



US 36 CORRIDOR

Final Environmental Impact Statement/
Final Section 4(f) Evaluation

APPENDIX C

SECTION 404(b)(1) EVALUATION

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Attachments

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Acronyms

<i>2025 MVIRTP</i>	<i>2025 Metro Vision Interim Regional Transportation Plan</i>
<i>2035 MVRTP</i>	<i>2035 Metro Vision Regional Transportation Plan</i>
a.m.	morning
BRT	bus rapid transit
CDOT	Colorado Department of Transportation
CFR	Code of Federal Regulations
CWA	Clean Water Act
DEIS	Draft Environmental Impact Statement
DRCOG	Denver Regional Council of Governments
DUS	Denver Union Station
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
Final Rule	Compensatory Mitigation for Losses of Aquatic Resources Final Rule
FTA	Federal Transit Administration
HOV	high-occupancy vehicle
I-25	Interstate 25
LEDPA	Least Environmentally Damaging Practicable Alternative
LOS	level of service
LPA	locally preferred alternative
LRT	light rail transit
NEPA	National Environmental Policy Act of 1969
OSMP	Open Space and Mountain Parks
p.m.	evening
PBA	Programmatic Biological Assessment
PEM	palustrine emergent
PEM/PSS	palustrine emergent and palustrine scrub/shrub combination
PFO	palustrine forested
PSS	palustrine scrub/shrub
ROD	Record of Decision
ROW	right-of-way
RTD	Regional Transportation District

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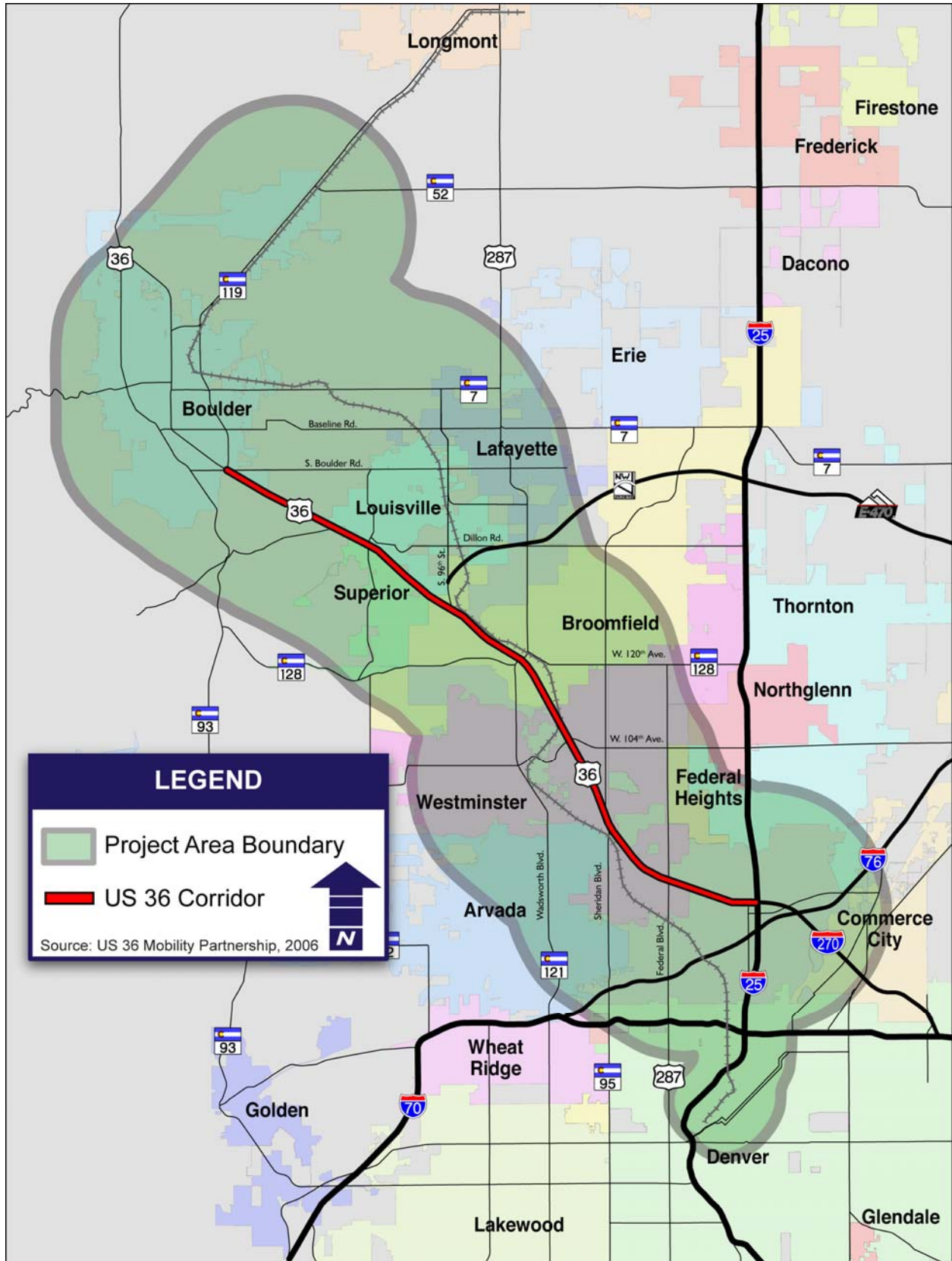
SOV	single-occupant vehicle
TDM	Transportation Demand Management
TSM	Transportation System Management
U.S.	United States
US #	United States Highway Number (e.g., US 36, US 287, etc.)
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VHT	vehicle hours traveled

The Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), in cooperation with the Colorado Department of Transportation (CDOT) and the Regional Transportation District (RTD), have jointly initiated the *US 36 Corridor Final Environmental Impact Statement — Final Section 4(f) Evaluation* (URS 2009a) to identify and evaluate impacts of multi-modal transportation improvements in the United States Highway 36 (US 36) corridor. The U.S. Army Corps of Engineers (USACE) is a cooperating agency for this project. The Final Environmental Impact Statement (FEIS) is anticipated to be released for public comment by FHWA and FTA in 2009.

1.1 PROJECT LOCATION

The US 36 corridor considered in this study is an existing highway alignment between Interstate 25 (I-25) in Adams County and Foothills Parkway/Table Mesa Drive in Boulder (a distance of approximately 18 miles). This portion of US 36 consists of four main through-lanes (two in each direction) and 10 major interchanges (Broadway, Pecos Street, Federal Boulevard, Sheridan Boulevard/92nd Avenue, Church Ranch Boulevard/104th Avenue, Wadsworth Parkway, East Flatiron Circle, 96th Street/Interlocken Loop, McCaslin Boulevard, and Foothills Parkway/Table Mesa Drive). The project area (Figure 1-1, US 36 Corridor Project Area) includes portions of several communities in the northwest Denver metropolitan area, including the City and County of Denver, the City of Westminster, the City and County of Broomfield, the City of Louisville, the Town of Superior, the City of Boulder, and portions of unincorporated Adams, Jefferson, and Boulder counties. The project area depicted in Figure 1-1 covers areas that were originally associated with a rail line action in addition to the US 36 roadway action, but the rail line action was removed from this FEIS and is going forward under a separate study. However, since the baseline information was collected for the greater project area from which impacts were assessed, this area is depicted in Figure 1-1 as shown. The red line showing the US 36 corridor represents the main extent of the impacts with some minor, adjacent, off-system roadwork that will be accomplished to make any new ramps associated with interchange improvements or other bridge replacements required that cross US 36 work more effectively.

Figure 1-1: US 36 Corridor Project Area



1.2 RECENT PROJECT CHANGES AND U.S. ARMY CORPS OF ENGINEERS INTERACTION

1.2.1 Coordination with the U.S. Army Corps of Engineers

During early coordination with the USACE, it was determined that the US 36 project would require a Section 404(b)(1) evaluation. This evaluation, in conjunction with National Environmental Policy Act of 1969 (NEPA) regulations, is referred to as the NEPA/Section 404 merger process. The NEPA/Section 404 merger process is guided by and supports the requirements of Section 404 of the Clean Water Act (CWA) (Public Law 92-500, as amended), U.S. Environmental Protection Agency (USEPA) regulations (40 Code of Federal Regulations [CFR] Part 230 et seq.), and the Memorandum of Agreement among the USACE, FHWA, and CDOT. The NEPA/Section 404 merger agreement requires consultation on four key points: (1) Purpose and Need, (2) Alternatives Selected for Detailed Evaluation, (3) the Preferred Alternative, and (4) Compensatory Mitigation. This NEPA/Section 404 merger process has since been updated, but this project is still under the older merger agreement from which this project was initiated.

USACE consultation with FHWA and FTA was completed on the first two concurrence points required under the merger during the development of the Draft Environmental Impact Statement (DEIS), with a letter received from USACE on January 9, 2006 stating such concurrence (see Attachment A, Index Listing, for all Section 404(b)(1) correspondence). The first concurrence point is discussed in detail in Section 2, Purpose of and Need for the Action, and the second concurrence point is discussed in Section 3, Alternatives Definition and Evaluation Process.

Consultation on the third and fourth concurrence points required under the merger ultimately resulted in this project diverting from the merger process due to the detailed mitigation requirements outlined in the USACE and USEPA Compensatory Mitigation for Losses of Aquatic Resources Final Rule (40 CFR Part 230) (Final Rule) (2009). CDOT, FHWA, and the USACE have all agreed that the best approach for the US 36 Corridor Project is to apply for a Section 404 Permit when the final mitigation plan satisfies the requirements of the Final Rule. This diversion from the merger process will allow CDOT and FHWA adequate time to develop the final mitigation plans for all jurisdictional waters of the United States (U.S.) impacted by the Combined Alternative Package (Preferred Alternative). CDOT and FHWA will apply for a Section 404 Individual Permit for the Combined Alternative Package (Preferred Alternative) after the FEIS is completed and likely after a Record of Decision (ROD) is signed, but before any jurisdictional waters of the U.S. are impacted from construction of the Combined Alternative Package (Preferred Alternative).

CDOT, FHWA, and the USACE provided signed concurrence of the diversion from the merger process in a letter dated August 31, 2009. Although the US 36 Corridor FEIS is diverting from the merger process as outlined above, the USACE has confirmed that the Combined Alternative Package (Preferred Alternative) appears to be the Least Environmentally Damaging Practicable Alternative (LEDPA) in a letter dated May 20, 2009. Detailed discussion of the modified third and fourth concurrence points are provided in Section 5, Combined Alternative Package (Preferred Alternative) Impact Evaluation, and Section 6, Compensatory Mitigation. Section 5

outlines the impacts under the Combined Alternative Package (Preferred Alternative), including a comparison to impacts under Package 2 and Package 4, and discusses the LEDPA analysis.

1.3 BACKGROUND AND PROJECT HISTORY

1.3.1 Roadways

The US 36 corridor was initially built as a toll road that opened to traffic in 1951. At the time, this four-lane road had one access point, located in Broomfield between Denver and Boulder. The toll road bonds were paid off early, and the toll facilities were removed in 1968. Since the early 1950s, the expansion of the Denver metropolitan area has led to additional housing and employment development, thereby altering the travel patterns in the northwest quadrant of the Denver region. There are now 10 interchanges along US 36 between I-25 and 28th Street in Boulder; however, the number of main through-lanes has remained at four.

1.3.2 Transit Service and Facilities

The US 36 corridor has a strong history of transit service and the highest bus ridership on regional routes in the RTD service area (RTD 2001). The US 36 corridor is currently served by RTD's express, regional, and skyRide bus routes, complemented by local service that feeds into the system at the following US 36 park-n-Ride facilities: Broadway, Westminster Center, Church Ranch, Broomfield, East Flatiron Circle, Superior/Louisville, and Table Mesa. Ridership in the northern metropolitan area has increased more than 80 percent in the past 12 years and RTD continues to add new service in response to the high levels of demand. Park-n-Ride facilities are near capacity at most locations along the US 36 corridor.

1.3.3 Pedestrian/Bicycle Facilities

Pedestrian and bicycle facilities along the US 36 corridor are limited to local bikepaths and designated bike lanes. Currently, no continuous bikeway exists between Denver and Boulder. There are many institutions and activity centers in the corridor that generate bicycle travel demand, including the University of Colorado and the federal laboratories in Boulder, the Front Range Community College in Westminster, and the Interlocken Business Park in Broomfield.

The corridor is represented by several bicycle advocacy groups. Local jurisdictions in the corridor produce and update a regional map, *Bike Links 36 Regional Bicycle Map* (U.S. Corridor Jurisdiction 2006). These jurisdictions also document the missing links that, if built, would facilitate intra-corridor bicycle use. The US 36 bikeway is included on the multi-jurisdictional missing links planning map as a desired facility. Multiple sources of funding are being identified for various aspects of work in this corridor, and partial funding for the US 36 bikeway is included as a part of the FasTracks Program.

1.3.4 Summary of Past and Ongoing Studies

Several studies have analyzed improvements to portions of the US 36 corridor since the late 1960s. Table 1-1, Summary of Previous and Ongoing US 36 Corridor Studies, summarizes these studies.

Table 1-1: Summary of Previous and Ongoing US 36 Corridor Studies

Date	Agency/Title	Summary
1983	<i>Turnpike Corridor Technical Feasibility Study</i> (RTD)	Studied the technical feasibility of rapid transit in the turnpike corridor.
1995	<i>US 36 Corridor Study</i> (prepared by a coalition of jurisdictions in the corridor)	Identified and evaluated, in a cursory manner, various strategies to recommend to decision makers.
1999	<i>US 36 Wadsworth Broomfield Interchange System Project Level Feasibility Study, Interchange Management Plan, and park-n-Ride Relocation Analysis</i> (CDOT)	Studied interchange reconfiguration and park-n-Ride relocation.
2000	<i>North Front Range Transportation Alternatives Feasibility Study</i> (CDOT)	Recommended future commuter rail line between Fort Collins, Longmont, Boulder, and Denver.
2001	<i>US 36 Major Investment Study</i> (RTD)	Recommended highway widening, HOV lanes, BRT, commuter rail service, and alternate transportation improvements.
2005	<i>120th Connection Environmental Assessment</i> (CDOT)	Studied reconstruction of the interchange and east/west extension of SH 128 across US 36. Received Finding of No Significant Impact from FHWA and the re-evaluation approved in 2008.
2005	<i>Safety Assessment Report for US 36 Corridor</i> (CDOT)	Assessed the nature and magnitude of safety problems in the US 36 corridor.
2008	<i>Denver Union Station EIS/ROD</i> (RTD)	EIS for regional multi-modal transportation center at DUS. ROD signed in October 2008.
2008	<i>Northwest Corridor Environmental Planning Study</i> (CDOT)	Planning Study for transportation linkage between US 36 and I-70 was published in July 2008.
2003/Ongoing	<i>North I-25 DEIS</i> (CDOT/RTD)	DEIS for corridor along I-25 and the BNSF corridor from DUS to Fort Collins was published in October 2008. The FEIS is in process.
2003/Ongoing	<i>East Corridor DEIS/Basic Engineering</i> (RTD)	EIS and basic engineering for transit improvements between downtown Denver and DIA was published in January 2009. The FEIS was released in September 2009.
2003/Ongoing	<i>I-70 East DEIS</i> (CDOT)	EIS for I-70 corridor between I-25 and Tower Road was published in November 2008.
2007/Ongoing	<i>Northwest Rail EE/EA</i> (RTD/USACE)	EE/EA to study commuter rail line along the BNSF between Denver, Boulder, and Longmont.
2008/Ongoing	<i>I-70 Central Park Boulevard EA/FONSI</i> (CDOT)	EA to study new interchange at Central Park Boulevard on I-70. FONSI was signed by FHWA in August 2009.

Source: US 36 Mobility Partnership, 2008; CDOT, 2009.

Notes:

BNSF = Burlington Northern Santa Fe	FHWA = Federal Highway Administration
BRT = bus rapid transit	FONSI = Finding of No Significant Impact
CDOT = Colorado Department of Transportation	HOV = high-occupancy vehicle
DEIS = Draft Environmental Impact Statement	I-25 = Interstate 25
DIA = Denver International Airport	I-70 = Interstate 70
DUS = Denver Union Station	ROD = Record of Decision
EA = Environmental Assessment	RTD = Regional Transportation District
EE = Environmental Evaluation	SH = State Highway
EIS = Environmental Impact Statement	USACE = U. S. Army Corps of Engineers
FEIS = Final Environmental Impact Statement	US 36 = United States Highway 36

The *US 36 Major Investment Study* (RTD 2001), the most recent corridor-wide study aside from the US 36 Corridor FEIS, concluded with approval of a locally preferred alternative (LPA) by the cities and counties in the US 36 corridor. The LPA was a multi-modal package of improvements, including highway widening, high-occupancy vehicle (HOV) lanes, bus rapid transit (BRT), commuter rail service along the BNSF Railway, and alternate transportation improvements, such as bicycle facilities. The FEIS evaluates alternatives that were in the *US 36 Major Investment Study* (RTD 2001) and other reasonable alternatives proposed during the scoping period for this project. The FEIS has utilized public input from the DEIS that asked for a lower cost and less impacting alternative to be considered, and includes input from the counties and cities along the corridor resulting in the development of an alternative that combined the favorable elements from the DEIS alternatives to make a Combined Alternative Package that was adopted as the Preferred Alternative.

1.3.5 Relationship to Regional Planning Process

The Metropolitan Planning Organization for the region is the Denver Regional Council of Governments (DRCOG). The DRCOG Board of Directors adopted the *2035 Metro Vision Regional Transportation Plan (2035 MVRTP)* in December 2007, and amended it in 2009 (DRCOG 2009). This long-range plan focuses on improving multi-modal transportation facilities, establishing inter-modal connections, and providing transportation programs and services.

The overall vision of the plan for the Denver metropolitan area is “a dynamic mixture of distinct pedestrian-friendly urban and suburban communities within a limited area...distinguished by a transportation system that includes sidewalks, bikepaths, bus service, rail transit, and roads; plentiful parks and open space; and clean air and water” (DRCOG 2007). Numerous policies identified in the *2035 MVRTP*, as amended (DRCOG 2009) are consistent with the needs identified in the US 36 corridor. Highlights of the key transportation-related policies from the plan include:

- Expanding capacity of existing roadways in the most critically congested corridors and at key traffic bottlenecks, and encouraging access controls to maintain capacity.
- Providing increased transit service and facilities that stimulate travel by means other than the single-occupant vehicle (SOV), encourage transit-oriented developments, and provide mobility options.
- Assuring the preservation and maintenance of existing facilities.
- Providing bicycle and pedestrian access through and between developments, and providing links to transit facilities.
- Developing and maintaining a safe transportation system for all of its users.
- Making the best use of existing transportation facilities by implementing measures that actively manage and integrate systems, improve traffic operations, and reduce the demand for SOV travel.

In addition, the DRCOG congestion management process documents also identify US 36 as a key congested corridor.

Estimated to cost \$1.3 billion (2008 year dollars), the Combined Alternative Package (Preferred Alternative) for the US 36 project is included in the *2035 MVRTP*, as amended (DRCOG 2009). The project, however, is only partially funded in the plan, meaning that the project would need to be phased over time as additional funding becomes available. At this time, a total of \$515.7 million (2008 dollars) is identified from DRCOG, CDOT, and local funding sources, with an additional \$195.4 million contribution from RTD.

Consistent with the proposed project phasing, the following elements are deemed to be fundable between now and 2035, and therefore are included in the Regional Transportation Plan:

- Reconstruction of the Sheridan Boulevard and US 36 interchange.
- Reconstruction of the Wadsworth Parkway and US 36 interchange.
- Addition of managed lanes on US 36 from Foothills Parkway to I-25.
- Addition of BRT lanes on US 36 and a bikeway parallel to US 36 (FasTracks).

The purpose of improvements in the US 36 corridor is to improve mobility along the US 36 corridor from I-25 in Adams County to Foothills Parkway/Table Mesa Drive in Boulder, and among intermediate destinations. The transportation needs of the project are listed below and described further in the following sections:

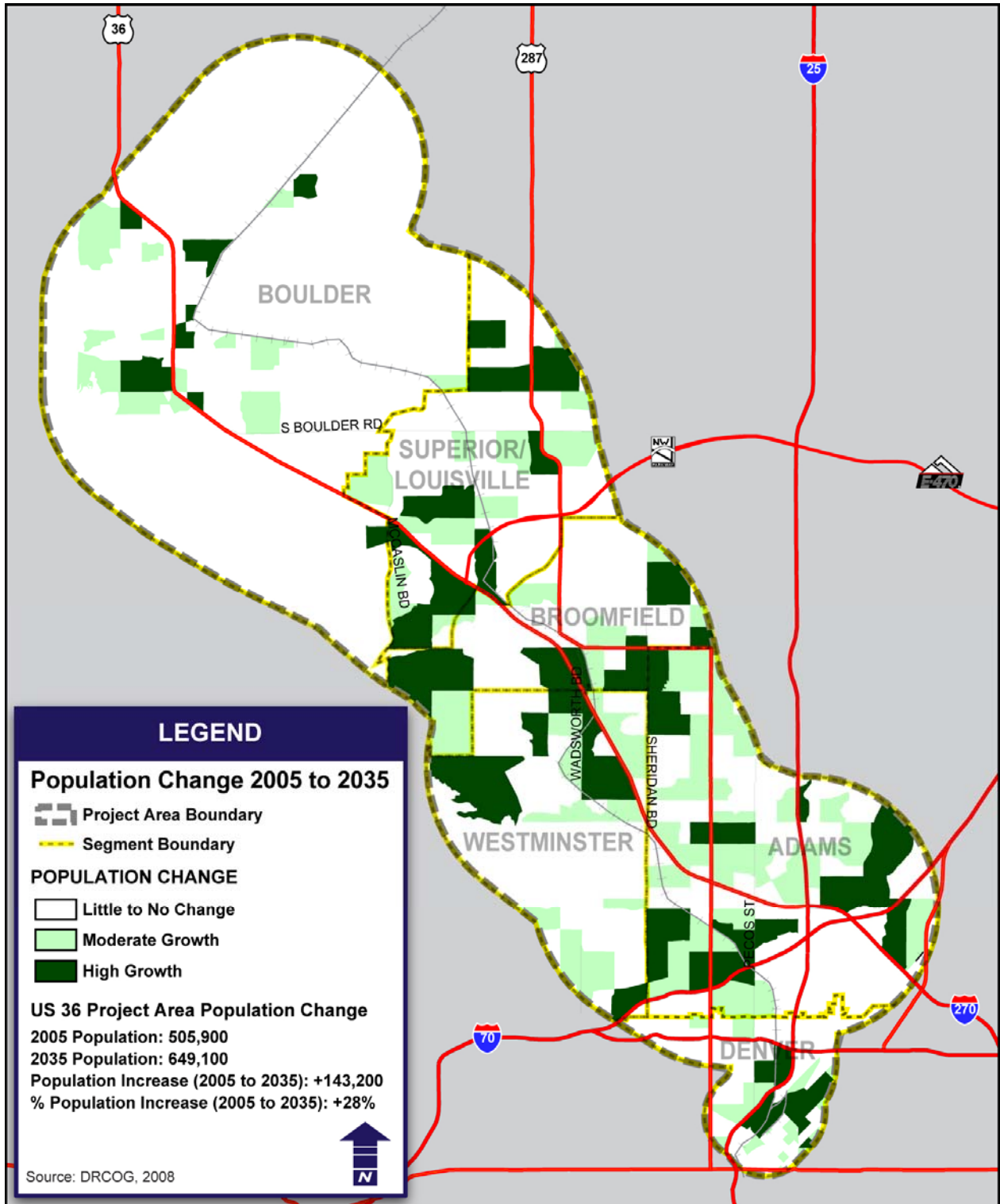
1. Increase trip capacity.
2. Expand access.
3. Provide congestion relief.
4. Expand mode of travel options.
5. Increase efficiency of transit service.
6. Update outdated highway facilities.

2.1 TRANSPORTATION NEED #1: INCREASE TRIP CAPACITY

Historical growth in population and employment has resulted in increased travel demand within the US 36 corridor. Additional growth is forecasted. One of the ways to respond to this continued growth is to increase trip capacity of the highway.

Substantial residential and employment growth along the US 36 corridor during the late 1990s, which continues today, has greatly increased the demand placed on the highway. According to DRCOG, in 2005, the population in the US 36 project area was estimated to be 505,900 and is expected to grow to 649,100 in 2035 — a 28 percent increase. As a whole, the population in the region is expected to increase from 2.7 million in 2005 to 4.4 million in 2035 — a 63 percent increase as illustrated in Figure 2-1, Anticipated Population Growth in the Project Area. Areas of high growth are predicted in the middle portion of the US 36 corridor, as well as on the eastern end in Adams County. These growth areas will generate additional travel demand for use of routes through and within the corridor (DRCOG 2007).

Figure 2-1: Anticipated Population Growth in the Project Area



DRCOG estimated employment in the project area to be 332,500 in 2005 and it is expected to grow to 508,500 in 2035 — a 53 percent increase, as illustrated in Figure 2-2, Anticipated Employment Growth in the Project Area. Overall employment in the region is expected to increase by 69 percent, from 1.3 million in 2005 to 2.2 million in 2035. Boulder, with more than 78,000 employees, has the region’s third-largest employment concentration. In the project area, retail employment is expected to grow by 47 percent between now and 2035 and is projected to be the fastest-growing component of employment growth, indicating an increasing number of regional shopping centers (DRCOG 2007). Areas of high employment growth are predicted in the middle portion of the US 36 corridor, primarily north and south of US 36 and west of US 287 in Broomfield. The Interlocken Business Park in Broomfield, on the south side of US 36, will experience substantial employment increases, as will some areas within the City of Boulder. Employment growth is also predicted in Adams County, particularly south of US 36.

Population and employment growth will result in increased travel demand and the need for increased trip capacity.

The analysis in Figure 2-3, US 36 2035 a.m. Peak-hour Travel Demand, shows that the capacity available in the US 36 corridor in 2035 will not be adequate to meet projected travel demand unless substantial improvements are made. Figure 2-3 compares the projected travel demand in 2035 to existing highway and transit capacity during the morning (a.m.) peak-hour. The comparison is made at eight locations along the highway. The demand that can be accommodated by the existing system is shown in blue and labeled as “Demand Served.”

The analysis indicates that in 2035, between 6,880 and 14,420 person-trips cannot be accommodated at locations along the highway during the a.m. peak-hour if the existing transportation system remains unimproved. This demand is shown in yellow and labeled as “Unmet Demand.” In transportation planning, facilities are often sized to accommodate 85 percent of the total projected demand. With an unmet demand of 14,400 person-trips in the peak-hour, the 85 percent level would set a threshold of 12,200 person-trips as the level at which the improvements would be considered to have met the Purpose and Need.

If no action is taken to meet the unmet demand on US 36, then existing transportation problems will worsen and cause increased traffic to spillover on to adjacent arterials and neighborhoods, resulting in more congestion, delays, and safety hazards throughout all parts of the corridor and project area.

Figure 2-2: Anticipated Employment Growth in the Project Area

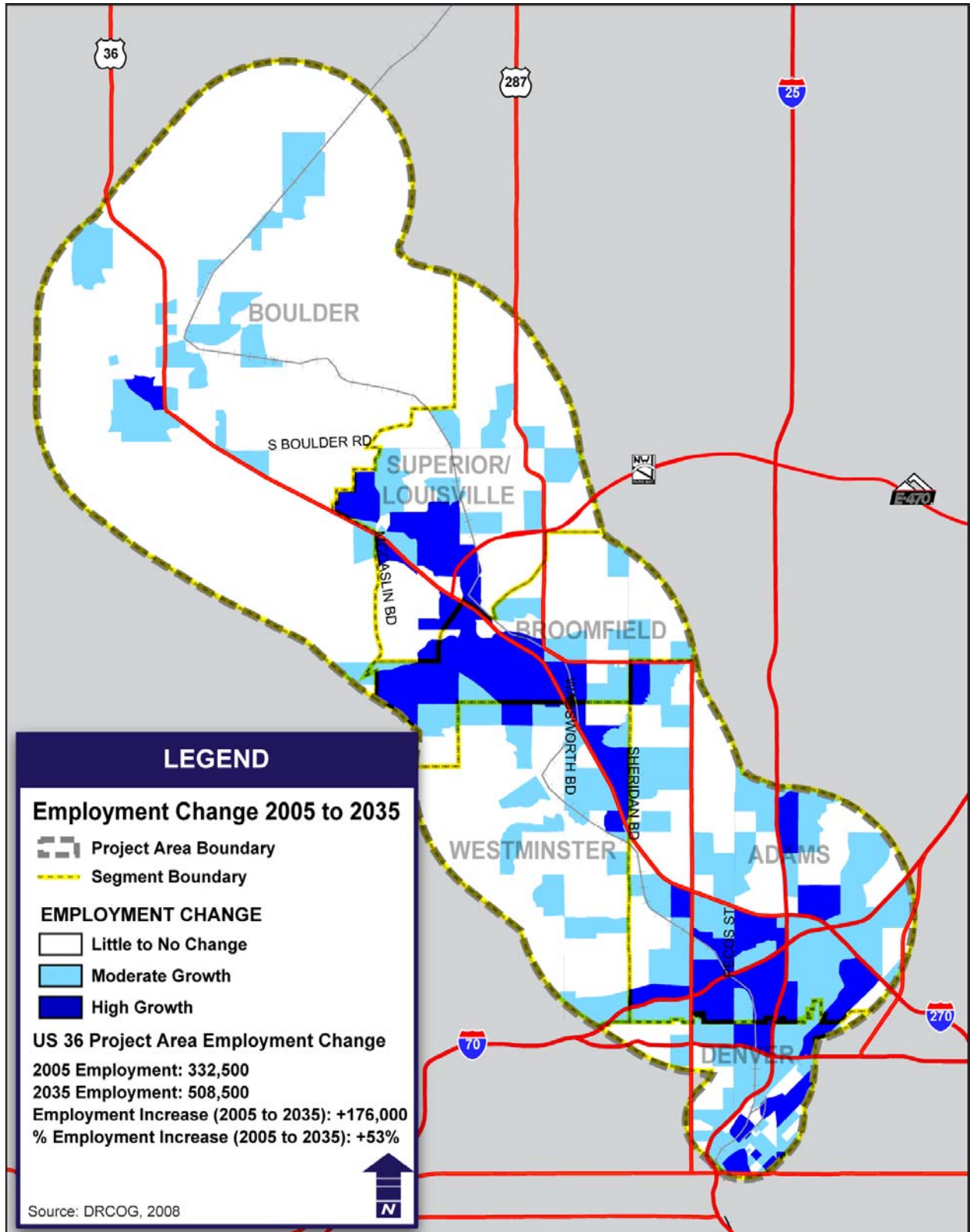
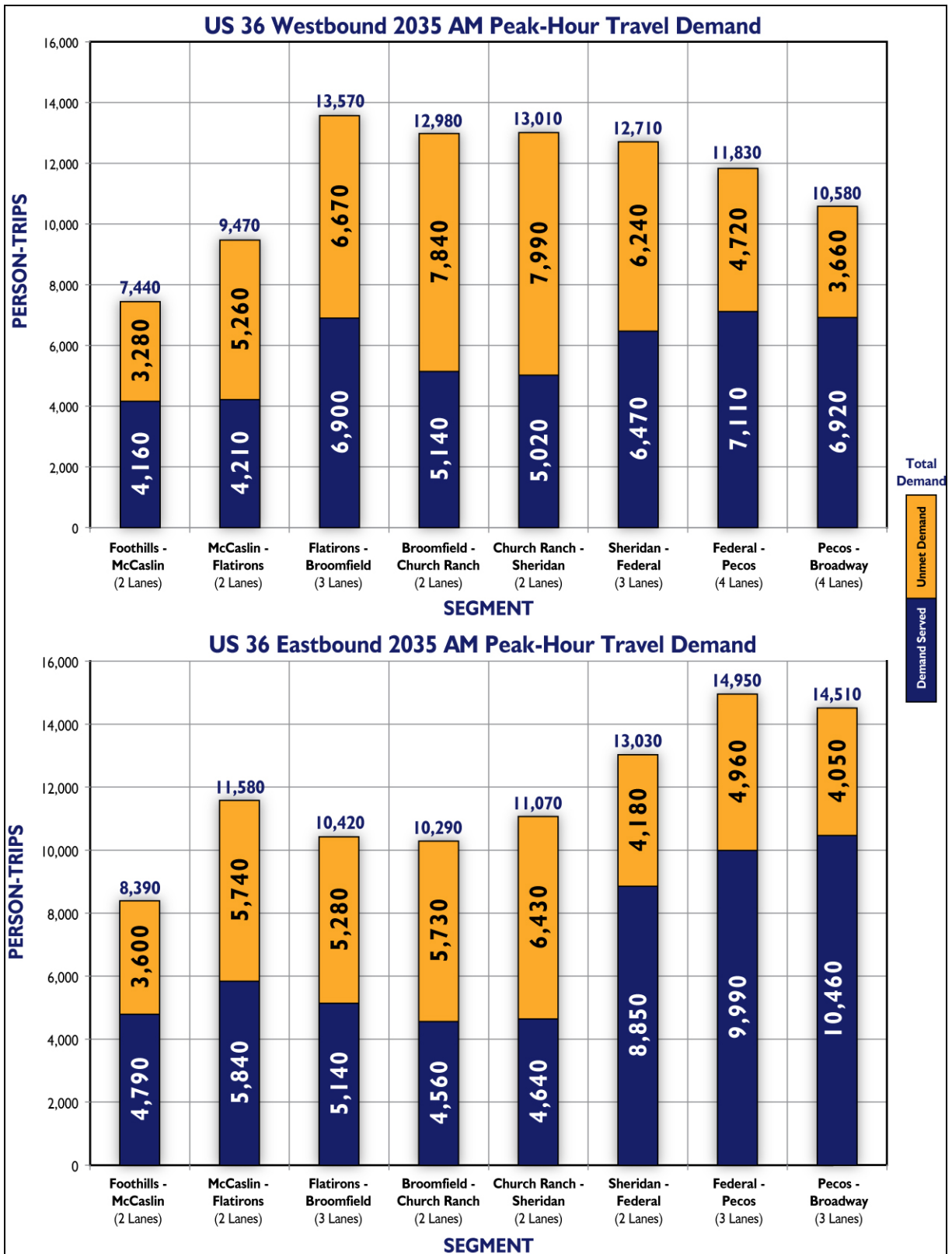


Figure 2-3: US 36 2035 a.m. Peak-hour Travel Demand



Source: US 36 Mobility Partnership, 2009.

2.2 TRANSPORTATION NEED #2: EXPAND ACCESS

Access to existing and planned activity centers such as Boulder, FlatIron Crossing, Westminster Center, and others is limited due to capacity constraints at the interchanges. Development of improved access at intersections is needed to meet the existing and future capacity demand.

A substantial amount of traffic exits and enters the US 36 corridor at activity and employment centers between I-25 in Adams County and Foothills Parkway/Table Mesa Drive in Boulder. Less than 10 percent of corridor drivers use the entire length of the US 36 corridor between Boulder and Denver; the remaining vehicle trips enter and/or exit at intermediate locations.

Based on DRCOG population and employment projections for 2035, and assuming no major transportation improvements in the US 36 corridor, access to activity centers will become more difficult for the following reasons:

- Access to activity centers is primarily served by US 36 interchanges, many of which are lacking in structure and capacity at intersections to meet existing and future capacity demand. Most arterial crossings of US 36 occur at interchanges that are already congested. This is because US 36 is a diagonal highway in an arterial grid network resulting in interchanges at locations where major arterials intersect (e.g., Sheridan Boulevard/92nd Avenue, Wadsworth Parkway/120th Avenue). These major arterials are already carrying high volumes of traffic north/south and east/west. As a result, travel to and between activity centers in the corridor can be difficult during peak periods.
- In 2035, congestion will delay travel to activity centers. The 2005 peak-hour SOV travel time in the a.m. between I-25 in Denver and Foothills Parkway in Boulder, was estimated to be 33 minutes. In 2035, without improvements to the US 36 corridor, the same trip is estimated to take 42 minutes. In the westbound direction during the evening (p.m.) peak hour, the SOV travel time increases from 25 minutes (2005) to 42 minutes (2035).

2.3 TRANSPORTATION NEED #3: PROVIDE CONGESTION RELIEF

In 2007, DRCOG released a report and map identifying the most congested roadways of the Denver metropolitan area. In the following categories (1) “most congested freeway ramps,” and (2) “worst traffic bottlenecks,” US 36 appeared at the top of the list (DRCOG 2007).

Corridor capacity is inadequate to meet growing travel demands. Relief is needed for increasing levels of congestion along the US 36 corridor.

As described in Transportation Need #1: Increase Trip Capacity, if no action is taken to meet the unmet demand on US 36, then existing transportation problems will worsen and cause traffic to spillover on to adjacent arterials and neighborhoods, resulting in more congestion, delays, and safety hazards throughout all parts of the corridor and project area.

Increasing levels of traffic congestion result in longer travel times for automobile drivers, commercial truck drivers, and transit patrons, as buses are mixed with general traffic.

A peak-hour travel time comparison was made for general-purpose and HOV-eligible traffic conditions between 2005 and 2035 (see Table 2-1, US 36 Travel Time Comparison with No Highway Capacity Improvements [I-25 to Foothills Parkway]). Model-estimated travel time was

examined along US 36 between I-25 and the interchange with Foothills Parkway. The results of this comparison are presented in Table 2-1. As shown in this table, the travel time for SOVs in general-purpose lanes for a.m. peak-hour traffic heading west is projected to increase by 27 percent if no improvements are made. The travel time for a.m. peak-hour traffic heading east is projected to increase by 53 percent. Eastbound p.m. peak-hour travel time is projected to increase by 38 percent and westbound p.m. peak-hour travel time will increase by 67 percent.

Table 2-1: US 36 Travel Time Comparison with No Highway Capacity Improvements (Foothills Parkway to Denver Union Station)

Peak-Hour and Direction	Travel Time in General-Purpose Lanes (minutes)				Travel Time in HOV Lanes (minutes)			
	2005	2035	Absolute Change	Percent Change	2005	2035	Absolute Change	Percent Change
a.m. Eastbound	34	52	18	53	27	32	5	19
p.m. Eastbound	37	40	3	8	N/A	N/A	N/A	N/A
a.m. Westbound	30	38	8	27	N/A	N/A	N/A	N/A
p.m. Westbound	33	55	22	67	27	39	12	44

Source: US 36 Mobility Partnership, 2009.

Notes:

- a.m. = morning
- HOV = high-occupancy vehicle
- N/A = not applicable
- p.m. = evening
- US 36 = United States Highway 36

Travel times for buses would be similarly affected, as they are required to use the general-purpose lanes. In addition, buses must also get on and off the highway to access park-n-Rides, which substantially increases travel time.

Travel time can be summarized for all vehicles during a day using the DRCOG travel demand model. Daily vehicle hours traveled (VHT) in the corridor in the Package 1 (No Action) 2035 would total 596,600 hours. Improvements to the transportation facilities and services would reduce VHT by making travel more efficient.

In addition to estimating travel time, congestion can also be evaluated by determining the level of service (LOS) on the highway. LOS is a measure of grades used to describe the amount of traffic congestion on a given segment of roadway at a given time, with values ranging from A to F. LOS A represents free-flow traffic, while LOS F represents stop-and-go conditions. Without capacity improvements on US 36, estimates of LOS for much of the highway are expected to be at or below LOS D. Any segment at LOS E or LOS F could be considered deficient. Table 2-2, US 36 Corridor Level of Service with No Highway Capacity Improvements, shows the peak-hour highway LOS along US 36 for current (2005) and projected (2035) conditions without highway capacity improvements. The worst LOS would be experienced at both ends of the corridor, with LOS F predicted for traffic eastbound from Sheridan Boulevard to I-25 in the a.m. peak-hour. Another location expected to experience LOS F in both the a.m. and p.m. peak-hour is from West Flatiron Circle to Foothills Parkway/Table Mesa Drive in Boulder. Westbound traffic between Sheridan Boulevard and Wadsworth Parkway, as well as from West Flatiron Circle toward Boulder, would also experience poor LOS (E) in the a.m. peak-hour. In the p.m. peak-hour, westbound US 36 from Federal Boulevard to Wadsworth Parkway is expected to be at LOS F.

Table 2-2: US 36 Corridor Level of Service with No Highway Capacity Improvements

Direction	a.m. Peak-Hour				p.m. Peak-Hour			
	Eastbound		Westbound		Eastbound		Westbound	
	2003	2035	2003	2035	2003	2035	2003	2035
Broadway to Pecos Street	D	F	C	C	D	D	D	D
Pecos Street to Federal Boulevard	C	F	C	D	D	D	D	D
Federal Boulevard to Sheridan Boulevard	D	F	C	D	F	F	D	F
Sheridan Boulevard to Church Ranch Boulevard	D	D	D	E	E	E	D	F
Church Ranch Boulevard to Wadsworth Parkway	C	D	E	E	D	D	D	F
Wadsworth Parkway to East Flatiron Circle	B	C	C	D	C	D	C	D
West Flatiron Circle to McCaslin Boulevard	C	F	D	E	E	F	D	F
McCaslin Boulevard to Foothills Parkway	C	F	D	F	F	F	D	F

Source: Analysis of counts by CDOT and the project team, and of forecasts from the US 36 Mobility Partnership, 2008 (2035 Data).

Notes:

- green shading = LOS D
- yellow shading = LOS E
- red shading = LOS F
- a.m. = morning
- LOS = level of service
- p.m. = evening

2.4 TRANSPORTATION NEED #4: EXPAND MODE OF TRAVEL OPTIONS

Currently, options for travel between Denver and Boulder on US 36 include bus and automobile.

The US 36 corridor is currently served by RTD’s express, regional, and skyRide bus routes, complemented by local service that feeds into the system at several park-n-Ride facilities. Bus frequency during peak-hours ranges from 10 to 60 minutes, with an average of 30 minutes for any one route. The RideArrangers VanPool Program is a partnership between RTD and DRCOG that provides long-distance commuting assistance to groups who form vanpools from across the Denver metropolitan region. RTD and DRCOG supply the van, fuel, and maintenance in exchange for a monthly fee.

Despite these services, no dedicated right-of-way (ROW) for transit or HOV is available in the US 36 corridor, so buses must exit and enter the highway to access stations on the sides of US 36, requiring travel through congested intersections resulting in slower travel times and little travel time reliability. In addition, many local bus routes require buses to stop at park-n-Rides to pick up and drop off passengers. Additional facilities to provide priority and reliability for multi-occupant vehicles (such as median or side-loaded BRT stations and queue jumps at on-ramps) is needed to encourage SOV users to change modes to transit or HOV.

HOV lanes are available for bus, vanpool, and carpool use but are limited to the easternmost segments of the corridor. Express lanes on I-25 allow multiple-occupant vehicles for no fee, with the excess capacity available for use by SOVs that choose to pay a toll. The express lanes only extend into the easternmost end of the US 36 corridor.

Jurisdictions along the corridor are requesting the expansion of a rapid transit system into their respective communities to encourage use of alternative modes. The extension of the priority treatment for transit and HOV users from the I-25 express lanes west to Boulder is reflected in local government plans. The jurisdictions are also committed to supporting CDOT and RTD to manage travel demands through congestion pricing applications such as express lanes. Increasing modal choice options is a key to managing congestion.

With no continuous bikeway in the US 36 corridor and limited inter-modal opportunities, non-motorized travel options are inadequate and result in a dependence on the automobile.

The high level of interest and community support for rapid transit of all types in the US 36 corridor is unique and highlights the need to evaluate a range of transportation solutions. Alternatives should provide several travel mode options to meet demands in the corridor.

2.5 TRANSPORTATION NEED #5: PROVIDE EFFICIENT TRANSIT SERVICE

Although rail in the BNSF Railway corridor has been approved as part of the FasTracks Program, efficient bus transit service is still needed in the US 36 corridor. While rail in the BNSF Railway corridor has some geographic overlap with the US 36 corridor, it will provide service to a different travel shed, particularly in the northern portion of the project area. In addition, due to its separate location from US 36, rail in the BNSF Railway corridor will not link the key activity centers within the US 36 corridor.

With respect to bus service, the US 36 corridor exhibits some of the highest ridership on regional bus routes on the RTD system. Currently, weekday ridership on the B route between Boulder and Denver is approximately 6,300 boardings per day (RTD 2008).

Buses along the US 36 corridor are often substantially delayed in traffic, traveling no faster than automobiles. In the morning, no HOV lane is available for westbound traffic between I-25 and Boulder, and the highway is often heavily congested. At some locations, buses must also get on and off the highway to access park-n-Rides, substantially increasing travel time. For transit and HOV travel to be a viable alternative for users of SOVs, buses and HOVs must have travel times that offer 1 minute of travel time savings per mile compared to Package 1 SOV users in the general-purpose lanes.

2.6 TRANSPORTATION NEED #6: UPDATE ROADWAYS

Roadway characteristics such as horizontal and vertical alignment, sight distance, highway cross section, lane continuity and balance, ramp sequencing, and accident history were evaluated for US 36 and compared to current standards. Along short sections of US 36, the vertical alignment was measured as “not to standard,” with grades of 5 percent or greater. There are several locations where stopping sight distance, decision sight distance, and highway cross section were also measured as “not to standard.” Structures such as bridges, retaining walls, and sound walls along US 36 were also evaluated. Of 35 bridges, 14 were determined to be either structurally deficient or functionally obsolete, and two are possibly hydraulically deficient (i.e., a 100-year flood event would cause water to pass over the bridge).

Several instances of lane imbalances also exist in the corridor. A lane imbalance occurs when the number of lanes approaching and the number of lanes leaving an interchange are not equal to each other or when the number of lanes does not remain relatively consistent through a corridor. For example, some portions of US 36 have two lanes, some three, and some four. The existence of through-lanes and acceleration/deceleration or auxiliary lanes on US 36 is likewise inconsistent, causing disruptions in the flow of traffic. The *Existing Conditions Inventory and Deficiency Analysis – Draft Technical Report* (URS 2003) provides a detailed description of roadway deficiency ratings.

A CDOT safety analysis conducted in 2004 showed a higher-than-expected accident frequency along the entire US 36 corridor when compared to similar urban four-lane highways. The *Safety Assessment Report for the US 36 Corridor* (CDOT 2005) provides a detailed description and the results of the safety assessment. The report suggests some accident reduction is possible with improvements to the highway, including the addition of ramp metering. Ramp meters are traffic signals placed at on-ramps and are used to control the volume of traffic entering the highway. The addition of ramp metering generally equates to a 20 percent accident reduction within 1 mile of the ramp meter location. In 2006, ramp metering was implemented at several locations on US 36. Additional safety improvements could be achieved with ramp meters at the remaining US 36 on-ramps.

3.1 INTRODUCTION

The development and evaluation of alternatives were conducted at four primary levels during development of the NEPA process, described below:

- **Assessment of Needs** consisted of identifying six points, described in Chapter 1, Purpose and Need, that demonstrated the need for transportation improvements in the US 36 corridor. These needs relate to the project purpose and summarize the major transportation issues facing the US 36 corridor.
- **General Alternatives** consisted of identifying a broad range of alternatives for meeting transportation needs in the US 36 corridor. This includes many of the alternatives originally defined and evaluated in the *US 36 Major Investment Study* (RTD 2001), along with other alternatives suggested during the agency and public scoping process. The general alternatives were evaluated using four criteria related to the project Purpose and Need and goals. The criteria used for the general alternatives evaluation include Purpose and Need, unacceptable environmental impacts, conformance with the Regional Transportation Plan, local plans, and practicality and feasibility.
- **Development of Conceptual Alternatives** consisted of evaluating the alternatives remaining after the general alternatives evaluation process. The conceptual alternatives were developed further to consider capital and operating costs, travel demand, facilities development, and environmental factors. The conceptual alternatives were evaluated using criteria developed from the project goals, which are to improve mobility, minimize environmental impacts, support local and regional land use visions and policies, and cost-effectiveness.
- **Packages** consisted of combinations of one or more of the remaining alternatives. The resulting five initial packages include Package 1, and four build packages (Packages 2 through 5). The packages were evaluated using criteria developed from the project goals. After the initial evaluation, Packages 3 and 5 were eliminated based on elements of the Purpose and Need (transportation mobility). In addition, the capital cost and operating cost of Package 3 are extraordinarily high for this type of facility and no one has attempted to build a similar exclusive busway. Packages 1, 2, and 4 were retained for detailed study in the DEIS. After the DEIS, a hybrid package, the Combined Alternative Package (Preferred Alternative), was developed using elements from Package 2 and Package 4. In addition to Package 1, Packages 2 and 4, and the Combined Alternative Package (Preferred Alternative) are studied in detail in the FEIS. These packages represent all reasonable alternatives and are described in more detail in Chapter 2, Alternatives Considered, of the FEIS.

3.2 GENERAL ALTERNATIVES DEVELOPMENT AND EVALUATION

The general alternatives were developed in response to the assessment of transportation needs identified for the US 36 corridor. General alternatives included those from the *US 36 Major Investment Study* (RTD 2001), *2025 Metro Vision Interim Regional Transportation Plan* (2025 *MVIRTP*) (DRCOG 2002), and public and agency comments obtained during the project scoping phase. A list of general alternatives, grouped by category and subcategory, appears in Table 3-1, List of General Alternatives by Category and Subcategory.

Table 3-1: List of General Alternatives by Category and Subcategory

Service Category	Subcategory	General Alternative
Package 1 (No Action)	None	<ul style="list-style-type: none"> None.
Roadway Alternatives	New roadway capacity	<ul style="list-style-type: none"> New freeways on new alignment. New general-purpose lanes on US 36 to increase capacity. New lanes on arterials in the US 36 corridor.
	Operational improvements	<ul style="list-style-type: none"> Acceleration/deceleration lanes on US 36 at major interchanges. Climbing lanes on US 36 (eastbound and westbound on either side of Davidson Mesa).
	Other roadway improvements	<ul style="list-style-type: none"> HOV lanes on US 36. Toll lanes on US 36.
Transit Alternatives	Local (shorter trips within communities)	<ul style="list-style-type: none"> Local bus expansion throughout the US 36 corridor.
	Express/regional (longer trips between communities)	<ul style="list-style-type: none"> Regional bus expansion primarily on US 36. Commuter rail (using either LHC or DMU self-propelled vehicles) on US 36.
	Rapid transit (moderate-length trips with high-frequency service and frequent stops)	<ul style="list-style-type: none"> BRT on US 36. LRT on US 36. Advanced guideway transit, including monorail, automated guideway transit, personal rapid transit, magnetic levitation transit, or similar grade-separated beam guideway transit on US 36.
Alternate Transportation Strategies	None	<ul style="list-style-type: none"> TDM improvements throughout the corridor, such as strategies designed to make the most efficient use of existing transportation facilities by reducing the actual "demand" placed on these facilities. Examples include: coordinating flexible work schedules to help decrease demand at peak periods, carpooling/vanpooling, employer and community-based ECO passes (bus passes), incident management, and coordinated land use and transportation planning that increases the convenience of using transit. TSM and ITS improvements on US 36 and arterials that might include ramp metering, bus transit priority treatments like signal bypass lanes, network surveillance/control, signal system monitoring/control, and traffic information dissemination. Bicycle and pedestrian facilities along US 36 and other locations.

Source: U.S. 36 Mobility Partnership, 2006.

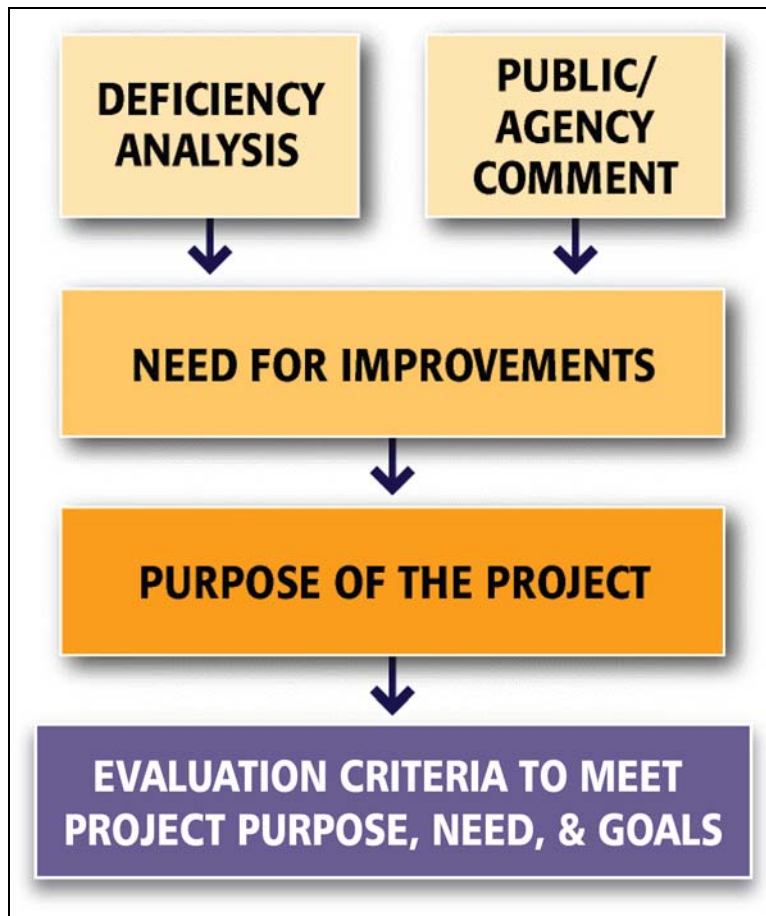
Notes:

- BRT = bus rapid transit
- DMU = diesel-multiple unit
- HOV = high-occupancy vehicles
- ITS = intelligent transportation system

- LHC = locomotive-hauled coach
- LRT = light rail transit
- TDM = Transportation Demand Management
- TSM = Transportation System Management
- US 36 = United States Highway 36

The general alternatives were evaluated based on four goals, which were derived from the six Purpose and Need elements, and other requirements developed from state and federal laws, consistency with local policies, and funding availability. Figure 3-1, Relationship of Evaluation Criteria to Project Purpose, Needs, and Goals, illustrates the general methodology used to develop the process and criteria for evaluating the general alternatives.

Figure 3-1: Relationship of Evaluation Criteria to Project Purpose, Needs, and Goals



Source: US 36 Mobility Partnership, 2009.

3.2.1 Goals

In response to the Purpose and Need, the project team developed and refined four overall goals, with the assistance of the project's Technical Support Committee, and the Corridor Governments Committee. The four goals were derived from the six Purpose and Need elements, and other requirements developed from state and federal laws, consistency with local policies, and funding availability. The goals were used to assist in the development of evaluation criteria for all evaluation levels:

- **Goal 1:** Improve transportation mobility through and within the US 36 corridor.
- **Goal 2:** Minimize adverse impacts to the socioeconomic and natural environments, and foster positive environmental impacts.
- **Goal 3:** Support the land use vision and future development patterns in the *2035 Metro Vision Regional Transportation Plan (2035 MVRTP)*, as amended (DRCOG 2009) and local plans and policies.
- **Goal 4:** Provide a cost-effective and efficient transportation investment strategy.

Although Goal 1 was the primary goal when developing and evaluating alternatives, Goals 2 through 4 supplemented the evaluation process by providing additional “discriminators,” or areas to focus evaluation efforts.

Four screening criteria, based on the four major goals described above, were used to evaluate the general alternatives. Table 3-2, Application of Goals to General Alternatives Evaluation, illustrates the application of the goals to the general alternatives screening process.

Table 3-2: Application of Goals to General Alternatives Evaluation

Goal	Screening Criterion	Description
Goal 1: Improve transportation mobility through and within the US 36 corridor.	Purpose and Need	Does the alternative increase trip capacity, expand access, provide congestion relief, a multi-modal opportunity, efficient transit service, and/or upgrade outdated highway facilities?
Goal 2: Minimize adverse impacts to the socioeconomic and natural environments, and foster positive environmental impacts.	Unacceptable environmental impacts	Does the alternative have a major environmental impact, or “fatal flaw”?
Goal 3: Support the land use vision and future development patterns in the 2035 MVRTP, as amended (DRCOG 2009), and local plans and policies.	Conformance with 2035 MVRTP, as amended, and local plans	Does the alternative conform to the 2035 MVRTP, as amended, and/or the local plan or policy with jurisdiction?
Goal 4: Provide a cost-effective and efficient transportation investment strategy.	Practical and Feasible	Would an alternative fail one of the following two tests: <ul style="list-style-type: none"> • The alternative has substantial construction costs or operational complexity that would result in impacts well beyond those of other general alternatives. • The alternative performs the same or similar transportation function as another alternative but with less complexity and less impacts. This could include alternatives that are unproven in revenue service in applications similar to those of the US 36 corridor (meaning that there are other, more traditional and accepted modes that can perform similar transportation functions at lower cost or less construction complexity), or that are inconsistent with local existing or planned transportation modes and systems.

Source: US 36 Mobility Partnership, 2006.

Notes:

2035 MVRTP, as amended = 2035 Metro Vision Regional Transportation Plan, as amended

US 36 = United States Highway 36

3.2.2 General Alternatives Evaluation

Using the four criteria (1) Purpose and Need, (2) unacceptable environmental impacts, (3) conformance with 2035 MVRTP, as amended (DRCOG 2009) and local land use plans, and (4) practical and feasible, the general alternatives were evaluated for further consideration. A summary of the evaluation by criterion appears in the following sections, focusing only on those alternatives that failed to advance beyond this point in the process.

3.2.2.1 Criteria 1: Purpose and Need

The alternative for new freeways on a new alignment was determined to not meet the Purpose and Need of the project because this alternative would not substantially improve mobility. Improved mobility often requires increasing capacity and providing greater access to existing land uses and future land development. Therefore, new freeways outside the existing US 36

corridor would not serve the existing and planned activity centers in the project area. Because of the amount of ROW needed for the construction of a new freeway, this alternative would essentially displace the very activity centers the roadway is meant to serve. For this reason, the alternative for new freeways was unable to meet the transportation needs of the US 36 corridor and was not considered reasonable.

Alternative transportation strategies, which includes Transportation System Management (TSM) and Transportation Demand Management (TDM) and contains elements such as ramp metering and bicycle facilities, would by themselves not meet the Purpose and Need of the project since they would not substantially improve mobility or travel times between Denver and Boulder. The most effective TSM programs in the country are focused at the activity center level and have achieved trip reductions of 20 to 25 percent. While the US 36 corridor has a large amount of employment and retail activity, few of these areas are highly concentrated enough to substantially reduce trips within the corridor through the use of alternative transportation strategies. The overall effect of alternative transportation strategies, such as a TSM alternative, in the US 36 corridor by itself would not be sufficient to meet the Purpose and Need. Therefore, alternative transportation strategies are not considered reasonable. While this alternative was not carried forward from the conceptual alternatives evaluation, elements of the alternative were considered as supportive measures in the conceptual alternatives development and evaluation.

3.2.2.2 Criteria 2: Unacceptable Environmental Impacts

At this level of detail, no alternative showed evidence of unacceptable environmental impacts. Therefore, no alternatives were eliminated as a result of this criterion.

3.2.2.3 Criteria 3: Conformance with 2035 Metro Vision Regional Transportation Plan, as amended, and Local Land Use Plans

At this level of detail, all the alternatives were in conformance with the 2035 MVRTP, as amended (DRCOG 2009) and local land use plans and policies. Therefore, no alternatives were eliminated as a result of this criterion.

3.2.2.4 Criteria 4: Practical and Feasible

The advanced guideway transit alternative failed the practical and feasible test. A monorail or similar grade-separated, guided-beam transit improvement is very complex. There is no situation anywhere in the U.S., similar to the US 36 corridor, where such a technology has been used in everyday, proven transit-revenue service. In addition, advanced guideway transit would be a new technology that is much different than what is in use or planned for other transit service in the Denver metropolitan area and would not be able to interface with other regional transit systems. Other rapid transit alternatives would provide a similar or greater level of transportation service with less cost and logistical complexity than the advanced guideway transit alternative. For these reasons, combined with a lack of community support, the alternative was not considered reasonable and was eliminated from further consideration.

Due to technology and cost issues, commuter rail within or on US 36 was not carried forward for further study. At Davidson Mesa near McCaslin Boulevard, the grade is a sustained 5 percent for approximately 1 mile westbound and approximately 0.5 mile eastbound. According to RTD

criteria, the absolute maximum grade that diesel multiple unit or locomotive-hauled coach rail technology could accommodate for short distances is approximately 4.0 percent, with greater grades as the distance increases. Constructing a rail tunnel through Davidson Mesa was determined to not be practical based on substantial construction costs. Tunneling costs would be 10 to 15 times more than at-grade construction costs and the presence of abandoned underground coalmines creates additional design challenges. For these reasons, commuter rail on US 36 was not considered reasonable.

3.2.3 Recommendations

As described above, the following four general alternatives were not considered reasonable and were not carried forward for further study as major alternatives:

1. New freeways on a new alignment
2. Alternative transportation strategies
3. Advanced guideway transit on US 36
4. Commuter rail on US 36

3.2.4 Major Alternatives and Supportive Alternatives

After the general alternatives evaluation process, the remaining alternatives were submitted to an organizing process. The alternatives were sorted by the potential to meet many or all of the project needs. If it was determined that an alternative, by itself, would not meet many or all of the project needs, then it was a supportive alternative that would function in a complementary role. All other alternatives were considered to be major alternatives. The results of this process appear in Table 3-3, Categorization of Major Alternatives and Supportive Alternatives.

Table 3-3: Categorization of Major Alternatives and Supportive Alternatives

Major Alternatives	Supportive Alternatives
<ul style="list-style-type: none"> • No action • New general-purpose lanes on US 36 • New arterial lanes • HOV lanes on US 36 • Toll lanes on US 36 • BRT (barrier-separated or buffer-separated) on US 36 • Light rail on US 36 	<ul style="list-style-type: none"> • Acceleration/deceleration lanes • Climbing lanes • Interchange upgrades or replacements • Local and regional bus expansion • TDM and TSM improvements • ITS • Bicycle and pedestrian facilities

Source: US 36 Mobility Partnership, 2006.

Notes:

BRT = bus rapid transit

HOV = high-occupancy vehicle

ITS = intelligent transportation system

TDM = Transportation Demand Management

TSM = Transportation System Management

US 36 = United States Highway 36

3.3 CONCEPTUAL ALTERNATIVES EVALUATION

The seven remaining major alternatives were further refined using results of the travel demand and engineering concept studies. The alternatives were then subjected to a conceptual alternatives evaluation process using the four goals developed as part of the Purpose and Need statement. These goals formed the basis for developing the conceptual alternatives evaluation criteria. The alternatives were evaluated against each of the goals by measuring how they met each criterion.

Table 3-4, Application of Goals to Conceptual Alternatives Evaluation, lists the conceptual alternatives evaluation criteria and illustrates the relationship between each criterion and the four goals. This evaluation used a combination of qualitative and quantitative comparisons. For a detailed description of the application of the criteria and results, see the technical memorandum, *Conceptual Alternatives Definition Evaluation* (URS 2004a).

Table 3-4: Application of Goals to Conceptual Alternatives Evaluation

Goal	Evaluation Criteria
Goal 1: Improve transportation mobility through and within the US 36 corridor.	<ul style="list-style-type: none"> • Peak-hour capacity at screenline locations • Daily travel capacity at screenline locations • Peak transit mode share • Travel times for both automobiles and transit • Levels of service
Goal 2: Minimize adverse impacts to the socioeconomic and natural environments, and foster positive environmental impacts.	<ul style="list-style-type: none"> • Land use • ROW and relocations • Social impacts and community facilities • Environmental justice • Parks and open space • Air quality measured in VMT and VHT • Noise • Biological resources, wildlife, vegetation, and threatened and endangered species • Water resources/floodplains/water quality • Construction-related impacts
Goal 3: Support the land use vision and future development patterns in the 2035 MVRTP, as amended (DRCOG 2009), and local plans and policies.	<ul style="list-style-type: none"> • Compatibility with current land use and transportation policies • Consistency with future land use and transportation plans • Compatibility with existing land uses
Goal 4: Provide a cost-effective and efficient transportation investment strategy.	<ul style="list-style-type: none"> • Capital cost • Annualized cost/increase in peak-hour capacity • Annualized cost/increase in daily demand • Annualized cost/increase in direct transit and/or HOV user

Source: US 36 Mobility Partnership, 2006.

Notes:

Screenline is a collection of parallel facilities analyzed as a group.

2035 MVRTP, as amended = 2035 Metro Vision Regional Transportation Plan, as amended

HOV = high-occupancy vehicle

ROW = right-of-way

VHT = vehicle hours traveled

VMT = vehicle miles traveled

US 36 = United States Highway 36

The following conclusions were made based on the results of the conceptual alternatives evaluation:

- New arterial lanes were not carried forward because this alternative does not meet the project Purpose and Need and results in substantial environmental impacts requiring nearly every arterial in the US 36 corridor be widened. This alternative would provide no substantial increase in regional automobile capacity, transit capacity, or percentage of trips carried by HOV or transit and would not reduce US 36 congestion. This alternative would not meet the projected demand threshold of 10,000 additional peak-hour person-trips as identified in the project Purpose and Need. In discussions with local agencies, this alternative would create the greatest level of impacts of any roadway alternative (ROW acquisition, low-income and minority populations, parkland, and noise impacts). For these reasons, new arterial lanes were not found to be reasonable and were excluded from further consideration.
- Light rail transit (LRT) on US 36 was not carried forward because it failed to meet the project Purpose and Need, would result in additional ROW acquisition (with additional environmental impacts), and would not provide the same multi-purpose mobility benefit as a BRT/HOV or managed lane. Without the highway improvements, this alternative would not meet the projected demand threshold of 10,000 additional peak-hour person-trips as identified in the project Purpose and Need. At the conceptual level, the mobility benefits associated with LRT and BRT on US 36 were similar. For example, ridership was the same for both LRT and BRT. Additionally, the west-end terminus for LRT would require additional ROW acquisition and result in additional impacts to local roadways and/or properties in order to create an alignment along Foothills Parkway that could access the Boulder Transit Village. LRT on US 36 would require use of CDOT ROW for transit. LRT would also duplicate transit service in the corridor, as commuter rail on the BNSF Railway is part of Package 1. Lastly, there are substantial visual impacts associated with the overhead electrification required for LRT. For these reasons, LRT on US 36 was not found to be reasonable and was not carried forward.

3.3.1 Recommendations

As described above, the following two conceptual alternatives were not considered reasonable and were not carried forward for further study:

- New arterial lanes
- LRT on US 36

The criteria developed in the NEPA/Section 404 merger process for this project were applied to the alternatives during the general and conceptual screening process. This screening process is shown in Table 3-5, Alternatives Eliminated During General or Conceptual Evaluation. Alternatives that were retained as supportive alternatives are not included, as they were considered in future evaluations. All the alternatives have been eliminated based on Purpose and Need and practicability. Therefore, the LEDPA has not been eliminated.

Table 3-5: Alternatives Eliminated During General or Conceptual Evaluation

Criteria Description ¹	Rationale Basis to Screening Criterion	New Freeway	Advanced Guideway	New Arterials	Commuter Rail along US 36, and US 36 and BNSF Railway	Light Rail along US 36 or the BNSF Railway Corridor
Purpose and Need The Purpose of the action in the US 36 corridor is to improve mobility between Denver and Boulder. The Need for the action is described in TN 6, shown below.	N/A	This alternative fails most Purpose and Need criteria, and does not meet the access needs in the corridor. The alternative was not evaluated past Purpose and Need.	Although this alternative has some failures in Purpose and Need, it was evaluated beyond Purpose and Need to see if it would pass or fail when combined with highway improvements.	This alternative fails all Purpose and Need criteria; it was not evaluated past Purpose and Need.	Although this alternative has some failures in Purpose and Need, it was evaluated beyond Purpose and Need to see if it would pass or fail when combined with highway improvements.	Although this alternative has some failures in Purpose and Need, it was evaluated beyond Purpose and Need to see if it would pass or fail when combined with highway improvements.
TN 1 and 3 The transportation system needs to respond to continuing population and employment growth, and increased travel demand in the US 36 corridor; corridor capacity is inadequate.	To advance, an alternative must provide sufficient additional person-carrying capacity to meet projected demand in 2025 based on the DRCOG model. For the US 36 project, 2025 forecasts show that up to 10,000 additional trips will be needed on US 36 at certain locations during the peak rush hour (screening based on 2025 model). Later analysis used 2030 model and a slight difference (2%) appeared not enough to affect screening results. This 2030 analysis was performed to make sure this analysis was still valid once DRCOG updated its model.	Pass – A new freeway between Denver and Boulder would increase capacity and respond to growing population and employment.	Fail – As a major alternative without highway improvements, would not meet the projected demand of an additional 10,000 peak-hour person-trips.	Fail – New arterials or improvements to arterials will not meet projected demand of 10,000 additional peak-hour person-trips.	Fail – As a major alternative without highway improvements, would not meet the projected demand of an additional 10,000 peak-hour person-trips.	Fail – As a major alternative without highway improvements; would not meet the projected demand of an additional 10,000 peak-hour person-trips.
TN 2 Access to existing and planned activity centers is limited. Additional access is needed.	To advance, an alternative must provide improved access to existing and planned activity centers.	Fail – A new freeway would not improve access issues along US 36.	Pass.	Fail – New arterials would not improve access to activity centers.	Pass.	Pass.
TN 4 and TN 5 Expanded options for mode of travel are needed, as well as more efficient transit service.	To advance, an alternative must provide increased peak-hour transit mode share, with at least 10% non-highway mode.	Fail – A new freeway would not increase transit modes.	Pass.	Fail – Would not increase transit use by 10%.	Pass.	Pass.

Table 3-5: Alternatives Eliminated During General or Conceptual Evaluation

Criteria Description ¹	Rationale Basis to Screening Criterion	New Freeway	Advanced Guideway	New Arterials	Commuter Rail along US 36, and US 36 and BNSF Railway	Light Rail along US 36 or the BNSF Railway Corridor
TN 6 Existing roadway facilities need to be updated to meet current standards in some locations.	To advance, an alternative must improve existing design and safety deficiencies to current AASHTO standards.	Fail – A new freeway would not improve existing design and safety issues that need to be addressed on US 36.	Fail – As a major alternative without highway improvements- would not improve existing design and safety issues that need to be addressed on US 36.	Fail – Would not improve existing design and safety issues that need to be addressed on US 36.	Fail – As a major alternative without highway improvements: would not improve existing design and safety issues that need to be addressed on US 36.	Fail – As a major alternative without highway improvements: would not improve existing design and safety issues that need to be addressed on US 36.
Practicability Existing Technology						
ET1 Must use proven technology.	To advance, proposed transportation technologies must be tested and proven by successful use in revenue service in similar transportation applications in other locations.	N/A.	Fail – This technology has not been used and proven in revenue service in other cities, and would not be consistent with Denver transit modes.	N/A.	Pass.	Pass.
ET2 Must be technically feasible to construct and operate.	To advance, known features or alternatives that are not technically feasible to construct or operate should not be carried forward.	N/A.	N/A.	N/A.	Fail – Commuter rail equipment cannot operate on grades steeper than 2.5%, the grades along US 36, at Davidson Mesa, are 5%. Therefore, commuter rail is not technically feasible along US 36.	Pass.
Practicability Logistics						
L1 Must conform to federal and state laws.	To advance, alternatives must not violate any applicable federal or state laws. One example would be an alternative that if implemented, would violate applicable air quality standards, thereby violating the Clean Air Act.	N/A.	N/A.	N/A.	N/A.	Pass.
L2 Location of transportation improvements.	To advance, alternative must be located outside of national parks, wilderness areas, wildlife refuges, and superfund sites.	N/A.	N/A.	N/A.	N/A.	Pass.

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Table 3-5: Alternatives Eliminated During General or Conceptual Evaluation

Criteria Description ¹	Rationale Basis to Screening Criterion	New Freeway	Advanced Guideway	New Arterials	Commuter Rail along US 36, and US 36 and BNSF Railway	Light Rail along US 36 or the BNSF Railway Corridor
L3 Social feasibility.	To advance, an alternative must be socially feasible. An example of an alternative that might not be socially feasible would be one that would require extensive relocation of numerous families or businesses within one or more neighborhoods.	N/A.	N/A.	N/A.	N/A.	Fail – Light rail would require additional ROW along both US 36 and the BNSF, resulting in the acquisition of many more homes.
Practicability Costs						
C1 Must not be, by inspection or detailed analysis during later screenings, unreasonably expensive.	To advance, an alternative must not be so unreasonably costly, relative to other alternatives, that it does not warrant further consideration. The determination of what constitutes reasonable expense should consider whether the projected cost is substantially greater than the costs associated with an alternative with generally equivalent effectiveness and impacts.	N/A.	Fail – Advanced guideway transit requires total grade-separation, and is therefore very costly. Also, not proven in similar corridors; and would require technology development expense.	N/A.	N/A.	Fail – Light rail would cost two to three times the cost of commuter rail with the same ridership numbers as commuter rail. Therefore, the costs of light rail for this corridor are not acceptable compared to commuter rail, by industry standards, for cost effectiveness.
Environmental Consequences						
None of these alternatives were screened on environmental consequences alone. The alternatives failed on reasons of not meeting Purpose and Need, or not being practicable.						

Source: US 36 Mobility Partnership, 2007.

Notes:

¹The Criteria Description categories developed in the NEPA/Section 404 merger process for this project.

TN = Purpose and Need Criteria 1-6

ET = Existing Technology Criteria 1-2

L = Logistics Criteria 1-3

C = Cost Criteria 1

% = percent

AASHTO =

DRCOG =

N/A =

ROW =

US 36 =

American Association of State and Highway Transportation Officials

Denver Regional Council of Governments

not applicable

right-of-way

United States Highway 36

3.4 PACKAGE DEVELOPMENT

Using the evaluation results from the conceptual alternatives phase and the bullets listed below as a guide, the project team developed multi-modal packages for further evaluation in the NEPA process.

- A preliminary assessment of the ability of the combination to meet overall project needs.
- A review of the compatibility of various improvements when combined together in the same package.
- The development of packages that show clear differences in operational characteristics and impacts.

The project team received comments from the Technical Support Committee, Corridor Governments Committee, the public, and agencies regarding possible elements and combinations for packaging.

As a result of public and agency input, four build packages, in addition to Package 1, were developed and carried forward for further analysis. The intent of developing these packages was to focus on the performance of specific transportation modes or combinations of modes that best met the Purpose and Need of the project.

Managed lanes provided a congestion management tool that extended beyond the project horizon. Managed lanes provided new capacity that offered a choice for travelers in the corridor to use the general-purpose lanes or the managed lanes. The managed lanes would be available for use by transit and HOV traffic at no cost and any remaining capacity could be tolled for use by SOV traffic through dynamic pricing. Additionally, revenue from the managed lanes could be used to cover operations and maintenance costs for the lanes and some construction costs, a funding mechanism that is not available in the other packages. This package was identified as Package 2.

Some local stakeholders expressed a preference for additional general-purpose lane capacity in the US 36 corridor as a means to improve mobility. Others expressed a strong interest in examining a BRT-only facility to better serve activity centers along the corridor. This interest included the suggestion that a separate BRT guideway—an exclusive BRT lane running primarily alongside US 36 instead of in the median—could facilitate BRT ridership and travel times in the corridor. Therefore, a package providing additional general-purpose lanes in the corridor and a separate BRT guideway was developed that would focus on facilitating general-purpose automobile traffic in addition to high-speed bus transit service in the corridor. It was designed to focus as much transit ridership as possible onto the bus system. This package was identified as Package 3.

Some local stakeholders expressed strong interest in a package that resembled the LPA in the *US 36 Major Investment Study* (RTD 2001). This package was designed to maximize transportation usage from all modes, focused on additional capacity with a BRT/HOV lane in the median of US 36 that would provide uncongested operations for transit, carpools, and vanpools. Comparing this new capacity with expected demand still left a deficiency; therefore, additional general-purpose lanes were added to meet the remaining demand. This package was identified as Package 4.

Finally, the federal agencies expressed an interest in determining the extent to which the proposed FasTracks Northwest Rail commuter rail (being studied under a separate environmental study) could absorb as much excess demand as possible. Therefore, a package was developed that focused on maximizing commuter rail service (Northwest Rail provided in Package 1 as part of the No Action Package), supplemented by providing express bus service and separate bus/HOV lanes the length of the corridor. These lanes would use slip-ramps to access park-n-Rides alongside US 36. The package would also provide additional general-purpose lanes to increase capacity for the remaining demand. This package was identified as Package 5.

Table 3-6, Packages Developed from Conceptual Alternatives, summarizes the packages that will be carried forward into the FEIS for detailed definition and evaluation.

Table 3-6: Packages Developed from Conceptual Alternatives

Mode Improvement	Package 1: No Action	Package 2: Managed Lanes/BRT	Package 3: General-Purpose Lanes and Exclusive BRT	Package 4: General-Purpose Lanes, HOV, and BRT	Package 5: General-Purpose Lanes and HOV
Transportation management improvements (TSM and TDM) and bikeway		✓	✓	✓	✓
New general-purpose lanes on US 36			✓	✓	✓
HOV		✓		✓	✓
BRT		✓	✓	✓	
Express bus	✓				✓
Managed lanes		✓			
Commuter rail on BNSF Railway ROW	✓				
Method of separating managed/BRT/HOV lanes from general-purpose lanes	N/A	Median barrier	Exclusive guideway (BRT lane)	Median buffer	Median buffer
Station type	N/A	Median (in US 36 ROW)	Side-loading (in US 36 ROW)	Median (in US 36 ROW)	Off-line (outside US 36 ROW or along US 36 ramps), uses existing park-n-Ride network

Source: US 36 Mobility Partnership, 2004.

Notes:

Check marks denote applicable mode improvement.

BRT = bus rapid transit

HOV = high-occupancy vehicle

N/A = not applicable

ROW = right-of-way

TDM = Transportation Demand Management

TSM = Transportation System Management

US 36 = United States Highway 36

Additionally, the packages included two west-end terminus options. During package development, some local stakeholders expressed a desire for bus-only access from the end of the managed lanes or BRT/HOV lanes just west of Cherryvale Road, to continue west to the Table Mesa park-n-Ride in Boulder. As a result, two options were considered at the west-end for the packages. Option A required that buses merge from the managed/BRT/HOV lanes into the general-purpose lanes (along with managed lane SOV and carpool traffic) in order to access the Table Mesa park-n-Ride. Option B included grade-separated bus-only ramps that begin where the managed/BRT/HOV lanes terminate and fly out and over US 36 to provide a direct

connection to the Table Mesa park-n-Ride for buses. Buses in Option B would not be required to merge with general-purpose traffic before accessing the park-n-Ride.

3.5 PACKAGE REVISIONS

With the passage of FasTracks in late 2004 and the provision of local funding for commuter rail and Phase 1 BRT, the definition of alternatives under consideration for the US 36 corridor changed because FasTracks was now part of Package 1. For the purposes of the NEPA analysis, the five packages were redefined as follows:

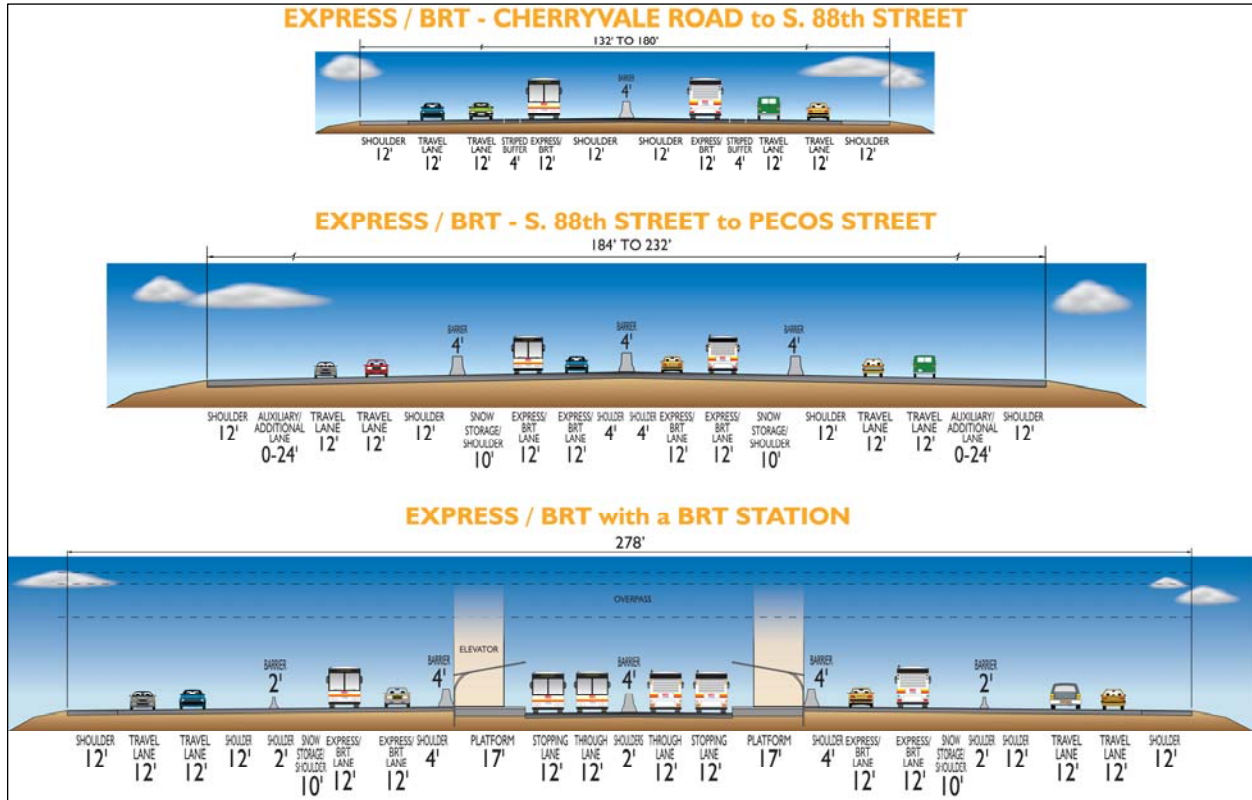
- Package 1 – includes planned or committed improvements in the US 36 corridor. New transit (bus) facilities and services contained in the FasTracks Program are now in this package.
- Package 2: Managed Lanes/Bus Rapid Transit – no change. This package is depicted in Figure 3-2, Typical Sections for Package 2.
- Package 3: General-Purpose Lanes and Exclusive Bus Rapid Transit – no change. This package is depicted in Figure 3-3, Typical Sections for Package 3.
- Package 4 – no longer includes commuter rail service, as it is now included in Package 1. Therefore, Package 4 is renamed General-Purpose Lanes, High-Occupancy Vehicle, and Bus Rapid Transit. This package is depicted in Figure 3-4, Typical Sections for Package 4.
- Package 5 – no longer includes commuter rail service, as it is now included in Package 1. Therefore, Package 5 is renamed General-Purpose Lanes and High-Occupancy Vehicles. This package is depicted in Figure 3-5, Typical Sections for Package 5.

Following the development of the five packages, more detailed design refinement and assessment of transportation performance and environmental impacts were undertaken. More detailed evaluation criteria were defined using the four goals and previous criteria as the starting point.

Design concepts were reviewed with corridor jurisdictions and with the general public. The footprint of the improvements for each package was developed from the concept design work for use in analyzing the extent of environmental impacts.

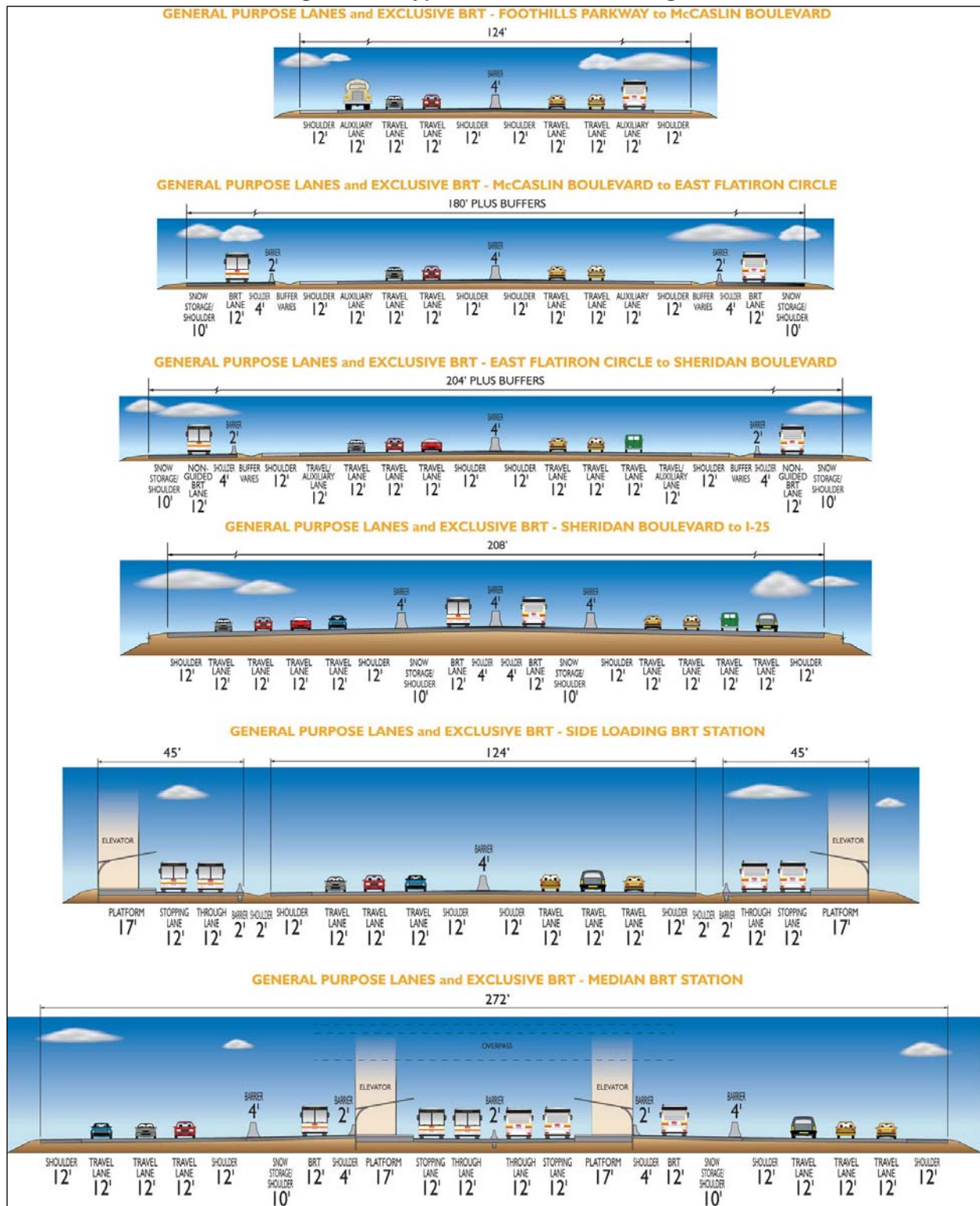
Detailed travel demand forecasts were developed for each package for 2025, since the timing of this analysis occurred when the 2025 DRCOG model was the current model. Highway and transit travel demands were compared among the packages. Capital and annual operating costs were estimated as well as annualized costs to compare to annual transportation benefits.

Figure 3-2: Typical Sections for Package 2



Source: US 36 Mobility Partnership, 2009.

Figure 3-3: Typical Sections for Package 3



Source: US 36 Mobility Partnership, 2006.

Figure 3-4: Typical Sections for Package 4

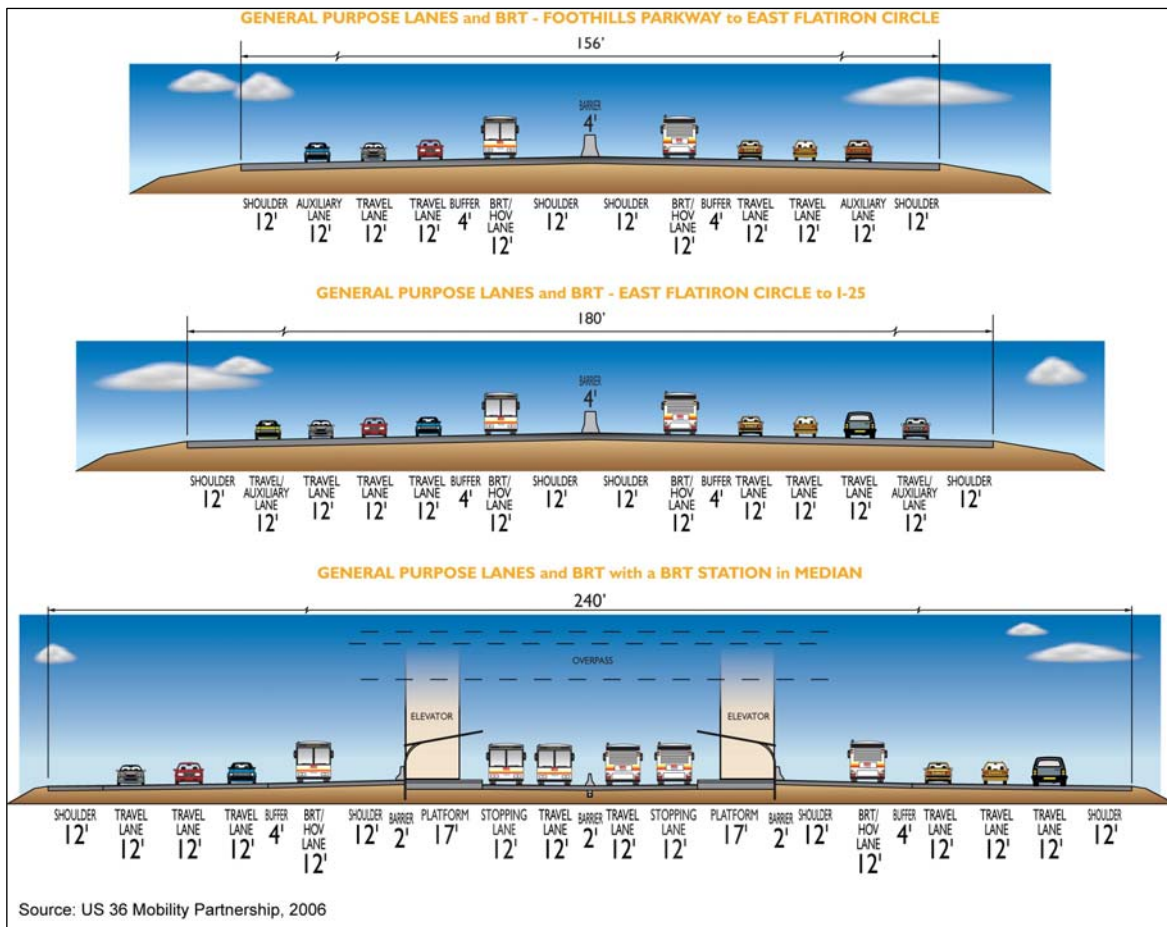
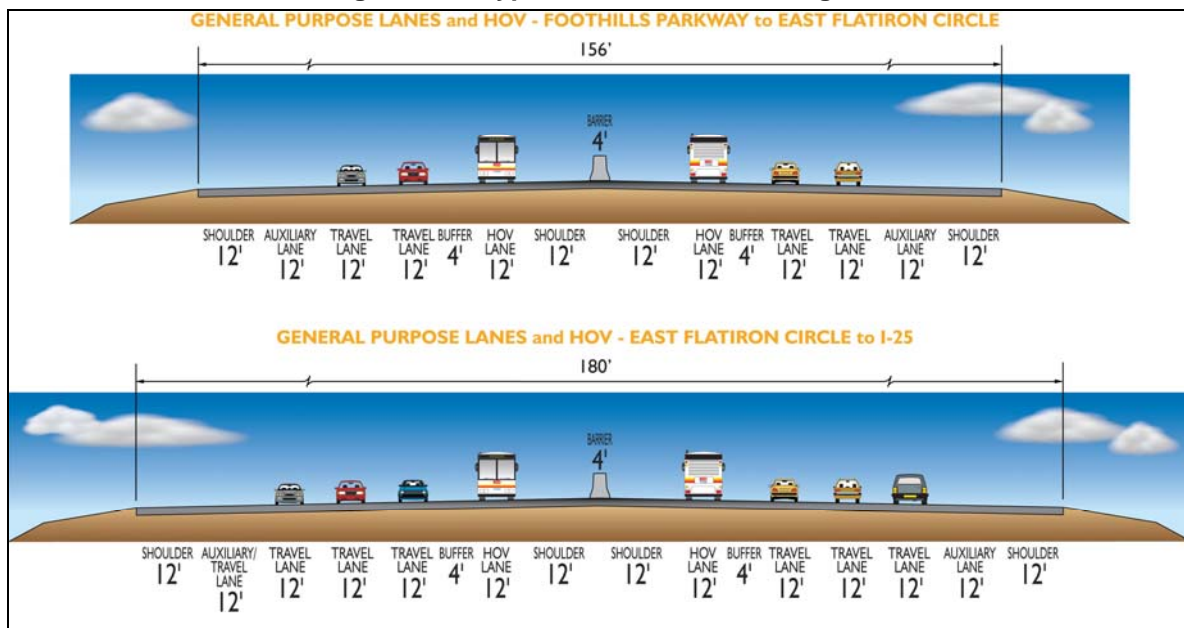


Figure 3-5: Typical Sections for Package 5



Source: US 36 Mobility Partnership, 2006.

Table 3-7, Application of Goals to Evaluation of Packages, lists the evaluation criteria and illustrates the relationship between each criterion and the four goals. For a detailed description of the application of the criteria and results, see *Alternatives Analysis Technical Report: Package Development and Evaluation* (URS 2007).

Table 3-7: Application of Goals to Evaluation of Packages

Goal	Detailed Evaluation Criteria
<p>Goal 1: Improve transportation mobility through and within the US 36 corridor.</p>	<ul style="list-style-type: none"> • Peak-hour capacity at screenline locations • Daily travel demand at screenline location • Freeway levels of service • Peak-period transit mode share at selected screenlines • Daily transit boardings by mode • Daily carpool person-trips • Travel time by mode • Lined and unlinked total daily transit trips • Transit passengers per hour • Daily VMT (corridor and region) • Daily VHT (corridor and region) • Interchange and intersection improvements
<p>Goal 2: Minimize adverse impacts to the socioeconomic and natural environments and foster positive environmental impacts.</p>	<ul style="list-style-type: none"> • Land Use • ROW and relocations • Social impacts and community facilities • Environmental justice • Historic preservation and paleontology • Parks and open space • Air quality • Noise • Biological resources, wildlife, vegetation, and threatened and endangered species • Water resources/floodplains/water quality • Construction-related impacts.
<p>Goal 3: Support the land use vision and future development patterns in the <i>2035 MVRTP</i>, as amended (DRCOG 2009), and local plans and policies.</p>	<ul style="list-style-type: none"> • Compatibility with current land use and transportation policies • Consistency with future land use and transportation plans • Compatibility with existing land uses
<p>Goal 4: Provide a cost-effective and efficient transportation investment strategy.</p>	<ul style="list-style-type: none"> • Capital cost • Annualized cost/increase in peak-hour capacity • Annualized cost/increase in daily demand • Annualized cost/increase in direct transit and/or HOV user

Source: US 36 Mobility Partnership, 2006.

Notes:

Screenline is a collection of parallel facilities analyzed as a group.

2035 MVRTP, as amended = *2035 Metro Vision Regional Transportation Plan*, as amended

HOV = high-occupancy vehicle

ROW = right-of-way

VHT = vehicle hours traveled

VMT = vehicle miles traveled

US 36 = United States Highway 36

3.5.1 Initial Package Evaluation

Each of the packages was evaluated using the four goals developed as part of the Purpose and Need. As with the alternatives evaluation process, the packages were evaluated against each of the goals. For a detailed description of the application of the criteria and results, see *Alternatives Analysis Technical Report: Package Development and Evaluation* (URS 2007).

For the purposes of this Section 404(b)(1) evaluation, the packages are compared below in Table 3-8, Comparison of Packages Using U.S. Army Corps of Engineers Criteria. The same criteria that were used in the earlier stages of general and conceptual alternative selection were refined and used in the package evaluation (see Table 3-5, Alternatives Eliminated During General or Conceptual Evaluation).

Both west-end options, Option A and Option B, were included in the DEIS to gather public and agency comment on the two options. Both options meet the project Purpose and Need. In response to public and agency comments on the DEIS and after subsequent evaluation, a modified Option A is included in the Combined Alternative Package (Preferred Alternative).

Based on the evaluation of the four packages against Purpose and Need, and the goals established for the project, two of the packages (Packages 3 and 5) were eliminated based on lack of ability to meet Purpose and Need. In addition, Package 3 had excessively high cost when compared to the other alternatives.

Package 3 does not include any provision for HOV lanes to serve carpools or vanpools. This package has an exclusive BRT guideway that is used only by buses. Therefore, the carpools and vanpools must operate in mixed traffic and will not have the time savings required to attract users to these high-occupancy modes. This package does not meet the fourth Purpose and Need criteria (TN 4) that calls for increased travel mode options.

There would be no time savings over the SOV user and no efficiency for HOVs. This option would not meet the 1 minute per mile travel time savings for HOVs over SOVs. To be successful, a special lane must offer at least 1 minute of travel time savings per mile over SOV travel in the general-purpose lanes, according to numerous studies, including *Traveler Response to Transportation System Change* (Transit Cooperative Research Program 2000). For this corridor, the travel time savings must be at least 26 minutes over the SOV time, representing 1 minute per mile for the 26 miles between Boulder and downtown Denver. Package 3 offers no travel time savings for HOV users as there is no designated HOV lane. Therefore, this package does not meet the fifth Purpose and Need criteria (TN 5).

As stated above, Package 5 has been eliminated because it does not meet Purpose and Need. This package fails to improve congested interchange intersections necessary for improved access to activity centers in the corridor, thus not meeting the second Purpose and Need criteria (TN 2).

Package 5 provides a separate HOV lane and a bikeway but fails to provide an additional modal option such as a managed lane or transit priority as required to meet the fourth Purpose and Need criteria (TN 4). To meet the criteria, this package would need to provide one additional modal option. Although the HOV lane and bikeway would be included, the added benefit to shift travelers from SOVs to managed lanes or to transit with improved priority or median stops would not be available. This package does not meet the fourth Purpose and Need criteria (TN 4). Due to the lack of ability of this package to meet two of the Purpose and Need categories, it has been eliminated from further consideration.

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Alternatives Definition and Evaluation Process

Table 3-8: Comparison of Packages Using U.S. Army Corps of Engineers Criteria

Criteria Description ¹	Rationale Basis to Screening Criterion	Package 1	Package 2	Package 3	Package 4	Package 5
Purpose and Need						
The Purpose of the action in the US 36 corridor is to improve mobility between Denver and Boulder. The Need for the action is described in TN 1-6, shown below.	N/A.	N/A.	Meets Purpose and Need.	Does not meet Purpose and Need for TN 4 and TN 5.	Meets Purpose and Need.	Does not meet Purpose and Need for TN 2, TN 4, and TN 5.
TN 1 The transportation system needs to respond to continuing population and employment growth, and increased travel demand in the US 36 corridor; corridor capacity is inadequate.	To advance, a package must provide sufficient additional person-carrying capacity to meet 2025-forecasted demand. For the US 36 project, by 2025, 10,000 additional trips will be needed on US 36 at certain locations during the peak rush hour.	Fail – Provides no new highway or transit capacity.	Pass – Meets additional 10,000 peak-hour person trips.	Pass – Meets additional 10,000 peak-hour person trips.	Pass – Meets additional 10,000 peak-hour person trips.	Pass – Meets additional 10,000 peak-hour person trips.
TN 2 Access to existing and planned activity centers is limited. Improvements to access links from the highway are needed.	To advance, a package must provide improved access to existing and planned activity centers by improving congested interchange intersections to reduce delays.	Fail – Does not improve interchange intersections.	Pass – Five interchange intersections improved.	Pass – Two interchange intersections improved.	Pass – Four interchange intersections improved.	Fail – No interchange intersections improved.
TN 3 Congestion relief on the highway is needed to provide for improved traffic operations and shorter travel times.	To advance, a package must provide improved peak-hour LOS to LOS D or better for highway operations compared to the No Action Package. VHT reduction is an indicator of travel time savings. (2025 projected volumes were used at this level of screening. They were subsequently updated to 2030 when this data became available from DRCOG.)	Fail – No improvement in highway lane operations. Number of highway segments at LOS E or LOS F – 11 of 21. Fail – No reduction in VHT.	Pass – Highway segments improved: GP – 3; Managed/HOV – 9; Total – 12. Managed lanes also guarantee LOS D and travel time for SOV users that pay a toll; would improve LOS on all 16 segments. Pass – Daily reduction in VHT versus no action – 40,700.	Pass – Highway segments improved: GP – 4; HOV – 0; Total – 4. Does not provide a separate HOV lane. Pass – Daily reduction in VHT versus No Action – 32,600. Least efficient due to least reduction in VHT.	Pass – Highway segments improved: GP – 6; BRT/HOV – 9; Total – 15. Pass – Daily reduction in VHT versus No Action – 36,500. Improves general purpose congestion best.	Pass – Highway segments improved: GP – 5; HOV – 9; Total – 14. Pass – Daily reduction in VHT versus No Action – 37,000.

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Table 3-8: Comparison of Packages Using U.S. Army Corps of Engineers Criteria

Criteria Description ¹	Rationale Basis to Screening Criterion	Package 1	Package 2	Package 3	Package 4	Package 5
TN 4 Expanded options for mode of travel are needed to reduce reliance on SOV travel.	To advance, a package must provide increased capacity and improved travel times for modal options other than SOV. A package must provide at least three of the following: <ul style="list-style-type: none"> • HOV lane • Managed lane • Transit priority lane or median stops • Bikeway 	Fail – Provides no travel time savings for transit or HOV and does not improve travel time reliability.	Pass – Provides a separate managed lane facility for use by BRT and HOV at no charge; provides median BRT stations for better travel time reliability; provides a bikeway.	Fail – Does not provide a separate HOV lane so carpools and vanpools would have no priority and would not benefit from improved travel time reliability; provides a bikeway.	Pass – Provides a separate HOV lane for BRT and HOV users; provides median BRT stations for better travel time reliability; provides a bikeway.	Fail – Only provides a separate HOV lane and bikeway but does not provide either a managed lane or transit priority with median stops.
TN 5 More efficient operations from improved facilities are needed for BRT and bus service, carpools, and vanpools.	To advance, a package must provide at least 1 minute per mile of travel-time savings for bus and HOV travel time over SOV travel time. (Distance is 26 miles, so must save 26 minutes.)	Fail – Provides no travel time savings for transit or HOV.	Pass – 29 minute travel-time savings over SOV.	Fail – 36 minute travel-time savings over SOV for buses in exclusive BRT guideway, but no travel time savings for HOVs because HOV lane not provided. Does not meet 1 minute per mile travel time savings over SOV for carpools and vanpools.	Pass – 30 minute travel-time savings over SOV for bus and HOV.	Pass – 26 minute travel-time savings over SOV.
TN 6 Existing roadway facilities need to be updated to meet current standards in some locations.	To advance, a package must improve existing design and safety deficiencies to current AA-SHTO standards.	Fail – Provides no new facilities to replace aging infrastructure.	Pass – Improvements will be made.	Pass – Improvements will be made.	Pass – Improvements will be made.	Pass – Improvements will be made.
Practicability Existing Technology						
ET1 Must use proven technology.	To advance, proposed transportation technologies must be tested and proven by successful use in revenue service in similar transportation applications in other locations.	N/A.	Proven technology.	Proven technology.	Proven technology.	Proven technology.
ET2 Must be technically feasible to construct and operate.	To advance, known features or alternatives that are not technically feasible to construct or operate should not be carried forward.	N/A.	Technically feasible.	Technically feasible.	Technically feasible.	Technically feasible.

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Alternatives Definition and Evaluation Process

Table 3-8: Comparison of Packages Using U.S. Army Corps of Engineers Criteria

Criteria Description ¹	Rationale Basis to Screening Criterion	Package 1	Package 2	Package 3	Package 4	Package 5
Practicability Logistics						
L1 Must conform to federal and state laws.	To advance, packages must not violate any applicable federal or state laws. One example would be a package that, if implemented, would violate applicable air quality standards, thereby violating the Clean Air Act.	N/A.	Conforms.	Conforms.	Conforms.	Conforms.
L2 Location of transportation improvements.	To advance, package must be located outside of national parks, wilderness areas, wildlife refuges, and superfund sites.	N/A.	Pass.	Pass.	Pass.	Pass.
L3 Social feasibility.	To advance, a package must be socially feasible. An example of a package that might not be socially feasible would be one that would require extensive relocation of numerous families or businesses within one or more neighborhoods.	None.	Business Relocations – 46. Residential Relocations – 163.	Business Relocations – 46. Residential Relocations – 164.	Business Relocations – 52. Residential Relocations – 168.	Business Relocations – 46. Residential Relocations – 163.
Environmental Consequences						
Direct Wetland Impacts with Option A.	N/A.	0.00 acre.	T = 21.38 acres.	N/A – This option requires a direct connection to Table Mesa park-n-Ride.	T = 20.44 acres.	T = 18.96 acres.
Other Waters Impacts with Option A.	N/A.	0.00 acre.	T = 4.34 acres.	N/A – This option requires a direct connection to Table Mesa park-n-Ride.	T = 4.13 acres.	T = 2.00 acres.
Total for Packages with Option A		0.00 acre.	T = 25.72 acres.	N/A – This option requires a direct connection to Table Mesa park-n-Ride.	T = 24.57 acres.	T = 20.96 acres.
Direct Wetland Impacts with Option B.	N/A.	0.00 acre.	T = 27.48 acres.	T = 24.71 acres.	T = 25.07 acres.	T = 24.71 acres.
Other Waters Impacts with Option B.	N/A.	0.00 acre.	T = 4.59 acres.	T = 2.56 acres.	T = 4.35 acres.	T = 2.22 acres.

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Alternatives Definition and Evaluation Process

Table 3-8: Comparison of Packages Using U.S. Army Corps of Engineers Criteria

Criteria Description ¹	Rationale Basis to Screening Criterion	Package 1	Package 2	Package 3	Package 4	Package 5
Total for Packages with Option B	N/A.	0.00 acre.	T = 32.07 acres.	T = 27.27 acres.	Package 4	Package 5
Option B versus Option A additional wetland direct impacts.	N/A.	0.00 acre.	T = +6.10 acres.	N/A.	T = 29.42 acres.	T = 25.81 acres.
Option B versus Option A other waters impacts.	N/A.	0.00 acre.	T = +0.25 acre.	N/A.	T = +4.63 acres.	T = +4.63 acres.
					T = +0.22 acre.	T = +0.22 acre.

Source: US 36 Mobility Partnership, 2007; and URS, 2009b.

Notes:

¹The Criteria Description categories developed in the NEPA/Section 404 merger process for this project.

TN = Purpose and Need Criteria 1-6

ET = Existing Technology Criteria 1-2

L = Logistics Criteria 1-3

C = Cost Criteria 1-2

\$ = dollars

% = percent

+ = Option B has the listed amount more acres of impacts over Option A

AASHTO = American Association of State and Highway Transportation Officials

BRT = bus rapid transit

DRCOG = Denver Regional Council of Governments

FHWA =

FTA = Federal Highway Administration

HOV = high-occupancy vehicle

LOS = level of service

N/A = not applicable

SOV = single-occupant vehicle

T = total (jurisdictional plus non-jurisdictional)

TN = transportation needs

US 36 = United States Highway 36

VHT = vehicle hours traveled

It should be noted that 2025 data were used for the evaluation in the comparison table because the 2025 data were the most up to date data available from DRCOG at the time of the evaluation. Since then, additional evaluation has been performed and the most current data (2030 at that time) were used for the next evaluation step. Comparison of the 2025 and 2030 data show that there is only a 2 percent variation in travel demand in the corridor. That slight difference does not affect the screening conclusions for Packages 3 and 5.

3.5.1.1 Impacts to Aquatic Resources

Wetlands were mapped along with other types of aquatic features and natural resources as part of the preparation of the FEIS. Combinations of aerial photography reviews, as well as field confirmations, were used to map wetlands, aquatic features, and natural resources.

Based on field investigations, approximately 70 acres of wetlands are located in the wetland study area. The wetland study area is defined as 300 feet to each side of the centerline of US 36. The entire 600-foot envelope will not be impacted by any of the alternatives, but was used to set the site-specific context to study the existing environment.

The majority of high quality wetlands (about 52 acres) are found along US 36 as it crosses the South Boulder Creek floodplain near Boulder. Other wetlands in the corridor are located in and along natural and man-made drainages, irrigation ditches, stormwater runoff ditches, or in other low-lying areas. When a modified version of the Montana Department of Transportation Wetland Functional Assessment Method (Berglund 1999) was applied, the South Boulder Creek floodplain wetlands rated high in the following functional areas: threatened and endangered species habitat, Colorado Natural Heritage Program habitat, general wildlife habitat, sediment/nutrient/toxicant removal, shoreline stabilization, and production export/food chain support (URS 2004b). The South Boulder Creek floodplain rated high for these functions because it:

- Contains intact stands of tallgrass prairie that provide high quality habitat.
- Provides habitat for the federally listed Preble's meadow jumping mouse and Ute ladies'-tresses orchid.
- The floodplain contains dense vegetation that uptake nutrients and toxicants and filter sediments.
- Creeks and drainages within the floodplain are vegetated by dense stands of sediment-binding willows (*Salix exigua* and *Salix amygdaloides*) that provide shoreline stabilization.
- Contains vegetative communities with structural diversity, wetlands with surface and subsurface outlets to promote export, and wetlands with standing water that increase use by fish, aquatic invertebrates, and amphibians to promote food chain support.

Using a standard classification system (Cowardin et al. 1979), the wetlands can be placed into four groups, including palustrine emergent (PEM), palustrine scrub/shrub (PSS), palustrine emergent and palustrine scrub/shrub combination (PEM/PSS), and palustrine forested (PFO).

PEM wetlands are defined as those wetlands that are dominated by erect and rooted herbaceous plants (Cowardin et al. 1979). These wetlands encompass approximately 59.27 acres in the study area. These wetlands are commonly dominated by cattails (*Typha* spp.), bulrushes

(*Scirpus* spp.), sedges (*Carex* spp.), rushes (*Juncus* spp.), and various other forbs. PFO wetlands are defined as those wetlands that are dominated by woody vegetation greater than 20 feet tall (Cowardin et al. 1979). These wetlands encompass approximately 0.44 acre in the study area and are found only at the US 36 crossing of Coal Creek. These wetlands contain an herbaceous layer similar to that described for PEM wetlands with an overstory dominated by peachleaf willow (*Salix amygdaloides*), crack willow (*Salix fragilis*), green ash (*Fraxinus pennsylvanica*), and plains cottonwood (*Populus deltoides*). These trees are rooted both inside and outside of the wetland boundary and create a closed canopy over the wetlands.

Package 2 has higher total impacts to wetlands and other waters primarily over Packages 3, 4, and 5 because of the drop-ramp locations and a wider footprint in some segments. Two design options are being considered for the project terminus at Foothills Parkway/Table Mesa Drive. These options provide a slightly different connection between the Table Mesa Station and US 36. Package 2 has an additional 6.4 acres of impacts (for a total of 32.1 acres) associated with Option B, which is also the highest wetland and other waters impact of all the packages. The other build packages have 4.9 more acres of wetland and other waters impacts for Option B over Option A, where applicable. The section that follows the Combined Alternative Package (Preferred Alternative) presents wetland and other waters impact of only 23.6 acres that has a modified Option A as part of the total impacts (Option B was not considered for this build package). This is the lowest of all package impacts (except for Package 5, Option A, that has 21 acres of impacts), other than Package 1, which has no wetland impacts associated with it.

In a similar fashion, impact acreages for “other” water features are defined as irrigation ditches, natural waterways, ponds, and reservoirs. An additional 0.2 acre of other waters impact would be associated with Option B. Wetland impacts calculated for the Combined Alternative Package (Preferred Alternative) are based on the total footprint of proposed construction footprint and represent the maximum acreage that could potentially be impacted by the project (the worst-case scenario). Engineering refinements and design modifications will be implemented into the final design whenever possible to avoid or minimize wetland impacts. It is expected that final wetland impact acreages will be less than the maximum calculated for the Combined Alternative Package (Preferred Alternative).

3.5.2 Summary of Comparative Analysis

From an environmental standpoint, Packages 3, 4, and 5 have fewer acres of impacts to wetlands and waters of the U.S. than Package 2. This is because of differences in the construction of lanes and highway features such as drop-ramps.

However, after a more thorough and detailed review of the operational features of the packages, Packages 3 and 5 clearly do not serve the mobility goals of Purpose and Need of the project. Additionally, Package 3 is not practicable in terms of cost.

The project team proposed to eliminate Packages 3 and 5, and concentrate on evaluating Packages 1, 2, and 4 in detail in the DEIS.

3.5.2.1 Reasons for Eliminating Packages 3 and 5

Package 3: General-Purpose Lanes and Exclusive Bus Rapid Transit

- Package 3 does not meet Purpose and Need because it does not include provisions for HOV lanes (TN 4 and TN 5 in Table 3-8, Comparison of Packages Using U.S. Army Corps of Engineers Criteria).
- Package 3 does not meet Purpose and Need because it fails to provide enough reduction in highway travel time (TN 4 and TN 5 in Table 3-8). It does not meet 1 minute per mile travel time savings for HOV users over SOV because a separate lane is not available for carpools.

Package 5: General-Purpose Lanes and High-Occupancy Vehicles with Express Bus

- Package 5 does not meet Purpose and Need because it does not improve interchange intersections providing improved access to activity centers (TN 2 in Table 3-8).
- Package 5 fails to meet Purpose and Need because it does not provide at least three other modal options in addition to the general-purpose lanes. Only a new HOV lane and a bikeway would be built. The additional modal options of a managed lane or transit priority or median stops would not be provided (TN 4 in Table 3-8.)

3.5.3 Recommendations

As described above, the following three packages were considered reasonable at this screening stage and were carried forward for further study:

- Package 1 (No Action)
- Package 2 (Managed Lanes/Bus Rapid Transit)
- Package 4 (General-Purpose Lanes, High-Occupancy Vehicle, and Bus Rapid Transit)

The following packages, as shown in Figure 3-6, Revised Packages as a Result of Independent Utility Action, were carried forward for evaluation in the DEIS.

Figure 3-6: Revised Packages as a Result of Independent Utility Action

Packages Fully Evaluated in the DEIS	PACKAGE 1 NO ACTION	PACKAGE 2 MANAGED LANES/ BRT	PACKAGE 4 GENERAL-PURPOSE LANES, HIGH-OCCUPANCY VEHICLE, BUS RAPID TRANSIT
FEATURE			
Transportation Management & Bikeway		✓	✓
Additional General-Purpose Lanes on US 36			✓
High-Occupancy Vehicle (HOV) Lanes		✓	✓
Managed Lanes		✓	
Bus Rapid Transit (BRT) with Stations		✓	✓
Express Bus	✓		
Commuter Rail on BNSF	✓		

Source: US 36 Mobility Partnership, 2009.

4.1 DEVELOPMENT OF THE COMBINED ALTERNATIVE PACKAGE (PREFERRED ALTERNATIVE)

The information provided in this section was taken directly from Chapter 2, Alternatives Considered, of the US 36 Corridor FEIS. The two following sections (Section 5, Combined Alternative Package [Preferred Alternative] Impact Evaluation, and Section 6, Compensatory Mitigation) outline the impacts of the Combined Alternative Package (Preferred Alternative), discuss the LEDPA, and address compensatory mitigation.

As described in Section 3, Alternatives Definition and Evaluation Process, the following three packages were considered reasonable and were carried forward for further study in the DEIS:

1. **Package 1:** No Action
2. **Package 2:** Managed Lanes/Bus Rapid Transit
3. **Package 4:** General-Purpose Lanes, High-Occupancy Vehicle, and Bus Rapid Transit

Comments received during the DEIS comment period identified public and agency interest in minimizing community and environmental impacts and reducing project costs, while providing increased mobility improvements throughout the US 36 corridor.

To respond to public and agency comments, a Preferred Alternative Committee (PAC), comprised of agency representatives, elected officials, and technical staff from local jurisdictions, was convened in January 2008. The purpose of the PAC was to recommend a Preferred Alternative for inclusion in the FEIS. The PAC reviewed and addressed DEIS public comments, evaluated corridor elements, identified a Preferred Alternative, and outlined implementation phases.

In July 2008, the PAC recommended a multi-modal transportation solution known as the Combined Alternative Package (Preferred Alternative). The Combined Alternative Package (Preferred Alternative) includes both transit and highway improvements that are responsive to the public and provide long-term transportation benefits.

4.2 PACKAGE DESCRIPTIONS

This section describes Package 1 and the Combined Alternative Package (Preferred Alternative) in detail. Each description covers roadway, transit, and pedestrian/bikeway improvements by segments. There are six segments in the corridor that were grouped together and that are generally defined as follows:

Denver and Adams Segments – I-25 from downtown Denver to US 36, and US 36 from I-25 to Sheridan Boulevard/88th Street. Interchanges along US 36 in these segments include Broadway, Pecos Street, and Federal Boulevard.

Westminster and Broomfield Segments – US 36 from Sheridan Boulevard/88th Street to Interlocken Loop/StorageTek Drive. Interchanges along US 36 in these segments include Sheridan Boulevard/92nd Avenue, Church Ranch Boulevard/104th Avenue, Wadsworth Parkway/120th Avenue, East Flatiron Circle, and Interlocken Loop/StorageTek Drive.

Superior/Louisville and Boulder Segments – US 36 from Interlocken Loop/StorageTek Drive to Foothills Parkway/Table Mesa Drive. Interchanges along US 36 in these segments include West Flatirons Circle, McCaslin Boulevard, and Foothills Parkway/Table Mesa Drive.

4.2.1 Package 1: No Action

Although it does not meet the Purpose and Need of the project, Package 1 must be considered throughout the NEPA process for comparison purposes to the build packages, pursuant to Council on Environmental Quality requirements. Package 1 does not propose any new build elements for US 36. However, the package assumes that committed improvements, like the Northwest Rail Corridor Project, bus, and park-n-Ride improvements from the locally funded FasTracks Program, would be implemented as planned by others. Figure 4-1, Package 1: No Action, is a map depicting this package.

The 2004 *FasTracks Plan* (RTD 2004) included seven rail stations for the Northwest Rail commuter rail line. Those stations were located at Twin Peaks in Longmont, Gunbarrel, Boulder Transit Village, Downtown Louisville, Flatiron in Broomfield, Church Ranch Boulevard, and South Westminster. Additional rail stations at 88th Avenue/Sheridan Boulevard in Westminster, 116th Avenue in Broomfield, and 63rd Avenue/Arapahoe Road in Boulder, were added in the early planning stages of the US 36 EIS at the request of corridor stakeholders when the Northwest Rail Corridor and US 36 projects were one combined project. The exact station locations and amenities at each station will be determined in the USACE/RTD Northwest Rail Environmental Assessment/Environmental Evaluation, now a separate study.

4.2.1.1 Denver and Adams Segments

Roadway

The I-25 corridor is an urban freeway with reversible express lanes from 20th Street north to 84th Avenue, just north of US 36. I-25 has major interchanges with I-70, I-76, and I-270, where it also connects with US 36. The express lanes are open southbound to traffic going into downtown in the morning, and northbound out of downtown in the evening. Westbound on US 36, the managed lane extends to Federal Boulevard, and from Pecos Street to I-25 in the eastbound direction. While there are numerous auxiliary lanes in these corridors, there are typically three general-purpose lanes in each direction on I-25 and US 36 in these segments. In addition, Package 1 includes 80th Avenue reconstruction where it crosses over US 36.

Figure 4-1: Package 1: No Action



Note: The 116th Avenue Rail Station is not a part of the 2004 FasTracks Program. Additional stations were added in the early planning stages of the US 36 Environmental Impact Statement. Exact rail station locations and additional stations may be reconsidered in the U.S. Army Corps of Engineers/Regional Transportation District Northwest Rail Environmental Assessment/Environmental Evaluation.

Transit

As shown in Table 4-1, Parking and Pedestrian Crossings at Transit Stations, there are three transit stations in these segments. The Denver Segment contains DUS, and the Adams Segment contains the Broadway park-n-Ride and the South Westminster Rail Station.

DUS is currently the railroad terminal for passenger service in the Denver metropolitan area handling RTD light rail and Amtrak services. DUS would be upgraded in Package 1 as part of the FasTracks Program. Improvements planned are to consolidate existing and future LRT tracks; the 16th Street Mall shuttle turn-around; passenger rail tracks from the Gold Line corridor, Northwest Rail corridor, North Metro corridor, and East corridor; regional bus (including the relocation of the existing Market Street bus station); and the future downtown circulator and pedestrian circulation into one multi-modal transportation center.

As a result of Package 1, 25 buses would enter downtown Denver from US 36 during the peak-hour. Twenty-two of these buses would serve DUS. Buses would no longer serve the downtown Denver Market Street Transfer Station, but the remaining four buses would serve the Civic Center Transfer Station to and from I-25 on 19th Street and 20th Street.

No improvements to the station, parking, or access at the Broadway park-n-Ride are planned as part of Package 1.

Pedestrian/Bicycle

There are no pedestrian or bicycle improvements as part of Package 1. Existing bicycle facilities, such as the Little Dry Creek Trail, Clear Creek Trail, and Platte River Trail system, would be used by pedestrians and bicyclists in these segments.

4.2.1.2 Westminster and Broomfield Segments

Roadway

US 36 is typically two lanes in each direction in the Westminster and Broomfield segments. There is an auxiliary lane in each direction between Wadsworth Boulevard and East Flatiron Circle. In addition, 120th Avenue would be extended west across US 36 to link with State Highway 128 at Wadsworth Parkway.

SECTION FOUR

Combined Alternative Package (Preferred Alternative)

Table 4-1: Parking and Pedestrian Crossings at Transit Stations

Segment	Station Name	Station Type: Package 1	Parking Spaces and Pedestrian Crossings: Package 1	Station Type: Combined Alternative Package (Preferred Alternative)	Parking Spaces and Pedestrian Crossings: Combined Alternative Package (Preferred Alternative)	Station Changes between Package 1 and the Combined Alternative Package (Preferred Alternative)
Denver and Adams Broomfield	Denver Union Station (17 th Street/Wynkoop Street)	Multi-modal hub	N/A	Multi-modal hub	N/A	None
	Westminster Center (US 36/Sheridan Boulevard)	park-n-Ride	park-n-Ride east side: 874 spaces (in existing parking structure) park-n-Ride west side: 351 spaces Total spaces: 1,225 Existing pedestrian bridge overpass	BRT	BRT east side: 874 spaces (in existing parking structure) BRT west side: 500 spaces Total spaces: 1,374 Pedestrian bridge overpass	+149 spaces on west side Replace existing pedestrian bridge overpass
	Church Ranch/104 th Avenue	park-n-Ride/rail	park-n-Ride east side: 144 spaces park-n-Ride west side: 252 spaces Rail west side: 230 spaces ¹ Total spaces: 626 Existing pedestrian (and vehicular) underpass	BRT/rail	park-n-Ride east side: 144 spaces park-n-Ride west side: 252 spaces Rail west side: 230 spaces ¹ Total spaces: 626 Pedestrian (and vehicular) underpass	No parking Replace existing pedestrian (and vehicular) underpass
	116 th Avenue ² (US 36/116 th Avenue)	park-n-Ride/rail	park-n-Ride west side: 940 spaces (200 dedicated spaces and 740 shared spaces in existing joint-use parking structure) park-n-Ride east side: none Rail east side: 360 spaces ¹ Total spaces: 1,300 Planned pedestrian bridge overpass	BRT/rail	park-n-Ride west side: 940 spaces (200 dedicated spaces and 740 shared spaces in existing joint-use parking structure) park-n-Ride east side: 870 spaces Rail east side: 360 spaces ¹ Total spaces: 2,170 Pedestrian bridge overpass	+870 spaces on east side Extend pedestrian bridge overpass
	Flatiron (US 36/96 th Street)	park-n-Ride/rail	park-n-Ride/rail east side: 250 spaces ¹ Total spaces: 250 Existing pedestrian underpass	BRT/rail	park-n-Ride/rail east side: 250 spaces ¹ Total spaces: 250 Pedestrian underpass	No parking Extend existing pedestrian underpass

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Combined Alternative Package (Preferred Alternative)

Table 4-1: Parking and Pedestrian Crossings at Transit Stations

Segment	Station Name	Station Type: Package 1	Parking Spaces and Pedestrian Crossings: Package 1	Station Type: Combined Alternative Package (Preferred Alternative)	Parking Spaces and Pedestrian Crossings: Combined Alternative Package (Preferred Alternative)	Station Changes between Package 1 and the Combined Alternative Package (Preferred Alternative)
Superior/Louisville and Boulder	McCaslin (US 36/McCaslin Boulevard)	park-n-Ride	park-n-Ride south side: 294 spaces park-n-Ride north side: 172 spaces Total spaces: 466 Existing pedestrian bridge overpass	BRT	park-n-Ride south side: 178 spaces park-n-Ride north side: 10 spaces Total spaces: 188 ³ Pedestrian bridge overpass	Loss of 116 spaces on south side Loss of 162 spaces on north side 278 total spaces lost (due to interchange expansion) Modify existing pedestrian bridge overpass
	Table Mesa (US 36/Table Mesa Drive)	park-n-Ride	park-n-Ride east side: 825 spaces (in existing parking structure) Total spaces: 825 Planned pedestrian bridge overpass	BRT	Side-loading park-n-Ride east side: 825 (in existing parking structure) spaces Total spaces: 825	No parking Modify pedestrian bridge overpass
	Boulder Transit Village (30 th Street/Pearl Street)	Boulder Transit Village Super Stop	park-n-Ride: 100 spaces Rail: 280 spaces ¹ Total spaces: 380	Super Stop	park-n-Ride: 100 spaces Rail: 280 spaces ¹ Total spaces: 380	None
	Boulder Transit Center (14 th Street/Walnut Street)	Multi-modal transfer center	N/A	Multi-modal transfer center	N/A	None

Source: US 36 Mobility Partnership, 2009.

Notes:

¹Estimated based on concept plans from the U.S. Army Corps of Engineers/Regional Transportation District Northwest Rail Environmental Assessment/Environmental Evaluation.

²These rail stations are not a part of the 2004 FasTracks Program. Additional stations were added in the early planning stages of the US 36 Environmental Impact Statement. Exact rail station locations and additional stations may be reconsidered in the U.S. Army Corps of Engineers/Regional Transportation District Northwest Rail Environmental Assessment/Environmental Evaluation.

³The loss of parking spaces would be mitigated as described in Chapter 3, Transportation Impacts and Mitigation of the US 36 Corridor FEIS.

+ = additional

BRT = bus rapid transit

N/A = not applicable

US 36 = United States Highway 36

Transit

There are four transit stations in these segments: the Westminster Segment contains the Westminster Center park-n-Ride and the Church Ranch/104th Avenue Station. The 116th Avenue Station and the Flatiron Station are located in the Broomfield Segment.

The South Westminster Station would be constructed as part of the Northwest Rail Corridor Project. The exact location and parking spaces associated with this station would be determined as part of that project.

In Package 1, all the park-n-Rides and park-n-Ride/rail stations for the Westminster and Broomfield segments would have parking on both sides of US 36, except the 116th Avenue park-n-Ride. The 116th Avenue park-n-Ride would have parking on the south side of US 36, a pedestrian crossing to connect the parking areas, and would be accessed by buses on US 36 via bus pull-outs. Rail stations would also have a boarding platform to access the Northwest Rail line. The type of pedestrian crossing (underpass or bridge over US 36), and parking associated with each station are listed in Table 4-1, Parking and Pedestrian Crossings at Transit Stations.

Queue jumps would be provided in both directions at Church Ranch Boulevard and the westbound on-ramp at Interlocken Loop.

Pedestrian/Bicycle

There would be no pedestrian or bicycle improvements as part of Package 1 in these segments. In Package 1, there are no existing continuous bikeway facilities adjacent to US 36 in the Westminster Segment. In the Broomfield Segment, on the south side of US 36, there is a multi-use path that extends from East Flatiron Circle to West Flatiron Circle through Interlocken and the Flatiron Crossing.

4.2.1.3 Superior/Louisville and Boulder Segments

Roadway

US 36 is typically two lanes in each direction in the Superior/Louisville and Boulder segments. In the Superior/Louisville Segment, the Northwest Parkway connects to US 36 via 96th Street. In the Boulder Segment, Cherryvale Road would be reconstructed where it crosses over US 36.

Transit

There are four stations located in the Boulder Segment, and two in the Superior/Louisville Segment. There are two stations associated with the Northwest Rail Corridor Project, the Downtown Louisville and Gunbarrel West rail stations. There are two park-n-Rides, located at McCaslin Boulevard and Table Mesa Drive. The Boulder Transit Center would have bus service, while the Boulder Transit Village would have both bus and rail service.

The Downtown Louisville and Gunbarrel rail stations would be constructed as part of the Northwest Rail Corridor Project. The exact location and parking spaces associated with these stations would be determined as part of that project.

As shown in Table 4-1, Parking and Pedestrian Crossings at Transit Stations, both park-n-Rides would have parking. However, parking for the McCaslin park-n-Ride would be on both sides of US 36, while the Table Mesa park-n-Ride would only have parking on the north side of US 36. Both park-n-Rides would be accessed from the highway by bus pull-outs and have a pedestrian bridge over US 36.

The City of Boulder has prepared a redevelopment plan for the Boulder Transit Village, which would be located at 33rd Street and Valmont Road in Boulder, west of the Northwest Rail Corridor Project. In Package 1, three in-bound buses would access the Boulder Transit Village during the peak-hour. The City of Boulder is building enhanced bus stops along 28th Street called super stops. Super stops include amenities for transferring transit customers (such as shelter, seating, schedule information, fare payment systems, supporting retail, etc.) and quality connections to important community destinations (such as improved roadway crossings, multi-paths, pedestrian connections, signage, and wayfinding systems). These buses would stop at the super stops and terminate at the Boulder Transit Village.

No improvements to the station, parking, or access at the Boulder Transit Center are planned as part of Package 1. However, fourteen in-bound buses would access the Boulder Transit Center during the peak hour as a result of this package.

A queue jump would be provided in the westbound direction at McCaslin Boulevard.

Pedestrian/Bicycle

There will be no pedestrian or bicycle improvements as part of Package 1 in the Superior/Louisville and Boulder segments. In Package 1, there are no continuous bikeway facilities adjacent to US 36 in the Superior/Louisville Segment. In the Boulder Segment, there is a bike route located along South Boulder Road and Cherryvale Road. In addition, US 36 itself is designated as a bike route from McCaslin Boulevard to Baseline Road.

**4.3 COMBINED ALTERNATIVE PACKAGE (PREFERRED ALTERNATIVE):
MANAGED LANES, AUXILIARY LANES, AND BUS RAPID TRANSIT**

Appendix A, Corridor Reference Maps, of the US 36 Corridor FEIS contains drawings of this package. An overview of the package elements is shown in Figure 4-2, Combined Alternative Package (Preferred Alternative): Managed Lanes, Auxiliary Lanes, and Bus Rapid Transit. Typical sections for this package are shown in Figure 4-3, Typical Sections for the Combined Alternative Package (Preferred Alternative), and Figure 4-4, Bikeway Typical Section.

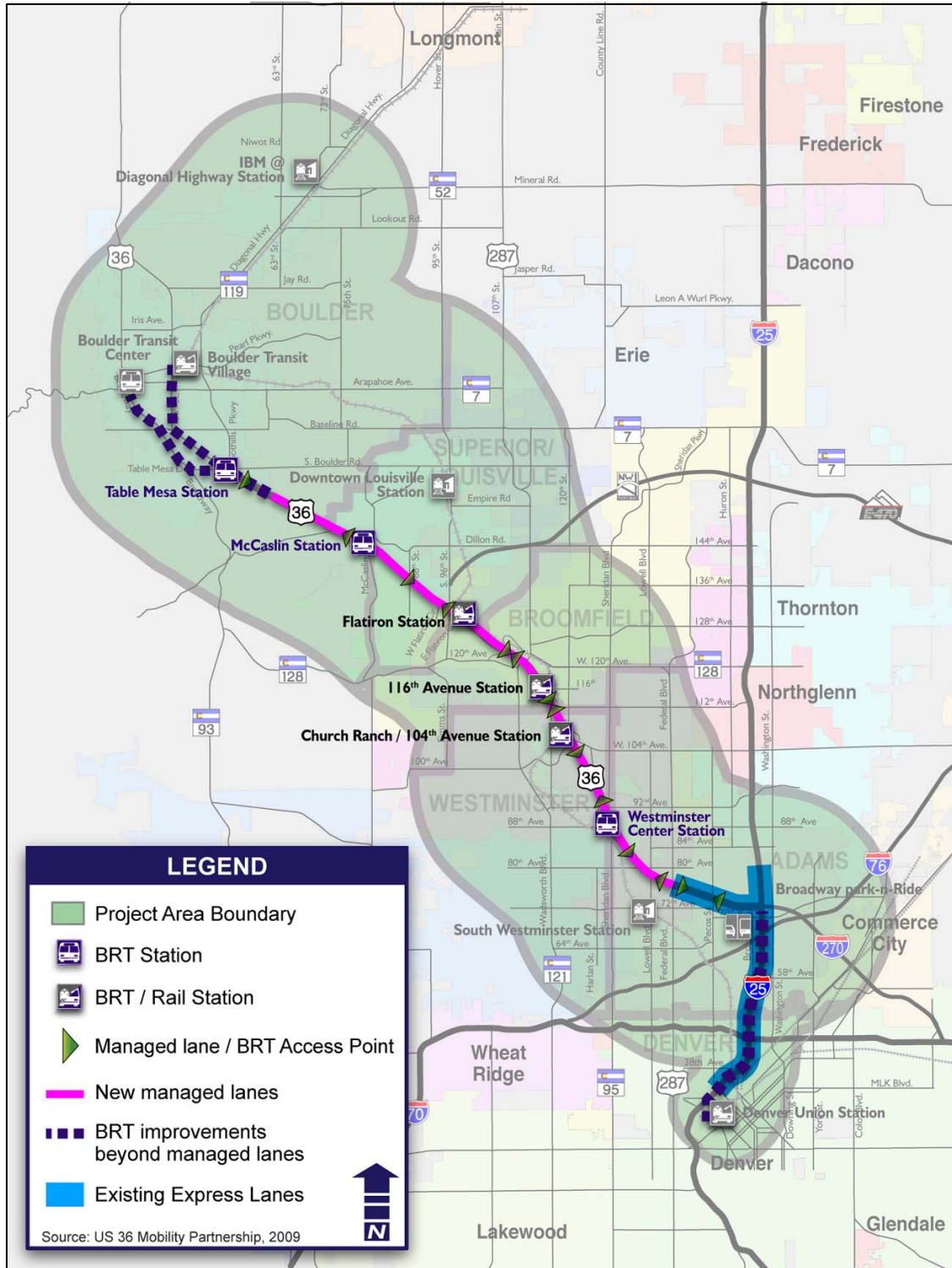
In general, the Combined Alternative Package (Preferred Alternative) would add one managed lane in each direction on US 36 and auxiliary lanes between most interchanges. The managed lanes would connect to and be an extension of the existing I-25 express lanes that go to and from downtown Denver. The reversible managed lane between I-25 and Pecos Street would remain and traffic would continue to use the existing I-25/US 36 managed lane ramp. The managed lanes from Pecos Street to West of Cherryvale Road in Boulder would be in both directions, located adjacent to the median of US 36, and separated from the general-purpose lanes by a painted buffer. Buses would exit the highway to pick up and drop off passengers at stations located on ramps and adjacent park-n-Rides. Bypass lanes would be provided at all on-ramps, with the exception of Foothills Parkway eastbound, Federal Boulevard, Pecos Street, and Broadway. Access to the managed lane would be provided at separate ingress and egress points located between each interchange. The general location of these access points is shown on Figure 4-2, Combined Alternative Package (Preferred Alternative): Managed Lanes, Auxiliary Lanes, and Bus Rapid Transit. Table 4-2, Combined Alternative Package (Preferred Alternative) — Managed Lane Access Points, lists the locations where slip-ramp access to the managed lanes would be provided.

**Table 4-2: Combined Alternative Package (Preferred Alternative) —
Managed Lane Access Points**

Access Location	Description
Cherryvale Road	Eastbound entrance; westbound exit
West of McCaslin Boulevard	Eastbound exit; westbound entrance
East of McCaslin Boulevard	Eastbound entrance; westbound exit
West of West Flatiron Circle	Eastbound entrance; westbound exit
East of East Flatiron Circle	Eastbound exit; westbound entrance
West of Wadsworth Boulevard	Eastbound entrance; westbound exit
West of 120 th Avenue	Eastbound exit; westbound entrance
West of 104 th Avenue/Church Ranch Boulevard	Eastbound entrance; westbound exit
East of 104 th Avenue/Church Ranch Boulevard	Eastbound exit; westbound entrance
West of Sheridan Boulevard	Eastbound entrance; westbound exit
East of Sheridan Boulevard	Eastbound exit; westbound entrance
West of Federal Boulevard	Eastbound entrance; westbound exit
East of Federal Boulevard	Eastbound exit; westbound entrance
West of Pecos Street	Eastbound entrance; westbound exit

Source: US 36 Mobility Partnership, 2009.

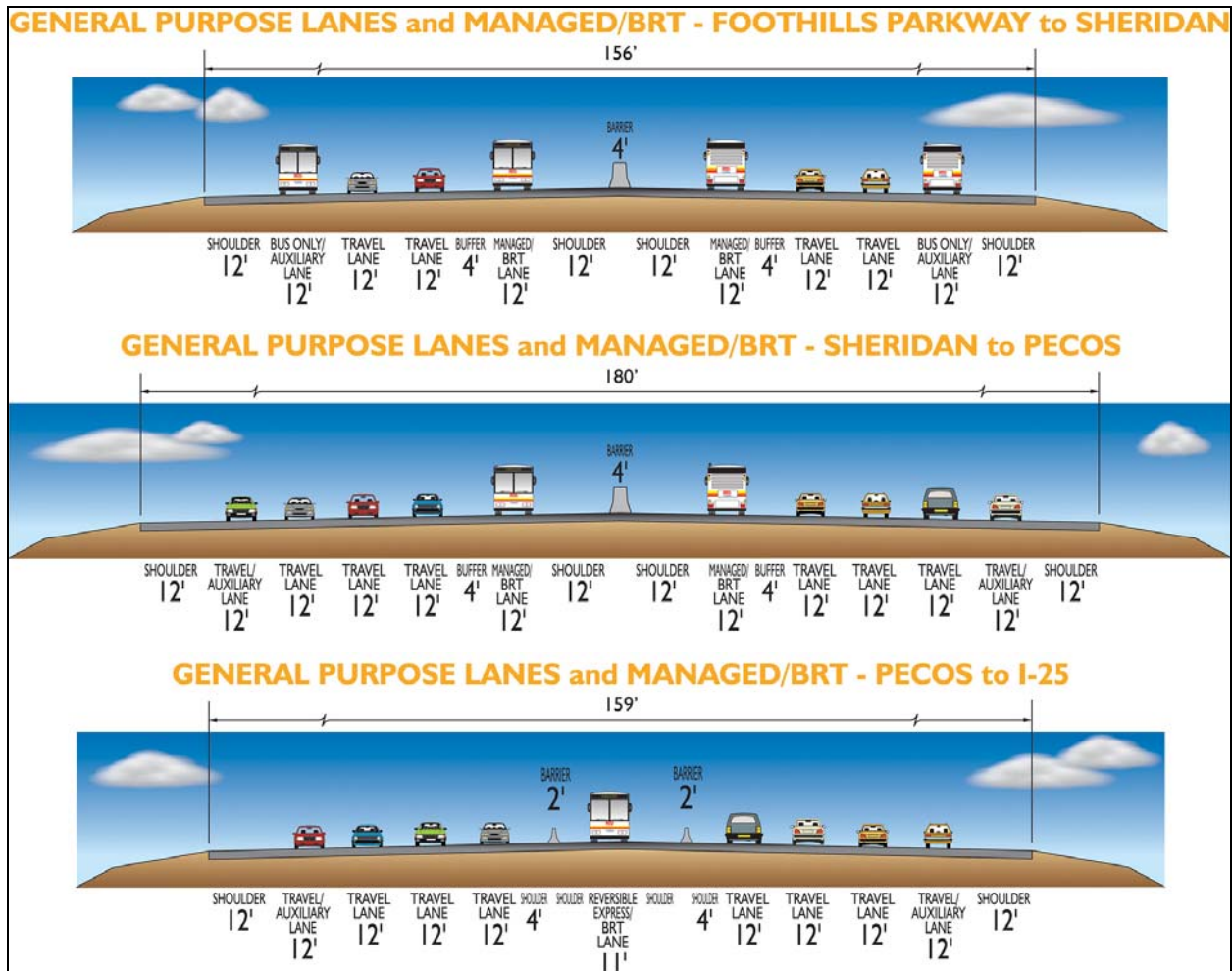
**Figure 4-2: Combined Alternative Package (Preferred Alternative):
Managed Lanes, Auxiliary Lanes, and Bus Rapid Transit**



SECTION FOUR

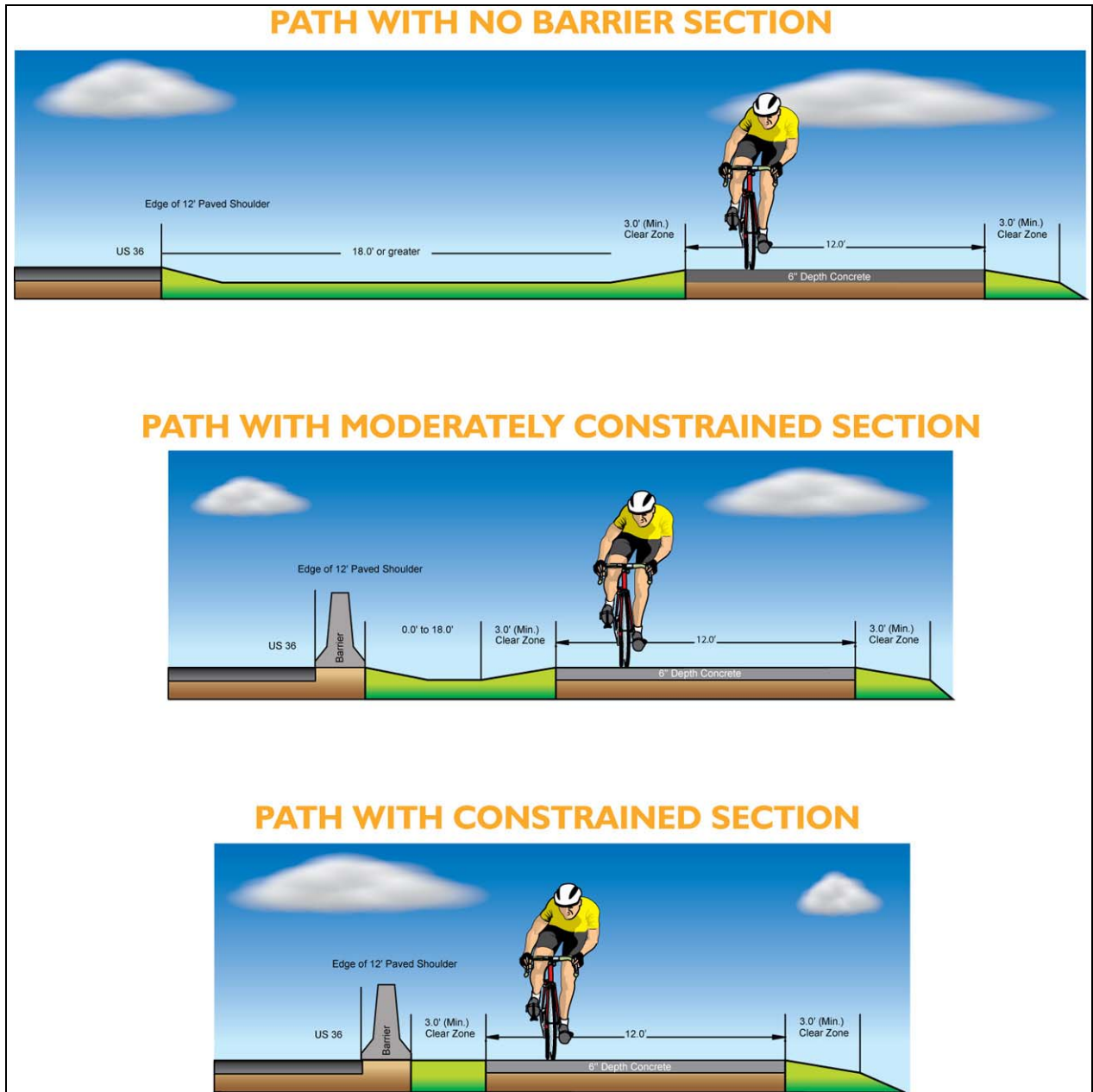
Combined Alternative Package (Preferred Alternative)

Figure 4-3: Typical Sections for the Combined Alternative Package (Preferred Alternative)



Source: US 36 Mobility Partnership, 2009.

Figure 4-4: Bikeway Typical Section



Source: US 36 Mobility Partnership, 2009.

SECTION FOUR

Combined Alternative Package (Preferred Alternative)

The Combined Alternative Package (Preferred Alternative) roadway changes would include improvements to cross street intersections and interchanges. Those improvements would include upgrading lane transitions of ramp terminals, widening cross streets at the intersection, lengthening turn-lanes and adding turn-lanes. These improvements are conceptual in nature and are based on the traffic analysis and engineering work completed at this level of project development. The design concepts will be further refined during final design but would occur within the conceptual project footprint.

The Combined Alternative Package (Preferred Alternative) would include a bikeway facility adjacent to US 36. In general, the bikeway is an off-street separated multi-use path adjacent to US 36. Where appropriate, the bikeway connects to and makes use of existing on-street and off-street facilities. Maintenance of the US 36 bikeway would be the responsibility of the local jurisdictions through an Intergovernmental Agreement with CDOT. Grade separations and connections are shown in Table 4-3, Bikeway Crossings and Connections.

Table 4-3: Bikeway Crossings and Connections

Cross Street/Trail/ park-n-Ride	Grade Crossing Type	Connection to Cross Street/ Trail/park-n-Ride
72 nd Avenue	Utilize existing	Utilize existing
80 th Avenue	Underpass extended	Existing trail
Westminster Center Station	Overpass	park-n-Ride
Sheridan Boulevard	Underpass	park-n-Ride
92 nd Avenue	Underpass	Not connected
Westminster Boulevard	Overpass (existing)/underpass	Existing bridge trail/southwest
Big Dry Creek Trail	Underpass	Existing trail
Church Ranch Boulevard	Underpass	Existing trail
Church Ranch/104 th Avenue Station	Underpass to parking	park-n-Ride (existing)
Wadsworth Boulevard (Old Wadsworth)	Overpass/at-grade	No
112 th Avenue	Underpass	No
116 th Avenue Station	Overpass	park-n-Ride
120 th Avenue	Underpass	Yes
Wadsworth Parkway	Underpass	Not connected
East Flatiron Park Trail	Crossing over existing underpass	Existing trail should be tied into
East Flatiron Circle	Overpass (existing)	Existing trail
Interlocken Loop	Underpass (existing)	Existing trail
Rock Creek Trail	Underpass	Existing trail
88 th Street	Underpass	N/A (no trail)
Cattle Crossing at Avista Hospital	Underpass	Intersects with existing
Coal Creek Trail	Underpass	Existing trail
McCaslin Boulevard	Underpass	Existing trail
McCaslin Station	Overpass (extended)	park-n-Ride
Cherryvale Road	Underpass	No
South Boulder Creek	Underpass	Intersects with existing
Table Mesa Station	Underpass	park-n-Ride
Table Mesa Drive	Underpass (under ramp)	Existing trail

Source: US 36 Mobility Partnership, 2009.

Note:

N/A = not applicable

The Combined Alternative Package (Preferred Alternative) would also include TDM improvements throughout the corridor, such as strategies designed to make the most efficient use of existing transportation facilities by reducing the actual demand placed on these facilities. Examples include coordinating flexible work schedules to help decrease demand at peak periods, carpooling/vanpooling, encouraging telecommuting, employer and community-based ECO passes (bus passes), an incident management plan and courtesy patrol, and coordinated land use and transportation planning that increases the convenience of using transit. Additionally, the Combined Alternative Package (Preferred Alternative) would offer the ability to use intelligent transportation system messaging to alert drivers to roadway conditions.

Improvements and changes to transit stations would be made throughout the corridor as part of the Combined Alternative Package (Preferred Alternative). Table 4-1, Parking and Pedestrian Crossings at Transit Stations, shows the changes as a result of the Combined Alternative Package (Preferred Alternative) and in comparison to Package 1.

The Combined Alternative Package (Preferred Alternative) would provide BRT improvements, including the following elements:

- Regional bus service enhancements.
- Local bus service enhancements.
- Ticket vending machines at BRT stations.
- Fare box upgrades on buses.
- Fiber along US 36 and connecting to the BRT stations.
- Funding for marketing and branding for BRT.
- Safety measures at BRT stations, including closed-circuit television/video surveillance, emergency telephones, and Crime Prevention Through Environmental Design strategies.
- Variable message signage at BRT stations to provide information on the next scheduled bus. This would be upgraded over time to provide real time bus information.
- Bus instrumentation to allow for future real time transit data collection. The intent is to initiate real time transit data collection and display.
- Smart cards, as the technology allows.
- If available and appropriate for the corridor, use of low-floor buses. These would need to consider the higher speeds and smoother travel needed for longer trips and also allow for bicycles.
- Wireless service on vehicles would continue to be explored and would be implemented if cost-effective and if it works.
- Automated stop announcements on buses in compliance with the Americans with Disabilities Act.
- Analysis of, and if appropriate, implementation of signal priority at key intersections. The intent is to move buses quickly through intersections. The analysis that would be done would include current and projected delay at key intersections, capital and operating costs, and effects to other signals in the vicinity.

SECTIONFOUR

Combined Alternative Package (Preferred Alternative)

New and more frequent bus service in the US 36 corridor would be provided. Proposed improvements include more frequent service on existing Route B and Route H between Denver and Boulder, a re-routed skyRide route for service from Boulder to Denver International Airport, and new Activity Center Circulator/Connector routes to activity centers in the corridor. Table 4-4, Proposed Changes to the RTD Bus System Plan for the Combined Alternative Package (Preferred Alternative), shows the proposed bus service for the corridor. The proposed bus route changes in the Combined Alternative Package (Preferred Alternative) are subject to change. Bus service plans for BRT would be merged with bus service plans for the Northwest Rail Corridor Project. Bus operations would be phased-in commensurate with service standards and ridership growth. RTD makes schedule changes and adjustments several times a year to respond to demand and improve productivity. The Combined Alternative Package (Preferred Alternative) proposed service changes reflect improvements to operations based on existing service at this time.

Table 4-4: Proposed Changes to the RTD Bus System Plan for the Combined Alternative Package (Preferred Alternative)

Service Type	Route	Route Name	Peak Headway ¹ (minutes)	Off-Peak Headway ¹ (minutes)	Early/Late Headway ¹ (minutes)	Change from Package 1
Regional/ Express/ skyRide	AB	Boulder to DIA (via Northwest Parkway)	30	60	60	Rerouted to Northwest Parkway; improved peak service; consolidated patterns, so slightly less off-peak service (with fewer stops along US 36)
	B	Boulder – Denver (all stop)	15	15	30	Improved off-peak service
	H	Boulder Transit Village (all stop)	15	30	N/A	Improved peak and off-peak service (new pattern)
	HX	Boulder Transit Village (express)	10	N/A	N/A	FlatIron Crossing stop removed; improved peak service
	L	Longmont – Denver	30	60	180	Improved off-peak service
Boulder Local	230	Lafayette – Louisville – Interlocken	15	30	N/A	New route
Activity Center Circulator/ Connector	AC-I	Denver – Boulder via Interlocken	15	30	N/A	New route
	AC-CP	Denver – Boulder via ConocoPhillips	15	30	N/A	New route

Source: US 36 Mobility Partnership, 2009.

Notes:

¹Headway refers to the frequency of service.

DIA = Denver International Airport

N/A = not applicable

RTD = Regional Transportation District

US 36 = United States Highway 36

4.3.1.1 Denver and Adams Segments

Roadway

The US 36 improvements for the Combined Alternative Package (Preferred Alternative) would begin at the US 36/I-25 interchange. The major changes at this interchange are improvements to the southbound I-25 to westbound US 36 ramp, which would be realigned to connect directly to US 36 instead of connecting to Broadway. This ramp would merge with the westbound on-ramp from Broadway. Access to Broadway from southbound I-25, westbound US 36, and westbound I-270 would no longer be available at this location with the elimination of the off-ramps. Access to Broadway would continue to be accommodated via southbound I-25 at 84th Avenue, and northbound I-25 at 70th Avenue.

In the eastbound direction on US 36, the managed lane would transition to a general-purpose lane at Pecos Street, or users could enter the existing I-25 reversible managed lanes during the a.m. peak period. In the westbound direction, vehicles exiting from the existing I-25 reversible managed lane would continue on a new managed lane, which would replace the existing HOV lane between Pecos Street and Federal Boulevard. From Federal Boulevard to the west, one managed lane in each direction would be built in the median of US 36. These lanes would be separated from the general-purpose lanes by a painted buffer.

The existing general-purpose lanes in these segments would need to be rebuilt, as they would move outward to accommodate the managed lanes in the median. An additional general-purpose lane would be constructed eastbound from Sheridan Boulevard to I-25. Both the Pecos Street and Federal Boulevard interchanges would be reconstructed but would maintain their existing configuration. The Pecos Street and Lowell Boulevard bridges would be widened but the Federal Boulevard bridge would not need to be reconstructed.

There are several arterial improvements in these segments. The improvements include:

- An extension of Bronco Road west to Greenwood Boulevard and the addition of a cul-de-sac at the east end of Bronco Road.
- Closing the Turnpike Drive access to Federal Boulevard.
- Reconstruction of Turnpike Drive to connect to Grove Street.
- Realignment of Sheridan Boulevard to the southwest between US 36 and the BNSF Railway tracks.
- Closing 88th Place access to Sheridan Boulevard.

An assessment of impacts to local intersections from improvements to US 36 revealed that traffic mitigation will be recommended at the Federal Boulevard and 74th Avenue intersection. Turn-lane additions and lane lengthening will mitigate the impacts at this intersection. For a more detailed discussion about the traffic impacts and recommended mitigation see Chapter 3, Transportation Impacts and Mitigation, of the US 36 Corridor FEIS.

Transit

No improvements to the station, parking, or access at DUS are included in the Combined Alternative Package (Preferred Alternative). However, as part of the BRT service enhancements in the Combined Alternative Package (Preferred Alternative), 42 buses would enter downtown Denver from US 36 during the peak hour. This would be 17 more than in Package 1. Thirty-two of these buses would serve DUS, with the remaining 10 buses serving the Civic Center Transfer Station to and from I-25 on 19th Street and 20th Street. No improvements to the station, parking, or access at the Broadway park-n-Ride or South Westminster BRT Station are planned as part of the Combined Alternative Package (Preferred Alternative).

Pedestrian/Bicycle

The bikeway in the Denver Segment would continue to use existing facilities. In the Adams Segment, the proposed bikeway would begin at Bradburn Boulevard at the existing Little Dry Creek Trail. A proposed pedestrian/bicycle signal and on-street striping would facilitate crossing 72nd Avenue at Bradburn Boulevard. An on-street bike route would go north from the Little Dry Creek Trail along Bradburn Boulevard to 80th Avenue. Only signing improvements are planned along Bradburn Boulevard. At 80th Avenue, the existing underpass would be extended and utilized by the bikeway. Connection to 80th Avenue would be provided by the existing trail. A grade-separated bikeway would then continue on the south side of US 36 to the Westminster Center BRT Station. A direct connection to the transit facilities would be provided. An at-grade crossing of 88th Avenue at the entrance to the Westminster Center BRT Station is proposed and access to 88th Avenue west would be provided.

4.3.1.2 Westminster and Broomfield Segments

Roadway

In these segments, the managed lane in each direction would remain in the median of US 36 and be separated from the general-purpose lanes by a painted buffer.

The existing general-purpose lanes would need to be rebuilt, as they would move outward to accommodate the managed lanes in the median. No additional general-purpose lanes would be constructed. The BNSF Railway and East Flatiron Circle bridges would be reconstructed as part of the Combined Alternative Package (Preferred Alternative). In addition, a new bridge at 112th Avenue would be constructed to replace the existing Old Wadsworth bridge. The approaches to the bridge and any associated street improvements would be constructed by other projects. Auxiliary lanes between interchanges would be constructed in both directions between East Flatiron Circle and Sheridan Boulevard.

At the Sheridan Boulevard interchange, the existing configuration would be expanded to a split-diamond between 92nd Avenue and Sheridan Boulevard, with an additional on-ramp to eastbound US 36 from the frontage road. The Church Ranch Boulevard/104th Avenue interchange would be reconstructed but would maintain its existing configuration.

At Wadsworth Parkway, the proposed partial cloverleaf configuration would incorporate loop-ramps in the northeast and southwest quadrants. These loop-ramps would eliminate the left-turn movements required for traffic to access US 36 from Wadsworth Parkway. This

configuration would also provide a grade-separated roadway for the eastbound US 36 off-ramp traffic destined for southbound Wadsworth Parkway to bypass the Wadsworth Parkway/120th Avenue intersection. A braided connection, where one ramp goes over the other, between Wadsworth Parkway and 120th Avenue to the north of US 36, would allow traffic from 120th Avenue to bypass Wadsworth Parkway for access to US 36. In addition, a new on- and off-ramp to and from the east would be provided at 120th Avenue.

Arterial improvements associated with the Combined Alternative Package (Preferred Alternative) include:

- The realignment of Old Wadsworth Boulevard to intersect with 112th Avenue.
- The closing of 120th Avenue at Commerce Street, and vacating Carr Street.

An assessment of impacts to local intersections from improvements to US 36 revealed that mitigation will be recommended at the Wadsworth Parkway/Midway Boulevard intersection. Additional lanes on Wadsworth Parkway south of Midway Boulevard, and signal timing changes, will mitigate the traffic impacts at the Wadsworth Parkway and Midway Boulevard intersection. For a more detailed discussion about the traffic impacts and recommended mitigations see Chapter 3, Transportation Impacts and Mitigation, of the US 36 Corridor FEIS.

Transit

In the Combined Alternative Package (Preferred Alternative), additional parking spaces would be provided at the Westminster Center BRT Station and 116th Avenue Transit Station. See Table 4-1, Parking and Pedestrian Crossings at Transit Stations, for a list of the proposed changes at stations. Buses would access these stations by exiting the highway to pick-up and drop-off passengers.

Bikeway

In the Westminster Segment, the proposed bikeway would continue west on the south side of the Westminster Center BRT Station and then under Sheridan Boulevard. Access to Sheridan Boulevard from the bikeway would be provided via 88th Avenue. From Sheridan Boulevard, the bikeway would travel west along the south side of US 36 and under 92nd Avenue. No direct access from the bikeway to 92nd Avenue would be provided. The bikeway would continue along the south side of US 36, until it reaches Westminster Boulevard. The bikeway would cross US 36 on the east side of the Westminster Boulevard bridge, then loop around to cross under Westminster Boulevard. Direct access from the bikeway to Westminster Boulevard would be provided. The bikeway would then leave Westminster Boulevard and travel along the north side of US 36 until it reaches the Big Dry Creek Trail. At the Big Dry Creek Trail, the bikeway would travel under US 36 via the existing Big Dry Creek underpass and direct access to the Big Dry Creek Trail would be provided. The bikeway would continue west on the south side of US 36, and cross under Church Ranch Boulevard. Access to the Church Ranch/104th Avenue Station and Church Ranch Boulevard would be provided through use of an existing trail at this location. The bikeway would then travel over the BNSF Railway tracks and cross into the Broomfield Segment, where it would go over Old Wadsworth Boulevard and under the proposed 112th Avenue overpass. No direct connection from the bikeway to Old Wadsworth Boulevard or 112th Avenue would be provided.

In the Broomfield Segment, the bikeway would continue west on the south side of US 36 providing access to the 116th Avenue Station. Prior to crossing under Wadsworth Parkway, a bikeway connection to 120th Avenue would be provided at the Arista development. A connection to Wadsworth Parkway would also be provided via a connection to the bikeway being constructed along 120th Avenue by others. After crossing under Wadsworth Parkway, the bikeway would also cross under 120th Avenue and continue west on the south side of US 36 until it reaches East Flatiron Circle. A connection to the trail at the East Interlocken Park would be provided. Just east of East Flatiron Circle, the bikeway would transition to the existing bike/pedestrian trail and a series of grade-separated crossings within the Flatiron Marketplace and the Flatiron Crossing shopping area as it enters the Superior/Louisville Segment. It would access the Flatiron Station at this location.

4.3.1.3 Superior/Louisville and Boulder Segments

Roadway

In these segments, the managed lane in each direction would remain in the median of US 36 and be separated from the general-purpose lanes by a painted buffer.

In the westbound direction, the managed lane would become a general-purpose lane west of Cherryvale Road. In the eastbound direction, traffic would enter the added managed lane just west of Cherryvale Road. A new climbing lane in each direction would be provided from McCaslin Boulevard westbound, and from Table Mesa Drive/Foothills Parkway eastbound to the top of Davidson Mesa. From Davidson Mesa westbound to Table Mesa Drive/Foothills Parkway and eastbound to McCaslin Boulevard, the climbing lane would become a bus-only lane. The bus-only portion of the lane would be constructed after certain conditions are met.

The McCaslin Boulevard interchange would remain in the existing configuration. However, the bridge over US 36 would need to be replaced to provide additional lanes on McCaslin Boulevard. The existing loop-ramp would need to be reconstructed to accommodate the new McCaslin Boulevard bridge.

The existing general-purpose lanes in these segments would need to be rebuilt, as they would move outward to accommodate the managed lanes in the median. No additional general-purpose lanes would be constructed. The Interlocken Loop, West Flatiron Circle, Coal Creek, Cherryvale Road, and South Boulder Creek bridges would be reconstructed.

In these segments, additional improvements would include:

- Reconstruction of the vehicular underpass under US 36 that provides access to the Superior Cemetery.
- Addition of a westbound left-turn and through-lane on Dillon Road.
- Realignment of Dyer Road at US 36 to the north so that the new alignment would be outside the current ROW.
- Closing access to Loop Drive from Table Mesa Drive.
- Reconstruction of Loop Drive to connect to Tantra Drive, restoring access to Table Mesa Drive.

An assessment of impacts to local intersections from improvements to US 36 revealed that mitigation will be recommended at the intersection of Dillon Road and McCaslin Boulevard and on the US 36 ramp intersections with Baseline Road. Recommended mitigation on Dillon Road includes an additional through-/left-lane for westbound traffic. The improvements to Baseline Road will consist of adding a right-turn lane to the northbound on-ramp for eastbound Baseline Road traffic. For a more detailed discussion about the traffic impacts and recommended mitigations, see Chapter 3, Transportation Impacts and Mitigation, of the US 36 Corridor FEIS.

The Foothills Parkway/Table Mesa Drive interchange would be reconfigured slightly to improve geometric conditions. In particular, the existing loop-ramp from westbound Table Mesa Drive to eastbound US 36 would be removed. The ramp from Foothills Parkway to eastbound US 36 would be relocated to improve the merging operations among the US 36, Table Mesa Drive, and Foothills Parkway traffic.

At this location, two options were evaluated to provide access from the University of Colorado, Boulder South Campus to Table Mesa Drive. This access is currently provided through Loop Drive, which connects to Table Mesa Drive at an intersection with the eastbound US 36 exit to Table Mesa Drive. The Combined Alternative Package (Preferred Alternative) would maintain this connection and require buses to access the BRT station on the south side of US 36 from a ramp located on Loop Drive. If approval of this alternative through CDOT's 1601 process and an agreement to participate in cost sharing is not reached, then the Local Streets Option would be implemented. In the Local Streets Option, this access would be provided from Table Mesa Drive, eliminating direct access from the Boulder South Campus to Table Mesa Drive from Loop Drive. Instead, this access to Table Mesa Drive would be provided through a connection to Tantra Drive. These options are shown in Appendix A, Corridor Reference Maps, of the US 36 Corridor FEIS.

Transit

At the McCaslin BRT Station, parking on both sides of US 36 would be reduced due to expansion of the interchange. This will be mitigated as described in Section 3.5.8, Impacts of Transit Patron Parking, of the FEIS.

BRT and express bus service would continue from the Foothills Parkway/Table Mesa Drive interchange to Boulder along Broadway to the Boulder Transit Center, and along 28th Street to the Boulder Transit Village.

The US 36 Corridor FEIS assumes both existing and planned super stops in the City of Boulder. Super stops are in place or planned by the City of Boulder along Broadway and along 28th Street. The map of super stops includes a potential super stop along US 36 at the Bear Creek pedestrian underpass, to serve both Williams Village and Martin Acres residents. Physical improvements at the potential Williams Village Super Stop will be implemented by others and are not considered part of the US 36 Corridor Project.

As a result of the Combined Alternative Package (Preferred Alternative), 18 in-bound buses would access the Boulder Transit Village during the peak-hour. No in-bound US 36-related regional buses serve this location in Package 1.

Twelve in-bound buses would access the Boulder Transit Center during the peak-hour as a result of the Combined Alternative Package (Preferred Alternative). This is three more buses per hour than in Package 1 at this location.

Bikeway

In the Superior/Louisville Segment, the proposed bikeway would continue along the existing bikepath on the south side of US 36 from East Flatiron Circle to West Flatiron Circle. The bikeway would use the existing Rock Creek Trail through Frank Varra Park. The bikeway would then cross under US 36 and continue west on the north side of US 36, going under 88th Street, to the vehicular underpass just east of Superior Cemetery, where it would cross back under US 36. No direct access from the bikeway to 88th Street would be provided. Continuing west, the bikeway would cross to the north of US 36 using the Coal Creek Trail underpass. Access to the Coal Creek Trail would be provided. Prior to crossing under McCaslin Boulevard, access would be provided to McCaslin Boulevard and the McCaslin BRT Station.

In the Boulder Segment, the proposed bikeway would continue west from McCaslin Boulevard on the north side of US 36, go around the Davidson Mesa scenic overlook, cross under Cherryvale Road, and continue west on the north side of US 36 until it reaches South Boulder Creek. No direct access from the bikeway to Cherryvale Road would be provided. The bikeway would then go under US 36 using the South Boulder Creek Trail underpass structure and continue west on the south side of US 36 to the Table Mesa BRT Station. Direct access to the Table Mesa BRT Station from the bikeway would be provided via the Table Mesa BRT Station pedestrian bridge over US 36. On-street facilities along Table Mesa Drive from west of Loop Drive and across US 36 could also be used to access the Table Mesa BRT Station.

4.4 COMPARISON OF FINAL PACKAGES USING U.S. ARMY CORPS OF ENGINEERS CRITERIA

The performance of Package 1 and the three build packages is documented in the US 36 Corridor FEIS. The evaluation of the packages relative to the USACE criteria was updated for Package 2 and Package 4 and the Combined Alternative Package (Preferred Alternative) compared to Package 1.

The criteria used previously in Section 3, Alternatives Definition and Evaluation Process, were updated to reflect the horizon year information for the packages. Results of the evaluation are presented in Table 4-5, Comparison of Final Packages Using U.S. Army Corps of Engineers Criteria (Horizon Year).

Additionally, Package 3 was previously eliminated was determined that it would not be the LEDPA because it did not meet Purpose and Need (TN4 and TN5) because it did not expand modal options for HOV and vanpools, and could not provide the 1 minute time savings per mile over SOVs for carpools and vanpools. It was also determined not practicable because of the extraordinary high cost of the BRT in a separate guideway. When compared with the performance of Package 3 against these criteria, the Combined Alternative Package (Preferred Alternative) better meets Purpose and Need because it includes priority treatment for HOVs (carpools and vanpools), and thus meets the TN4 criterion of providing expanded options for

various modes of travel. The cost for the Combined Alternative Package (Preferred Alternative) is reasonable and normal for a project of this type.

Package 5, as previously eliminated, as it was determined to not be the LEDPA because it did not provide improved access to activity centers (TN2) and failed to provide the minimum effective travel time savings. When compared with the performance of Package 5 against these criteria, the Combined Alternative Package (Preferred Alternative) better meets Purpose and Need because it includes improvements to six interchanges, thus providing improved access to activity centers. It includes bus bypass lanes, auxiliary lanes, and queue jumps, all of which would improve travel time reliability (TN5) for buses compared to vehicles in the general-purpose lanes. The travel time savings for the Combined Alternative Package (Preferred Alternative) is calculated to be the same as Package 5.

To summarize, the Combined Alternative Package (Preferred Alternative) meets Purpose and Need (TN4) while Package 3 does not. The Combined Alternative Package (Preferred Alternative) meets Purpose and Need (TN2 and TN5) while Package 5 does not. The results of the comparisons show that Package 2, Package 4, and the Combined Alternative Package (Preferred Alternative) would all meet the Purpose and Need of the project. The Combined Alternative Package (Preferred Alternative) would be comparable in terms of transportation performance with the other two packages. A full discussion of the transportation performance is provided in Chapter 3, Transportation Impacts and Mitigation, of the US 36 Corridor FEIS.

SECTION FOUR

Combined Alternative Package (Preferred Alternative)

Table 4-5: Comparison of Final Packages Using U.S. Army Corps of Engineers Criteria (Horizon Year)

Criteria Description ¹	Rationale Basis to Screening Criterion	Package 1	Package 2	Package 4	Combined Alternative Package (Preferred Alternative)
The Purpose of the action in the US 36 corridor is to improve mobility between Denver and Boulder. The Need for the action is described in TN 1-6, shown below.	N/A.	N/A.	Meets Purpose and Need.	Meets Purpose and Need.	Meets Purpose and Need.
TN 1 The transportation system needs to respond to continuing population and employment growth, and increased travel demand in the US 36 corridor; corridor capacity is inadequate.	To advance, a package must provide sufficient additional person-carrying capacity to meet horizon year (2030) forecasted demand. For the US 36 project, by 2030, 10,000 additional trips will be needed on US 36 at certain locations during the peak rush hour.	Fail – Provides no new highway or transit capacity.	Pass – Meets additional 10,000 peak-hour person trips.	Pass – Meets additional 10,000 peak-hour person trips.	Pass – Meets additional 10,000 peak-hour person trips.
TN 2 Access to existing and planned activity centers is limited. Improvements to access links from the highway are needed.	To advance, a package must provide improved access to existing and planned activity centers by improving congested interchange intersections to reduce delays.	Fail – Does not improve interchange intersections.	Pass – Six interchange intersections improved.	Pass – Six interchange intersections improved.	Pass – Six interchange intersections improved.
TN 3 Congestion relief on the highway is needed to provide for improved traffic operations and shorter travel times.	To advance, a package must provide improved peak-hour LOS to LOS D or better for highway operations compared to Package 1. Average speed on US 36 is an indicator of congestion relief and improved efficiency. (2030 projected volumes were used as the horizon year). An increase in speed is better.	Fail – No improvement in highway lane operations. Number of highway segments at LOS E or LOS F – 9 of 16. Fail – No improvement in US 36 average speed.	Pass – Highway segments improved: GP – 2; Managed/HOV – 12; Total – 14. Managed lanes also guarantee minimum travel speed of 45 mph for SOV users that pay a toll; would improve LOS on all 16 segments. Pass – Improved US 36 average speed of 48.5 mph (+7.0 mph).	Pass – Highway segments improved: GP – 6; BRT/HOV – 12; Total – 18. Pass – Improved US 36 average speed of 51.9 mph (+10.4 mph).	Pass – Highway segments improved: GP – 3; HOV – 12; Total – 15. Pass – Improved US 36 average speed of 48.8 mph (+7.3 mph).
TN 4 Expanded options for mode of travel are needed to reduce reliance on SOV travel.	To advance, a package must provide increased capacity and improved travel times for modal options other than SOV. A package must provide at least three of the following: <ul style="list-style-type: none"> • HOV priority • Managed lane • Transit priority lane or median stops • Bikeway 	Fail – Provides no additional modes of travel or travel time savings for transit or HOV, and does not improve travel time reliability.	Pass – Provides a separate managed lane facility for use by BRT and HOV at no charge; provides median BRT stations for better travel time reliability.	Pass – Provides a separate HOV lane for BRT and HOV users; provides median BRT stations for better travel time reliability; provides bikeway.	Pass – Provides a managed lane with priority for BRT, HOV, and SOV toll; provides bikeway; provides side stations with auxiliary lanes and priority at interchange ramps.

SECTION FOUR

Combined Alternative Package (Preferred Alternative)

Table 4-5: Comparison of Final Packages Using U.S. Army Corps of Engineers Criteria (Horizon Year)

Criteria Description ¹	Rationale Basis to Screening Criterion	Package 1	Package 2	Package 4	Combined Alternative Package (Preferred Alternative)
TN 5 More efficient operations from improved facilities are needed for BRT and bus service, carpools, and vanpools.	To advance, a package must provide at least 1 minute per mile of travel-time savings for bus and HOV travel time over SOV travel time compared to SOV travel time in Package 1. (Distance is 26 miles, so must save 26 minutes compared to Package 1 SOV travel time.)	Fail – Provides no travel time savings for transit or HOV.	Pass – 28 minute travel-time savings over SOV.	Pass – 28 minute travel-time savings over SOV for bus and HOV.	Pass – 26 minute travel-time savings over SOV.
TN 6 Existing roadway facilities need to be updated to meet current standards in some locations.	To advance, a package must improve existing design and safety deficiencies to current AASHTO standards.	Fail – Provides no new facilities to replace aging infrastructure.	Pass – Improvements will be made.	Pass – Improvements will be made.	Pass – Improvements will be made.
ET 1 Must use proven technology.	To advance, proposed transportation technologies must be tested and proven by successful use in revenue service in similar transportation applications in other locations.	N/A.	Proven technology.	Proven technology.	Proven technology.
ET 2 Must be technically feasible to construct and operate.	To advance, known features or alternatives that are not technically feasible to construct or operate should not be carried forward.	N/A.	Technically feasible.	Technically feasible.	Technically feasible.
L 1 Must conform to federal and state laws.	To advance, packages must not violate any applicable federal or state laws. One example would be a package that, if implemented, would violate applicable air quality standards, thereby violating the Clean Air Act.	N/A.	Conforms.	Conforms.	Conforms.
L 2 Location of transportation improvements.	To advance, packages must be located outside of national parks, wilderness areas, wildlife refuges, and superfund sites.	N/A.	Pass.	Pass.	Pass.

SECTION FOUR

Combined Alternative Package (Preferred Alternative)

Table 4-5: Comparison of Final Packages Using U.S. Army Corps of Engineers Criteria (Horizon Year)

Criteria Description ¹	Rationale Basis to Screening Criterion	Package 1	Package 2	Package 4	Combined Alternative Package (Preferred Alternative)
L 3 Social feasibility.	To advance, a package must be socially feasible. An example of a package that might not be socially feasible would be one that would require extensive relocation of numerous families or businesses within one or more neighborhoods.	None.	Business Relocations – 138. Residential Relocations – 201.	Business Relocations – 135. Residential Relocations – 202.	Business Relocations – 24. Residential Relocations – 65.

Source: US 36 Mobility Partnership, 2009; and URS, 2009b.

Notes:

¹The "Criteria Description" categories developed in the NEPA/Section 404 merger process for this project are as follows:

- AASHTO = American Association of State and Highway Transportation Officials
- BRT = bus rapid transit
- C = Cost Criteria 1-2
- ET = Existing Technology Criteria 1-2
- GP = general-purpose
- HOV = high-occupancy vehicle

- L = Logistics Criteria 1-3
- LOS = level of service
- Mph = miles per hour
- N/A = not applicable
- SOV = single-occupant vehicle
- US 36 = United States Highway 36

5.1 IMPACTS TO WETLANDS AND OTHER WATER FEATURES

The methodology used to determine impacts to wetlands and other water features for each package is outlined in Section 4.21, Wetlands and Other Waters, of the FEIS. The following provides a summary of the impacts associated with the Combined Alternative Package (Preferred Alternative), and a comparison with impacts calculated for Package 2 and Package 4.

Approximately 71 acres of wetlands occur in the wetland study area, defined as within 300 feet of the centerline of US 36. Approximately 21 acres of wetlands would be disturbed along the US 36 corridor from implementation of the Combined Alternative Package (Preferred Alternative). These wetlands are mostly located in and along natural and man-made drainages, irrigation ditches, stormwater runoff ditches, or in other low-lying areas. Many are immediately adjacent to the roadway, particularly in the Boulder Segment.

The following section describes the impacts to wetlands and other water features that would occur under the Combined Alternative Package (Preferred Alternative). More detailed information on the wetlands identified and methods used in the analysis is available in Section 4.21, Wetlands and Other Waters, of the FEIS.

5.1.1 Direct Wetland Impacts under the Combined Alternative Package (Preferred Alternative)

Direct impacts would be the result of earthwork, including cut-and-fill areas for the roadway and the installation of concrete, riprap, or other materials. These impacts are quantifiable and are presented in the following text.

The Combined Alternative Package (Preferred Alternative) would result in the direct, permanent impact of 21 acres of wetlands, including 17 acres of PEM, 3 acres of PSS, 0.9 acre of PEM/PSS (combination), and 0.1 acre PFO. Approximately 60 percent of these impacts would be in the Boulder Segment, 14 percent in the Westminster Segment, 15 percent in the Broomfield Segment, 6 percent in the Superior/Louisville Segment, and 5 percent in the Adams Segment. Most of the impacts would be the result of the placement of fill for widening the roadway. Acres of wetland impacts for the Combined Alternative Package (Preferred Alternative) are provided in Table 5-1, Summary of Direct Permanent Wetland Impacts in the Combined Alternative Package (Preferred Alternative).

Table 5-1: Summary of Direct Permanent Wetland Impacts in the Combined Alternative Package (Preferred Alternative)

Segment	Wetland Type ¹				Total (acres)
	PEM (acres)	PSS (acres)	PEM/PSS (acres)	PFO (acres)	
Denver	0	0	0	0	0
Adams	0.78	0.26	0	0	1.04
Westminster	1.80	0.90	0.20	0	2.90
Broomfield	2.91	0.36	0	0	3.27
Superior/Louisville	1.14	0.08	0	0.10	1.32
Boulder	10.76	1.41	0.7	0	12.88
Total	17.39	3.01	0.90	0.10	21.40

Source: US 36 Mobility Partnership, 2009.

Notes:

¹Wetland type is based on Cowardin et al. (1979).

PEM = palustrine emergent

PEM/PSS = palustrine emergent and palustrine scrub/shrub combination

PFO = palustrine forested

PSS = palustrine scrub/shrub

Table 5-2, Comparison of the Direct Permanent Wetland Impacts by Build Package, shows whether the Combined Alternative Package (Preferred Alternative) total impact numbers represent an increase or a decrease (in acres) when compared to the total impacts associated with Package 2 and Package 4.

Table 5-2: Comparison of the Direct Permanent Wetland Impacts by Build Package

Segment	Combined Alternative Package (Preferred Alternative)	Package 2	Package 2 Difference	Package 4	Package 4 Difference
Denver	0	0	0	0	0
Adams	1.04	1.26	-0.22	1.21	-0.17
Westminster	2.90	3.02	-0.12	3.02	-0.12
Broomfield	3.27	3.88	-0.61	2.90	+0.37
Superior/Louisville	1.32	1.77	-0.45	1.28	+0.04
Boulder Option A	12.88 ¹	12.33	+0.55	13.09	-0.21
Boulder Option B	12.88 ¹	18.43	-5.55	17.72	-4.84
Total Option A	21.40¹	22.26	-0.86	21.50	-0.10
Total Option B	21.40¹	28.36	-6.96	26.13	-4.73

Source: US 36 Mobility Partnership, 2009.

Notes:

There are no impacts under Package 1 (No Action) so these are not outlined in this table.

¹There is no separate Option A and Option B for the Combined Alternative Package (Preferred Alternative), so these numbers reflect the one total under the Combined Alternative Package (Preferred Alternative).

+ = The Combined Alternative Package (Preferred Alternative) impacts are more than the package it is being compared to

- = The Combined Alternative Package (Preferred Alternative) impacts are less than the package it is being compared to

The comparison results show that wetland impacts associated with the Combined Alternative Package (Preferred Alternative) are less than the impacts associated with Package 2 and Package 4. This is primarily due to the removal of median bus stations, which decreased the overall footprint of the Combined Alternative Package (Preferred Alternative). The following are wetland impacts of the Combined Alternative Package (Preferred Alternative) by segment and by major water features or wetland concentrations.

Denver Segment

There would not be any wetland impacts in the Denver Segment.

Adams Segment

Approximately 1.04 acres of wetlands would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes 0.13 acre of impact to the Allen Ditch area wetlands, and 0.91 acre of impact to 10 other wetlands.

Westminster Segment

Approximately 2.90 acres of wetlands would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes 0.69 acre of impact to the wetlands associated with Walnut/Big Dry Creek, and 2.21 acres of impact to 13 other wetlands.

Broomfield Segment

Approximately 3.27 acres of wetlands would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes approximately 0.04 acre of impact to the Community Ditch wetlands, and 3.23 acres of impact to 22 other wetlands.

Superior/Louisville Segment

Approximately 1.32 acres of wetlands would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes 0.40 acre of impact to the wetlands associated with Rock Creek and its tributary to the west, 0.15 acre of impact to Coal Creek wetlands, and 0.77 acre of impact to 16 other wetlands.

Boulder Segment

Approximately 12.87 acres of wetlands would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes 0.78 acre of impact to the South Boulder Creek area wetlands, and 12.09 acres of impact to 20 other wetlands.

5.1.2 Direct Impacts to Other Water Features Under the Combined Alternative Package (Preferred Alternative)

Other water features include any non-vegetated aquatic features, including ephemeral, intermittent, and perennial waterways; irrigation ditches; ponds; reservoirs; and any other features that are predominately open water. Based on field investigations, approximately 11.35 acres of other water features are located in the study area. These are mostly irrigation ditches, natural waterways, and small ponds or reservoirs.

The Combined Alternative Package (Preferred Alternative) would result in the direct, permanent impact of 2.6 acres of other water features. Approximately 29 percent of these impacts would be in the Broomfield Segment, with 39 percent in the Boulder Segment, 2 percent in the Adams Segment, 14 percent in the Superior/Louisville Segment, and 16 percent in the Westminster Segment. Most of the impacts would be the result of the placement of fill for widening the roadway.

Acres of impacts to other water features for the Combined Alternative Package (Preferred Alternative) are provided in Table 5-3, Summary of Direct Permanent Impacts to Other Water Features in Combined Alternative Package (Preferred Alternative). Table 5-4, Comparison of the Direct Permanent Impacts to Other Waters by Build Package, shows whether the Combined Alternative Package (Preferred Alternative) total impact numbers represent an increase or a decrease (in acres) when compared to the total impacts associated with Package 2 and Package 4.

Table 5-3: Summary of Direct Permanent Impacts to Other Water Features in the Combined Alternative Package (Preferred Alternative)

Segment	Other Water Features		
	Channels (acres)	Open Water (acres)	Total (acres)
Denver	0	0	0
Adams	0.05	0	0.05
Westminster	0.12	0.29	0.41
Broomfield	0.41	0	0.76
Superior/Louisville	0.07	0.29	0.36
Boulder	0.40	0.29	1.01
Total	1.05	0.87	2.59

Source: US 36 Mobility Partnership, 2009.

Table 5-4: Comparison of the Direct Permanent Impacts to Other Waters by Build Package

	Combined Alternative Package (Preferred Alternative)	Package 2	Difference	Package 4	Difference
Denver	0	0	0	0	0
Adams	0.05	0.4	-0.35	0.38	-0.33
Westminster	0.41	0.29	+0.12	0.27	+0.14
Broomfield	0.76	2.82	-2.06	2.64	-1.88
Superior/Louisville	0.36	0.42	-0.06	0.38	-0.02
Boulder Option A	1.01 ¹	0.65	+0.36	0.71	+0.30
Boulder Option B	1.01 ¹	0.90	+0.11	0.93	+0.08
Total Option A	2.59¹	4.58	-1.99	4.38	-1.79
Total Option B	2.59¹	4.83	-2.24	4.60	-2.01

Source: US 36 Mobility Partnership, 2009.

Notes:

There are no impacts under Package 1 (No Action) so these are not outlined in this table.

¹There is no separate Option A and Option B for the Combined Alternative Package (Preferred Alternative), so these numbers reflect the one total under the Combined Alternative Package (Preferred Alternative).

+ = The Combined Alternative Package (Preferred Alternative) impacts are more than the package it is being compared to

= = The Combined Alternative Package (Preferred Alternative) impacts are less than the package it is being compared to

The comparison results show that impacts to other water features associated with the Combined Alternative Package (Preferred Alternative) are substantially less than the impacts associated with Packages 2 and 4. This is primarily due to the removal of median bus stations, which decreased the overall footprint of the Combined Alternative Package (Preferred Alternative).

The following text briefly describes the Combined Alternative Package (Preferred Alternative) impacts to the other water features by segment and main “other water” areas.

Denver Segment

There would be no impacts to other water features in the Denver Segment.

Adams Segment

Approximately 0.05 acre of other water features would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes 0.04 acre of impact to the Allen Ditch and 0.01 acre to two other water features.

Westminster Segment

Approximately 0.41 acre of other water features would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes impacts to approximately 0.06 acre of Allen Ditch, 0.06 acre to the Farmers Highline Canal, 0.29 acre to Walnut/Big Dry Creek, and less than 0.01 acre of impact to one other water feature. There would be no impact to Lower Church Lake.

Broomfield Segment

Approximately 0.76 acre of other water features would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes impacts to 0.38 acre of an unnamed ditch, 0.27 acre to an old farm pond and ditch, 0.03 acre to Community Ditch, and 0.08 acre of impact to two stormwater ponds.

Superior/Louisville Segment

Approximately 0.36 acre of other water features would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features. This includes impacts to 0.07 acre of Rock Creek, 0.22 acre of Coal Creek, and 0.07 acre to three other water features.

Boulder Segment

Approximately 1.02 acres of other water features would be permanently impacted in this segment as a result of the placement of fill for highway widening and other project features such as development-driven special access to the University of Colorado Boulder South Campus parcel by Table Mesa Drive. This includes impacts to 0.06 acre of Davidson Ditch, 0.03 acre of Goodhue Ditch, 0.06 acre of South Boulder Canyon Ditch, 0.28 acre of South Boulder Creek, and 0.60 acre to 10 other water features.

5.1.3 Indirect Impacts to Wetlands and Other Water Features

Indirect impacts to wetlands include sedimentation, erosion, noxious weed invasion, and the loss of vegetation due to shadowing from a bridge. Other than shadowing, these impacts are not quantifiable, are common to all of the segments, and are briefly discussed below.

All Segments

The Combined Alternative Package (Preferred Alternative) would result in some indirect impacts. Indirect impacts to wetlands and other water features include sedimentation, erosion, noxious weed invasion, and the loss of vegetation due to shadowing from bridges. In general, these impacts are not quantifiable. It is likely that these impacts would lead to some reduction in wetland quality.

5.2 IMPACTS TO THREATENED AND ENDANGERED SPECIES

In accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 United States Code 1531 et seq.), a Programmatic Biological Assessment (PBA) has been prepared to assess impacts to species listed as threatened or endangered under the Endangered Species Act that would be affected as a result of the proposed US 36 project. Formal consultation with the U.S. Fish and Wildlife Service (USFWS) has been initiated as the proposed project *may affect, and is likely to adversely affect*, federally-listed threatened and endangered species. The PBA outlines the species evaluated for this project, the effects of the action on the listed species, and the conservation measures that will be implemented to avoid, minimize, and mitigate for impacts to federally listed species. This section provides a summary of the impacts discussed in the PBA.

5.2.1 Direct Impacts to Threatened and Endangered Species

Based on the results of research conducted and coordination efforts described in the PBA, three species were evaluated including Preble's meadow jumping mouse, Ute ladies'-tresses, and the Colorado butterfly plant. No direct impacts to the Colorado butterfly plant are expected as a result of this project, because it is known to occur about 0.7-mile upstream of US 36 on Walnut Creek but not within the US 36 construction footprint. Under the Combined Alternative Package (Preferred Alternative), the US 36 project *may affect, but is not likely to adversely affect*, the Colorado butterfly plant due to the fact that the population could spread downstream into the project area.

The Combined Alternative Package (Preferred Alternative) acres of impacts (direct habitat loss) to Preble's meadow jumping mouse and Ute Ladies'-tresses orchid are provided in Table 5-5, Combined Alternative Package (Preferred Alternative) Direct Habitat Loss to Threatened and Endangered Species. The table also shows that the Combined Alternative Package (Preferred Alternative) impact numbers represent a decrease (in acres) when compared to impacts associated with Packages 2 and 4. For example, the impact to Preble's meadow jumping mouse habitat under the Combined Alternative Package (Preferred Alternative) would be 41.72 acres, which represents 10.04 acres less of an impact when compared to Package 2, Option B.

**Table 5-5: Combined Alternative Package (Preferred Alternative)
Direct Habitat Loss to Threatened and Endangered Species**

Species	Combined Alternative Package (Preferred Alternative) (acres)	Package 2		Package 4	
		Option A (acres)	Option B (acres)	Option A (acres)	Option B (acres)
Preble's meadow jumping mouse	41.71	-1.60	-11.10	-8.76	-12.92
Ute ladies'-tresses orchid	35.94	-1.98	-9.65	-5.10	-10.94

Source: US 36 Mobility Partnership, 2009.

Notes:

There are no impacts under Package 1 (No Action) so these are not outlined in this table.

- = The Combined Alternative Package (Preferred Alternative) impacts are less than the package it is being compared to

Impacts to Preble's meadow jumping mouse habitat for the Combined Alternative Package (Preferred Alternative) would be less than those described for Package 2 and Package 4, and the types of impacts that would occur would be the same. For the Combined Alternative Package (Preferred Alternative), the project *may affect, and is likely to adversely affect*, Preble's meadow jumping mouse habitat.

Impacts to Ute Ladies'-tresses orchid habitat for the Combined Alternative Package (Preferred Alternative) would be less than those described for Packages 2 and 4, and the types of impacts that would occur would be the same. Implementation of the US 36 improvements under the Combined Alternative Package (Preferred Alternative), *may affect, and is likely to adversely affect*, Ute ladies'-tresses orchids habitat.

Additionally, the Colorado butterfly plant is known to occur about 0.7 mile upstream of US 36 on Walnut Creek, but not within the US 36 construction footprint. The plant could become established downstream along portions of Walnut Creek and/or Dry Creek prior to construction. If present in the construction footprint, construction activities would destroy plants and destroy soil seed banks by exposure or deep burial. Package 1 would have no effect on the Colorado butterfly plant. Under the Combined Alternative Package (Preferred Alternative), the US 36 project *may affect, but is not likely to adversely affect*, the Colorado butterfly plant. Potential habitat is present in the project area, but the plant is not known to occur in the project area.

5.2.2 Indirect Impacts to Threatened and Endangered Species

All Segments

Indirect impacts for the Combined Alternative Package (Preferred Alternative) would be similar to those described for Packages 2 and 4.

- Indirectly, wider roads reduce wildlife access to preferred habitats by further restricting connectivity, isolating populations as land becomes more fragmented, and isolating individual animals from other populations and habitat.
- Indirect effects to Preble's meadow jumping mouse from further restricting connectivity at riparian corridors may occur in some locations. However, replacement of crossing structures would increase connectivity across the highway at some locations. Other indirect effects on Preble's meadow jumping mouse include degradation of habitat caused by increased noxious weeds, habitat alteration caused by changes in hydrology and drainage patterns from development, and increased water runoff. Changes in hydrology caused by highway construction could eliminate wetlands adjacent to the highway, reducing habitat suitability for the Preble's meadow jumping mouse. Increased runoff could reduce water quality and result in increased flow in culverts, which would reduce connectivity under US 36 for Preble's meadow jumping mouse.
- Indirect effects could occur to Ute ladies'-tresses orchid plants from increased competition with noxious weeds, as well as alteration of hydrology and drainage patterns in areas adjacent to the highway in the Boulder Segment.

5.3 SUMMARY OF IMPACTS AND EVALUATION OF LEDPA

5.3.1 Summary of Impacts Under the Combined Alternative Package (Preferred Alternative)

When compared to Package 2 and Package 4, the Combined Alternative Package (Preferred Alternative) results in fewer impacts to aquatic resources. The Combined Alternative Package (Preferred Alternative) would result in an impact of 21.40 acres of wetlands and 2.59 acres of other waters, for a total impact to jurisdictional waters of 23.99 acres. Although the wetland impacts represent approximately 30 percent of the wetlands identified in the study area (71.69 total acres), avoidance and minimization modifications were incorporated into the development of the Combined Alternative Package (Preferred Alternative) in an effort to reduce wetland and other water impacts compared to Packages 2 and 4. The result of that effort is that the impacts under the Combined Alternative Package (Preferred Alternative) represent a decrease in both wetland and other water impacts when compared to the four options in Package 2 and Package 4 that have wetland/other waters impacts of the following (where the first number is wetland impacts and the second number is other water impacts):

- Package 2, Option A = 22.26 acres/4.58 acres
- Package 2, Option B = 28.36 acres/4.83 acres
- Package 4, Option A = 21.50 acres/4.38 acres
- Package 4, Option B = 26.13 acres/4.60 acres

The Combined Alternative Package (Preferred Alternative) design modifications incorporated to avoid and minimize impacts to wetlands and other waters wherever possible include:

- The removal of the median stations that minimized the amount of land needed in places along the corridor.
- The addition of retaining walls on US 36 in the South Boulder Creek Area (Boulder Segment), at Coal Creek (Superior/Louisville Segment), and at the Allen Ditch (Adams Segment).
- The reconfiguration of the Table Mesa Drive interchange at US 36 to minimize impacts from Option B (Boulder Segment).
- The relocation of several stormwater ponds along US 36 in the Boulder and Broomfield segments, moving them out of the wetland areas.
- The redesign of the US 36 crossing of Rock Creek in the Superior/Louisville Segment.
- The realignment of the bikepath in several locations in the Broomfield and Westminster segments.
- The re-design of the 88th Avenue and Sheridan Boulevard improvements along US 36 (Adams Segment).

Additional avoidance and minimization measures would be implemented, where possible, during final design.

The Combined Alternative Package (Preferred Alternative) would result in an impact of 41.71 acres of Preble's meadow jumping mouse habitat, and 35.94 acres of Ute Ladies'-tresses orchid habitat. Avoidance and minimization modifications were incorporated into the development of the Combined Alternative Package (Preferred Alternative) in an effort to reduce impacts for these two species compared to Package 2 and Package 4. The result of that effort is that the impacts under the Combined Alternative Package (Preferred Alternative) represent a decrease of Preble's meadow jumping mouse and Ute Ladies'-tresses habitat impacts over both Package 2 and Package 4. The mitigation techniques planned to reduce these impacts are outlined in the PBA.

Mitigation techniques to reduce impacts to biological resources overall are described in detail in Section 4.14, Biological Resources: Wildlife, Vegetation, and Threatened and Endangered Species, of the FEIS.

5.3.2 Evaluation of LEDPA

Based on the impacts outlined above for wetlands, other waters, and threatened and endangered species, including the avoidance and minimization elements incorporated into design of the Combined Alternative Package (Preferred Alternative), the USACE confirmed that "the Combined Alternative Package (Preferred Alternative) appears to be the LEDPA" in a letter dated May 20, 2009 (see Attachment A, Index Listing, for all Section 404[b][1] correspondence).

This section discusses compensatory mitigation opportunities for loss of wetlands and other waters and the loss of habitat for Preble's meadow jumping mouse and Ute ladies'-tresses as a result of the US 36 corridor improvements. During design and construction, CDOT and FHWA will continue to avoid or minimize impacts to these resources; however, some impacts are unavoidable. These impacts will be offset by various conservation measures that are outlined in this section. The project will follow the Final Rule (33 CFR 332, April 10, 2008), which states that creation on-site and off-site, mitigation banks, and in-lieu fee programs, are all acceptable methods of wetland mitigation.

A conceptual compensatory mitigation plan was prepared to support the FEIS. A more detailed mitigation plan that meets the requirements of the Final Rule will be prepared after completion of the FEIS, and will be submitted along with an application for a Section 404 Individual Permit before any jurisdictional waters of the U.S. are impacted from construction of the Combined Alternative Package (Preferred Alternative). More details on the Section 404 permitting process and the associated NEPA/Section 404 merger process are provided in Section 6.4, NEPA/404 Merger and Section 404 Permit Process.

CDOT's desired approach to compensatory mitigation for impacts on the western end of the US 36 project corridor is to continue consultation with USACE, USFWS, and other applicable federal, state, and local agencies to develop a comprehensive mitigation strategy with a focus on the South Boulder Creek floodplain ecological system for wetland impacts on the western end of the corridor. Due to the similar habitat requirements associated with mitigation for Preble's meadow jumping mouse, Ute ladies'-tresses orchid, and wetlands, mitigation efforts for these three resources can be linked and improvements can be made on an ecological level. The impacts to Preble's meadow jumping mouse and Ute Ladies'-tresses orchid habitat are concentrated in the South Boulder Creek floodplain, and this location is also where a high percentage of the wetland impacts would occur. CDOT is committed, where practicable, to developing mitigation in this area that will provide a benefit to the system as a whole, rather than small isolated improvements. Although the project will be constructed in phases, and mitigation requirements will need to be met for each individual phase, CDOT is confident that the mitigation for each phase can be completed as part of a larger, comprehensive approach.

CDOT's approach to mitigation for eastern and central corridor wetland impacts would likely follow the Transportation Equity Act for the 21st Century guidance and utilize wetland mitigation banking where feasible, since most of these wetland impacts are to roadside ditches or upland swales. However, all accepted methods of mitigation will remain valid options for all sections of the corridor as the project moves through final design.

6.1 COMPENSATORY MITIGATION — WETLANDS

Compensatory mitigation for wetlands is outlined in Section 4.21, Wetlands and Other Waters, of the FEIS, and is summarized below. For more details on mitigation opportunities, refer to Section 4.21.

The USACE is taking a holistic "watershed approach" to the mitigation of impacts to waters of the U.S. This philosophy suggests that the USACE is likely to request not only wetland creation, but also the use of vegetated upland buffers. Mitigation that includes a mix of habitats such as open water (i.e., streams), as well as wetlands and adjacent uplands, is normally more

ecologically sustainable. This approach by USACE is consistent with CDOT's mitigation approach outlined above.

Per Section 404 of the CWA, impacts to wetlands and other water features must be avoided, minimized, or mitigated (in order of preference). Although the CWA requires compensatory mitigation only for those wetlands and other water features considered jurisdictional by the USACE, it is FHWA and CDOT policy to mitigate all wetland impacts (jurisdictional and non-jurisdictional).

The overall goals of any compensatory mitigation would be to replace acreage of wetlands directly impacted by the project, and to replace those wetland functions lost, on an ecosystem level. This can be accomplished by linking wetland mitigation efforts in the western end of the corridor with mitigation efforts for threatened and endangered species, since habitat requirements are similar. In cases of wetland creation or enhancement, a compensatory mitigation site would include the delivery of water, grading, excavating, and planting herbaceous and woody vegetation. The Transportation Equity Act for the 21st Century included a preference for the use of wetland mitigation banking to the extent that a local mitigation bank exists, contains enough credits to offset the impacts, and is federally approved. All accepted methods of mitigation will remain valid options for all sections of the corridor, and a detailed mitigation plan will be developed during final design.

6.2 COMPENSATORY MITIGATION — THREATENED AND ENDANGERED SPECIES

Compensatory mitigation for threatened and endangered species is outlined in the PBA, and is summarized below. For more details on mitigation opportunities, refer to the PBA.

In anticipation of mitigation requirements, and in an effort to stay consistent with the overall ecosystem approach to mitigation on the west-end where there are also wetland-associated endangered species impacts, CDOT has coordinated with City of Boulder Open Space and Mountain Parks (OSMP) to identify potential mitigation sites that may provide opportunity for habitat improvements. Off-site mitigation would include property acquisition, restoration, monitoring, and possible ownership transfer, and would be focused on creation, enhancement, and restoration of habitat to create habitat linkages for Ute ladies'-tresses orchid, and provide continuous movement corridors for Preble's meadow jumping mouse. Mitigation would compensate for Combined Alternative Package (Preferred Alternative) impacts to Preble's meadow jumping mouse and Ute ladies'-tresses orchid habitat and increase the quantity and quality of habitat for both species within their localized range.

The South Boulder Creek floodplain was identified by the City of Boulder OSMP as the preferred location for mitigation to offset impacts to both wetland and threatened and endangered species. As stated above, it is CDOT's desired approach to develop a comprehensive mitigation strategy focusing on this area. In addition to the South Boulder Creek floodplain, nine other potential mitigation sites identified by Boulder County Parks and Open Space and City of Boulder OSMP. These sites were categorized based on two factors: their need for restoration and their vulnerability to development or other threats. Restorable sites have degraded habitat but are contiguous to known occupied habitat of Preble's meadow jumping mouse or Ute ladies'-tresses orchid, and could potentially be restored with an investment of resources for at least a season. Vulnerable sites contain suitable habitat or are occupied by Preble's meadow jumping mouse or Ute ladies'-tresses orchid but are not protected through ownership by a public agency or

land trust, or are not within a conservation easement. The acquisition of restorable or vulnerable sites for mitigation for the US 36 project would need to result in a balance or gain of *occupied* or *potentially occupied* habitat, not of *potential* habitat. Additionally, acquisition of open space buffers would be allowed that would enhance the survival and spread of the species in occupied habitat.

These properties may not be available or may not fit the requirements of the project when CDOT is ready to implement mitigation. If a site is not currently owned by the OSMP or Boulder County, CDOT would have to acquire (through purchase or conservation easement), restore, and monitor the property for several seasons to ensure success, and possibly transfer ownership of the site. Funding for property acquisition and mitigation will be determined during the final design process. No contact has been made with the landowners to gather specific information about the current availability of the properties or their cost.

Reintroduction of Ute ladies'-tresses orchid to suitable habitat may provide another potential mitigation option, although it presents more uncertainties than conservation and/or restoration. Re-establishment of populations would be conducted in cooperation with the USFWS, which would need to assist in development and approval of reintroduction protocol.

Although the project will result in alteration and loss of Preble's meadow jumping mouse and Ute ladies'-tresses orchid habitat, the project would not cause additional habitat fragmentation and loss of connectivity within and between populations in the project area once construction and restoration is complete. Habitat connectivity and mouse mobility would improve at project sites by improved culvert and bridge designs. The nature of the impacts and subsequent restoration actions will allow populations in the project impact area to recover.

All acceptable methods, strategies, and locations for mitigation will remain viable options for this project at this FEIS level.

6.3 COMPENSATORY MITIGATION SUMMARY

CDOT's desired approach to compensatory mitigation for the US 36 project is to continue consultation with USACE, USFWS, and other applicable federal, state, and local agencies to develop a comprehensive mitigation strategy for the corridor with a focus on the South Boulder Creek floodplain ecological system. CDOT is committed to developing mitigation in this area that will provide a benefit to the system as a whole, rather than small isolated improvements. Although the project will be constructed in phases, and mitigation requirements will need to be met for each individual phase, CDOT is confident that the mitigation for each phase can be completed as part of a larger, comprehensive approach.

6.4 NEPA/SECTION 404 MERGER AND SECTION 404 PERMIT PROCESS

During early coordination with the USACE, it was determined that the US 36 Corridor Project would require a Section 404(b)(1) evaluation. This evaluation, in conjunction with NEPA regulations, is referred to as the NEPA/Section 404 merger process. The merger process is guided by and supports the requirements of Section 404 of the CWA (Public Law 92-500, as amended), USEPA regulations (40 CFR Part 230 et seq.), and the Memorandum of Agreement among the USACE, FHWA, and CDOT. The merger process agreement requires consultation on four key concurrence points: (1) Purpose and Need, (2) Alternatives Selected for Detailed

Evaluation, (3) the Preferred Alternative, and (4) Compensatory Mitigation. This merger process has since been updated but this project is still under the older merger agreement by which this project was initiated.

The US 36 Corridor Project obtained by USACE approval on Concurrence Points 1 and 2 in a letter dated January 9, 2006. According to the merger, USACE approval of Concurrence Points 3 and 4 is provided through issuing the Section 404 Permit for the project. However, the USACE has determined that the mitigation plan provided in the FEIS does not meet the requirements of the Final Rule, and therefore, the USACE cannot issue a Section 404 Permit on the same timeline as the US 36 Corridor FEIS.

CDOT, FHWA, and the USACE worked together to develop a process that would allow the US 36 Corridor FEIS to be completed without applying for a Section 404 Permit with the issuance of the FEIS. For this US 36 Corridor Project, where the compensatory mitigation plan provided in the FEIS does not satisfy the requirements of the Final Rule, a diversion from the merger process is necessary. CDOT, FHWA, and the USACE have all agreed that the best approach for the US 36 Corridor Project is to apply for a Section 404 Permit when the final mitigation plan satisfies the requirements of the Final Rule. This diversion from the merger process will allow CDOT and FHWA adequate time to develop the final mitigation plan for all jurisdictional waters of the U.S. impacted by the Combined Alternative Package (Preferred Alternative). CDOT and FHWA will apply for a Section 404 Individual Permit for the Combined Alternative Package (Preferred Alternative) after the FEIS is completed and likely after a ROD is signed, but before any jurisdictional waters of the U.S. are impacted from construction of the Combined Alternative Package (Preferred Alternative). As individual projects are funded and constructed over time, the Section 404 Permit will be amended to reflect the actual impacts.

CDOT, FHWA, and the USACE provided signed concurrence of the diversion from the merger process in a letter dated August 31, 2009. Although the US 36 Corridor FEIS is diverting from the merger process as outlined above, the USACE has confirmed that the Combined Alternative Package (Preferred Alternative) appears to be the LEDPA in a letter dated May 20, 2009. The USACE has also issued a Preliminary Jurisdictional Determination for the FEIS (May 8, 2009), stating that all wetlands and other water features in the project area are considered jurisdictional. This decision was made based on CDOT and FHWA's commitment to mitigate for all wetland impacts regardless of jurisdiction.

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Attachment A
Index Listing

INDEX LISTING

Note: Correspondence is listed chronologically by date, in ascending order by section.

Date	Recipient	Submitter
04-06-05	David Nicol, FHWA	Timothy T. Carey, USACE
05-26-05	Timothy T. Carey, USACE	Jean Wallace for David A. Nicol, FHWA, and Lee O. Waddleton, FTA
11-17-05	Timothy T. Carey, USACE	Lee O. Waddleton, FTA, and David A. Nicol, FHWA
01-09-06	David Nicol, FHWA, and Lee O. Waddleton, FTA	Timothy T. Carey, USACE
11-20-06	Scott Franklin, USACE	Lee Waddleton, FTA, and David A. Nicol, FHWA
03-05-07	Scott Franklin, USACE	David A. Nicol, FHWA, and Charmaine Knighter for Letitia A. Thompson, FTA
04-27-07	David A. Nicol, FHWA, and Letitia A. Thompson, FTA	Timothy T. Carey, USACE
06-22-07	Timothy T. Carey, USACE	Charmaine Knighter for Terry J. Rosapep, FTA, and David A. Nicol, FHWA
07-11-07	David A. Nicol, FHWA, and Terry J. Rosapep, FTA	Timothy T. Carey, USACE
05-08-09	Jon Chesser, CDOT	Timothy T. Carey, USACE
05-20-09	Jon Chesser, CDOT	Timothy T. Carey, USACE
08-31-09	Tim Carey, USACE	Jon Chesser, CDOT

Notes:

- FHWA = Federal Highway Administration
- FTA = Federal Transit Association
- USACE = United States Army Corps of Engineers



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BLVD.
LITTLETON, COLORADO 80128-6901

April 6, 2005

Mr. David Nicol
Division Administrator
U.S. Department of Transportation
Federal Highway Administration
Colorado Federal Aid Division
12300 West Dakota Avenue, Suite 180
Lakewood, Colorado 80228

RE: I-70 East EIS

Dear Mr. Nicol:

I am writing this letter in response to your correspondence of March 28, 2005, regarding the above referenced project. In your letter you requested that the U.S. Army Corps of Engineers (Corps) provide written concurrence that the Purpose and Need Statement (P&N) and the alternatives to be evaluated in detail, based on three levels of screening, are acceptable to the Corps under the NEPA/404 merger process.

The Corps concurs with the P&N. While the needs are not written as statements, similar to what was done for the Northwest Corridor project, the screening criterion table (Table 2-1) and supporting rationale adequately justifies and explains the needs. In the future, we request that the needs be written as definitive needs statements. For example, one of the highway capacity needs could be written as, "There is a need to increase capacity to reduce the projected 2025 congestion to an acceptable level". The screening criterion for this need would be based on what is an acceptable level.

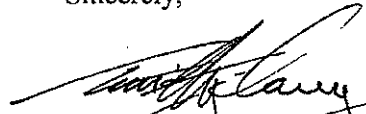
The Corps does not concur, at this time, with the selection of alternatives to be evaluated in detail. Our inability to concur is based on the following:

1. In the Pre-Screening Results section, the statement is made that the evaluation of alternatives was based on a series of yes or no questions. What were the questions and what were the answers for each alternative?
2. The Comparative Screening Results section states that, "A qualitative approach was used to decide the alternatives within each category that were most effective at meeting the purpose and need", yet numerous alternatives were eliminated due to practicability criteria, not the effectiveness of meeting P&N. In addition, elimination of alternatives based on practicability should be done using quantitative factors.
3. Various alternatives were eliminated due to potential community impacts. What were the impacts and how were they quantified?

4. During our last meeting, we requested that a table or chart, similar to the one used for the Northwest Corridor project, be provided. The table was to contain quantifiable data, on a broad scale basis, regarding the impacts of the various alternatives. Such a table was provided, however, only for the alternatives selected for detailed analysis and only for impacts to aquatic resources. Perhaps there was a misunderstanding of our request for such a table at our last meeting. In order to concur with the three levels of screening preceding selection of alternatives for detailed analysis, we must be able to quantifiably justify elimination of alternatives. At the present time, all that is provided is subjective, narrative text. As an example, in the third level of screening, one of the Downtown Transit Alternatives was eliminated due to, "...more potential residential and historical property impacts than other alternatives". What were the historic property impacts and how much more were they than other alternatives? When alternatives are eliminated based on quantitative data, we need to see the data, which is what the Northwest Corridor has done with their table(s). Without this data, it is impossible for the Corps to determine if the LEDPA was improperly eliminated during the three screenings.

If you have any questions regarding the above comments, please call or e-mail me at 303-979-4120 or timothy.t.carey@usace.army.mil, respectively.

Sincerely,



Timothy T. Carey
Chief, Denver Regulatory Office



U.S. Department
of Transportation

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Mr. Timothy T. Carey
Chief, Denver Regulatory Office
Department of the Army
Corps of Engineers, Omaha District
9307 South Wadsworth Boulevard
Littleton, CO 80128-6901

MAY 26 2005

Dear Mr. Carey:

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), in conjunction with the Colorado Department of Transportation (CDOT) and the Regional Transportation District (RTD), are preparing a Draft Environmental Impact Statement (DEIS) on the US 36 corridor between Denver and Boulder. This corridor includes the existing US 36 highway and the BNSF railroad that roughly parallels the highway. Alternatives that will increase mobility between Denver and Boulder are being considered along both the existing highway and the railroad.

CDOT, FHWA and the US Army Corps of Engineers (USACE) have established a NEPA/404 Merger Process to assist in decision-making and compliance with the National Environmental Policy Act (NEPA). As you know, a meeting has been scheduled to discuss the US 36 project on June 3, 2005, at 10:00 AM at the USACE office in Littleton, Colorado.

The merger process is a sequential process intended to achieve interagency concurrence on four key issues: 1) Purpose and Need; 2) Alternatives Selected for Detailed Evaluation; 3) the Preferred Alternative; and 4) Compensatory Mitigation.

At this time, FHWA is requesting formal concurrence through the NEPA/404 Merger process on two points: purpose and need and alternatives that were screened and eliminated.

Under the NEPA/404 Merger Process, the US Environmental Protection Agency (USEPA) and the US Fish and Wildlife Service (USFWS) are to be provided the opportunity to participate as commenting agencies in the process. Commenting agency status requires that these agencies be



included in the concurrence meetings and that all information provided to the USACE will also be provided to USEPA and USFWS for their review. Representatives from both USEPA and USFWS have indicated that they will be attending the June 3 meeting.

A copy of the draft purpose and need chapter is enclosed for your review. In addition, the development and evaluation of alternatives for the US 36 Corridor DEIS was conducted at several levels. The enclosed table ("Stand-Alone Alternatives Eliminated During General or Conceptual Evaluation") shows the concepts that were completely eliminated during either "general" or "conceptual" screening because they did not meet the purpose and need for the project or because they were not practicable (in terms of existing technology, logistics or cost). Consequently, these alternatives did not receive extensive environmental analysis, since they did not pass the criteria used for purpose and need or practicability.

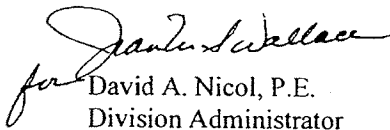
Although some of the alternatives at the conceptual level did not meet purpose and need as "stand-alone" alternatives, they did meet the mobility requirements of purpose and need when combined with highway improvements. These alternatives, when combined or complemented with other alternatives or ideas, became viable alternatives and were combined together into "packages." Four of these packages, plus the no action package will be carried forward into the DEIS for detailed evaluation. This information is detailed in the enclosed document titled "General and Conceptual Alternatives and Evaluation Process."

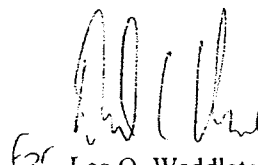
It is important to understand that the differences in packages are related to operational mode or type (bus, commuter rail, toll lanes, HOV lanes) rather than changes in alignments. All packages of alternatives that will go through detailed evaluation will use the existing US 36 and/or BNSF alignments.

We look forward to meeting with you on June 3 to obtain concurrence on purpose and need and alternatives that were screened and eliminated. Per the NEPA/404 Merger agreement, the USACE will issue a written concurrence or provide detailed comments outlining deficiencies that prevent a concurrence within 30 business days following a concurrence meeting.

Please call Jean Wallace at (720) 963-3015 if you have questions or need further information about the project.

Sincerely,


David A. Nicol, P.E.
Division Administrator


for Lee O. Waddleton
Regional Administrator

Enclosures:

cc: Tom Norton, CDOT (letter only)
Brad Beckham, CDOT Env. Programs Branch, w/enc.
Jeff Wassenaar, CDOT Region 6, w/enc.
Sandi Kohrs, CDOT Region 6, w/enc.
Dave Shelley, RTD w/enc.
Dave Beckhouse, FTA, w/enc.
Scott Franklin, USACE, w/enc.
Sarah Fowler, EPA, w/enc.
Alison Michael, FWS, w/enc.
Rick Pilgrim, URS, w/enc.
R. Sperl, J. Wallace, M. Pavlik and M. Vanderhoof, FHWA



U.S. Department
of Transportation

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NOV 17 2005

Mr. Timothy T. Carey
Chief, Denver Regulatory Office
Department of the Army
Corps of Engineers, Omaha District
9307 South Wadsworth Boulevard
Littleton, CO 80128-6901

Dear Mr. Carey:

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), in conjunction with the Colorado Department of Transportation (CDOT) and the Regional Transportation District (RTD), are preparing the DEIS on the US 36 corridor between Denver and Boulder. This corridor includes the existing US 36 highway and the existing BNSF railroad that roughly parallels the highway. Alternatives that will increase mobility between Denver and Boulder are being considered along both the highway and railroad alignments.

This letter follows our letter and submittal of May 26, 2005, (copy enclosed) and our subsequent meeting on June 3, 2005, regarding the US 36 Corridor Draft Environmental Impact Statement (DEIS). We have enclosed a revised Draft of the 404(b)1 Appendix to the US 36 DEIS for your review and preparation activities in advance of our meeting on November 30, 2005, at 10:00 a.m. at your office.

The draft of the Appendix was revised based on comments that we received from your staff during the June 3 meeting. Participating in the June 3 meeting were representatives of US Army Corps of Engineers (USACE), US Environmental Protection Agency, US Fish and Wildlife Service, FHWA, FTA, CDOT and RTD.

The information in the revised Appendix is provided to you, and the November 30 meeting has been scheduled to advance the NEPA/404 Merger Process. The merger process was developed to assist the USACE, CDOT and FHWA in decision-making and compliance with NEPA and Section 404 regulations on projects like the US 36 DEIS.

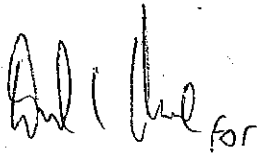


The Draft Appendix addresses the first two of the four points needed to achieve interagency concurrence. The first two points consist of: 1) Purpose and Need; and 2) Alternatives Selected for Detailed Evaluation. Our May 26 letter formally requested concurrence on these points from USACE.

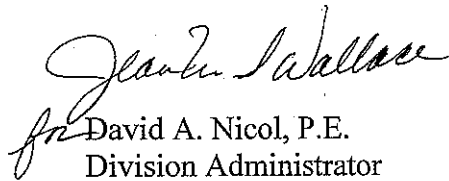
We look forward to meeting with you on November 30 to advance this process as outlined previously. Per the NEPA/404 Merger agreement, the USACE will issue a written concurrence or provide detailed comments outlining deficiencies that prevent concurrence within 30 business days following a concurrence meeting.

Please call Jean Wallace at (720) 963-3015 if you have any questions or need further information about this project.

Sincerely,



Lee O. Waddleton
Regional Administrator
Federal Transit Administration



for David A. Nicol, P.E.
Division Administrator
Federal Highway Administration

Enclosure

- cc: Tom Norton, CDOT (letter only)
Brad Beckham, CDOT Env. Program Branch, w/enc.
Jeff Wassenaar, CDOT Region 6, w/enc.
Sandi Kohrs, CDOT Region 6, w/enc.
Dave Shelley, RTD, w/enc.
Dave Beckhouse, FTA, w/enc.
Scott Franklin, USACE, w/enc.
Sarah Fowler, EPA, w/enc.
Alison Michael, FWS, w/enc.
Rick Pilgrim, URS, w/enc. ✓
R. Sperial, J. Wallace, M. Pavlik and M. Vanderhoof, FHWA

**US 36 Corridor- NEPA/404 Merger Process
 Response to Scott Franklin's written comments on
 Purpose and Need and Alternatives
 November 17, 2005**

Comment	Old Page/New Page	Response
Might be nice to mention NEPA/404 merger agreement (so public is aware)	1.1-3/3	Added in the last paragraph, in the discussion of regulations, "the NEPA/404 Merger Process – an agreement for transportation projects in Colorado,"
If new transit is provided, how will this impact and address highway capacity issues.	1.1-10/24	Additional transit operations are added into the traffic modeling. However, highway capacity is still needed even after adding transit options. Added text to further explain packaging of alternatives: Package 4: "Comparing this new capacity with expected demand still left a deficiency, therefore additional general purpose lanes would then be added to meet any remaining demand." Package 5: "The package would also provide additional general purpose lanes to try to increase capacity for any remaining demand not already met by the transit options."
Merged (or changed) P and N etc. in equal criteria?	2-2/15	Improving transportation mobility was used as the first criteria; Criterion 2 through 4 were used as discriminators. Trip capacity is a subset of mobility. No change was made to text.
Bus in guideway?	2-3/15	That would be the BRT, first bullet. No change to text.
Natural only or human?	2-4/16	Revised Environmental Criteria text to read "Natural Environmental" and Practicability Criteria text to read only "human environmental effects."
Why wouldn't this meet need as a stand-alone?	2-8/19	Revised table. Tolling did become a Major Alternative, (formerly "Stand Alone"), in the process of packaging alternatives.
Why? Need a factual reason	2-8/19	Added text to describe why a TDM alternative would not significantly improve mobility or travel times between Denver and Boulder: "The most effective transportation management programs in

		the country are focused at the activity center level and have achieved trip reductions of 20-25%. The US 36 Corridor has few concentrated employment/retail activity centers. Therefore, the overall effect of a transportation management alternative in the US 36 Corridor would not be sufficient to meet the purpose and need.”
Commuter or light rail?	2-8/19	This discussion was for commuter rail. Added heading to clarify.
Can this technological problem be overcome? How could rail work on I-70 West and not here? What is the “moderate” distance?	2-8/19	Added more explanation regarding cost and complexity: “Tunneling costs would be ten to fifteen times more than at-grade construction and the presence of abandoned underground coal mines creates additional complexity.”
Conceptual Alternatives –Are the mobility needs quantitatively defined somewhere?	2-10/20	Mobility of the modes under consideration were quantitatively developed for the Conceptual Alternatives and documented in the Technical Report with great detail; Table 8 in the June 2005 version identified the criterion/measures used at the Conceptual level evaluation that included demand assessments among modes; in order to focus more directly on the USACE interests, old Tables 8,9,10 and 11 were removed from the November version.
Commuter rail along US 36 – how much more expensive?	2-10/19-20	Added text to describe the increased costs for Commuter Rail along US 36 for two conditions: 1. In a tunnel under Davidson Mesa that would be 10-15 times more costly; and, 2. Along US 36 instead of BNSF requiring alignment to cross under ramps, interchanges, etc. with greater complexity and costs.
Sure would appreciate mentioning practicable alternatives, per NEPA/404 merger.	2-11/14	Added text,” In the NEPA/404 Merger Process, the alternatives screening process can only eliminate alternatives that may be least damaging to the aquatic ecosystem if they do not meet purpose and need, have other significant consequences to the natural environment or they are not practicable based on the Section 404 (b)(1) guidelines. The definition of practicable

		as defined in 40 CFR 230.3, is that which is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.”
So only these packages are carried forward, not the stand-alone alternatives?	2-12/21	Revised the term “Stand-Alone” alternatives. Alternatives were considered Major or Supportive and combined to create packages.



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BLVD.
LITTLETON, COLORADO 80128-6901

January 9, 2006

Mr. David Nicol
Division Administrator
Federal Highway Administration
Colorado Federal Aid Division
12300 W. Dakota Avenue, Suite 180
Lakewood, Colorado 80228

Mr. Lee O. Waddleton
Regional Administrator
Federal Transit Administration
Region 8
12300 W. Dakota Avenue, Suite 310
Lakewood, Colorado 80228

RE: U.S. 36 Corridor EIS

Dear Messrs. Nicol and Waddleton:

I'm writing this letter in response to your correspondence of November 17, 2005 and the subsequent meeting with your staff on November 30, 2005. In your letter, you requested that the Corps of Engineers (Corps) provide concurrence on the Purpose and Need (P&N) Statement and alternatives to be evaluated in detail in the Draft EIS for the above referenced project. In response to your request, and in accordance with our NEPA/404 Merger Agreement with the Federal Highway Administration, the Corps generally concurs with the P&N Statement and concurs with the alternatives to be evaluated in detail.

The Corps requests that the beginning sentence of the P&N statement be reworded to remove the "by" statement at the end of the following sentence: "The purpose of a proposed action in the US 36 Corridor is to improve mobility between Denver and Boulder and between intermediate destinations by". The three bulleted points that follow this sentence are transportation needs that should not be included as part of the purpose statement. These transportation needs, as well as others, are well documented in the proceeding sections.

Please extend my thanks to Ms. Jean Wallace and the project team for taking the Corps' earlier comments into consideration. If you have any questions, please call me at 303-979-4120.

Sincerely,

Timothy T. Carey
Chief, Denver Regulatory Office

SEN 1 001



U.S. Department
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RECEIVED

NOV 20 2006

NOV 27 2006

URS Corp.

Mr. Scott Franklin
US Army Corps of Engineers
Denver Regulatory Office
Omaha District
9307 South Wadsworth Blvd
Littleton, CO 80128-6901

Dear Mr. Franklin:

Subject: Request for Concurrence of Alternatives in the US 36 Draft EIS

The US 36 DEIS project team is currently seeking USACE concurrence on eliminating two build alternatives from final consideration in the DEIS. This letter will provide our justification and will describe how we screened out two build alternatives since we last consulted with you on January 9, 2006. This letter also demonstrates that the least environmentally damaging practicable alternative has not been eliminated from further consideration in the DEIS. If you support our recommendation to screen out two alternatives, the No Action Alternative and two build alternatives will remain and will be completely evaluated in the DEIS.

As a reminder, the following packaged alternatives have been subject to detailed evaluation since January 9, 2006:

- Package 1: No Action
- Package 2: Express Toll Lanes plus Bus Rapid Transit
- Package 3: General Purpose Lanes plus Exclusive Bus Rapid Transit on a separate busway (no HOV lane)
- Package 4: General Purpose Lanes plus High Occupancy Vehicle Lanes combined with Bus Rapid Transit
- Package 5: General Purpose Lanes plus High Occupancy Vehicle Lanes combined with Express Bus Service

The type and amount of impact to wetlands and aquatic resources associated with each package is expressed in Tables 1 and 2 on the next page.

As shown in these tables, Package 5 has the least impact to Waters of the U.S. including wetlands.

CDOT, RTD, FTA, and FHWA have reached agreement that Package 3 is not a practicable alternative because it does not meet purpose and need and has exorbitant capital and operating costs. Similarly, Package 5 is not a practicable alternative because it does not meet purpose and need.



Table 1: Summary of Direct Permanent Wetland Impacts by Package

Package	Total Wetlands (acres)
1	0
2	21.4 to 27.5
3	20.1 to 26.9
4	20.4 to 25.1
5	19.0 to 22.0

Source: US 36 DEIS impact analysis, November 2006

Table 2: Summary of Direct Permanent Impacts to Other Water Features by Package

Package	Other Water Features (acres)			Total (acres)
	Irrigation Ditches	Natural Waterways	Ponds and Reservoirs	
1	0	0	0	0
2	1.24-1.32	0.48 to 0.53	2.63 to 2.75	4.35 to 4.60
3	1.23	0.57	0.54	2.34
4	1.22-1.29	0.43 to 0.46	2.47 to 2.59	4.12 to 4.34
5	1.20	0.74	0.06	2.0

Source: US 36 MP; November 2006

Package 3 has no provisions for High Occupancy Vehicle Lanes. Carpools and vanpools would need to use the General Purpose Lanes. For this reason, congestion continues on the General Purpose Lanes and the reduction in vehicle hours of travel between this alternative and the No-Action Alternative is not sufficient to provide acceptable congestion relief or to expand the range of travel options for carpools and vanpools. If travel time is not less for carpools and vanpools, there is no longer any incentive to use this mode of travel. In addition, Package 3 includes a totally separate busway. The capital and operating cost for this element is so costly that it would not meet the FTA threshold for receiving federal transit funds. The annual BRT cost for this alternative is \$150 million, substantially greater than the other packages (which are all less than \$100 million) and the additional new transit trips is similar (within two percent) to the other packages with BRT included. For these reasons, Package 3 is not practicable.

Package 5 has no provisions for Bus Rapid Transit. The buses would travel instead in the one HOV lane that would be provided in each direction. In order to pick up and drop off passengers, the buses would need to exit the HOV lane and travel to a drop off area at an interchange, mixing with general purpose traffic in the process. This constraint would result in bus travel time that is so much longer that projected bus ridership would not meet the purpose and need of providing for efficient transit service. The bus travel time is 11 to 17 minutes longer in the AM peak period than the other packages and only four minutes shorter than automobile travel. The effect of this on ridership is substantial: Package 5 results in over one million fewer person trips annually compared to the other packages. Total corridor bus ridership would increase only about five percent compared to the No Action for Package 5 while each of the other packages would increase ridership by at least 28 percent. Bus passengers have to see an improvement in travel time to justify switching from a single occupant vehicle. In addition, because Package 5 only includes one additional HOV lane in each direction, it does not meet the purpose and need of providing congestion relief to peak hour congested intersections. It provides no improvement in the number of peak hour congested intersections (compared to the No Action Alternative.).

For these reasons, we request your concurrence on the alternatives to be evaluated in detail in the DEIS: Package 1 (No Action), Package 2 (Express Toll Lanes plus BRT) and Package 4 (General Purpose Lanes plus HOV Lanes including BRT). Please contact Sandi Kohrs, CDOT Project Manager, at (303) 757-9183; Dave Shelley, RTD Project Manager, at (303) 299-2408; or Monica Pavlik, FHWA Senior Operations Engineer, at (720) 963-3012 if you have any questions. We look forward to discussing this information with you in more detail on November 29, 2006.

Sincerely yours,



Lee Waddleton
Regional Administrator
Federal Transit Administration



David A. Nicol, P.E.
Division Administrator
Federal Highway Administration

cc: Sandi Kohrs, CDOT Region 6
Pam Hutton, CDOT
Brad Beckham, CDOT
Chuck Attardo, CDOT
Dave Shelley, RTD FasTracks
Nadine Lee, RTD FasTracks
Gina McAfee, RTD FasTracks
Kick Pilgrim, URS



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March 5, 2007

Scott Franklin
U.S. Army Corps of Engineers
Denver Regulatory Office
9307 S. Wadsworth Blvd
Littleton, CO 80128-6901

Re: US 36 Corridor DEIS and Section 404 (b)(1) Evaluation

Dear Scott,

We appreciate your involvement and help with the US 36 Corridor DEIS. Enclosed is a copy of the revised draft Section 404 (b)(1) Evaluation. As you know, your office has previously received a draft Section 404 (b)(1) Appendix and has concurred with the Purpose and Need and the alternatives selection up to that time.

Contents of the revised draft Section 404 (b)(1) Evaluation

The revised draft Section 404 (b)(1) Evaluation is intended to be a working document as we progress through the NEPA phase and satisfy the requirements of the NEPA/404 Merger Process for Transportation Projects in Colorado. In this revised version, we have provided an introduction that explains the history of the project and how the status has changed over the last year, primarily due to the separation of the highway and rail corridors into separate studies.

Section 2 of the revised draft Section 404 (b)(1) Evaluation contains the Purpose and Need and describes the six transportation needs. These are the same needs shown in the earlier version. Even with the removal of the rail project, the Purpose and Need has stayed essentially the same for the US 36 highway corridor. For purposes of this letter request, the two transportation needs that are germane to the identification of the final two build packages are transportation needs #4 - *Expand Mode of Travel Options* and #5 - *Efficient Transit Service*.

Section 3 of the revised draft Section 404 (b)(1) Evaluation now takes you through our "packaging" process. It begins with the general alternatives, followed by conceptual alternatives, package development and revisions to the packages. You had previously seen the information on general and conceptual alternatives, but not the detail on the development and initial evaluation of the four build packages. Packages were developed by combining alternatives from the general and conceptual alternatives development phases. By utilizing input from the Technical Support Committee, Corridor Governments Committee, general public, and government agencies, the project team combined alternatives into packages that addressed all six needs to varying degrees.

Table 3-7 in the revised draft Section 404 (b)(1) Evaluation summarizes and compares the features of the packages using the USACE criteria of Purpose and Need, Practicability, and Environmental

Consequences. For your convenience, Table 3-7 has also been attached to this letter. It is important to understand that the packages are combinations of operational modes and features that would not meet Purpose and Need as stand alone improvements. All of the packages use the same existing US 36 highway corridor. Therefore, the amount of additional right-of-way needed to build any of the packages is very similar, as are the environmental consequences. As shown in Table 3-7, Packages 3 and 5 have the least amount of impact to wetlands and other waters of the U.S. Environmental impacts for each resource, including aquatic resources, were calculated using the worst-case footprint.

Request for Elimination of Two Packages

At this time, the US 36 project team would like to remove Packages 3 and 5 from further consideration and carry forward Packages 1 (No Action), 2, and 4 in the DEIS for detailed evaluation. The details of the screening can be found in the revised draft Section 404(b)(1) Evaluation and Chapter 2 of the US 36 DEIS.

In general, Packages 3 and 5 do not provide as much mobility as Packages 2 and 4. This is important because part of the purpose for the project is to provide multimodal transportation options that are effective and attractive.

A major portion of this evaluation step has considered the trade-off between the cost to make an improvement versus the change in travel mode. The Federal Transit Administration (FTA) uses this type of comparison to evaluate transit investments proposed in cities across the country. This is because the evaluation process helps to define actions that would result in the most effective use of public funds.

In the US 36 corridor, Packages 3 and 5 are not as effective as Packages 2 and 4 because:

- Package 5 would attract much lower levels of transit riders because the improvements would not provide as much travel time savings as the other packages.
- Package 3 is much more expensive to construct because this package would use a separate bus guideway for the length of the corridor. Even with the separate guideway, this package would not attract the substantially higher number of riders needed to justify the expenditure; ridership would be about the same as Packages 2 and 4.

Specifically, Package 3 does not provide improved travel time for carpools and vanpools because they will be traveling in the general purpose lanes. This package therefore does not meet transportation need #4. Package 5 results in a bus travel time which is 11 to 17 minutes longer than the other packages. Therefore, this package does not meet transportation need #5. By reference, both Packages 2 and 4 will offer travel time savings compared to the single occupant vehicle of 29 and 30 minutes respectively. According to numerous studies (and as documented in "Traveler Response to Transportation System Change", Transit Cooperative Research Program, March 2000, to be successful, a HOV lane must offer at least one minute of travel time savings per mile. Only Packages 2 and 4 meeting this threshold.

Package 3 is very expensive to build because a barrier separated Bus Rapid Transit lane would be added to the outside of the highway rather than in the median. This would require rebuilding all of the existing interchanges and acquiring large amounts of additional right-of-way. As shown in Table 3-7, the cost of Package 3 is at least 50% higher than the other packages. The capital and operating cost for this guideway would be so costly that FTA would not provide federal transit funds.

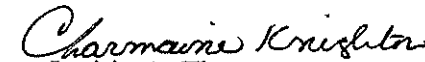
The Cost per Total Corridor Transit Rider in Package 5 is at least double the cost of the other packages. This low cost-effectiveness makes this package not practicable. Package 5 also does not include provisions for BRT and on-line median transit stations as required through the Denver voter's approval of the FasTracks program. Finally, in the design of Package 5, buses would have to continually mix with general-purpose traffic to access the HOV lane, which would result in slower bus travel times and reduced use of transit by potential bus riders.

For these reasons, we request your concurrence on the alternatives to be evaluated in detail in the DEIS: Package 1, Package 2 and Package 4. We look forward to your review of this document, and appreciate the cooperation of the USACE. Please call with any questions or concerns.

Sincerely,



DR David A. Nicol, P.E.
Division Administrator
Federal Highway Administration



Letitia A. Thompson
Acting Regional Administrator
Federal Transit Administration

Attachments



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BLVD
LITTLETON, CO 80128-6901

April 27, 2007

David A. Nicol, P.E.
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12300 West Dakota Ave, Suite 180
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Letitia A. Thompson
Acting Regional Administrator
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12300 West Dakota Ave, Suite 310
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**RE: US 36 Corridor EIS (Corps File #200380602)
Comments, US36 Corridor DEIS Section 404(b)(1) Appendix**

Dear Mr. Nicol and Ms. Thompson:

Reference is made to your letter dated March 5, 2007 and accompanying US36 Corridor DEIS Section 404(b)(1) Appendix sent to this office. In your letter you requested that the Corps of Engineers (Corps) provide concurrence that the alternatives to be evaluated in detail in the DEIS are Packages 1, 2 and 4. Although in a letter dated January 9, 2006 this office generally concurred with the alternatives evaluated in detail at that time, you indicate in your March 5, 2007 letter that the status of the project changed over the last year, primarily due to the separation of the highway and rail corridors into separate studies.

In response to your current March 5, 2007 request, and in accordance with the NEPA/404 Merger Agreement with the Federal Highway Administration, the Corps again generally agrees with the new set of alternatives to be evaluated in detail. We appreciate the opportunity to offer the following comments:

Comment 1. Page 2 of your cover letter, 2nd to last paragraph.

You indicate that "...to be successful, a HOV lane must offer at least one minute of travel time savings per mile. Only Packages 2 and 4 meet this threshold." This is a valid, threshold-supported screen for the Section 404 (b)(1) guidelines, but is not supported in Table 3-7, page 3-16, Criteria Description TN 4 and 5. Recommend you explain the one-minute threshold. Why do Packages 2 (29 mins) and 4 (30 mins) meet the threshold but not Package 3 (36 mins)?

Comment 2. Page 1-3, Section 1.2.1, second to last sentence, "...among the USACE, FHWA, and CDOT."

Recommend you add to this sentence, "...and the NEPA/404 merger process and agreement for transportation projects in Colorado."

Comment 3. Page 3-8, Table 3-5, Criteria Description TN 1 and 3, Advanced Guideway column.

This cell references "...additional 10,000 peak-hour person trips." We didn't find "10,000 peak-hour person trips" in the Purpose and Need section.

Page 3-8, Table 3-5, Criteria Description TN 1 and 3 row, New Arterials column.

Recommend you reference the actual projected need (10,000 peak-hour trips?).

Page 3-16, Table 3-7, Criteria Description TN 1 and 3 row, Rationale Basis column.

This cell mentions projected demand in 2025, whereas most of the Purpose and Need section indicates projected demand in 2030. Recommend that these years match.

Page 3-16, Table 3-7, Criteria Description TN 1 and 3 row, Package 3.

What is "...*enough* reduction in highway travel time..."? An alternative that fails needs a threshold that it doesn't meet...not just that it has the least reduction in highway travel time.

Page 3-18, Table 3-7, Criteria Description C1, Package 3.

For the 404(b)(1) guidelines, to eliminate a project based on cost, the project's cost has to be compared to an industry standard. In your report you're comparing the cost between the five packages, not against a standard industry threshold. Based on other similar transportation projects, are 50% higher costs reasonable? If a 50% higher cost is within the industry standard, then you can't screen based on the practicability factor of cost.

Page 3-18, Table 3-7, Criteria Description C2, Packages 3 and 5.

Again, based on the 404(b)(1) guidelines, we can't eliminate an alternative because it's not "cost-effective" compared to other packages. You need to use a standard industry threshold. Please show why Packages 3 and 5 don't meet the FTA thresholds for cost-effectiveness and are subsequently not eligible for federal funding. This is a valid way to screen out Packages 3 and 5 based on the 404(b)(1) Guidelines.

Page 3-20, Boxed text, Package 3, bullet #1 reads:

"Package 3 features a separate BRT guideway along the side of US 36. The capital and operating cost for this guideway would be so costly that it would not meet the FTA threshold for receiving federal transit funds. The high cost renders this package as not practicable."

Recommend you change this to read:

"Package 3 features a separate BRT guideway along the side of US 36. The capital and operating cost for this guideway would not meet the FTA threshold of _____ for receiving federal transit funds, and thus is not practicable."

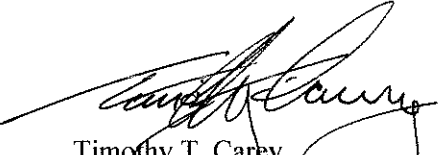
Page 3-20, Boxed text, Package 5, bullet #3, reads:

"Cost per Total Corridor Transit Rider is \$33.49, which is more than double that of the other packages. This package is not cost-effective compared to other packages and is considered not practicable." Under the 404(b)(1) Guidelines, you can't screen an alternative because it is the most expensive. You can, however, screen it out because it doesn't meet a cost threshold, as shown in Package 3. Does Package 5 not meet a certain threshold?

As stated above, it appears that Packages 1, 2 and 4 should be evaluated in detail in the DEIS, and that Packages 3 and 5 might be suitable for elimination. However, we recommend that elimination of Packages 3 and 5 be based on thresholds as described in our comments above. Request you allow this office to review the screening criteria again before we offer final concurrence on this document, since the DEIS appendix will be used to support the 404(b)(1) Guidelines evaluation in any future potential Section 404 Permit.

Thank you for the opportunity to be part of the EIS process. If there are any questions concerning these comments, please contact Scott Franklin of this office at 303-979-4120.

Sincerely,



Timothy T. Carey
Chief, Denver Regulatory Office

200380602.deis b1 appendix comments.doc



U.S. Department
of Transportation

Federal Transit Administration
Region VIII
12300 West Dakota Avenue, Suite 310
Lakewood, CO 80228-2583
Telephone: 720-963-3300

Federal Highway Administration
Colorado Division
12300 W. Dakota Ave., Suite 180
Lakewood, CO 80228
Telephone: 720-963-3000

Mr. Timothy T. Carey
Chief, Denver Regulatory Office
U.S. Army Corps of Engineers, Omaha District
9307 South Wadsworth Boulevard
Littleton, CO 80128-6901

JUN 22 2007

Dear Mr. Carey:

**Re: US 36 Corridor EIS (Corps File #211380602)
Comments on Draft US 36 Corridor DEIS Section 404(b)(1) Appendix**

We have received your comments dated April 27, 2007 regarding the Draft Section 404(b)(1) Appendix. We offer the following responses:

Comment 1: Clarification has been added to Table 3-8, page 3-20, that Package 3 fails to meet the expressed threshold of one minute travel time savings per mile compared to single occupant vehicles—for carpools and vanpools because the alternative does not include HOV lanes for these travelers. Package 5 fails to meet the expressed threshold because the mileage between downtown Boulder and downtown Denver is 29 miles and it only provides 26 minutes of travel time savings rather than 29 or 30 with Packages 2 and 4. This clarification has been included in Table 3-8 of the revised Draft 404(b)(1) Appendix that will be included in the DEIS and is enclosed with this letter.

Comment 2: The suggested phrase (... and the NEPA/404 merger process and agreement of transportation projects in Colorado) has been added to the Purpose and Need chapter, Section 1.2.1. This now reads: *The NEPA/404 Merger process is guided by and supports the requirements of Section 404 of the Clean Water Act (CWA) (Public law [PL] 92-500, as amended), U.S. Environmental Protection Agency (EPA) regulations (40 Code of Federal Regulations [CFR] Part 230 et seq.), and the Memorandum of Agreement (MOA) among the USACE, FHWA, and CDOT and the NEPA/404 merger process and agreement for transportation projects in Colorado.*

Comments 3 and 4: The 10,000 peak hour person trips needed is one way to measure Transportation Need #1—Increase Trip Capacity. The other ways that are used to measure this need are daily reduction in vehicle hours of travel compared to the No Action Alternative, whether or not there is an improvement in travel time reliability and whether or not congested intersections are improved. The 10,000 person trips reflect the forecast travel demand from the 2025 modeling effort which is based on the DRCOG adopted regional transportation model. The 10,000 figure is not an absolute threshold; rather this indicator is a balance of these various factors (daily reduction in vehicle hours of travel, improvement in travel time reliability, and whether or not congestion intersections are improved.) An explanation of where the needed 10,000 person trips come from is included in section 2.1 Transportation Need #1: Increase Trip Capacity. Clarification has also been added to Tables 3-5 and 3-8 related to this. (See revised Draft 404(b)(1) Appendix, enclosed.)

Comment 5: Evaluation of alternatives for the draft EIS spanned two planning horizons, 2025 and 2030. The reason that 2025 travel demand data was used for the Detailed Evaluation chart was because this was the available data from DRCOG at the time that evaluation was performed. Since that time, additional evaluation has been performed and the most current 2030 data was used for the later evaluations. Comparison of the

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ECONOMY**

2025 data and 2030 data show that there is only a 2% variation in travel demand in the corridor. That slight difference does not affect the screening conclusions for P3 or P5. Text has been added to Table 3-5 and section 3.5.1 (page 3-25) to explain the travel demand model year update.

Comment 6: The lack of the ability for an alternative to be able to provide the reduction in travel time is a way to measure how well an alternative reduces congestion. The difficulties of this criterion are that it is generally used in comparison of the other alternatives and there is no threshold developed to use for screening. Because Package 3 focuses improvements on bus transit, the other types of travelers (HOV and van pools) do not see associated benefits and therefore do not see as much travel time savings. This may be the least efficient in terms of vehicle hours of travel, and primarily this is evident in Package 3 not being able to meet the purpose and need for TN4 – Expand Mode of Travel Options. This is not the only reason that indicates that Package 3 is not reasonable or practicable. Later in this response, clarification on practicability related to cost will demonstrate that Package 3 is not practicable based on cost as well as not meeting the purpose and need.

Comment 7: Demonstrating that an alternative is not practicable based on cost will vary depending on the type of project proposed. The determination of what constitutes an unreasonable expense should generally consider whether the projected cost is substantially greater than the costs normally associated with the particular type of project. In this corridor, the project is evaluating a number of alternatives for providing efficient bus transit, HOV, and options for SOV. To accommodate these options there are differing levels of operations, costs, levels of service among the alternatives considered. When the cost of an alternative exceeds others by a wide margin and does not provide the service and benefits of the other alternatives the alternative is not reasonable, which is the industry standard. In this case the capital costs, added to Table 3-8 under C1 show that for implementing the BRT facilities for Package 3 is \$643 million dollars more than the next highest cost package (Package 2) and does not increase the ridership over the other alternatives. The Package 3 BRT facilities cost \$44 million per mile is an extraordinarily high cost for this type of facility, which is normally built for around \$8 million per mile making Package 3 not practicable based on cost. There are no other similar corridor exclusive busway applications nationwide that are available to be used for comparison purposes. For comparison on a national basis, FTA provides cost-effective thresholds for helping the federal agency make decisions regarding funding. The response to Comment 8 explains how the cost-effective threshold has been applied.

Comment 8: Using cost-effectiveness is the industry standard that FTA uses to make decisions regarding funding of transit projects. On a New Starts candidate projects (a class of major investment transit projects) FTA calculates the Transportation System User Benefits (TSUB), and if an alternative is not close to the medium rating for TSUB it will not receive funding and the alternative is eliminated. Because this corridor is not likely to pursue FTA funding it is acceptable to calculate reasonable surrogates that are more accessible than the TSUB. This study is using cost per new rider as a surrogate to the TSUB measurement used for FTA's New Starts process and created these thresholds to correspond to the range of projects that FTA has determined are cost effective. Data comparing the five alternatives to the most recent list of projects that have received a rating of medium and higher from FTA has been added to Table 3-8. These data show that a cost per new rider "Medium" cost-effectiveness rating that would qualify these packages ranges from \$14.00 to \$21.99 per new rider. The cost per new user (transit plus HOV) would require a "High" rating of less than or equal to \$10.99 per new user to be considered cost effective. Packages 2, 4 and 5 are comparable to projects in FTA's cost effective projects list and are therefore considered to be cost effective based on the industry standard. Package 3 is not. Package 3 has a cost per New Rider of \$33.36 and also a cost per New Rider/HOV user of \$33.36, as there is no HOV lane in this package. This also demonstrates that Package 3 is not practicable based on cost.

Comment 9 and 10: The suggested language has been put into context in Table 3-8 and the discussion of Package 3 starting on page 3-19. From Table 3-8, the basis for screening is: To advance, a package must be cost-effective in terms of cost per new transit rider when compared to other packages, improvements in other

corridors, or national thresholds used by FTA or FHWA. The FTA threshold was taken from recent New Starts corridors (which ranged in cost from \$14.00 to \$21.99 per new rider). Two measures were used: 1) Cost per new transit rider, 2) Cost per new user (transit plus HOV) should be less than or equal to \$10.99. Package 3 cost per New Rider is \$33.36. The cost per New Rider/HOV user is also \$33.36. Both well beyond FTA's threshold for funding making Package 3 not practicable.

Clarifications Included in the Draft 404(b)(1) Appendix

Table 3-8 in the Draft 404(b)(1) Appendix shows the wetland impacts for packages 2, 3, 4 and 5. This table shows two options for the western terminus for each package, option A and option B. Option A requires buses to merge from the bus/HOV lanes into the general purpose lanes in order to access RTD's Table Mesa park-n-Ride in Boulder. Option B includes separate ramps (flyovers) connecting busses directly via "bus only" lanes to the Table Mesa park-n-Ride in Boulder. Both options meet purpose and need, and the project team feels it is important to gather public and agency comment on both options presented in the DEIS. Both options will be studied in more detail in the FEIS. A preferred option will be presented in the FEIS only after the travel time savings and ridership advantages of each option are weighed, and environmental impacts, cost, and public input are considered.

The previous draft of the 404 Appendix Table 3-7 (currently Table 3-8) listed the highest impact numbers for wetland impacts for the packages in hopes of simplifying the information. Unfortunately, this resulted in Packages 2 and 4 including option B, while packages 3 and 5 included only option A. At the time packages 3 and 5 were screened, option B had not been fully developed. Therefore, it was not applied to packages 3 and 5 in the previous draft of Table 3-7. In the current draft, Package 3 assumes that the bus will be in a separate guideway all the way to Table Mesa so option A would never apply. In the enclosed Table 3-8 we have estimated the impacts for Package 5 for both option A and B so you can easily see the differences among all of the packages.

The attached Draft 404(b)(1) Appendix, unless your office recommends changes, will be circulated with the DEIS. This draft reflects your suggested changes to the purpose and need and screening. Table 3-8 presents a summary of the reasons that support carrying Packages 1, 2, and 4 forward in the DEIS for detailed analysis and wetland and waters of the US impacts.

Summary

Package 5 is being eliminated because it does not meet the purpose and need (TN2, TN4 and TN5). It fails to improve interchange intersections that would provide improved access to activity centers, does not provide on-line BRT stations for better travel time reliability, and fails to provide the minimum effective travel time savings of one minute per mile for the expanded mode of travel options. By not providing median BRT station platforms, Package 5 affects travel time and travel time reliability for buses and transit users requiring buses to navigate interchanges and slip ramps through general purpose lanes for loading and unloading increasing their travel times.

Package 3 does not meet purpose and need (TN4 and TN5) because it does not expand modal options for HOV and vanpools so it can not provide the one minute time savings per mile over SOVs for carpools and vanpools. Package 3 is also not practicable because of the extraordinary high cost of the BRT in a separate guideway.

On the basis of these responses and clarifications, we again request that you provide written concurrence to fully evaluate Packages 1, 2 and 4 in the DEIS. We would appreciate your response by June 29, 2007.

Please call Shaun Cutting of FHWA at (720) 963-3033 or Dave Beckhouse of FTA at (720) 963-3306 if you have any questions.

Sincerely yours,

Charmoux Knighton
Terry J. Rosapep
Acting Regional Administrator
Federal Transit Administration

Shaun Cutting
David A. Nicol, P.E.
Division Administrator
Federal Highway Administration

Enclosure: Draft Section 404(b)(1) Evaluation

Cc: Sandi Kohrs, CDOT



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BLVD
LITTLETON, CO 80128-6901

July 11, 2007

David A. Nicol, P.E.
Division Administrator
Federal Highway Administration
Colorado Division
12300 West Dakota Ave, Suite 180
Lakewood, CO 80228

Terry J. Rosapep
Acting Regional Administrator
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Region VIII
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Lakewood, CO 80228

**RE: US 36 Corridor EIS (Corps File #200380602)
Concurrence, US36 Corridor DEIS Section 404(b)(1) Appendix C**

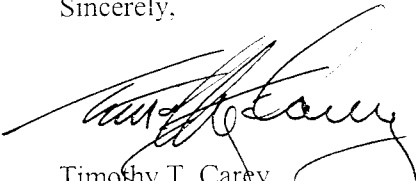
Dear Messrs. Nicol and Rosapep:

Reference is made to your letter dated June 22, 2007 and accompanying US36 Corridor Draft Environmental Impact Statement (DEIS) Section 404(b)(1) Appendix C sent to this office. In your letter you requested that the Corps of Engineers (Corps) provide concurrence that the alternatives to be evaluated in detail in the DEIS are Packages 1, 2 and 4.

In response to your June 22, 2007 request, and in accordance with the NEPA/404 Merger Agreement with the Federal Highway Administration, the Corps concurs that Packages 1, 2 and 4 are appropriate for detailed evaluation in the DEIS. While Package 5 has the least adverse impacts to the aquatic environment, the Corps concurs that it does not meet the project's purpose and need.

Thank you for the opportunity to be part of the EIS process. Please extend my appreciation to Monica Pavlik and Sandi Kohrs for taking the Corps' earlier comments into consideration.

Sincerely,



Timothy T. Carney
Chief, Denver Regulatory Office



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 SOUTH WADSWORTH BOULEVARD
LITTLETON, COLORADO 80128-6901

May 8, 2009

Jon Chesser
Colorado Department of Transportation
Region 6, Planning/ Environmental
2000 South Holly Street
Denver, CO 80222

**RE: CDOT/FHWA US36 Corridor, Preliminary Jurisdictional Determination
Corps File No. NWO-2003-80602-DEN**

Dear Mr. Chesser:

Reference is made to the above-mentioned project and your request for a Preliminary Jurisdictional Determination.

We have prepared a Preliminary Jurisdictional Determination (JD) which is a written indication that wetlands and waterways within your project area may be Waters of the United States (attached). Such waters will be treated as jurisdictional Waters of the US for purposes of computation of impacts and compensatory mitigation requirements. If you concur with the findings of the Preliminary JD, please sign it and return it to the letterhead address within two weeks. If you believe the Preliminary JD is inaccurate, you may request an Approved JD, which is an official determination regarding the presence or absence of Waters of the U.S.

If there are any questions call Margaret Langworthy or Kiel Downing of my office at (303) 979-4120 and reference **Corps File No. 200380602**.

Sincerely,

A handwritten signature in black ink, appearing to read "Timothy T. Carey".

Timothy T. Carey
Chief, Denver Regulatory Office

ATTACHMENT

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): May 8, 2009

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

Jon Chesser
Colorado Department of Transportation
Region 6, Planning /Environmental
2000 South Holly Street
Denver, CO 80222

**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:
NWO-2003-80602-DEN CDOT/FHWA US36 Corridor**

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)**

State: **CO** County/parish/borough: **Denver, Adams, Jefferson, and Boulder** City:

Center coordinates of site (lat/long in degree decimal format): Lat. **39° 58' 15.64"° N**, Long. **105° 11' 54.71"° W**. Universal Transverse Mercator:
Name of nearest waterbody: Many named aquatic resources are located along the linear project

Identify (estimate) amount of waters in the review area:

Non-wetland waters: linear feet: width (ft) and/or **10.89** acres.
Cowardin Class:
Stream Flow:
Wetlands: **69.87** acres.
Cowardin Class:

Name of any water bodies on the site that have been identified as Section 10 waters:

Tidal:

Non-Tidal:

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date: **5/8/09**

Field Determination. Date(s):

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This preliminary JD finds that there "may be" waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply)

- checked items should be included in case file and, where checked and requested, appropriately reference sources below):

Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:**Wetland Technical Report for the US 36 EIS Project.**

Data sheets prepared/submitted by or on behalf of the applicant/consultant.

Office concurs with data sheets/delineation report.

Office does not concur with data sheets/delineation report.

Data sheets prepared by the Corps:

Corps navigable waters' study:

U.S. Geological Survey Hydrologic Atlas:

USGS NHD data.

USGS 8 and 12 digit HUC maps.

U.S. Geological Survey map(s). Cite scale & quad name:**Colorado Base Map 1:500,000.**

USDA Natural Resources Conservation Service Soil Survey. Citation:

National wetlands inventory map(s). Cite name:

State/Local wetland inventory map(s):

FEMA/FIRM maps:

100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)

Photographs: Aerial (Name & Date):

or Other (Name & Date):

Previous determination(s). File no. and date of response letter:

Other information (please specify):**Google Earth & Live Maps.**

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

 5/18/09

Signature and date of
Regulatory Project Manager
(REQUIRED)

Signature and date of
person requesting preliminary JD
(REQUIRED, unless obtaining
the signature is impracticable)

Site Number	Latitude (N)	Longitude (W)	Acreage	Resource Type
1	39° 50' 12.99"	105° 01' 33.73"	0.16	Section 404- Wetland
2	39° 50' 55.38"	105° 02' 45.23"	0.02	Section 404- Wetland
3	39° 51' 02.48"	105° 02' 52.77"	< 0.01	Section 404- Wetland
4	39° 51' 04.42"	105° 02' 54.88"	0.19	Section 404- Wetland
5	39° 51' 05.18"	105° 02' 58.16"	0.35	Section 404- Wetland
6	39° 50' 44.11"	105° 02' 33.71"	0.63	Section 404- Wetland
7	39° 51' 19.70"	105° 03' 07.33"	0.01	Section 404- Wetland
8	39° 51' 25.61"	105° 03' 10.10"	0.05	Section 404- Wetland
8A	39° 51' 23.59"	105° 03' 13.30"	0.02	Section 404- Wetland
8C	39° 51' 32.37"	105° 03' 17.44"	0.04	Section 404- Wetland
9	39° 51' 12.07"	105° 02' 59.86"	0.24	Section 404- Wetland
11	39° 51' 53.90"	105° 03' 22.52"	0.71	Section 404- Wetland
11B	39° 51' 28.85"	105° 03' 01.76"	0.01	Section 404- Wetland
11C	39° 51' 34.98"	105° 03' 03.78"	0.06	Section 404- Wetland
12	39° 52' 11.75"	105° 03' 32.46"	0.07	Section 404- Wetland
13	39° 52' 12.84"	105° 03' 36.50"	0.67	Section 404- Wetland
14	39° 52' 31.29"	105° 03' 45.75"	0.39	Section 404- Wetland
16	39° 53' 41.28"	105° 04' 33.65"	0.29	Section 404- Wetland
17	39° 54' 02.54"	105° 04' 52.25"	0.03	Section 404- Wetland
18	39° 54' 11.05"	105° 04' 56.38"	0.20	Section 404- Wetland
19	39° 54' 12.93"	105° 04' 55.87"	0.06	Section 404- Wetland
20	39° 54' 17.13"	105° 05' 04.59"	0.23	Section 404- Wetland
21	39° 54' 44.03"	105° 05' 13.73"	0.14	Section 404- Wetland
22	39° 55' 00.89"	105° 05' 28.78"	0.05	Section 404- Wetland
22A	39° 55' 27.25"	105° 05' 25.73"	0.03	Section 404- Wetland
23	39° 54' 31.06"	105° 05' 08.90"	0.08	Section 404- Wetland
24	39° 54' 49.94"	105° 05' 22.33"	0.05	Section 404- Wetland
25	39° 54' 51.27"	105° 05' 26.22"	0.01	Section 404- Wetland
26	39° 55' 11.31"	105° 06' 03.02"	0.08	Section 404- Wetland
27	39° 55' 17.78"	105° 06' 14.21"	0.10	Section 404- Wetland
28	39° 55' 18.01"	105° 06' 17.10"	0.05	Section 404- Wetland
29	39° 55' 29.13"	105° 06' 39.18"	0.01	Section 404- Wetland
30	39° 55' 39.72"	105° 06' 50.94"	0.20	Section 404- Wetland
31	39° 55' 53.33"	105° 07' 10.03"	0.01	Section 404- Wetland
32	39° 55' 55.73"	105° 07' 10.05"	0.07	Section 404- Wetland
33	39° 55' 38.28"	105° 06' 48.02"	0.03	Section 404- Wetland
35	39° 55' 34.32"	105° 06' 41.64"	0.02	Section 404- Wetland
36	39° 55' 27.56"	105° 06' 33.32"	0.11	Section 404- Wetland

37	39° 55' 28.83"	105° 06' 34.76"	0.12	Section 404- Wetland
38	39° 55' 22.76"	105° 06' 22.75"	0.02	Section 404- Wetland
39	39° 56' 11.16"	105° 07' 42.79"	0.27	Section 404- Wetland
40	39° 56' 10.27"	105° 07' 42.87"	0.04	Section 404- Wetland
41	39° 56' 23.50"	105° 08' 13.17"	0.06	Section 404- Wetland
42	39° 56' 37.38"	105° 08' 35.70"	0.04	Section 404- Wetland
43	39° 56' 50.89"	105° 08' 54.36"	0.31	Section 404- Wetland
44	39° 56' 49.16"	105° 08' 59.53"	0.06	Section 404- Wetland
45	39° 56' 56.16"	105° 09' 08.63"	0.12	Section 404- Wetland
46	39° 57' 19.69"	105° 09' 32.49"	0.56	Section 404- Wetland
47	39° 57' 24.33"	105° 09' 57.97"	0.34	Section 404- Wetland
48	39° 57' 49.81"	105° 10' 47.71"	0.20	Section 404- Wetland
49	39° 57' 52.42"	105° 10' 54.51"	0.01	Section 404- Wetland
51	39° 58' 15.64"	105° 11' 54.71"	0.22	Section 404- Wetland
52	39° 58' 24.42"	105° 12' 15.07"	0.07	Section 404- Wetland
53	39° 58' 29.92"	105° 12' 27.99"	3.72	Section 404- Wetland
54	39° 58' 28.21"	105° 12' 34.52"	0.41	Section 404- Wetland
55	39° 58' 43.98"	105° 12' 45.84"	0.57	Section 404- Wetland
56	39° 58' 41.27"	105° 12' 54.60"	17.16	Section 404- Wetland
57	39° 58' 49.86"	105° 13' 10.11"	0.83	Section 404- Wetland
58	39° 58' 47.15"	105° 13' 10.28"	0.04	Section 404- Wetland
59	39° 58' 52.18"	105° 13' 15.43"	1.67	Section 404- Wetland
60	39° 58' 54.35"	105° 13' 22.69"	20.34	Section 404- Wetland
61	39° 59' 01.90"	105° 13' 48.98"	0.31	Section 404- Wetland
62	39° 59' 08.80"	105° 13' 45.19"	0.08	Section 404- Wetland
63	39° 59' 04.93"	105° 13' 45.08"	0.02	Section 404- Wetland
63A	39° 59' 07.26"	105° 13' 59.41"	0.17	Section 404- Wetland
64	39° 58' 57.09"	105° 13' 39.16"	0.68	Section 404- Wetland
65	39° 50' 58.42"	105° 02' 50.90"	0.03	Section 404- Wetland
66	39° 50' 19.70"	105° 02' 05.50"	0.01	Section 404- Wetland
67	39° 49' 41.71"	104° 59' 01.93"	0.04	Section 404- Wetland
68	39° 58' 27.33"	105° 12' 35.12"	1.14	Section 404- Wetland
69	39° 58' 20.54"	105° 12' 17.31"	3.22	Section 404- Wetland
70	39° 58' 14.76"	105° 11' 59.60"	1.27	Section 404- Wetland
71	39° 57' 24.09"	105° 09' 50.13"	0.03	Section 404- Wetland
72	39° 57' 17.39"	105° 09' 37.04"	0.06	Section 404- Wetland
73	39° 57' 05.45"	105° 09' 20.76"	0.03	Section 404- Wetland
74	39° 56' 52.94"	105° 09' 07.75"	0.07	Section 404- Wetland
75	39° 56' 08.84"	105° 07' 51.12"	4.13	Section 404- Wetland
76	39° 56' 20.98"	105° 08' 18.57"	0.07	Section 404- Wetland
77	39° 56' 10.59"	105° 07' 56.29"	0.02	Section 404- Wetland
78	39° 56' 11.00"	105° 07' 53.55"	0.05	Section 404- Wetland
79	39° 56' 00.76"	105° 07' 29.72"	0.01	Section 404- Wetland

79B	39° 55' 59.07"	105° 07' 38.76"	0.03	Section 404- Wetland
80	39° 55' 38.48"	105° 06' 58.36"	0.25	Section 404- Wetland
81	39° 55' 21.53"	105° 06' 30.50"	0.74	Section 404- Wetland
82	39° 55' 18.44"	105° 06' 26.01"	0.28	Section 404- Wetland
83	39° 55' 07.24"	105° 05' 58.77"	0.03	Section 404- Wetland
84	39° 55' 03.58"	105° 05' 56.11"	0.14	Section 404- Wetland
84B	39° 54' 37.56"	105° 05' 45.00"	0.04	Section 404- Wetland
84C	39° 54' 30.92"	105° 05' 44.68"	0.04	Section 404- Wetland
84D	39° 54' 28.48"	105° 05' 34.81"	0.05	Section 404- Wetland
85	39° 54' 51.13"	105° 05' 29.21"	0.02	Section 404- Wetland
86	39° 54' 35.80"	105° 05' 23.67"	1.05	Section 404- Wetland
87	39° 54' 47.47"	105° 05' 29.64"	0.04	Section 404- Wetland
88	39° 53' 00.16"	105° 04' 05.54"	0.90	Section 404- Wetland
89	39° 52' 55.45"	105° 04' 06.13"	0.12	Section 404- Wetland
90	39° 52' 41.00"	105° 03' 55.81"	0.03	Section 404- Wetland
91	39° 52' 24.82"	105° 03' 44.37"	1.64	Section 404- Wetland
92	39° 51' 53.74"	105° 03' 27.45"	0.30	Section 404- Wetland
1-4	39° 59' 12.29"	105° 14' 08.37"	0.06	Section 404- Wetland
1-5	39° 57' 22.21"	105° 09' 58.19"	0.02	Section 404- Wetland
1-6	39° 57' 21.76"	105° 09' 58.07"	<0.01	Section 404- Wetland

**TOTAL
WETLAND**

69.87

2	39° 50' 55.38"	105° 02' 45.23"	<0.01	Section 404- Open Water
4	39° 51' 06.29"	105° 02' 55.21"	0.23	Section 404- Open Water
6	39° 51' 24.09"	105° 03' 28.96"	0.40	Section 404- Open Water
13	39° 52' 12.84"	105° 03' 36.50"	0.19	Section 404- Open Water
16	39° 53' 32.60"	105° 04' 37.94"	0.60	Section 404- Open Water
23	39° 58' 59.05"	105° 13' 43.40"	0.24	Section 404- Open Water
27	39° 55' 17.78"	105° 06' 14.21"	0.14	Section 404- Open Water
34	39° 55' 39.30"	105° 06' 48.08"	0.01	Section 404- Open Water
39	39° 56' 11.75"	105° 07' 47.85"	0.05	Section 404- Open Water
44	39° 56' 48.58"	105° 08' 43.91"	0.10	Section 404- Open Water
45	39° 57' 07.46"	105° 09' 25.22"	0.03	Section 404- Open Water
46	39° 57' 19.29"	105° 09' 32.49"	0.47	Section 404- Open Water
47A	39° 57' 39.27"	105° 10' 32.53"	0.24	Section 404- Open Water
49	39° 57' 52.02"	105° 10' 55.13"	0.03	Section 404- Open Water
50	39° 58' 06.88"	105° 11' 30.88"	0.02	Section 404- Open Water
51	39° 58' 15.64"	105° 11' 54.71"	0.17	Section 404- Open Water
52	39° 58' 25.51"	105° 12' 14.56"	0.14	Section 404- Open Water
53	39° 58' 29.92"	105° 12' 27.99"	0.35	Section 404- Open Water
54	39° 58' 30.95"	105° 12' 39.06"	<0.01	Section 404- Open Water
55	39° 58' 38.16"	105° 12' 44.11"	0.17	Section 404- Open Water

56	39* 58' 36.18"	105* 12' 51.43"	0.14	Section 404- Open Water
57	39* 58' 49.86"	105* 13' 10.11"	0.20	Section 404- Open Water
59	39* 58' 52.18"	105* 13' 15.43"	0.50	Section 404- Open Water
60	39* 59' 02.41"	105* 13' 37.81"	0.15	Section 404- Open Water
61	39* 59' 01.44"	105* 13' 38.53"	0.02	Section 404- Open Water
62	39* 59' 09.61"	105* 14' 04.26"	0.02	Section 404- Open Water
63A	39* 59' 06.51"	105* 14' 00.22"	0.57	Section 404- Open Water
67C	39* 49' 36.53"	104* 59' 22.84"	0.04	Section 404- Open Water
69	39* 58' 20.30"	105* 12' 20.19"	0.06	Section 404- Open Water
70	39* 58' 17.94"	105* 12' 12.83"	0.01	Section 404- Open Water
74	39* 56' 52.94"	105* 09' 07.75"	0.34	Section 404- Open Water
75	39* 56' 08.87"	105* 07' 51.24"	0.50	Section 404- Open Water
76	39* 56' 20.98"	105* 08' 18.57"	0.38	Section 404- Open Water
81	39* 55' 31.19"	105* 06' 48.07"	1.94	Section 404- Open Water
82	39* 55' 14.51"	105* 06' 18.52"	1.29	Section 404- Open Water
84	39* 55' 06.21"	105* 06' 00.22"	0.35	Section 404- Open Water
86	39* 54' 35.80"	105* 05' 23.67"	0.38	Section 404- Open Water
88	39* 53' 00.16"	105* 04' 05.54"	0.42	Section 404- Open Water
90	39* 52' 40.41"	105* 03' 55.08"	<0.01	Section 404- Open Water
TOTAL OPEN WATERS			10.89	
TOTAL WATERS OF THE U.S.			80.76	



DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
DENVER REGULATORY OFFICE, 9307 S. WADSWORTH BOULEVARD
LITTLETON, COLORADO 80128-6901

May 20, 2009

Jon Chesser
CDOT- Region 6
Planning & Environmental
2000 South Holly Street
Denver, Colorado 80222

RE: U.S. 36 Corridor EIS

Dear Mr. Chesser:

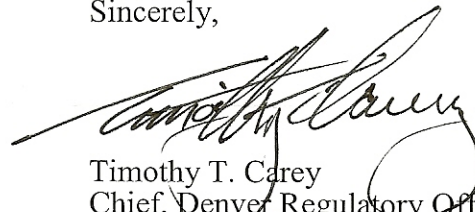
I'm writing this letter in response to a meeting you had on May 12, 2009 with Ms. Margaret Langworthy of my staff, and subsequent discussions I had with Ms. Langworthy. At the meeting, the U.S. 36 Project Team (Team) presented the results of the detailed analysis of alternatives conducted in the Draft EIS.

Through this analysis, a Preferred Alternative, referred to as the Combined Alternative Package (CAP), was developed. At the conclusion of the meeting, the Team requested that the Corps provide concurrence, in accordance with the NEPA/404 Merger Agreement, that the Preferred Alternative appears to be the Least Environmentally Damaging, Practicable Alternative (LEDPA) that meets the project's purpose and need. In response to the Team's request, the Corps concurs that the Preferred Alternative (CAP) appears to be the LEDPA. Our formal determination of it being the LEDPA would occur if a Section 404 permit is issued.

In accordance with the NEPA/404 Merger Agreement, please send a complete permit application to Ms. Langworthy prior to release of the Final EIS, so that the public review period for the Final EIS and the permit application coincide. To allow sufficient time for preparation of the Corps' public notice, the complete application should be received by the Corps two weeks prior to release of the Final EIS.

Thank you for the opportunity to participate in this collaborative effort. If you have any questions, please call me at (303) 979-4120.

Sincerely,



Timothy T. Carey
Chief, Denver Regulatory Office

CF:

Monica Pavlik
Federal Highway Administration
Colorado Federal Aid Division
12300 W. Dakota Avenue, Suite 180
Lakewood, Colorado 80228

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Region 6
Planning & Environmental
2000 South Holly Street
Denver, CO 80222
303-757-9372; FAX: 303-757-9907



August 31, 2009

Mr. Tim Carey
U.S. Army Corps of Engineers
Denver Regulatory Office
9307 South Wadsworth Blvd
Littleton, CO 80128

Re: US36 Corridor FEIS
NEPA/404 Merger Process and Section 404 Permit

Dear Mr. Carey:

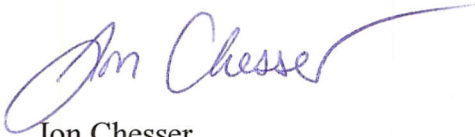
The Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA) are currently in the process of preparing the US36 Corridor Final Environmental Impact Statement (FEIS). The EIS has been following the 2004 NEPA/404 Merger Process (Merger) from the beginning of the project, and obtained U.S. Army Corps of Engineers (USACE) approval on Concurrence Points 1 (Purpose and Need) and 2 (Alternatives to be Evaluated) in a letter dated January 9, 2006. According to the Merger, USACE approval of Concurrence Points 3 (Preferred Alternative) and 4 (Compensatory Mitigation) is provided through issuing the section 404 permit for the project. However, the USACE has determined that the mitigation plan provided in the FEIS does not meet the requirements of the Compensatory Mitigation for Losses of Aquatic Resources Final Rule (Final Rule), and therefore the USACE cannot issue a section 404 permit on the same timeline as the US 36 FEIS.

Based on this determination, CDOT, FHWA and USACE worked together to develop a process that would allow the US36 FEIS to be completed without applying for a section 404 permit with the issuance of the FEIS. For this project, where the compensatory mitigation plan provided in the FEIS does not satisfy the requirements of the Final Rule, a diversion from the Merger process is necessary. CDOT, FHWA and USACE have all agreed that the best approach for the US36 Corridor Project is to apply for a section 404 permit when the final mitigation plan satisfies the requirements of the Final Rule. This diversion from the Merger will allow CDOT and FHWA adequate time to develop the final mitigation plan for all jurisdictional waters of the U.S. impacted by the Preferred Alternative. CDOT and FHWA will apply for a section 404 Individual Permit for the Preferred Alternative after the FEIS is completed and likely after a Record of Decision (ROD) is signed, but before any jurisdictional waters of the U.S. are impacted from construction of the Preferred Alternative. As individual projects are funded and constructed over time, the section 404 permit will be amended to reflect the actual impacts.

CDOT and FHWA hereby request your concurrence with the process outlined in this letter that would allow the US36 Corridor Project to divert from the NEPA/404 Merger Process and

postpone the application for a section 404 permit. CDOT and FHWA agree and understand that a separate public comment period will be necessary after the section 404 permit application is submitted to the USACE. CDOT and FHWA have provided signed concurrence with this process and request your signature in the space provided below. If you have any questions regarding the content of this letter or the project in general, please contact me at (303) 757-9397 or jonathon.chesser@dot.state.co.us, or Jane Hann at (303) 757-9397 or jane.hann@dot.state.co.us. Thank you.

Sincerely,



Jon Chesser
CDOT – Region 6
Environmental Project Manager and Biologist


I concur,

 Date: 9/1/09
for Karla S. Petty
Federal Highway Administration

I concur,

 Date: 9/1/09
Brad Beckham
Colorado Department of Transportation

I concur,

 Date: 9/1/09
Tim Carey
U.S. Army Corps of Engineers