

Chapter 2. Alternatives

What Alternatives Were Considered for this Environmental Assessment?

Alternative Transportation Modes	Parallel Highway Facilities	Major Realignment of US 34	Widening US 34 Using CSS
No alternative transportation modes, as stand-alone projects, meet the US 34 project purpose and need criteria.	Improvement to parallel transportation facilities would not meet the US 34 project purpose and need criteria.	Physical constraints prevent significant realignment of US 34 in this corridor.	Widening US 34 using Context Sensitive Solutions would meet the US 34 project purpose and need criteria.
Alternative Eliminated	Alternative Eliminated	Alternative Eliminated	Alternative Retained

Chapter 2. Alternatives

2.1 Introduction

2.1.1 What is project scoping?

Scoping was initiated at the start of the Environmental Assessment (EA) process to identify issues and concerns related to US 34 and its potential improvement. These issues and concerns were used to:

- Develop project purpose and need
- Develop alternatives to examine
- Identify screening criteria to apply
- Identify alternatives to retain for further study

An agency and public outreach process was initiated during project scoping. Chapter 5, Public Involvement, provides specific information about this process, which included:

- Agency and local government coordination
- Newsletter and project questionnaire
- Project website
- Mailings to corridor residents and businesses
- Project open house

2.1.2 What is alternative screening?

Alternative screening is a systematic process through which a broad range of alternatives is narrowed down to those that best meet the project goals based on the purpose and need. Alternatives passing the screening process advance to the environmental analysis phase. The results of the environmental analysis phase lead to the identification of a Preferred Alternative.

2.1.2.1 Level 1 Screening

The following apply to Level 1 screening:

1. Preliminary alternatives not meeting the purpose and need are eliminated, including transportation modes presented as separate solutions and alignment options.
2. Alternatives meeting the purpose and need are retained.
3. As required by the National Environmental Policy Act of 1969 (NEPA), the No Action Alternative is carried forward.

2.1.2.2 Level 2 Screening

The No Action Alternative and all Action Alternatives retained after Level 1 screening are evaluated. Context sensitive solutions (CSS) can be used with any of the retained alternatives to avoid and minimize human, community, and environmental impacts.

2.1.3 What are Context Sensitive Solutions (CSS)?

Originally called context sensitive design (CSD), the practice has evolved into context sensitive solutions (CSS) to represent the multidimensional nature of the process, particularly the leading role of the public and

other stakeholders in defining needs and crafting answers. CSS, a collaborative, interdisciplinary approach, involves all stakeholders in developing a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic, and environmental resources, while maintaining mobility and safety. CSS is an approach that considers the total context within which a transportation improvement project exists. For the US 34 project, this can mean designing a project that avoids and minimizes human, community, and environmental impacts through identification of sensitive areas by stakeholders and application of appropriate design and engineering practices.

2.2 Preliminary Alternatives Considered for This Environmental Assessment

The US 34 preliminary alternatives were presented to the public at a project open house held on April 25, 2006, at a school in the project corridor. Additional information on this public outreach activity, including public responses, can be found in Chapter 5.

Level 1 screening included the analysis of the following types of preliminary alternatives:

- **Alternative Transportation Modes.** Alternative transportation modes for US 34 include carpooling and vanpooling, bus transit, bicycling, walking, high occupancy vehicle (HOV) lanes, rapid transit, or commuter rail. Currently, the Colorado Department of Transportation (CDOT) does not have plans for HOV lanes, rapid transit, or commuter rail in this corridor, nor does 2030 travel demand support this level of improvement for the US 34 corridor or the Loveland area. Carpooling and vanpooling, bus transit, and bike/pedestrian systems were considered.
- **Highway Corridor Alignments.** Improvements to parallel highway facilities, major realignment of US 34, and widening US 34 using CSS were considered.

Intelligent transportation system (ITS) improvements are independent of the proposed project and would be implemented regardless of the alternative selected. These improvements are a consideration under alternatives analysis but cannot meet project needs as stand-alone elements. US 34 corridor ITS improvements are included in the *Region 4 ITS (Intelligent Transportation Systems) Strategic Plan* (February 16, 2004). The following US 34 improvements are identified in this plan: a video surveillance camera at US 287, a dynamic message sign (DMS) westbound east of I-25, an anti-icing system on the I-25 bridge, a DMS sign eastbound west of I-25, and a vehicle detection device at Larimer County Road 3 (LCR 3). A pavement sensor already exists in US 34 east of I-25. Automatic traffic recorders (ATRs) are also located both east and west of I-25 along US 34. The *Region 4 ITS Strategic Plan* identifies a 10-year period for phased deployment of the ITS projects.

2.2.1 What criteria were used for assessing the preliminary alternatives?

Project purpose and need criteria were used for assessing the preliminary alternatives. The purpose of the proposed project is to provide an improved transportation facility between US 287 and LCR 3 that would meet the following needs:

- Improve current and future traffic mobility
- Improve transportation safety
- Accommodate 2030 travel demand

2.2.2 What alternative transportation modes were considered?

2.2.2.1 Carpooling and Vanpooling

SMARTTrips™ is a regional public program designed to reduce automobile dependency and promote the use of alternative transportation in northern Colorado. SMARTTrips™ is a division of the North Front Range Transportation and Air Quality Planning Council (NFRT & AQPC). The program also includes marketing bus transit service to northern Colorado communities. SMARTTrips™ encourages residents to leave their cars at home at least one day a week to help preserve air quality, decrease traffic congestion, conserve fuel, and promote better health.

The 2005 North Front Range MPO Annual Report identified a database of 1,400 carpoolers and approximately 340 vanpoolers within the entire North Front Range. The use of SMARTTrips™ and the VanGo vanpooling program has been increasing annually. At this time vehicle miles traveled (VMT) savings is under 2 percent of the regional VMT. This means that for those who use the carpooling and vanpooling programs a reduction in mileage is realized; however, on a regional scale few travelers use this opportunity or experience reduction in mileage.

Interesting facts: North Front Range daily regional vehicle miles traveled (VMT) is projected at nearly 19 million miles per day by 2030, slightly more than double the 2000 number. VMT in the Loveland area was approximately 1.2 million miles per day for 2000 and is forecast at 2.4 million by 2030. US 34 corridor VMT represents about 20 percent of the Loveland VMT. Current carpooling and vanpooling represents a regional savings of 160,000 miles per day (assuming 100-mile trips).

Additional regional carpooling and vanpooling successes would not measurably change the VMT along US 34 by 2030, nor would these programs meet the project purpose and need as stand-alone programs. This does not preclude the use of the US 34 corridor as a route for carpooling and vanpooling activities.

2.2.2.2 Bus Transit

City of Loveland Transit (COLT) is managed by the city and includes service along US 34. Current service includes the one-hour loop Jitterbus intersecting US 34 between North Madison Avenue and the Outlet Mall, and also runs around Lake Loveland, north to 29th Street and as far south as 8th Street. This service runs 12 hours a day (6:38 AM to 6:38 PM), seven days a week. The one-hour Tango loop joins US 34 west of the project terminus and leaves US 34 to run south at North Washington Avenue. It is possible to get a transfer to the Fox Trot system to Fort Collins from the COLT system.

Based on the existing bus service offered, even as services are increased in future years, the continued success of bus transit would not measurably change the travel demand along US 34 by 2030, nor would it meet the project purpose and need as a stand-alone operation. This does not preclude the use of the US 34 corridor as a route for bus transit activities.

2.2.2.3 Bike/Pedestrian Systems

The City of Loveland Bicycle Program and SMARTTrips™ bikeways map shows an on-street bikeway along portions of US 34. One segment currently runs along North Garfield Avenue south to US 34 and east to North Jefferson Avenue. Another segment runs along North Boise Avenue both north and south of US 34 and also east on US 34 past LCR 3. This route also accesses the commercial development west of the

Outlet Mall. An off-street recreational trail crosses US 34 via an underpass adjacent to the Greeley and Loveland Ditch east of Cheyenne Avenue. No Regionally Significant Bike/Pedestrian Corridors run parallel to or cross the US 34 project corridor. Bike/pedestrian systems along US 34 would be accounted for during the analysis of the proposed project; however, these systems do not fulfill the project purpose and need.

2.2.2.4 Conclusions on Alternative Transportation Modes

After examination of existing and planned carpooling and vanpooling programs, bus transit service, and bike/pedestrian systems in the vicinity of US 34, it can be concluded that as stand-alone solutions, none of these alternative transportation modes would measurably contribute to a reduction in highway traffic along US 34 by the 2030 design year. No alternative transportation modes meet the US 34 project purpose and need. This does not preclude the use of the US 34 corridor to support any of these programs. Alternatives supporting the project purpose and need would enhance these multimodal transportation activities along US 34.

No alternative transportation modes, as stand-alone projects, meet the US 34 project purpose and need criteria.

2.2.3 What highway corridor alignments were considered?

2.2.3.1 Parallel Facilities

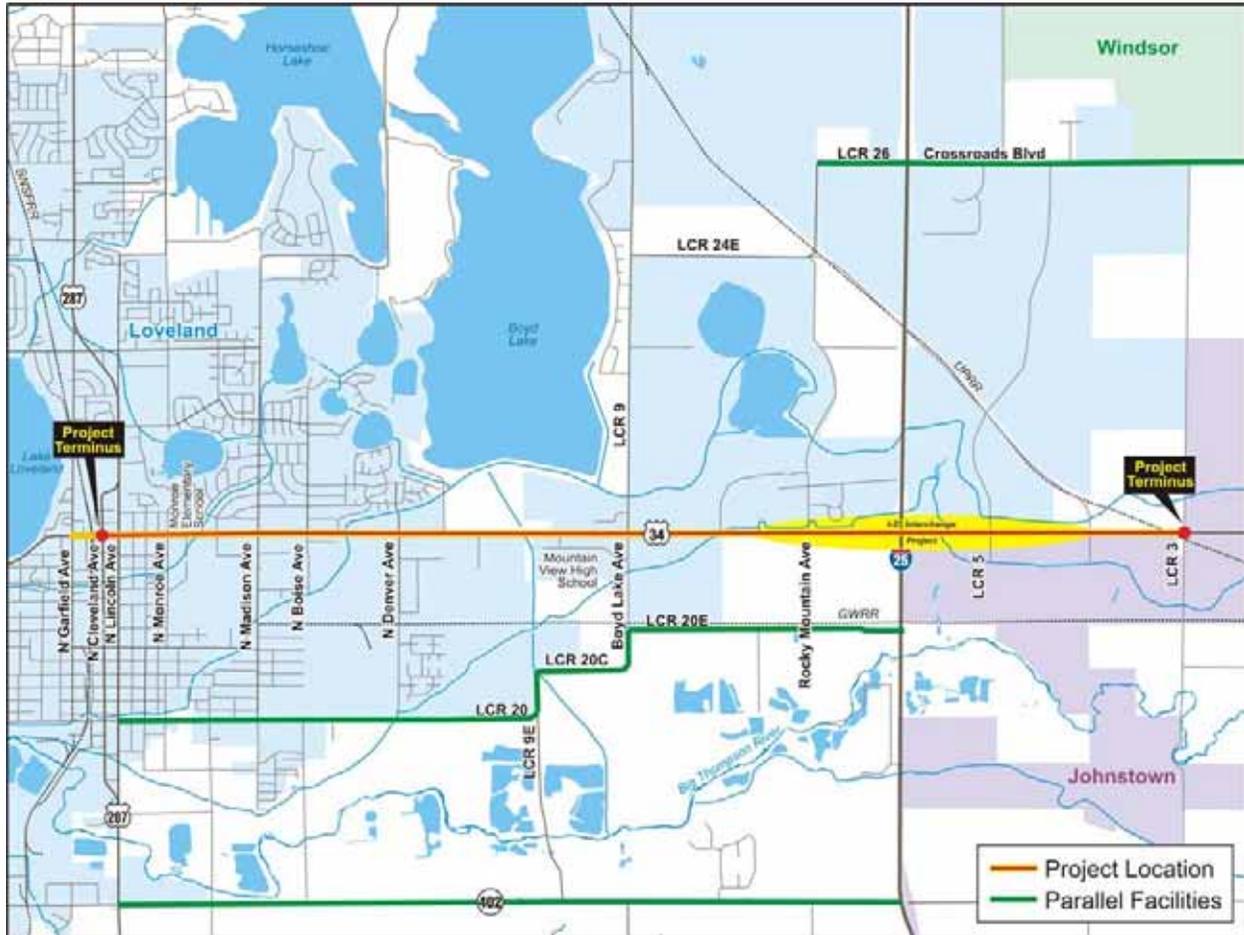
The identification of US 34 as a Regionally Significant Corridor indicates that this particular corridor has regional importance for a longer stretch than between US 287 and LCR 3. US 34 is identified as regionally significant for its entire length within the NFR MPO boundary, from the west, extending through Larimer County from north of the Larimer-Boulder County line east, past the Weld County line to Greeley. The continuation of US 34 outside the boundaries of the state of Colorado is an indication of the roadway's past significance for interstate travel as well. Today, US 34 probably has more significance serving multi-city/multi-county connections than for high volume interstate travel, the latter having shifted to the Interstate Highway system in the past 50 years.

SH 402 (14th Street) is a parallel facility in the Loveland and Greeley area, located approximately 2 miles south of US 34. SH 402 transitions into 14th Street in Loveland at US 287 on the west and terminates at I-25 four miles to the east. SH 402 improvements were included in the North Front Range 2030 forecast for travel demand for US 34. Exhibit 2-1 illustrates the parallel facilities discussed in this section.

North of SH 402 and the Big Thompson River, another west-to-east connection exists south of US 34 between US 287 and I-25. When linked from the west, LCR 20 (1st Street) ties into LCR 9E (Corvus Drive), which veers north to connect to LCR 20C. LCR 20C runs east into Boyd Lake Avenue. After a jog to the north, access can be made to LCR 20E, which parallels the Great Western Railroad east to I-25. LCR 20E crosses I-25 and connects to developments in that area. Traffic for 2030 has been adjusted to show these links as a major arterial.

Crossroads Boulevard (LCR 26) to O Street in Greeley is a parallel facility north of US 34, extending from the vicinity of I-25 east. Improvements to Crossroads Boulevard were included in the North Front Range 2030 forecast for travel demand for US 34. No significant parallel facilities to US 34 are located between US 287 and I-25 due to the presence of Boyd Lake and Lake Loveland.

**Exhibit 2-1
US 34 Project Location and Parallel Facilities**



SH 402 and Crossroads Boulevard are parallel facilities for which improvements are already committed. These committed improvements would not reduce the travel demand along US 34 based on their inclusion in the 2030 forecast. Improving these facilities alone would not meet any of the proposed US 34 project purpose and need criteria. Distributing 2030 traffic to LCR 20-20C-20E also would not provide the needed congestion relief on US 34.

Improvements to parallel transportation facilities would not meet the US 34 project purpose and need criteria.

2.2.3.2 Major Realignment of US 34

Sometimes the major realignment of all or a portion of a highway can provide congestion relief without creating impacts on adjacent development. Such an alternative would require land availability for a new or modified transportation corridor.

Construction of a new parallel highway facility is not feasible due to the lack of land availability.

Major physical constraints within the US 34 study area limit the potential for major realignment. To the south, the Big Thompson River meanders through the study area between SH 402 and US 34, creating a physical barrier to highway expansion. In addition, although there are currently some undeveloped parcels

(mostly between Boyd Lake Avenue and I-25), urban development, Mountain View High School, Youth Sports Park, the existing I-25 interchange location, Farmers Ditch, and Boyd Lake Outlet Exchange Ditch create physical obstacles to a smooth alignment transition in this area.

To the north, Boyd Lake and Lake Loveland restrict linear transportation development (see Exhibit 2-1). In addition, the north side of the US 34 study area between US 287 and LCR 3 is largely developed or developing. Only a few undeveloped pockets remain, and there is no benefit or practical reason to design a realignment of US 34 through these small areas.

2.2.3.3 Widening US 34 Using Context Sensitive Solutions

The proposed widening project would increase the number of through lanes from four to six. The general cross section for the widened US 34 between US 287 and LCR 3 would include sidewalks on each side as appropriate, a variable width parkway on each side, bike lanes on each side, three travel lanes in each direction, and a variable median width that can accommodate one or two turn lanes in each direction as needed.

The current US 34 alignment is constrained by existing development from US 287 east to the Greeley and Loveland Ditch crossing between North Boise and North Denver avenues. Development surrounds Lake Loveland and Boyd Lake to the north and development extends to the south beyond LCR 20. Some flexibility exists for highway widening to the east as more recent developments and those in progress have allowed space for US 34 expansion along its existing alignment.

Improvements to the current US 34 alignment, with minor design level realignment considerations to avoid and minimize human, community, and environmental impacts, would meet all of the project purpose and need criteria. This alternative will be carried forward.

Widening US 34 at its existing location using CSS addresses:

- Current and future traffic mobility
- Transportation safety
- 2030 travel demand

Widening US 34 using CSS would meet the US 34 project purpose and need criteria.

2.3 Alternatives Eliminated from Further Study

The following alternatives have been eliminated from further study as stand-alone solutions. Exhibit 2-2 summarizes the screening process.

Alternative Transportation Modes:

- Carpooling and vanpooling
- Bus transit
- Bicycle/pedestrian systems

Highway Corridor Alignments:

- Parallel highway facilities
- Major realignment of US 34

**Exhibit 2-2
Alternative Screening Process Summary**

Alternative Transportation Modes	Parallel Highway Facilities	Major Realignment of US 34	Widening US 34 Using CSS
No alternative transportation modes, as stand-alone projects, would meet the US 34 project purpose and need criteria.	Improvement to parallel transportation facilities would not meet the US 34 project purpose and need criteria.	Physical constraints prevent significant realignment of US 34 in this corridor.	Widening US 34 using CSS would meet the US 34 project purpose and need criteria.
Alternative Eliminated	Alternative Eliminated	Alternative Eliminated	Alternative Retained

2.4 Alternatives Selected for Further Study

2.4.1 What would happen if no improvements were made?

The No Action Alternative would result in no changes to the existing highway; however, standard operation (including proposed COLT bus service, SMARTTrips™, and VanGo) and maintenance practices would continue. I-25/US 34 interchange improvements would occur independent of the Proposed Action.

Mobility and safety concerns are expected to escalate as traffic volumes increase. Highway through segments and intersections are projected to decline to LOS E and F along the entire corridor by 2030. It is also expected that the difficulty of making a left turn onto or off of the highway would increase with higher traffic volumes.

2.4.2 What is the Action Alternative?

The Action Alternative is for the proposed widening of US 34 to six lanes between US 287 (North Cleveland and North Lincoln one-way pair) and LCR 3. The widened roadway would taper from six lanes back to the existing four lanes at each end. The inclusion of the tapers would result in the extension of the project study area west to North Garfield Avenue and east 1,200 feet past LCR 3. The Action Alternative would not include ramps and long-term configurations for the I-25 interchange and associated local roads between and including Rocky Mountain Avenue and LCR 3E. Exhibit 2-3 illustrates the Action Alternative with intersection configurations and cross section details.

2.4.2.1 Action Alternative Highway Cross Sections Using CSS

Use of CSS principles throughout the corridor means that commitments would be made to avoid or minimize impacts on sensitive resources by modifying the cross section. These modifications would not compromise the function of US 34, its safety or level of service.

Although the functional classification of US 34 today is “urban” between US 287 and I-25 and “rural” from I-25 east to LCR 3, an urban section with curb and gutter would be designed throughout the entire project corridor. Proposed cross sections are illustrated in Exhibit 2-3. Although the entire project would have an urban section, two different cross sections are shown.

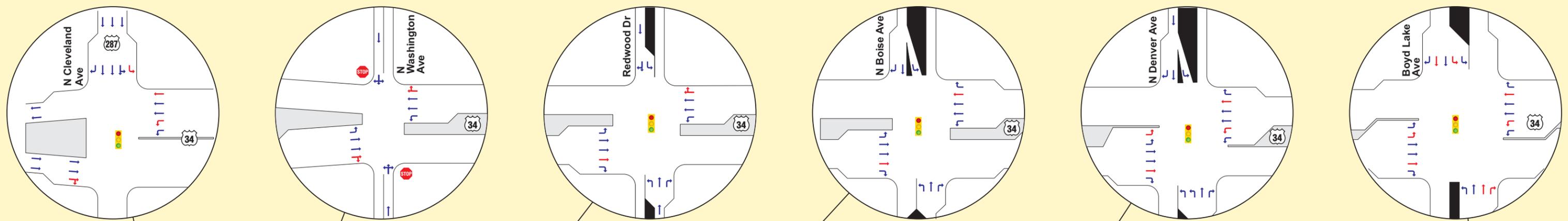
The first cross section includes the transition between the proposed six-lane at North Cleveland Avenue and the existing four-lane at North Garfield. It also includes the area between North Cleveland Avenue and the Greeley and Loveland Ditch where, due to close proximity of cross streets and narrow right-of-way, the utilities would be beneath the parkway, sidewalk and/or bike lane. The median width also would vary in this area; in some cases it would need to accommodate two sets of left turn lanes, one for each direction.

The second cross section, which extends from the Greeley and Loveland Ditch to the eastern project terminus at LCR 3, is the result of larger spacing between cross-streets and a wider right-of-way potential. Space for utilities could be made outside the sidewalk and/or parkway area, and the median would not need to contain overlapping sets of turn lanes.

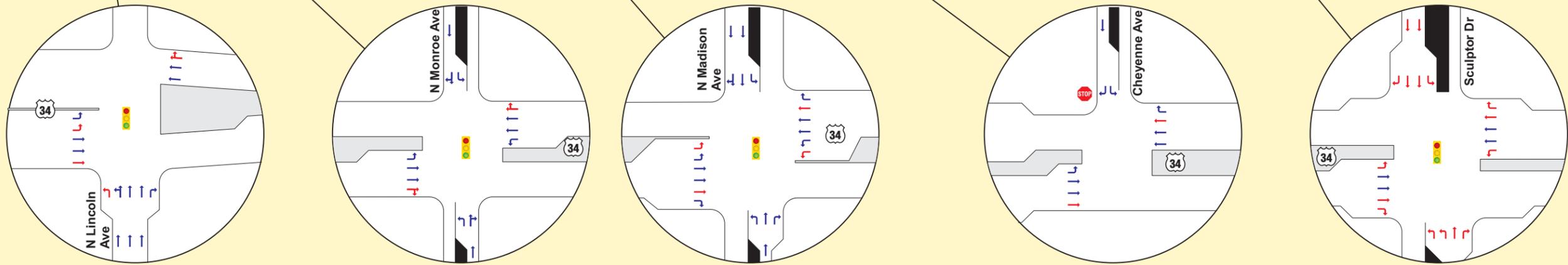
The proposed six-lane cross section for the US 34 project would generally contain 154 to 178 feet of right-of-way, which would accommodate:

- 28 to 52 feet set aside for a raised median and left turn lanes in the center of the highway
- Six 12-foot general purpose travel lanes (three in each direction)
- Two 7-foot bike lanes (one in each direction)
- Two 6-foot sidewalks separated from the highway by approximately 10 feet (where space permits). Although a 6-foot detached sidewalk is shown on Exhibit 2-3 (with a variable width parkway separation of 0 to 10 feet between the bike lane/curb and the walk), an 8-foot sidewalk width will be included in project design for areas of attached sidewalk (no parkway strip) per *Larimer County Urban Area Street Standards, Loveland Only, Figure 7-1L*.
- Curb and gutter
- 13 to 23 feet of along each side of the highway west of the Greeley and Loveland Ditch or a 14-foot utility corridor easement for buried utilities to the east of the Ditch

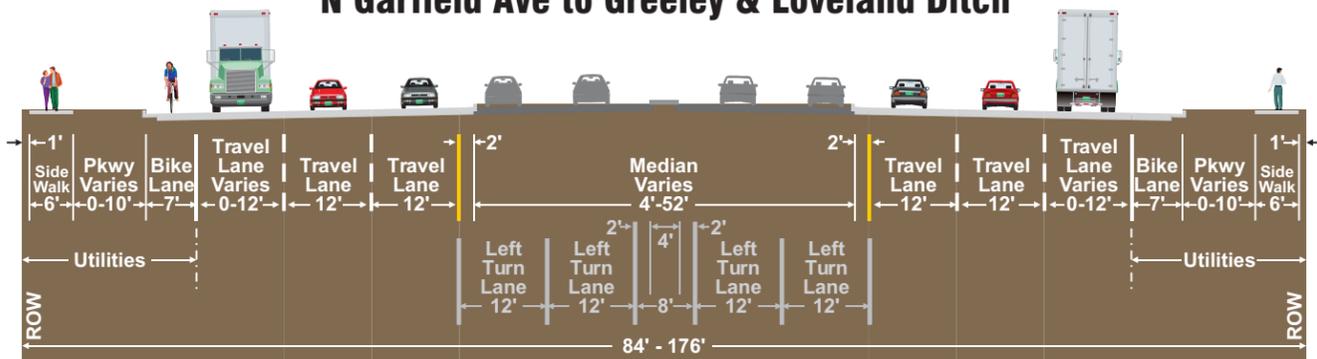
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See Exhibit 2-3 on the following pages.**



Double left turns from US 34 to northbound N. Boise Avenue are needed to meet 2030 intersection LOS goals. These are not shown since cross-street improvements are not committed at this time.



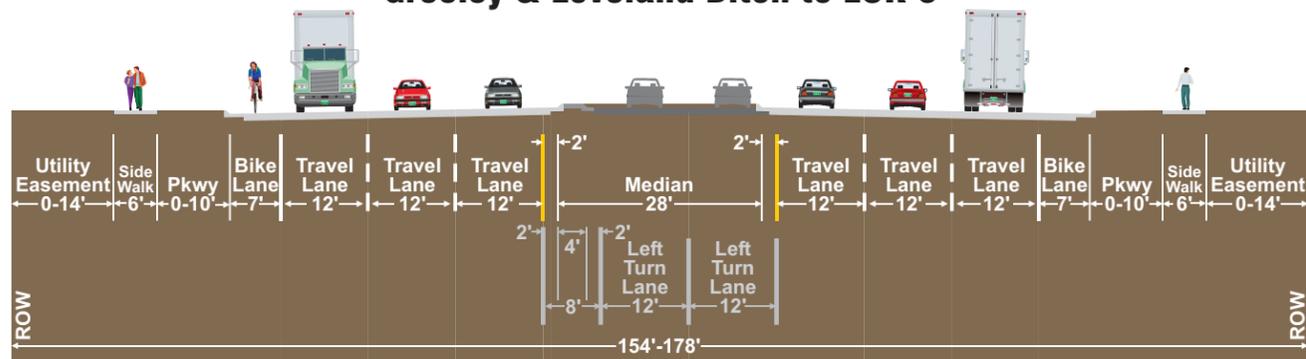
N Garfield Ave to Greeley & Loveland Ditch





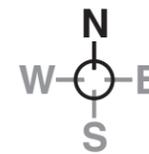
February 7, 2007

Greeley & Loveland Ditch to LCR 3



Key

- Parcels
- Railroads
- Canals & Ditches
- Schools
- Edge of Pavement
- Lane Lines
- Proposed Right-Of-Way



- Existing Lane
- Future Lane



Exhibit 2-3 Action Alternative with 2030 Intersection Configurations and Cross Section Details

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2.4.2.2 Access Issues Along US 34

If the Action Alternative were selected, CDOT would work with affected property owners to maintain or bring access onto US 34 into compliance with the *Colorado State Highway Access Code*. Chapter 3, Section 3.3.1.2 of this EA includes additional access-related discussions.

The portion of US 34 in the project corridor east of I-25 is included in the *US 34 Access Control Plan, Final Report*, May 2003. This level of access analysis included both interim and ultimate plans. The interim plan calls for signalized intersections at LCR 5 (Centerra Parkway/Thompson Parkway), LCR 3E (Kendall Parkway/Larimer Parkway), and LCR 3 with an at-grade crossing of the UPRR. This EA is consistent with the interim plan recommendations. The ultimate plan includes grade separations or interchanges at each of these locations.

2.4.2.3 Project Costs

The following project costs were estimated in April 2007 using 2006 dollars:

- Right-of-way and relocation costs - \$9,660,000
- Utilities - \$1,000,000
- Construction - \$59,268,000
- Design and construction engineering - \$16,002,000

Total costs are estimated at \$85,930,000.

2.4.3 How Does the Action Alternative Meet Project Purpose and Need?

The Action Alternative would meet US 34 project corridor mobility, safety and travel demand requirements for 2030 in the following ways:

Mobility - It would provide for the minimum required level of service in 2030, LOS D.

Safety - Project improvements would decrease congestion, improve intersection design through addition of turn lanes, and improve access. These factors are expected to result in a reduction in crash rates.

Travel Demand - Capacity increases provided by the expansion of US 34 from four lanes to six lanes, together with addition of left-turn lanes in the median and auxiliary lanes, would meet the 2030 travel demand.

Why Do We Need the US 34 Project?

The purpose of the proposed project is to provide an improved transportation facility between US 287 and LCR 3 that would meet the following needs:

- Improve current and future traffic mobility
- Improve transportation safety
- Accommodate 2030 travel demand

The Action Alternative meets these needs.

2.4.3.1 Future 2030 Level of Service (LOS) for the Action Alternative

The Action Alternative would meet mobility needs by improving 2030 LOS. Without the proposed improvements, 2030 LOS would be F throughout the corridor. Action Alternative LOS is described below.

Due to the close proximity of intersections along US 34, only intersection LOS has been identified. Exhibit 2-4 identifies LOS for summer Friday PM peak hour.

Exhibit 2-3 indicated the future 2030 intersection configurations. Local jurisdiction ability to upgrade cross streets to accept the US 34 traffic will affect LOS. To obtain the overall LOS desired at US 34 intersections, North Boise Avenue would need to be designed to accept double left turns (northbound) from US 34. Exhibit 2-3 shows single left turns due to local jurisdiction inability to upgrade North Boise Avenue to accept the proposed turn lane movements from US 34. It is understood that LOS would be compromised should upgrades not occur. Coordination between CDOT and the City of Loveland has continued throughout the project. This intersection will be revisited when US 34 goes into final design.

**Exhibit 2-4
2030 Action Alternative
Intersection Overall Delay and Level of Service (LOS)**

Intersection Name	Level of Service (LOS)				Overall Int. Delay	Overall Int. LOS
	EB	WB	NB	SB		
N Cleveland Ave	C	B	NA	D	27	C
N Lincoln Ave	B	D	D	NA	39	D
N Washington Ave	A	D	A	B	26	C
N Monroe Ave	A	D	D	B	28	C
Redwood Dr	D	C	D	D	38	D
N Madison Ave	D	C	D	D	46	D
N Boise Ave	D	E	C	D	49	D
Cheyenne Ave	A	F	NA	A	NA – Stop sign only	
N Denver Ave	D	F	D	D	77	E
Sculptor Dr	C	E	E	E	29	D
Boyd Lake Ave	B	D	D	D	35	D
McWhinney Blvd	A	C	NA	A	NA – Stop sign only	
Hahn's Peak Dr	C	B	NA	C	18	B
Rocky Mountain Ave	C	E	NA	E	55	D
I-25 SB Ramp	B	B	NA	D	15	B
I-25 NB Ramp	A	B	C	NA	13	B
LCR 5	E	D	E	D	55	D
LCR 3E	C	C	B	E	31	C
LCR 3	D	C	E	A	27	D

LOS data shown below is for the condition where North Boise could accept the desired double left turns. LOS impacts extend both directions on US 34.

Redwood Dr	C	C	C	D	26	C
N Madison Ave	D	C	D	D	33	C
N Boise Ave	D	C	B	C	37	D
Cheyenne Ave	A	C	NA	A	NA – Stop sign only	
N Denver Ave	C	E	C	C	48	D
Sculptor Dr	C	C	D	C	29	C
Boyd Lake Ave	C	E	C	C	48	D

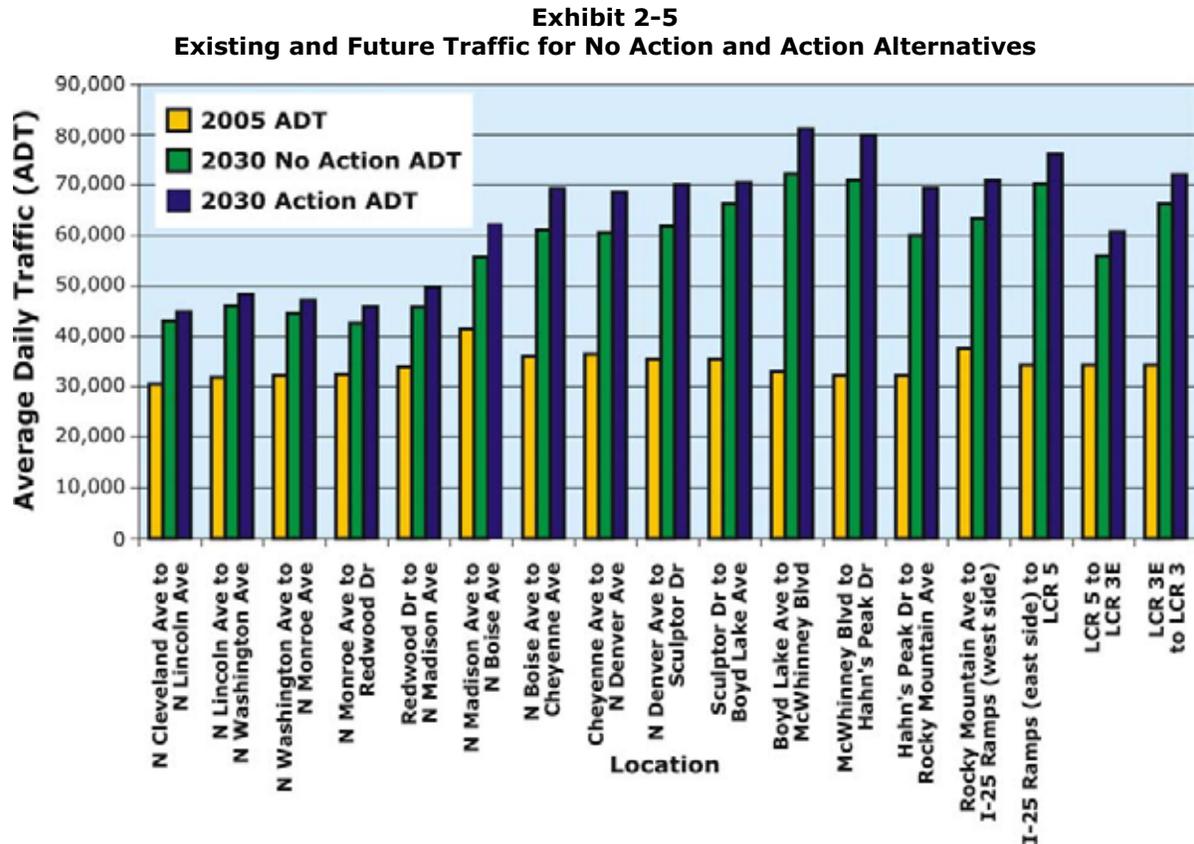
Exhibit 2-4 shows the desired LOS data for intersections between Redwood Drive and Boyd Lake Avenue in a footnote. The LOS data shown in the main table illustrates the result of the North Boise Avenue compromised turn lane design.

2.4.3.2 Future 2030 Traffic (ADT) Comparing Action and No Action Alternatives

The 2030 Action Alternative network forecast average daily traffic (ADT) (see Exhibit 2-5) shows similar peaks along the US 34 corridor as the 2030 No Action network (also see Exhibit 1-4 in Chapter 1 of this

EA). The 2030 Action Alternative volumes are approximately 2,000 to 9,000 more vehicles per day than those of the 2030 No Action network, or between 4.2 and 13.7 percent higher than the No Action network.

The 2030 peak volume in the corridor is 81,200 vehicles per day between Boyd Lake Avenue and McWhinney Boulevard, which is 12.5 percent higher than that of the No Action network at the same location. At the west end of the corridor, the Action Alternative volume of 44,900 vehicles per day between North Cleveland and North Lincoln avenues is 4.2 percent more than that of the No Action network. In the east, improvements to US 34 would result in 72,100 vehicles per day between LCR 3E and LCR 3, which is 13.7 percent more than in the No Action network.



The average daily traffic (ADT) shown on the graph above is for a typical weekday (Monday through Thursday) during the school year. Peak summer tourist season daily traffic and some weekend daily traffic numbers will be higher.

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