA = Possible Regional Transportation Authority CDOT = Colorado Department of Transportation CIP = Capital Improvement Program			
* State and Federal funds distributed through the transportation planning process.			



6.3 Consequences Of Non-Implementation

Table 6, showing volume/capacity ratios, was created to show intersection operational information in the event that some of the improvements would not take place. This analysis was conducted assuming that signalized intersections would be in place and that none of the proposed grade-separated interchanges would be built by 2025. Clearly, the construction of an interchange would greatly alleviate operational deficiencies at the signalized intersections.

The analysis was conducted using a maximum intersection lane geometry scenario that would include dual left turn lanes along all approaches, a separate right turn lane along each approach, and at least two through lanes along each approach. Scenarios that include establishing US 34 as a six-lane facility obviously incorporate 3 through lanes along the east and west approaches. All signalized intersections along the corridor should be constructed with the “maximum” lane geometry.

Table 6 shows that adding signals to the corridor without any of the other improvements (Scenario 1) would result in each signalized intersection operating very poorly as the year 2025 volume/capacity (v/c) ratios are all greater than 1.0. Several intersections, including the future LCR 5, Two Rivers Parkway, and 35th Avenue, would experience a v/c ratio of well over 1.0. This is indicative of a LOS F condition for numerous continuous hours.

Widening the highway (Scenario 2) would greatly improve the operations at the traffic signals, but the v/c ratios would still be greater than 1.0 for nearly every intersection under signalized control. This clearly indicates that widening the highway alone will not address long-term travel conditions along the corridor. Incorporating the parallel four-lane arterials (Scenario 3) further reduces the v/c ratios. Even with these improvements, there would still be some intersections that operate poorly. With the addition of the Two Rivers Parkway/Harmony connection (Scenario 4), only a handful of intersections would operate at a v/c ratio greater than 1.0. The last line in Table 6 illustrates which intersections should be considered for grade-separated interchanges given the 2025 traffic volumes. These are the future LCR 5, Two Rivers Parkway, and 35th Avenue. As mentioned, the 35th Avenue interchange is already included in the NFR 2025 Fiscally Constrained Transportation Plan, and this analysis bears out that condition.

As an additional step in the analysis, the land use reductions (including the 20 percent reduction and 40 percent reduction per Alternative 17) were considered in alleviating poor operations at the worse three signalized intersections. Given a 20 percent reduction in adjacent land use (between I-25 and 65th Avenue), the v/c ratios for LCR 5 and Two Rivers Parkway would reduce approximately 5 percent. The v/c ratio at the 35th Avenue intersection would not change much relative to Table 6 as the land use reductions do not apply to the surrounding area; this area is already built up. Given the 20 percent reduction, the v/c ratios for the three critical intersections would remain greater than 1.0.



Table 6. US 34 Year 2025 PM Peak Hour Volume/Capacity Ratios ¹

Scenario	Improvement Element	Segment 1 Intersections					Segment 2 Intersections		Segment 3 Intersections			Segment 4 Intersections	
		LCR 5	LCR 3E	LCR 3	County Line	WCR 17	Promontory Parkway	Two Rivers Parkway	65th	47th	35th	17th	11th
1	Existing Four-Lane	1.56	1.23	1.31	1.30	1.40	1.10	1.40	1.21	1.18	1.58	1.12	1.00
2	Six-Lane US 34	1.46	1.20	1.12	1.13	1.27	1.05	1.33	1.10	1.10	1.51	1.08	0.97
3	Six-Lane US 34 Four-Lane WCR 54 Four-Lane Crossroads Blvd.	1.26	1.07	1.01	0.98	1.07	0.98	1.24	0.99	0.98	1.40	0.99	0.90
4	Same as Number 3 Plus Two-Rivers Parkway Harmony Connection	1.19	0.92	0.94	0.85	1.02	0.97	1.16	1.00	0.99	1.40	0.99	0.90

¹ A volume/capacity (v/c) ratio is a measure reflecting an intersection's operation. A v/c = 1.0 is indicative of an intersection operating at its capacity. Greater than 1.0 means the intersection will function poorly with motorists experiencing significant delays (Level of Service F). Approximate Level of Service ranges are as follows:
 LOS C – v/c between 0.7 and 0.8
 LOS D – v/c between 0.8 and 0.9
 LOS E – v/c between 0.9 and 1.0



A 40 percent land use reduction results in a 10 to 15 percent drop in the v/c ratio for the LCR 5 and Two Rivers Parkway intersections. Clearly, reducing the land uses along the corridor would have a positive affect on the v/c ratios since the US 34 traffic and the cross-street traffic demand would be reduced.

6.4 US 34 Cross-Section

One of the key planning considerations from this study is the determination of the US 34 cross-section that should be accommodated. The cross-sectional width needs to accommodate six through lanes along US 34 plus shoulders and turn lanes. Figures 6 and 7 show the cross-section that should be planned along the corridor. As shown, 185 feet of ROW width should be planned to accommodate the six through lanes at the mid-block locations, 185 feet should be provided at the major intersections to accommodate six through lanes, dual left turn lanes, right turn acceleration/deceleration lanes, and still provide additional space for clear zones and opposing lane separation. The existing ROW along most of the corridor is at least 180 feet, so very little additional ROW will be needed to accommodate the plan's cross-section.



Proposed US 34 6-Lane Cross-Section "Mid-Block"

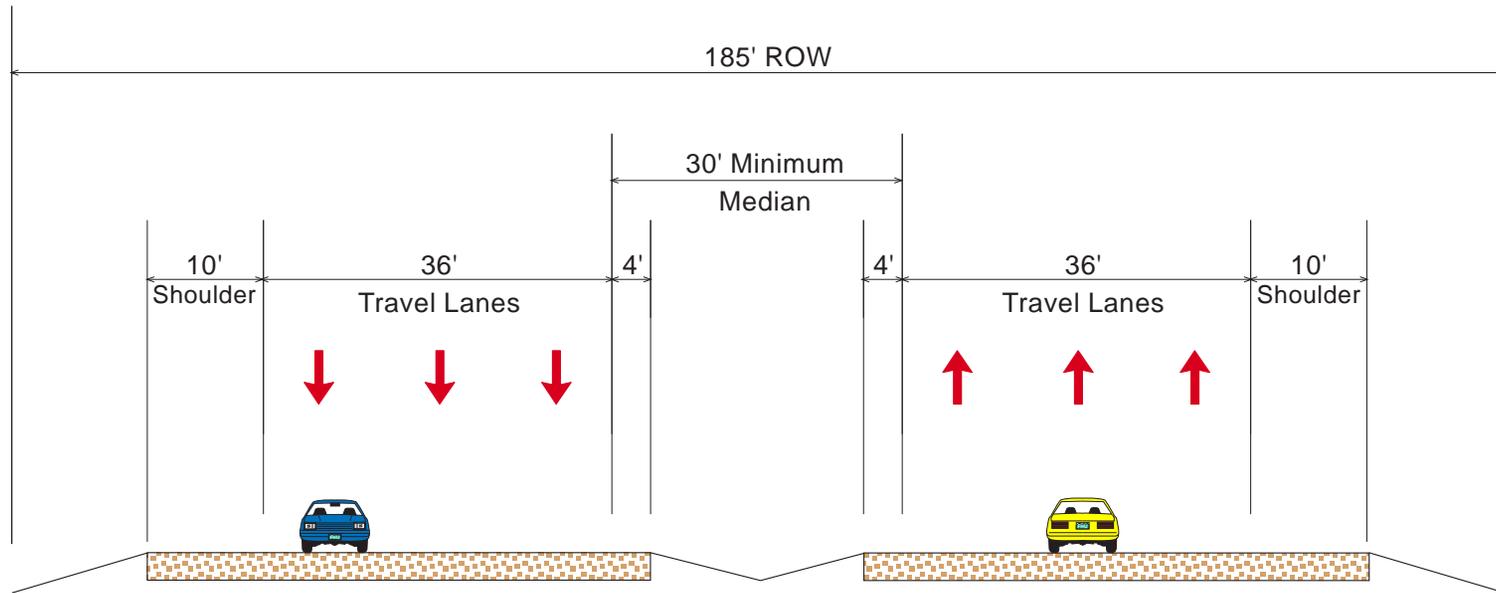


Figure 6





Proposed US 34 6-Lane Cross-Section "At Intersections"

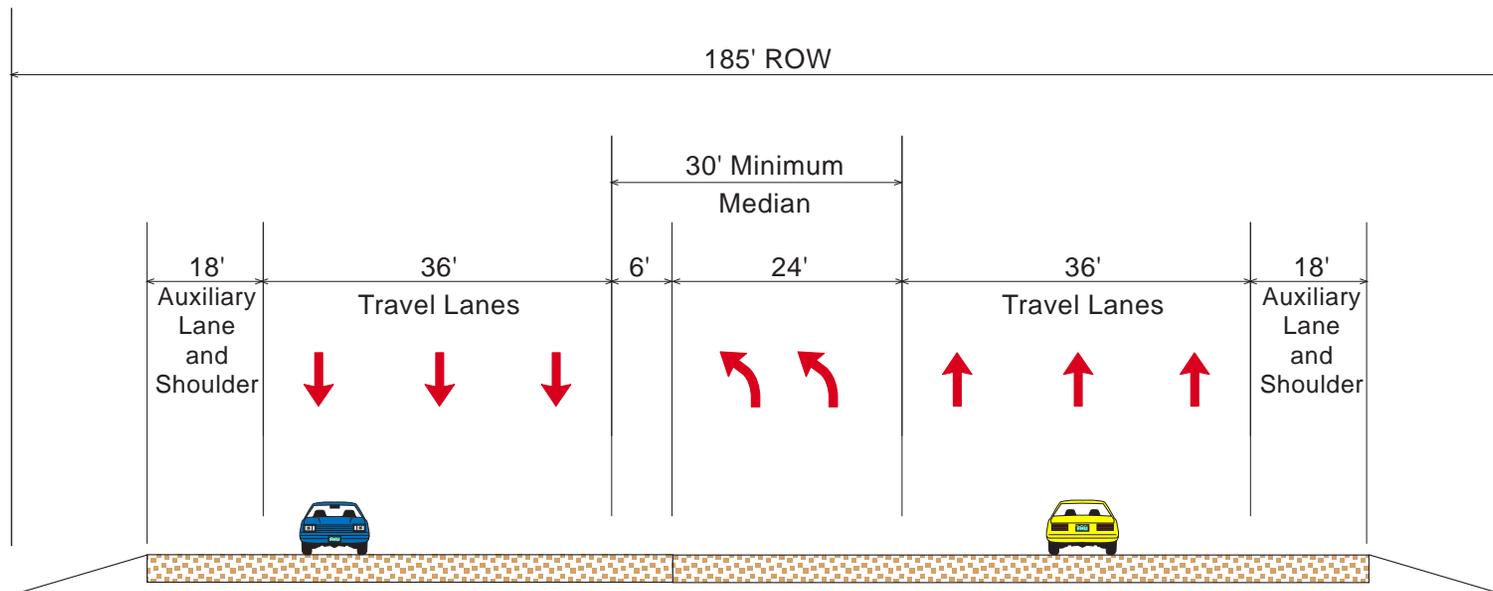


Figure 7





7.0 ENVIRONMENTAL CONSIDERATIONS

As part of the US 34 COP, an environmental analysis was conducted to identify major environmental concerns and assess the potential of meeting regulatory and permitting requirements for each of the transportation alternatives. The environmental information collected will be important towards identifying CDOT's potential environmental liabilities and will help streamline the NEPA process for future transportation work. The NEPA process is composed of performing a future Environmental Assessment (EA) or Environmental Impact Study (EIS) as a means toward selecting a preferred alternative that will eventually be designed and constructed.

A cursory environmental evaluation was performed as part of the US 34 COP. Felsburg Holt & Ullevig's Environmental Manager (Art Hirsch) traveled the US 34 Project Corridor from I-25 east to US 85 on February 20, 2002. US 34 and the northern and southern parallel corridors were traveled and reviewed to identify potential environmental issues or sites that may require further detailed study during the NEPA process. This site evaluation was also performed to identify "red flags" that may impact future transportation management decisions, such as potential highway alignment within the corridor or watershed.

The following highlight the findings of the environmental evaluation:

- ◆ Threatened and Endangered Species may exist within the project corridor. A complete survey will be needed as part of the NEPA process. Species such as the prairie dog are not currently endangered but may be given this designation in the future when the NEPA process is initiated by CDOT.
- ◆ The future transportation alternatives must consider protection of surface water systems including the Big Thompson River, the Cache La Poudre River, their tributaries and wetlands. Location of transportation systems must consider avoidance and mitigation in recreational areas associated with these surface water systems. Widening Crossroads Boulevard and connecting it to "O" Street must consider the impacts to the Cache La Poudre River Floodplain.
- ◆ Oil tanks and pumping stations have the potential of causing potential soil and groundwater contamination from spillage or leakage from tanks. These tanks and pumping systems are located throughout the project corridor. A Phase I, and possibly a Phase II, Environmental Site Assessment will need to be performed in the future.
- ◆ Environmental justice issues must be considered along LCR 18/WCR 54 and possibly along "O" Street where mobile home locations were noted. Information concerning the location, minority status and economic conditions in this area will need to be reviewed in the future during the NEPA process.
- ◆ There are residential homes near US 34 and in the new development area on WCR 54 that may require noise analysis if major improvements are implemented.



- ◆ The City of Greeley and CDOT will be required to have a Phase II Stormwater Permit from Colorado Department of Public Health and Environment by March of 2003. The conditions of the permit will require that new or redeveloped areas (such as road systems) have stormwater controls to protect sensitive surface waters. These controls are called best management practices (BMPs) and may require the creation of retention ponds, detention ponds, wetlands, etc.
- ◆ Avoidance of historical designation of buildings and structures (irrigation canals) needs to be considered for improvements. Impacts to historical structures such as buildings and irrigation structures are important NEPA issues that can affect highway alignment and location of transportation systems.



APPENDIX A US 34 ULTIMATE ACCESS CONTROL PLAN



APPENDIX B. SELECT LINK ANALYSIS RESULTS



APPENDIX C. ENVIRONMENTAL REPORT



General Corridor Issues

Threatened and Endangered Species

Threatened and Endangered Species issues could be critical in the US 34 corridor. Based upon US Fish and Wildlife information (*Federally Listed and Candidate Species in Colorado, US Fish and Wildlife Service, Ecological Services, Colorado Field Office, Effective August 21, 2001*) there are several species whose presence will need to be evaluated during the NEPA process. These species include:

Listed Threatened

- ◆ Bald eagle, *Haliaeetus leucocephalus*
- ◆ Piping plover, *Charadrius melodus*
- ◆ Mexican spotted owl, *Strix occidentalis lucida*
- ◆ Preble's meadow jumping mouse, *Zapus hudsonius preblei*
- ◆ Ute ladies'-tresses orchid, *Spiranthes diluvialis*
- ◆ Colorado Butterfly Plant (*Gaura neomexicana* var. *coloradensis*)
- ◆ Mountain plover, *Charadrius montanus*
- ◆ Pallid sturgeon (*Scaphirhynchus albus*)

Listed Endangered

- ◆ Whooping crane, *Grus americana*
- ◆ Black-footed ferret, *Mustela nigripes*
- ◆ Least tern (interior population), *Sterna antillarum*
- ◆ Eskimo curlew, *Numenius borealis*

The US Fish and Wildlife Service may eventually protect the Black-tailed prairie dog (*Cynomys ludovicianus*) and this future regulation should be anticipated by CDOT. This species is listed as a "candidate for listing".

Historical Structures

Historical irrigation ditches such as the Greeley #1, #2 and #3 (Owl Canal) are protected and need to be avoided as historical structures. Historical buildings especially along the US 34 corridor will need to be determined during the NEPA process. To date, no historical survey has been performed by CDOT on the historical significance of these structures in the US 34 corridor.



4(f) Recreational Areas

There are several locations in the project area that have potential 4(f) designation. These areas are recreational areas such as county parks, playgrounds and trails/bike paths. For example there is a regional bikeway that is managed by the Town of Windsor, City of Greeley and Weld County that follows the Cache La Poudre River; impact to these bike trails should be avoided if possible.

Oil Pumping and Storage Locations

Oil tanks and pumping systems near the existing ROW pose a potential environmental concern due to transfer spillage into tankers or potential tank integrity problems. Potentially acquired land for additional ROW may contain spilled crude oil/hydrocarbons onto the underlying soil or groundwater. These oil tank and pump area exist throughout all the potential alternatives reviewed for this study.

Water Quality and River Floodplains

The Big Thompson River and the Cache La Poudre Rivers flow within the project area. These rivers are critical resources to the surrounding area. They provide water for aquatic habitat for fish, recreation and agriculture. These uses and water quality of these rivers and other surface waters in the area must be protected and maintained according the Clean Water Act and State of Colorado Water Quality regulations. There are numerous wetland locations in the project area that will need to be delineated and potentially mitigated. Protection of these surface water systems must be taken into account during the NEPA process, highway design and construction process. Permits may include a General Construction Stormwater Permit, a Section 402 Permit (direct discharges into surface water from dewatering) and a 404 Permit from the Army Corps of Engineers for wetland disruption and dredging.

Field Study and Review

The objective of the field study was to perform a site evaluation of the US 34 alternative corridors to identify potential environmental issues and sites that will require further detailed study. The field study involved driving and observing the environmental conditions between I-25 and US 85 at: 1) US 34, 2) LCR 18/WCR 54, and 3) Crossroads and "O" Street. The observations are noted below:

US 34

There are numerous irrigation canals located within the existing ROW. Water quality within these canals must be protected during construction activities. A General Construction Stormwater Permit will need to be obtained from the Colorado Department of Public Health and Environment (CDPHE) and possibly by the City of Greeley.



Wetlands and ponds near US 34, such as those near the Home Depot Store (at 35th Avenue and other locations) will need to be delineated and protected. Existing ponds along US 34 may be constructed as part of stormwater management system for large parking lot areas associated with large retail businesses. Wetlands that may be impacted in the future will require CDOT to obtain a 404 Permit from the Army Corps of Engineers.

There are residential areas on US 34 near 17th Avenue where no noise barriers exist. If major improvements take place, noise analysis may be required.

Southern Parallel Arterial Alternative (LCR 18/WCR 54)

Older type gasoline stations were noted near US 85 including Seven/Eleven and U Pump It. A newer Phillips 66 is located on this stretch of road. Historical releases from underground tanks are a potential concern if the property is taken for ROW. A Phase I Environmental Site Assessment should be performed as part of the NEPA process. This evaluation will determine the potential of having hazardous waste in the soils and groundwater that may represent an environmental risk and liability to CDOT.

Residential areas should be monitored for noise and potential noise mitigation (barriers) anticipated during the NEPA process.

Evans Village Park (a City Park) may be impacted by increased ROW needs. 4(f) recreation impacts would require avoidance or mitigation.

There may be environmental justice issues with low income or minority populations. It is possible that impacts to mobile home areas may involve these populations. Disproportional impact to low income or minority communities should be evaluated as part of the NEPA process.

There are four large oil tanks and compressor/pumping station near Stampede Drive and Ashcroft Estates. A potential spill area exists from localized oil collection, handling and transfer activities.

Just west of 47th Avenue is a stretch of wetlands, primarily on the north side of the road, will need to be delineated, protected or mitigated.

An electrical transformer pad was noted near Valley Block (1/4 mile east of I-25) that poses a potential Polychlorinated Biphenyls (PCB) contamination risk in the soil.

Surface waters such as the Big Thompson River, several tributaries and irrigation ditches (some dry during observation) will need protection during construction and highway operations and maintenance. Any discharges to the river will require a permit from CDPHE.



Northern Parallel Arterial Alternative (Crossroads Boulevard/"O" Street)

The potential environmental impacts associated with this alternative route were not as apparent. Since there is not an established road system east of Crossroads Boulevard that links to "O" Street. To connect these two existing roads will require a road that will go through the Cache La Poudre floodplain and possibly recreational areas.

There are some irrigation canals that cross or are adjacent to Crossroads Boulevard/"O" Street.

On the gravel road portion of Crossroads Boulevard there is a location where a prairie dog colony was located. A hawk was also noted in the trees near the colony.

A potential landfill location was observed on the gravel road portion of Crossroads Boulevard (south side). Debris was noted in a notch carved out of a slope. The slope of the hill seems to be graded resembling a former landfill area. A future Phase I Environmental Site Assessment will need to evaluate this location.

The intersection of Crossroads Boulevard and SH 257 is where the road would "take off" east toward "O" Street through agricultural land and within the floodplain of the Cache La Poudre River.

There is a County park called Missile Silo Park that was a former Atlas Missile Silo. The interior of the park is owned by the Federal Government. This area is on a ridge to the south of the La Poudre River. This park area will likely fall under a 4(f) recreational location that will require avoidance, impact minimization or mitigation. The limits of this park should be verified during the NEPA process to ensure this recreational area can be avoided whenever possible.

There is a trail and bike system associated with the Cache La Poudre River on the southern portion of the stream bank area. Stream and floodplain protection will need to be considered for this northern alternative.

On "O" Street near the small area known as Farmers, there are several train tracks and buildings near the road. Several railroad tanker cars were noted to be stored at this location. If this is a normal tanker storage area, there is a potential of historical spills. A Phase I Environmental Site Assessment should review the spill history of this site.

A CDOT Region 4 Environmental Representative (Jeff Manuel) mentioned a Spanish minority community on the northern east portion of the northern alternative that may be a potential environmental justice issue.

Tanks associated with oil pumping and storage were noted in the area.



303.721.1440
fax 303.721.0832

Greenwood Corporate Plaza
7951 E. Maplewood Ave. Ste. 200
Greenwood Village, CO 80111

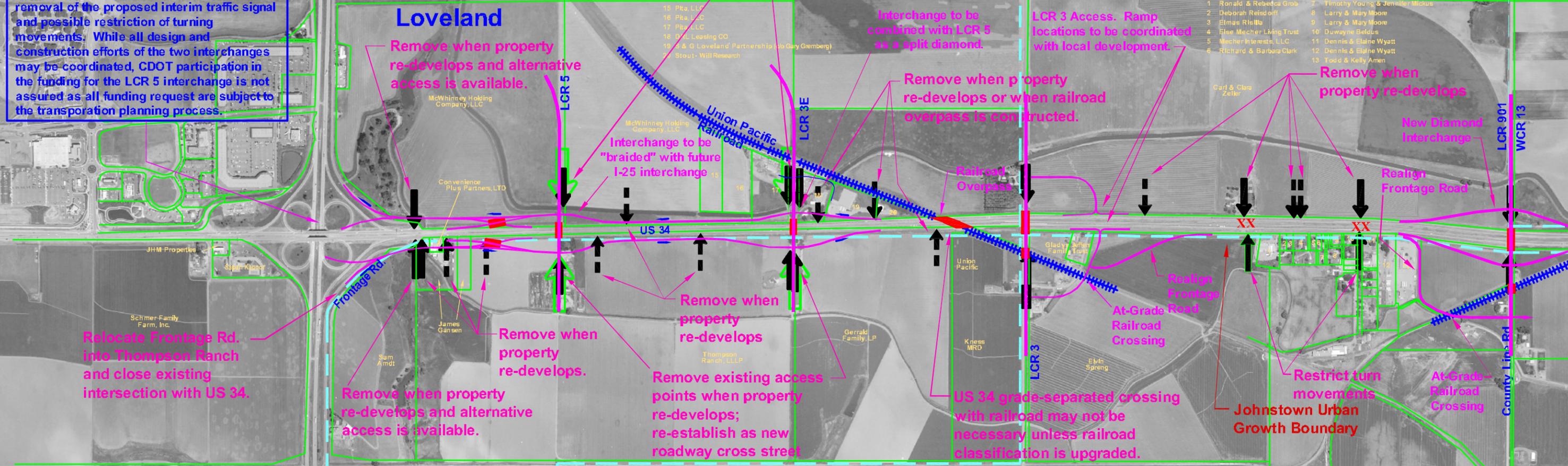
ULTIMATE ACCESS CONTROL PLAN

CDOT analysis of this area indicates that the LCR 5 grade-separated interchange may need to be built prior to or concurrent with the future I-25 / US 34 reconstructed interchange. The ultimate configuration of the I-25 / US 34 interchange may impact the LCR 5 intersection in such a way as to necessitate removal of the proposed interim traffic signal and possible restriction of turning movements. While all design and construction efforts of the two interchanges may be coordinated, CDOT participation in the funding for the LCR 5 interchange is not assured as all funding request are subject to the transportation planning process.



Provide Parallel Roadway Connections
To be determined by development plans.

Provide Parallel Roadway Connections
To be determined by development plans.



Relocate Frontage Rd. into Thompson Ranch and close existing intersection with US 34.

Remove when property re-develops and alternative access is available.

Remove existing access points when property re-develops; re-establish as new roadway cross street

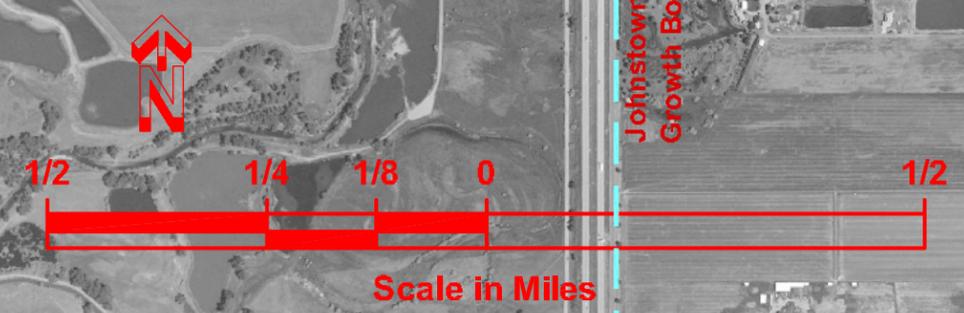
US 34 grade-separated crossing with railroad may not be necessary unless railroad classification is upgraded.

Restrict turn movements

Provide Parallel Roadway Connection
To be determined by development plans.

Provide Parallel Roadway Connection
To be determined by development plans.

CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.



- Legend**
- ➡ Existing Full movement access
 - ➡ Existing Right-in/ Right-out access
 - ⊞ Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards; Per Lane Designations Indicated
 - ➡ New Roadway Cross Street
 - 3/4 Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
 - 🚦 Signalized Intersection
 - X Median Openings or Streets to Be Closed

Johnstown Urban Growth Boundary

Loveland Urban Growth Boundary

Johnstown

ULTIMATE ACCESS CONTROL PLAN

CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.

Provide Parallel Roadway Connections
To be determined by development plans.

Provide Parallel Roadway Connections
To be determined by development plans.

Remove when property re-develops

Provide Cross Access

Remove when surrounding property develops and alternative access is provided

Unsignalized Full Movement Intersection until land redevelops; then close or provide overpass.

Windsor Urban Growth Boundary

Remove when property re-develops

New Diamond Interchange

3/4
With connection to WCR 13

Accesses removed when property re-develops

Interchange to remain

(MEDIAN OPENING)

Grade Separation. Provide extra width to accommodate ramp acceleration lanes

US 34 grade-separated crossing with railroad may not be necessary unless railroad classification is upgraded.

Provide Parallel Roadway Connection
To be determined by development plans.

Provide Parallel Roadway Connection
To be determined by development plans.

- 1 Stephen & Christine Lydon
- 2 Alan & Shay Black
- 3 Vern Stutzman
- 4 Luke & Heidi Baylinger
- 5 Robert & Deborah Ackelson
- 6 Duane & Janice Leopold
- 7 Teresa Ribble
- 8 Richard & Leigh Grotegky
- 9 William & Kathleen Quam

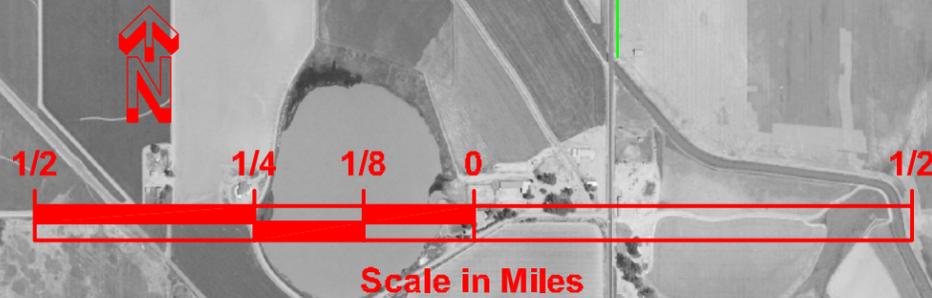
Remove when property re-develops

Johnstown Urban Growth Boundary

Remove when property re-develops

Legend

- Existing Full movement access
- Existing Right-in/ Right-out access
- Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards, Per Lane Designations Indicated
- New Roadway Cross Street
- Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
- Signalized Intersection
- Median Openings or Streets to Be Closed



ULTIMATE ACCESS CONTROL PLAN

CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.

Provide Parallel Roadway Connections
To be determined by development plans.

Provide Parallel Roadway Connection
To be determined by development plans.

Unsignalized Full Movement Intersection until land redevelops; then close or provide overpass.

Accesses to be removed at first opportunity.

Planned 20th Street re-alignment

34 Business

Accesses to be removed at first opportunity

New Diamond Interchange

Accesses removed when property re-develops

Interchange to remain

Access removed when property re-develops

With connection to Promontory Pkwy. intersection.

Interchange to remain

257

Greeley Urban Growth Boundary

Remove existing access when property re-develops; re-establish as new roadway cross street

Accesses removed when properties re-develop

Accesses removed when properties re-develop

Provide Parallel Roadway Connection
To be determined by development plans.

Provide Parallel Roadway Connection
To be determined by development plans.

Milliken

Legend

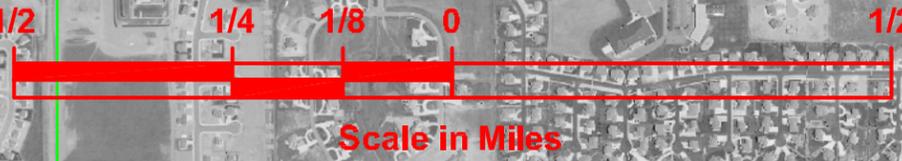
-  Existing Full movement access
-  Existing Right-in/ Right-out access
-  Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards; Per Lane Designations Indicated
-  New Roadway Cross Street
-  Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
-  Signalized Intersection
-  Median Openings or Streets to Be Closed



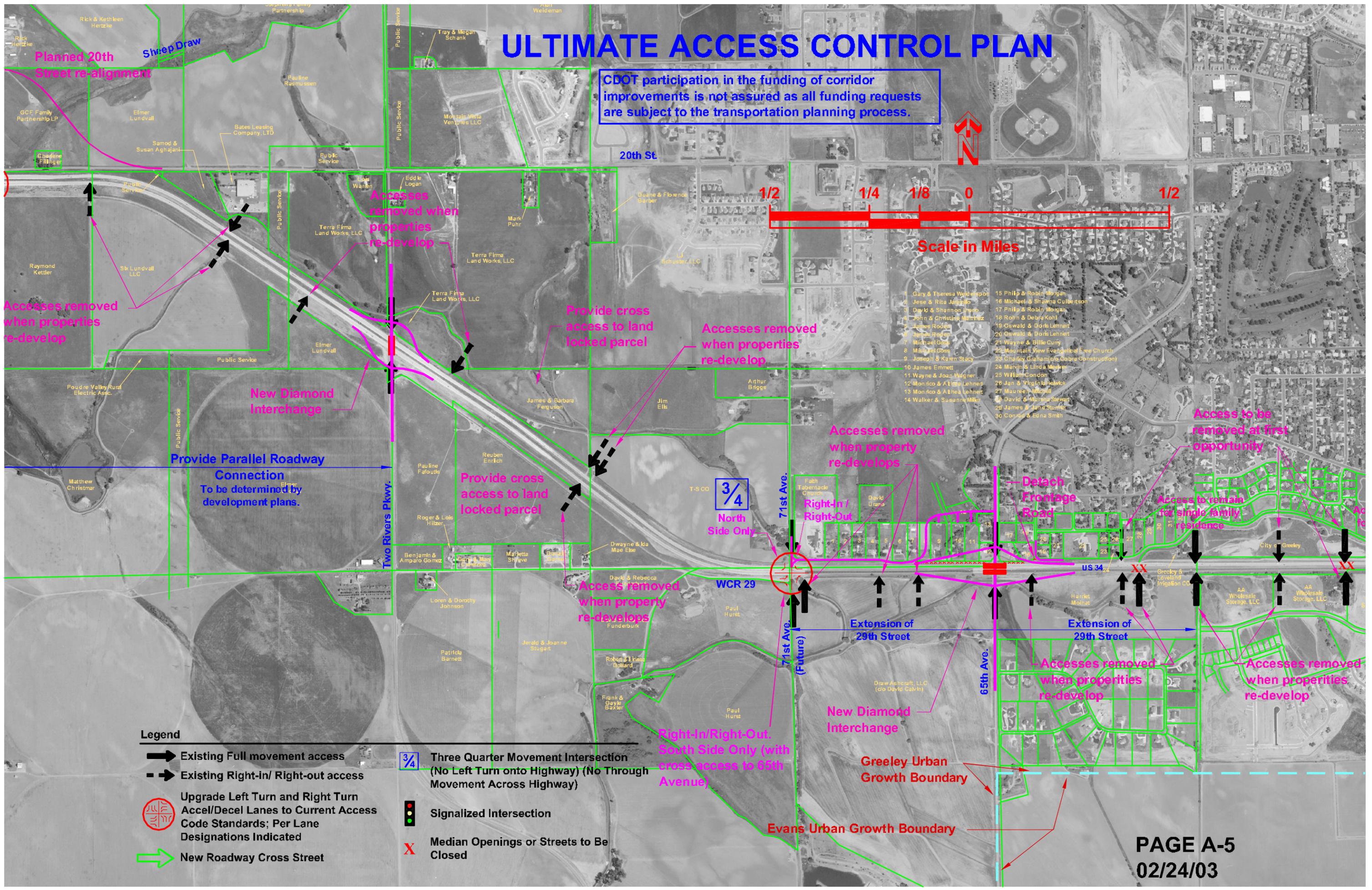
Scale in Miles

ULTIMATE ACCESS CONTROL PLAN

CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.



- 1 Gary & Theresa Woodson
- 2 Jesse & Rita Jaramila
- 3 David & Shannon Ingho
- 4 John & Christine Martinez
- 5 James Rodea
- 6 Nancy Rodea
- 7 Michael Goss
- 8 Michael Goss
- 9 Joseph & Karen Stacy
- 10 James Emmett
- 11 Wayne & Joan Wagner
- 12 Monico & Alita Lehner
- 13 Monico & Alita Lehner
- 14 Walker & Susanna Miller
- 15 Philip & Robin Morgan
- 16 Michael & Shawna Culbertson
- 17 Philip & Robin Morgan
- 18 Robin & Debra Kohl
- 19 Oswald & Doris Lehner
- 20 Oswald & Doris Lehner
- 21 Wayne & Billie Cury
- 22 Mountain View Evangelical Free Church
- 23 Charley Graham's Cobra Construction
- 24 Marvin & Linda Medler
- 25 William Condon
- 26 Jan & Virginia Helwick
- 27 Maureen Mitchell
- 28 David & Monica Stewart
- 29 James & Linda Stinger
- 30 Conroy & Edna Smith



Legend

- Existing Full movement access
- Existing Right-in/ Right-out access
- Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards; Per Lane Designations Indicated
- New Roadway Cross Street
- Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
- Signalized Intersection
- Median Openings or Streets to Be Closed

ULTIMATE ACCESS CONTROL PLAN

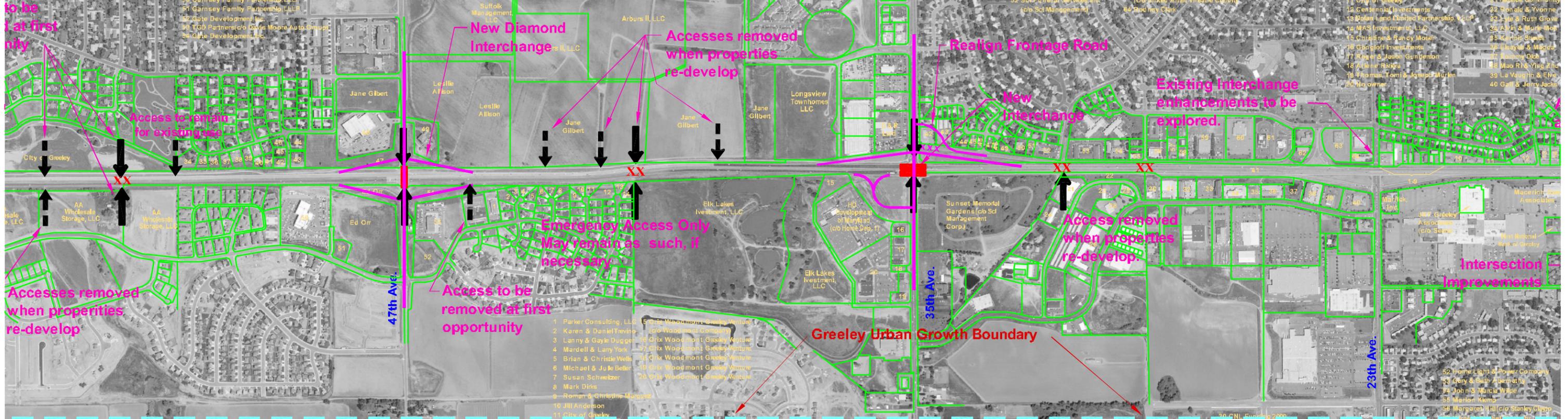
CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.

Greeley

- 25 William Sander
- 26 Jan & Virginia Helm
- 27 Maureen Merrill
- 28 David & Maria Skowron
- 29 James & Jane Sumner
- 30 Conrad & Edna Smith
- 31 Terry & Compagn Mowse
- 32 Glenn & Judith Gregori
- 33 Michael & Margaret McMillan
- 34 Michael & Edna Sander
- 35 Harold & Gloria Chawwa
- 36 Charlene & Wanda Brady
- 37 Russell & Cynthia Jackson
- 38 Scott Hopp
- 39 David & Karen Glatzer
- 40 Tyson Schroeder
- 41 Raymond & Evelyn Smith
- 42 Leonard & Pamela Babick
- 43 Ruth Lord
- 44 George & Norma Townsend
- 45 Donald & Lela Kottler
- 46 Nancy Matz
- 47 Roy Lundvall
- 48 Benton Frank Land & Lva Stock Co
- 49 Co County General Car Area Inc
- 50 Stagecoach Stop, LLC
- 51 Gamsey Family Partnership, LLP
- 52 Gate Development, Inc.
- 53 TGD Partners/c/o Davis Moore Auto Group
- 54 Gate Development, Inc.

- 42 Diamond Shamrock Station, Bus 2 Andrews Enterprises, LLC
- 43 James & Linda Baker
- 44 Kurt Hagmiller
- 45 Timothy & Brandelyn Bege
- 46 Sheila Krespel
- 47 Lainea Fisher
- 48 Jose Regina Gonzalez
- 49 Paul & Mellyn Long
- 50 xxx
- 51 Self General Services, Inc. (c/o Sci Management)
- 52 Self General Services, Inc. (c/o Sci Management)
- 53 xxx
- 54 xxx
- 55 Roger & Vira Inokopene
- 56 Greer Gerel for Independence
- 57 Edward & Nancy Bigden
- 58 Edward & Nancy Bigden
- 59 Jacobus & Ader Van Hecke/Smith
- 60 Chemika Dynamics, Inc.
- 61 xxx
- 62 Hays Enterprises (c/o Hays Realty Corp.)
- 63 Washington Trust (c/o United Artist Theatre Society)
- 64 Rodney Clark

- 1 Diamond Shamrock Station
- 2 Rhodes Investments, LLC
- 3 Carolyn Barber
- 4 Carolyn Barber
- 5 Lawrence & Margaret Myers
- 6 Rich Wallace
- 7 Reuben Ehrlich
- 8 Reuben Ehrlich
- 9 Reuben Ehrlich
- 10 Centennial Investments
- 11 City of Greeley
- 12 Centennial Investments
- 13 Nolan Land Limited Partnership, L.P.
- 14 MAS Investments, LLC
- 15 Christine & Randy Moser
- 16 Grogloff Investments
- 17 Roger & Jason Gunverson
- 18 Helen Rigdon
- 19 Thomas, Tam & Joseph Muden
- 20 no owner
- 21 Jose & Noemi Med
- 22 Cheryl Contrabon
- 23 Paul Gilt
- 24 Wayne Rainbin
- 25 Francisco Giaman
- 26 Francine & Margaret
- 27 Harold & Ned Van W
- 28 Margen Foote
- 29 Kelli & Martha Flo
- 30 A Smith & Beverly
- 31 Boston Community
- 32 Ronald & Yvonne
- 33 Lee & Ruth Grov
- 34 Alvin & Muriel Mos
- 35 Keith Shear
- 36 Clayton & Margde
- 37 xxx
- 38 Mao Rongying & H
- 39 La Vaughn & Elbe
- 40 Galt & Jerry Jack



- Legend**
- ➔ Existing Full movement access
 - ➔ Existing Right-in/ Right-out access
 - ⊕ Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards; Per Lane Designations Indicated
 - ➔ New Roadway Cross Street

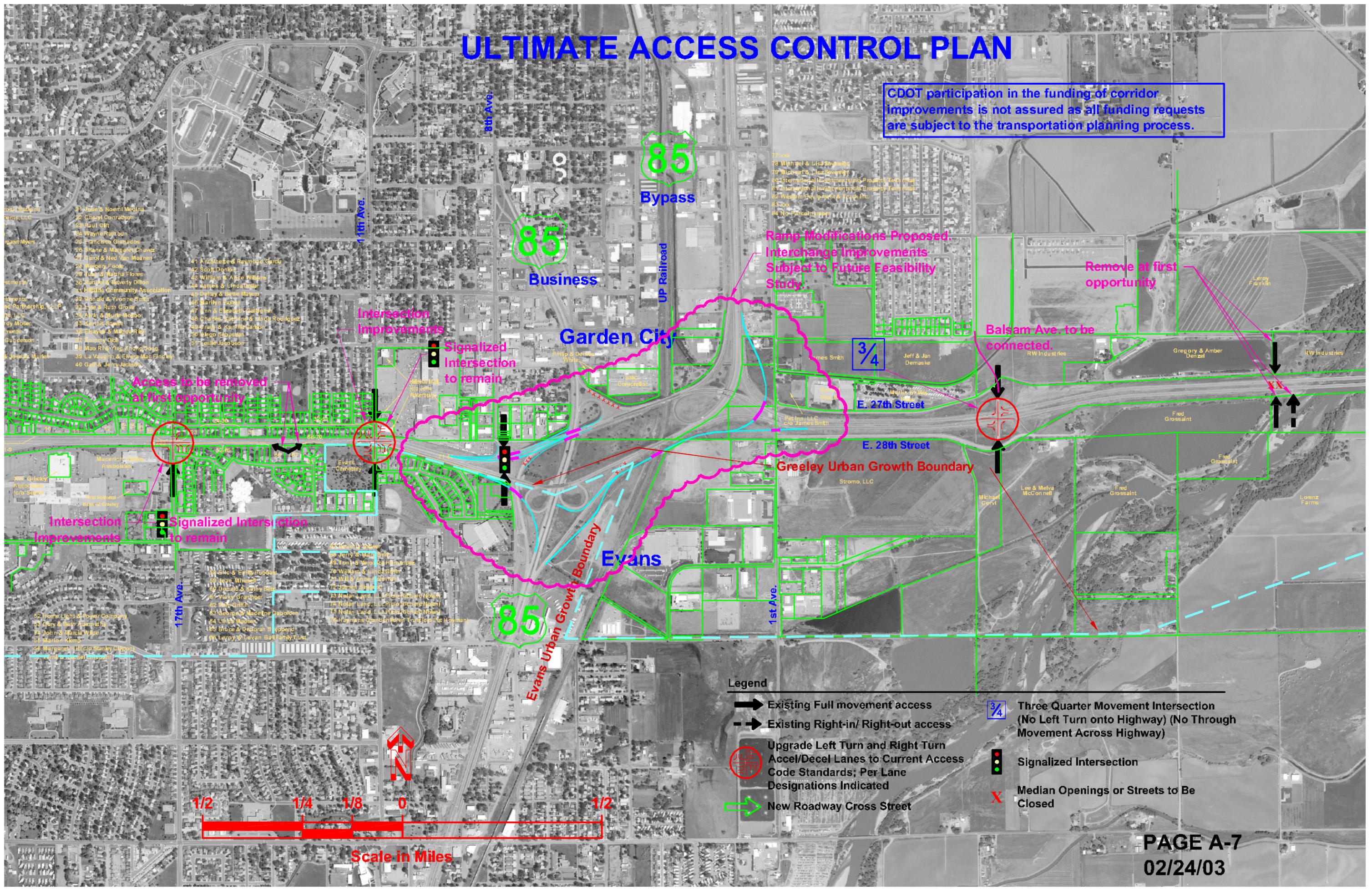
- 3/4 Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
- 🚦 Signalized Intersection
- X Median Openings or Streets to Be Closed



Scale in Miles

ULTIMATE ACCESS CONTROL PLAN

CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.



- 31 Jose & Noemi Medina
- 32 Chavel Contreras
- 33 Paul Giff
- 34 Wayne Rajthan
- 35 Francisco Gonzalez
- 36 Shane & Margaret Chavez
- 37 Carol & Ned Van Maanen
- 38 Margery Poole
- 39 Lisa & Martha Flores
- 40 Daniel & Beverly Dillon
- 41 Housing Community Association
- 42 Ronald & Yvonne Smith
- 43 Lisa & Ruth Grove
- 44 Alan & Marie Mosbor
- 45 Keith Smith
- 46 Clayton & Magda Ray
- 47 Patricia Dick
- 48 Mao Rix & Ying Fung Hoang
- 49 La Vanya & Elvira Mac Findley
- 40 Gail & Jenni Jackson

- 41 Anneliese & Raymond Garcia
- 42 Scott Douglas
- 43 William & Alice Williams
- 44 James & Linda Miller
- 45 Dorey & Steve Walters
- 46 Marilyn Foster
- 47 Ann & Elizabeth Gallagher
- 48 Charles, Kathleen & Maria Rodriguez
- 49 Craig & Kamille Carlson
- 50 Alejo Sabasala
- 51 Leslie Johnson

- 52 Tom & Emily Fuggard
- 53 Jean Mitchell
- 54 Donald & Kathy Rose
- 55 Rusty Graninger
- 56 Tracy Smith
- 57 George & Madeline Rabolden
- 58 LINDA MOORE
- 59 Bruce & Deborah S. Eppend
- 60 Leroy & Lavan Ball Family Trust

- 61 James & Nancy
- 62 Jerry & Mary Smith
- 63 Tom & Mary
- 64 William & Linda Smith
- 65 Will & Anna J. Ginner
- 66 James Smith
- 67 Melan Land, LLC, Lisa Richards-Nolan
- 68 Nolan Land, LLC, Lisa Richards-Nolan
- 69 Nolan Land, LLC, Lisa Richards-Nolan
- 70 Rogmans Foundation, Warren Hooper & Son

- 71 Tom
- 72 Michael & Lisa Brown
- 73 Michael & Lisa Brown
- 74 International Homelessness Project, Technical
- 75 International Homelessness Project, Technical
- 76 Western Equipment & Truck Inc.
- 77 Tom
- 78 No. Fairchild

- James Smith
- Jeff & Jan Demaske
- Pat Inn, LLC, c/o James Smith

Legend

- Existing Full movement access
- Existing Right-in/ Right-out access
- Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards; Per Lane Designations Indicated
- New Roadway Cross Street
- Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
- Signalized Intersection
- Median Openings or Streets to Be Closed



ULTIMATE ACCESS CONTROL PLAN

CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.

34
Business

Possible Connection From WCR 45. Exact Alignment to be Determined with Development Plans.

Greeley Urban Growth Boundary
South Platte River

Consolidate to a single access when conditions allow

Remove access and use access across from WCR 49 when property re-develops

Signalized Intersection

Emergency Access Only

Access removed when property re-develops

Signalized Intersection

Remove and use

Right-in/Right-out or Close with connection to US 34 Business route intersection.

Provide cross access when property develops.

Accesses removed when properties re-develop

Accesses removed when properties re-develop

Accesses removed when properties re-develop.

Accesses to be removed at first opportunity

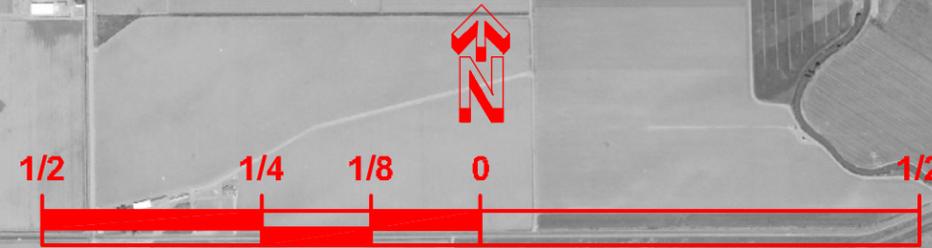
Remove and establish access to WCR 49 and to point across from WCR 49.5 when property re-develops.

Ultimately remove accesses and use access across from WCR 47.5 in association with re-development

Ultimately remove accesses and use access across from WCR 49.5 in association with re-development

Legend

- ➔ Existing Full movement access
- ➔ Existing Right-in/ Right-out access
- ⊕ Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards; Per Lane Designations Indicated
- ➔ New Roadway Cross Street
- $\frac{3}{4}$ Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
- 🚦 Signalized Intersection
- X Median Openings or Streets to Be Closed



ULTIMATE ACCESS CONTROL PLAN

CDOT participation in the funding of corridor improvements is not assured as all funding requests are subject to the transportation planning process.

Remove access and use access across from WCR 49 when property re-develops.

3/4

Remove access and use WCR 51.

Improve "One-Way" movement enforcement

Accesses removed when properties re-develop

Dual left turn lanes on south approach given short distance to Hill Street.

Remove existing access when property re-develops; re-establish as new roadway cross street.

Signalized Intersection

Connect WCR 56 to new WCR 55 intersection

Accesses removed when property re-develops

Convert to right-in / right-out

Signalized Intersection

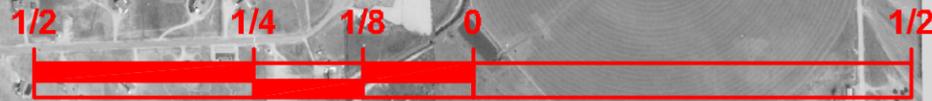
Establish cross access roadway between WCR 51 and 1st Street

Close intersection when new WCR 55 intersection is complete

Remove accesses access across from 5 in association with

Legend

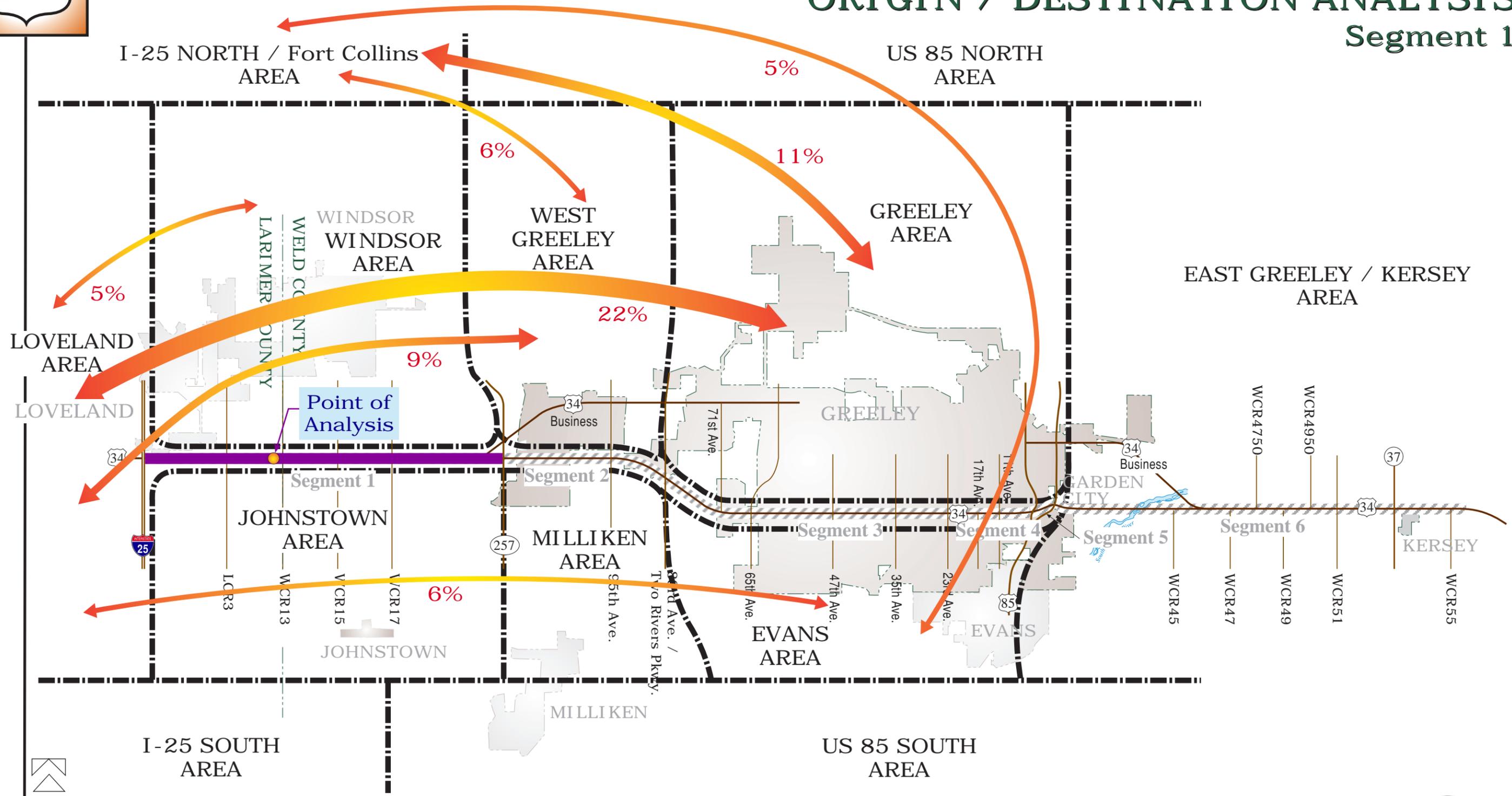
-  Existing Full movement access
-  Existing Right-in/ Right-out access
-  Upgrade Left Turn and Right Turn Accel/Decel Lanes to Current Access Code Standards; Per Lane Designations Indicated
-  New Roadway Cross Street
-  Three Quarter Movement Intersection (No Left Turn onto Highway) (No Through Movement Across Highway)
-  Signalized Intersection
-  Median Openings or Streets to Be Closed





Corridor Optimization Plan

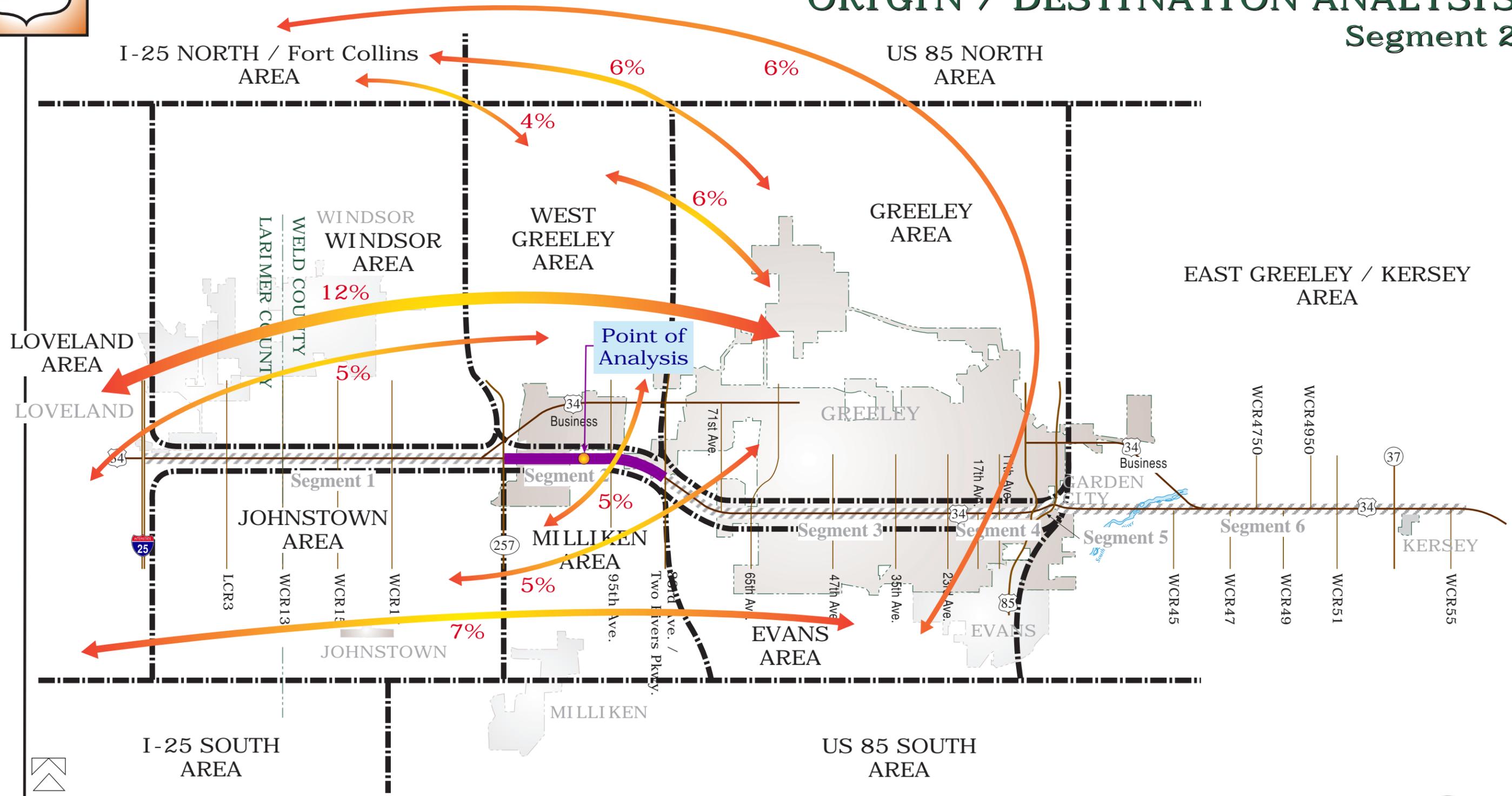
ORIGIN / DESTINATION ANALYSIS Segment 1





Corridor Optimization Plan

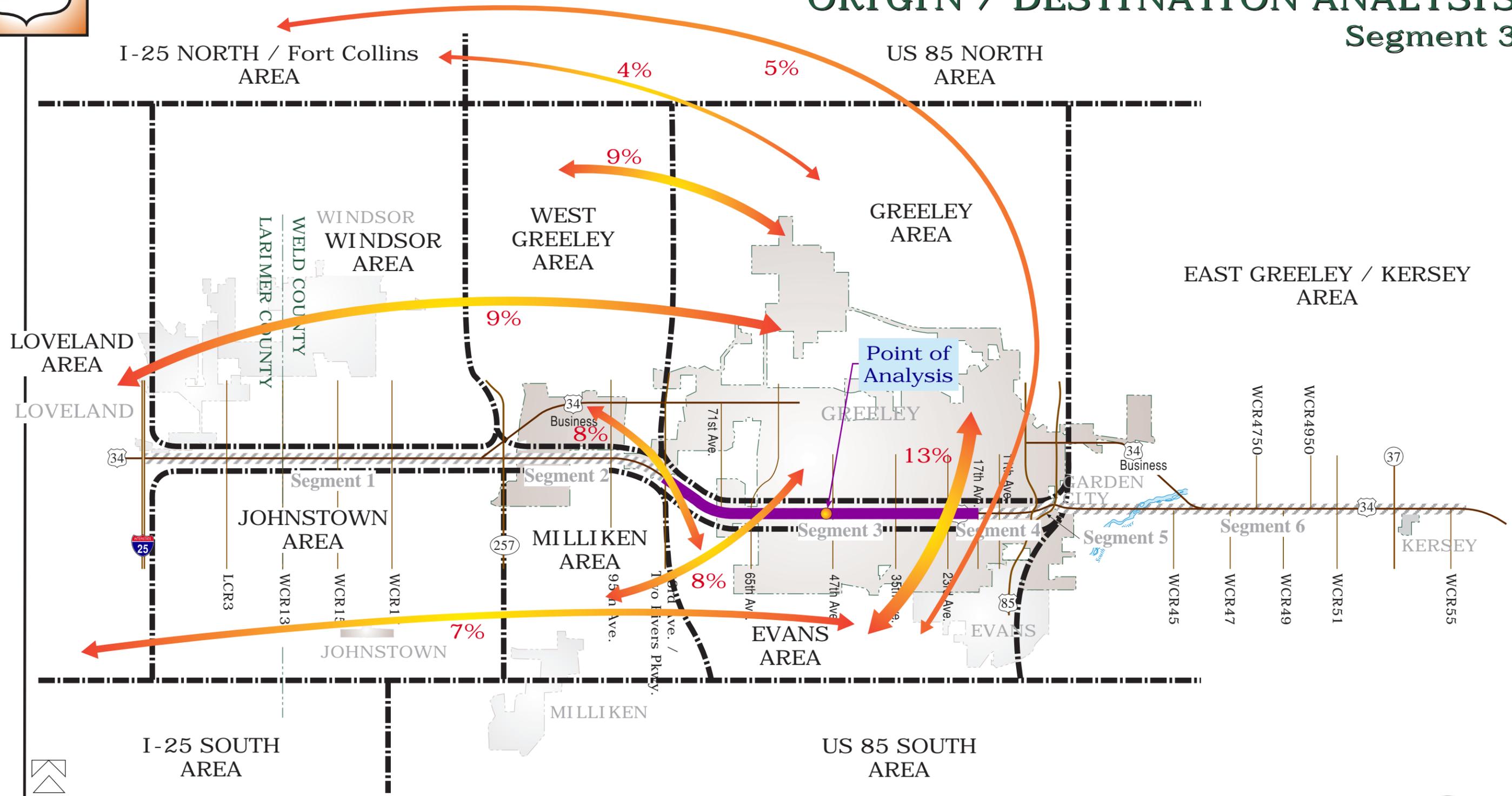
ORIGIN / DESTINATION ANALYSIS Segment 2





Corridor Optimization Plan

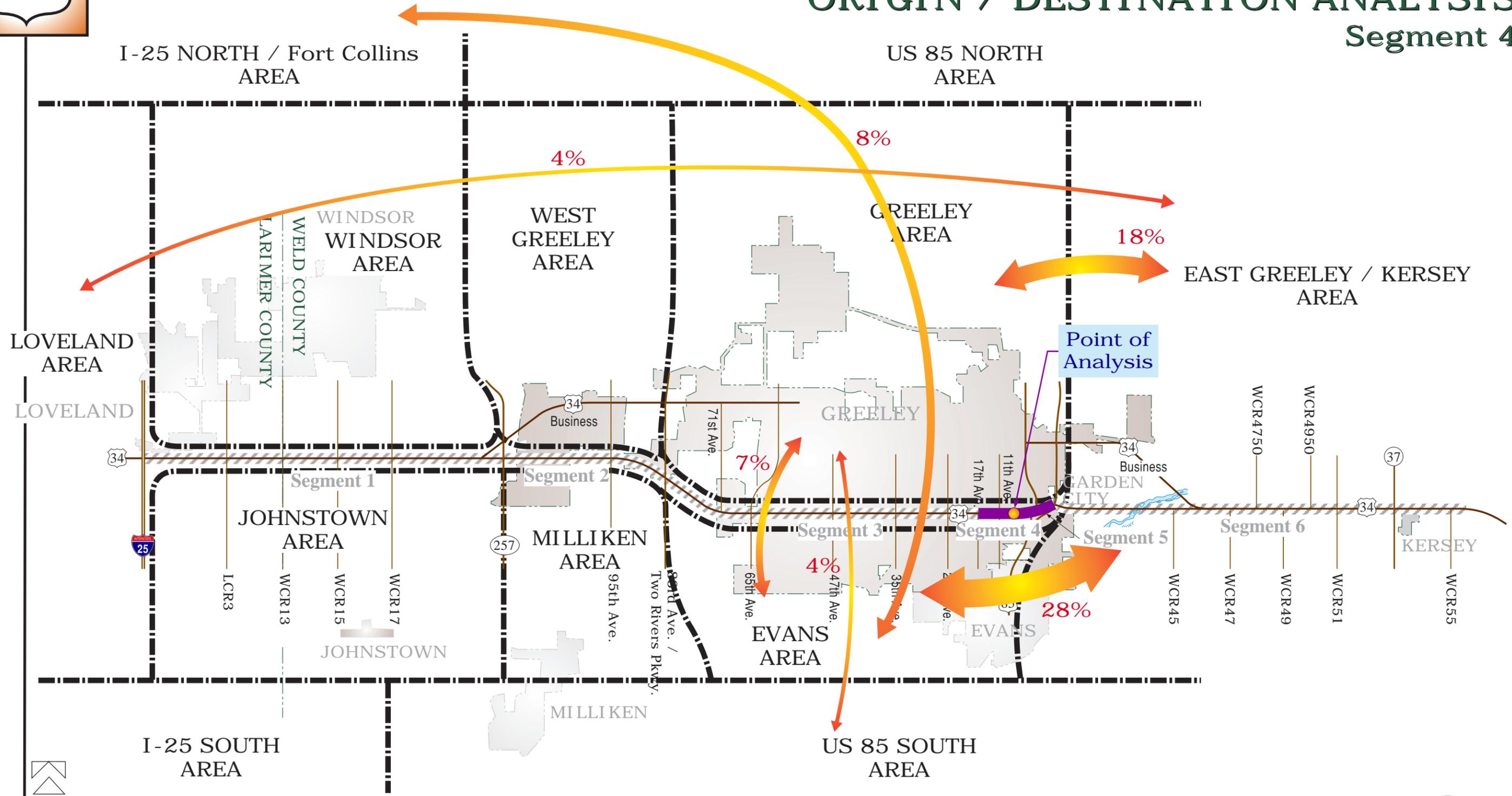
ORIGIN / DESTINATION ANALYSIS Segment 3





Corridor Optimization Plan

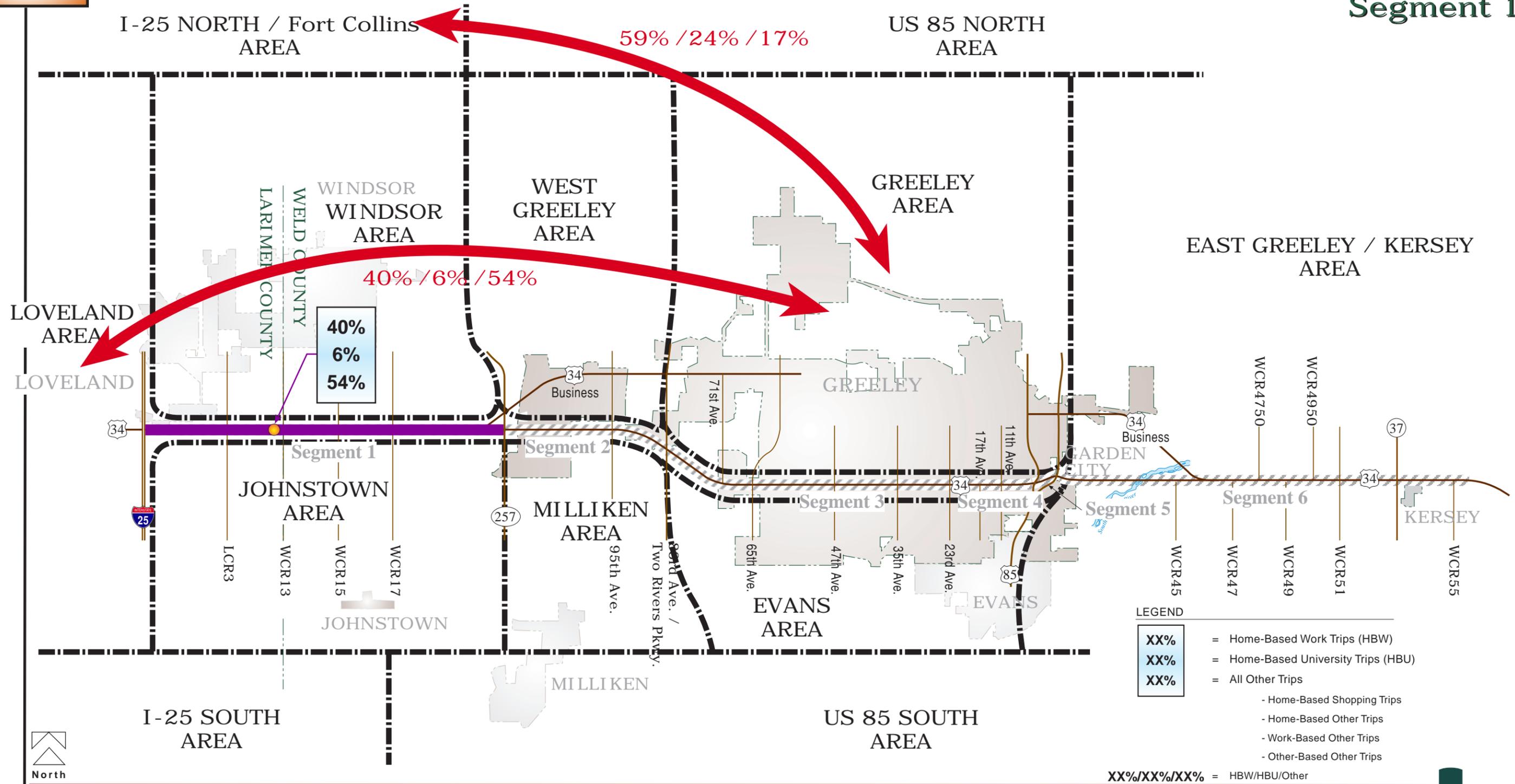
ORIGIN / DESTINATION ANALYSIS Segment 4





Corridor Optimization Plan

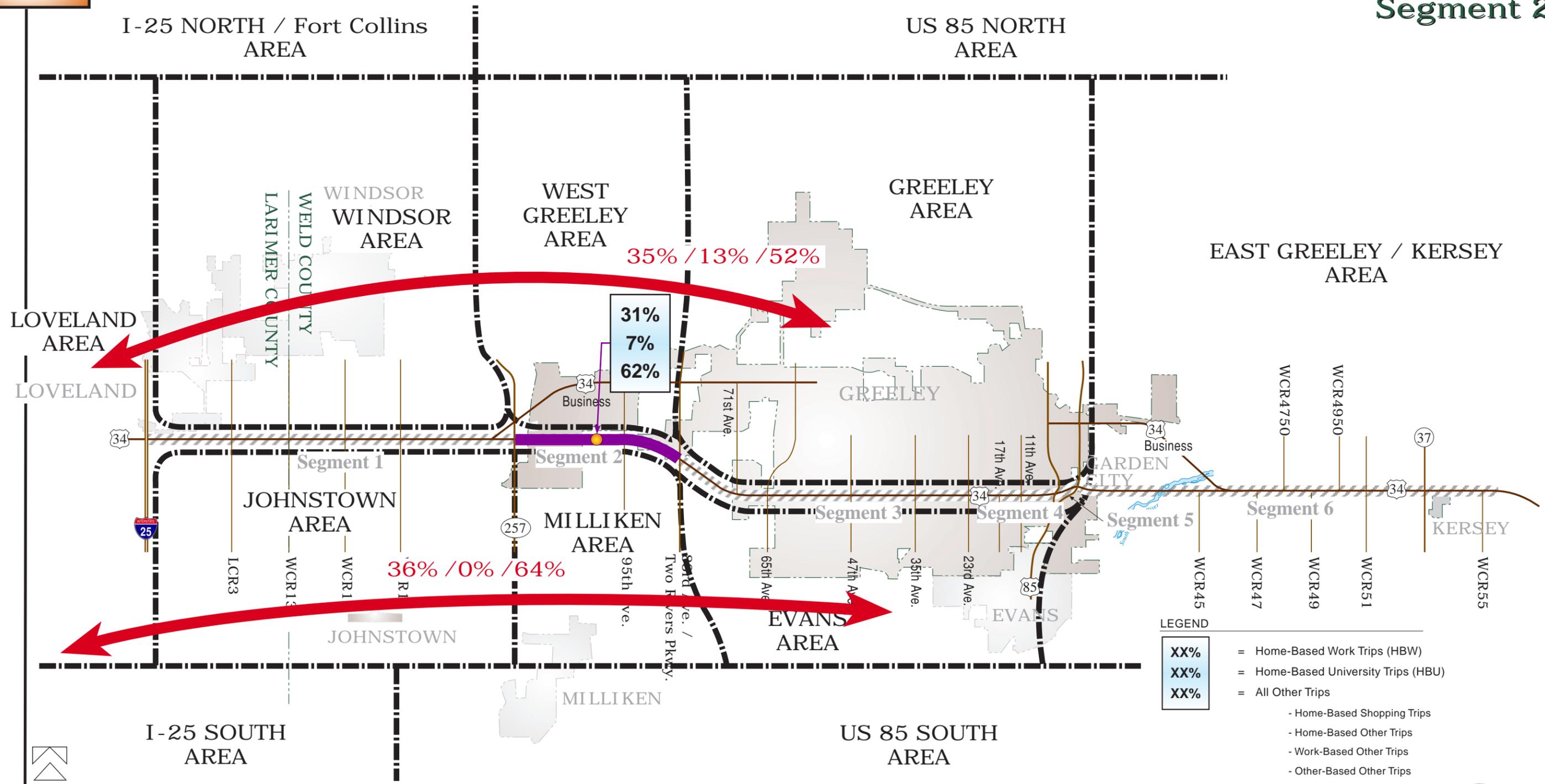
TRIP TYPE ANALYSIS Segment 1





Corridor Optimization Plan

TRIP TYPE ANALYSIS Segment 2

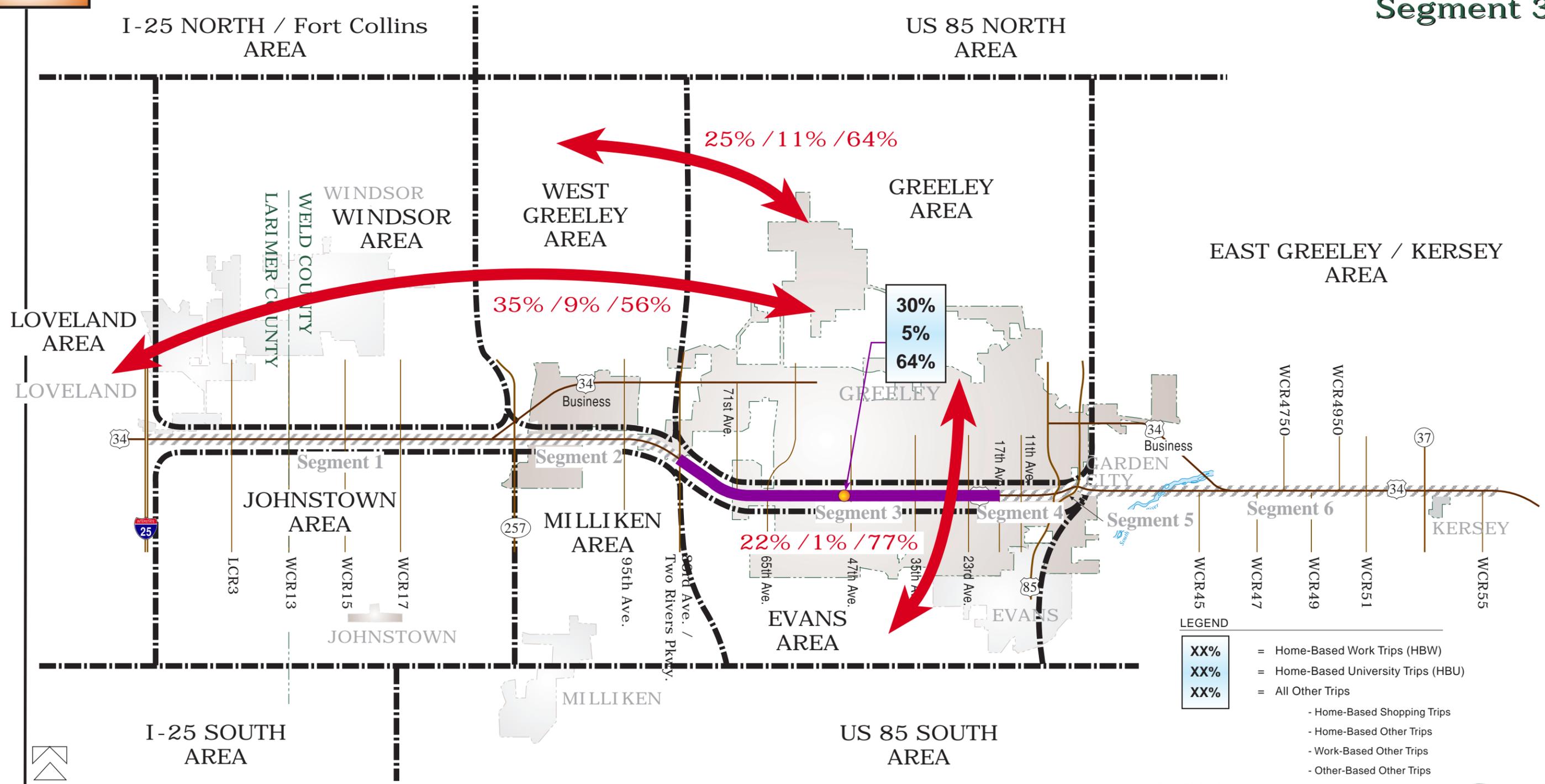


North



Corridor Optimization Plan

TRIP TYPE ANALYSIS Segment 3



LEGEND

- XX%** = Home-Based Work Trips (HBW)
- XX%** = Home-Based University Trips (HBU)
- XX%** = All Other Trips
 - Home-Based Shopping Trips
 - Home-Based Other Trips
 - Work-Based Other Trips
 - Other-Based Other Trips

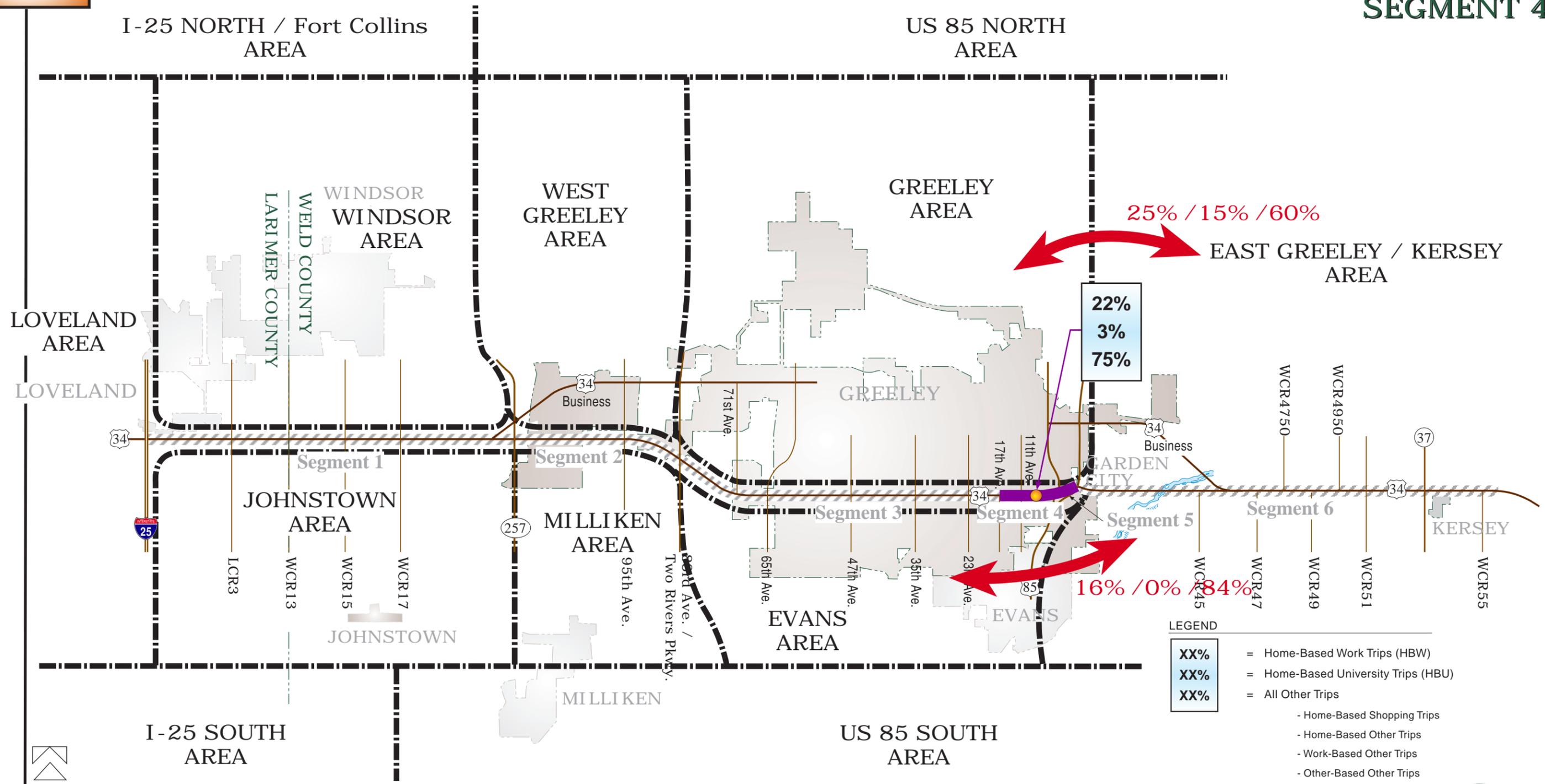
XX%/XX%/XX% = HBW/HBU/Other





Corridor Optimization Plan

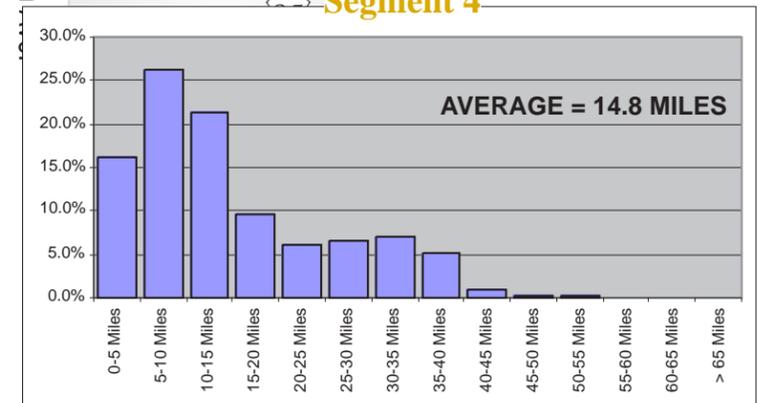
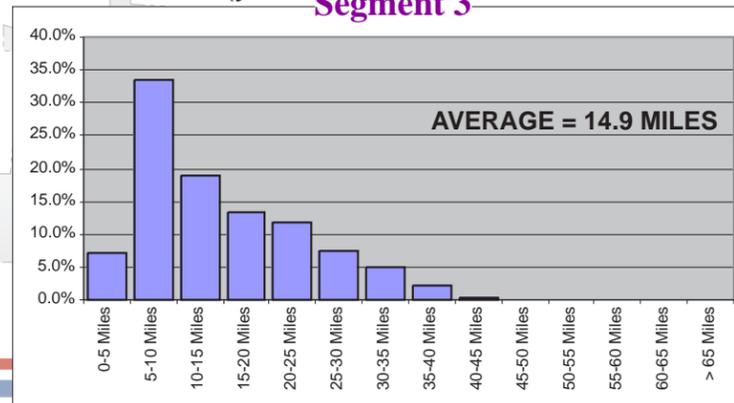
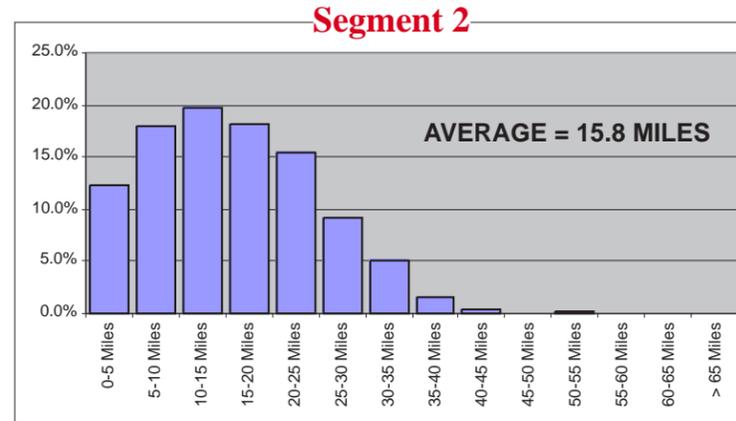
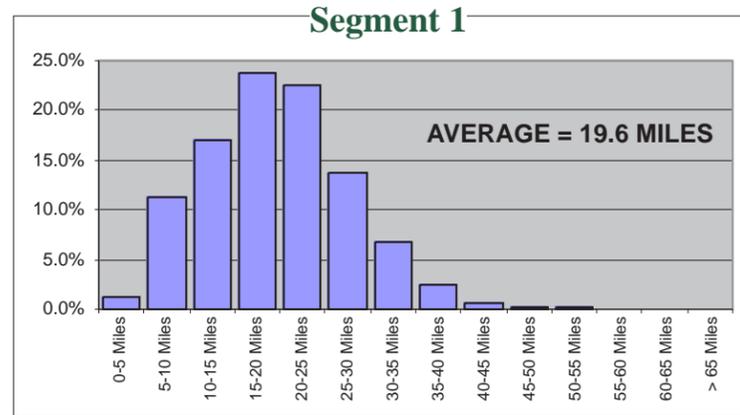
TRIP TYPE ANALYSIS SEGMENT 4





Corridor Optimization Plan

Trip Length Distribution



LOVELAND



LCR3

WCR13

WCR15

WCR17

JOHNSTOWN



95th Ave

Two Rivers

83rd Ave

65th Ave.

47th Ave.

35th

23rd

11th Ave.

17th Ave.



Business

GARDEN CITY



North