US 6 and Wadsworth Environmental Assessment

CDOT Project STU #0062-019 (15215)
CH2M HILL Project No. 358660

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STU 0062-019

US 6 and Wadsworth Boulevard Interchange
Environmental Assessment

Submitted Pursuant to:
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by the
U.S. Department of Transportation
Federal Highway Administration
and the
Colorado Department of Transportation

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Environmental Assessment Availability

Copies of the Environmental Assessment are available in hard copy format for public review at the following locations and/or by request from CDOT Region 6. The document also is available on the project website at http://us6wadsworth.com.

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Table of Contents

Section **Page**

Summary **1**

1 Purpose and Need **1-1**
1.1 Purpose of the Proposed Action 1-1
1.2 Need for the Proposed Action 1-1
1.2.1 Safety 1-1
1.2.1.1 Traffic Safety 1-1
1.2.1.2 Pedestrian and Bicycle Safety 1-3
1.2.2 Capacity and Operations 1-3
1.2.2.1 Interchange Area 1-4
1.2.2.2 Wadsworth 1-4
1.2.3 Modal Connectivity 1-5
1.2.3.1 Pedestrian and Bicycle Facilities 1-5
1.2.3.2 Transit Operations 1-5

2 Alternatives Considered **2-1**
2.1 Process for Developing and Evaluating Alternatives 2-1
2.2 Description of Alternatives 2-2
2.2.1 No Build Alternative 2-2
2.2.2 Build Alternative 2-2
2.2.3 Refinements to the Build Alternative 2-5
2.2.4 RTD West Corridor 2-5
2.2.5 Cost 2-5
2.2.6 Funding 2-6

3 Affected Environment and Environmental Consequences **3-1**
3.1 Transportation Resources 3-1
3.1.1 Environmental Consequences of the No Build Alternative 3-2
3.1.1.1 Traffic Capacity and Operations 3-2
3.1.1.2 Safety 3-2
3.1.1.3 Transit Operations 3-2
3.1.2 Environmental Consequences of the Build Alternative 3-2
3.1.2.1 Traffic Capacity and Operations 3-5
3.1.2.2 Safety 3-5
3.1.2.3 Transit Operations 3-6
3.1.2.4 Construction 3-6
3.1.3 Mitigation 3-6
3.2 Pedestrian And Bicycle Facilities 3-6
3.2.1 Environmental Consequences of the No Build Alternative 3-6
3.2.2 Environmental Consequences of the Build Alternative 3-7
3.2.3 Mitigation 3-7
3.3 Noise Conditions 3-8
3.3.1 Environmental Consequences of the No Build Alternative 3-9
3.3.2 Environmental Consequences of the Build Alternative 3-9
3.3.3 Mitigation 3-10

3.4 Right-of-Way 3-10
3.4.1 Environmental Consequences of the No Build Alternative 3-11
3.4.2 Environmental Consequences of the Build Alternative 3-11
3.4.3 Mitigation 3-12
3.5 Socioeconomic Resources 3-13
3.5.1 Demographic and Neighborhood Characteristics 3-13
3.5.2 Economic Development 3-15
3.5.3 Community Resources 3-15
3.5.4 Parks and Recreation Resources 3-15
3.5.5 Environmental Consequences of the No Build Alternative 3-16
3.5.6 Environmental Consequences of the Build Alternative 3-16
3.5.7 Mitigation 3-17
3.6 Environmental Justice 3-17
3.6.1 Minority and Low-Income Populations 3-17
3.6.2 Minority-Owned Businesses 3-18
3.6.3 Environmental Consequences of the No Build Alternative 3-18
3.6.4 Environmental Consequences of the Build Alternative 3-18
3.6.5 Mitigation 3-20
3.7 Land Use 3-20
3.7.1 Environmental Consequences of the No Build Alternative 3-21
3.7.2 Environmental Consequences of the Build Alternative 3-21
3.7.3 Mitigation 3-22
3.8 Historic Properties 3-22
3.8.1 Environmental Consequences of the No Build Alternative 3-22
3.8.2 Environmental Consequences of the Build Alternative 3-24
3.8.2.1 7395 West 6th Avenue Frontage Road (5JF3548) 3-24
3.8.2.2 7423 West 6th Avenue Frontage Road (5JF3549) 3-24
3.8.2.3 7433 West 6th Avenue Frontage Road (5JF4542) 3-26
3.8.2.4 700 Wadsworth Boulevard (5JF4536) 3-26
3.8.3 Mitigation 3-26
3.9 Hazardous Materials 3-27
3.9.1 Environmental Consequences of the No Build Alternative 3-27
3.9.2 Environmental Consequences of the Build Alternative 3-27
3.9.3 Mitigation 3-29
3.10 Floodplains 3-29
3.10.1 Environmental Consequences of the No Build Alternative 3-30
3.10.2 Environmental Consequences of the Build Alternative 3-30
3.10.3 Mitigation 3-32
3.11 Water Quality 3-32
3.11.1 Environmental Consequences of the No Build Alternative 3-33
3.11.2 Environmental Consequences of the Build Alternative 3-33
3.11.3 Mitigation 3-33
3.12 Wetlands 3-34
3.12.1 Environmental Consequences of the No Build Alternative 3-35
3.12.2 environmental Consequences of the Build Alternative 3-35
3.12.3 Avoidance and Minimization 3-35
3.12.4 Mitigation 3-36
3.13 Cumulative Impact analysis 3-36
3.13.1 Past, Present, and Reasonably Foreseeable Actions 3-36
3.13.2 Cumulative Impacts 3-37
3.13.3 Mitigation 3-39
3.14 Other Resources 3-39
3.14.1 Archaeological Resources 3-39
3.14.2 Paleontological Resources 3-39
3.14.3 Native American Consultation 3-40
3.14.4 Air Quality 3-40

3.14.5 Energy 3-41
3.14.6 Geological Resources and Soil 3-41
3.14.7 Farmlands 3-41
3.14.8 Fish and Wildlife 3-41
3.14.9 Threatened and Endangered Species 3-41
3.14.10 Vegetation and Noxious Weeds 3-41
3.14.11 Visual Resources 3-42
3.14.12 Utilities 3-42
3.15 Summary of Impacts and Mitigation 3-42

4 Section 4(f) Evaluation 4-1
4.1 introduction 4-1
4.2 Section 4(f) 4-1
4.2.1 Direct Uses 4-1
4.2.2 *De Minimis* Impacts 4-1
4.3 Purpose and Need 4-2
4.4 Feasible and Prudent Alternatives 4-2
4.5 Parks and Recreation Resources 4-4
4.5.1 Description of 4(f) Resources 4-4
4.5.2 *De Minimis* Impacts 4-4
4.5.3 Consultation and Coordination 4-4
4.6 Historic Resources 4-5
4.6.1 *De Minimis* Impacts 4-5
4.6.2 Direct Uses 4-5
4.6.3 Least Harm Analysis 4-6
4.6.4 Measures to Minimize Harm 4-8

5 Consultation and Coordination 5-1
5.1 Agency Charter 5-1
5.2 Agency Coordination 5-1
5.2.1 Agency Coordination Activities 5-2
5.2.2 Key Issues Raised 5-3
5.3 Public Involvement 5-3
5.3.1 Public Meetings 5-4
5.3.2 Public Outreach Efforts 5-4
5.3.3 Specialized Outreach to Minority and Low-Income Populations 5-5
5.3.4 Key Issues Raised 5-5
5.4 Remaining Public and Agency Involvement 5-6

6 References 6-1

Appendixes

A Glossary
B Summary of Mitigation and Monitoring Commitments
C Correspondence (Presented on CD only)
D Supporting Documentation Outline (Presented on CD only)

Exhibits

ES-1 Summary of Impacts and Mitigation, US 6/Wadsworth Environmental Assessment

1-1 Project Location and Areas Needing Improvements
1-2 Utility Poles in Walkway near Jefferson County Open School Force Students into Travel Lanes
1-3 Existing and Forecast Daily Traffic Volumes

2-1 Level 1 Interchange Screening Results
2-2 Proposed Interchange Design
2-3 Proposed Wadsworth Cross Section
2-4 Proposed Turning Movements on Wadsworth

3-1 Year 2035 No Build Alternative Traffic Conditions – Wadsworth Boulevard and US 6 Interchange
3-2 Year 2035 Build Alternative Traffic Conditions – Wadsworth Boulevard and US 6 Interchange
3-3 Noise Study Subareas
3-4 Existing Noise Conditions
3-5 Future Noise Conditions
3-6 Wadsworth Existing Right-of-Way Width (north to south)
3-7 Estimated Total and Partial Parcel Acquisitions by Property Type
3-8 Community Resources within 0.5 Mile of the Proposed Project
3-9 Demographic Characteristics, 1990-2000
3-10 Minority and Low-Income Populations Identified Using Census 2000 and HUD 2008 Data
3-11 Historic Properties Located within Study Area
3-12 Effects to Historic Properties and Districts
3-13 5JF3548 (7395 W. 6th Ave. Frontage Road)
3-14 5JF3549 (7423 W. 6th Ave. Frontage Road)
3-15 5JF4542 (7433 W. 6th Ave. Frontage Road)
3-16 5JF4536 (700 Wadsworth Blvd.)
3-17 Location of Hazardous Materials Sites
3-18 Listing of the Sites with the Potential to Impact the Project
3-19 Waterways and 100-Year Floodplains in Study Area
3-20 Dry Gulch Crossing at Wadsworth
3-21 Lakewood Gulch West of Wadsworth
3-22 Summary of Build Alternative Impacts to Wetlands and Waters of the United States
3-23 Past, Present, and Reasonably Foreseeable Land Development Projects
3-24 Summary of Impacts and Mitigation, US 6/Wadsworth Environmental Assessment

4-1 Project Location
4-2 Summary of Feasible and Prudent Alternatives
4-3 Boundaries of Two Creeks Park
4-4 Dry Gulch Culvert
4-5 Summary of *De Minimis* Impacts for Section 4(f) Historic Resources
4-6 Section 4(f) Historic Properties
4-7 Summary of Direct Uses of Section 4(f) Historic Resources
4-8 Least Harm Analysis
4-9 Design Features of the Tight Diamond with Loop Interchange and Consideration of Impacts to Section 4(f) Resources

5-1 Agencies Consulted on US 6/Wadsworth Study
5-2 Agency Coordination Activities
5-3 Public Meetings

ACRONYMS AND ABBREVIATIONS

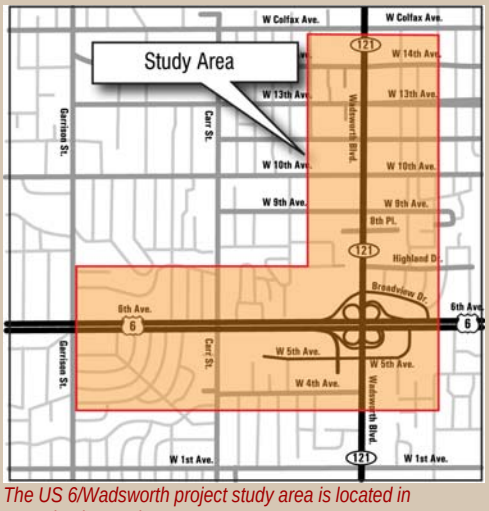
AASHTO	American Association of State Highway and Transportation Officials
ADA	Americans with Disabilities Act
ADT	average daily traffic
AM	ante meridiem (before noon)
APE	area of potential effect
ASTM	American Society for Testing and Materials
Ave,	Avenue
Blvd.	Boulevard
BMP	best management practice
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
City	City of Lakewood
CLOMR	Conditional Letter of Map Revision
CO	carbon monoxide
dB	decibel(s)
dBA	A-weighted decibel(s)
DOT Act	Department of Transportation Act of 1966
Dr.	Drive
DRCOG	Denver Regional Council of Governments
EA	Environmental Assessment
EB	Eastbound
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HABS	Historic American Building Survey
HUD	U.S. Department of Housing and Urban Development
ITS	Intelligent Transportation System
LBP	lead-based paint
Ln.	Lane
LOMR	Letter of Map Revision
LOS	level(s) of service
LRT	light rail transit
MBO	Minority Business Office
MESA	Modified Environmental Site Assessment
MOA	Memorandum of Agreement
mph	miles per hour
MSAT	mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWP	Nationwide Permit
O_3	ozone
OAHP	Office of Archaeology and Historic Preservation
OSHA	U.S. Occupational Safety and Health Administration
PCN	Pre-Construction Notification
Pl.	Place
PLT	Project Leadership Team
PM	post meridiem (after noon)
PM_{10}	particulate matter less than 10 microns in diameter
RIRO	right-in/right-out
ROW	right-of-way
RTD	Regional Transportation District

Section 106	Section 106 of the National Historic Preservation Act of 1966
SHPO	State Historic Preservation Office
SPUI	single-point urban interchange
St.	Street
T&E	threatened and endangered
TCLP	Toxicity Characteristic Leaching Procedure
TLT	Technical Leadership Team
TMU	transit mixed use
U.S.C.	United States Code
UDFCD	Urban Drainage and Flood Control District
Uniform Act	Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VMT	vehicle miles traveled
Wadsworth	Wadsworth Boulevard
WB	Westbound
WQCD	Water Quality Control Division
WQCV	water quality capture volume
WUS	waters of the United States

Summary

The US 6/Wadsworth Environmental Assessment (EA) analyzes the impacts of the Colorado Department of Transportation's (CDOT) proposal for roadway improvements at the US 6 (also known as 6th Avenue) and Wadsworth Boulevard interchange and along Wadsworth Boulevard between 4th and 14th Avenues. The EA describes the purpose and need for the action (Chapter 1), the alternatives for implementing the action considered and evaluated in the EA (Chapter 2), the social and environmental consequences of the alternatives (Chapter 3), evaluation of effects to historic and park resources protected by Section 4(f) of the Department of Transportation Act (Chapter 4), comments and coordination with the public and other agencies (Chapter 5), references (Chapter 6), and other supporting materials (presented in appendices).

WHERE IS THE PROPOSED PROJECT LOCATED?



The US 6/Wadsworth project study area is located in central Lakewood.

The proposed US 6/Wadsworth project centers around the US 6 and Wadsworth Boulevard (Wadsworth) interchange in the heart of the City of Lakewood (Lakewood). The study area includes both US 6 and Wadsworth. Both roadways serve a broad cross section of local and regional travelers. The east-west limits along US 6 are from the eastern interchange ramps with Wadsworth west to Garrison Street. On Wadsworth, the project limits are 4th Avenue to 14th Avenue.

Wadsworth is a regionally important highway and is the longest continuous roadway connecting communities across the western Denver metropolitan area. The study area links northern Lakewood with Lakewood's City Commons at Wadsworth and Alameda Avenue south of the project area, provides regional access to large commercial developments at Wadsworth and Colfax Avenue, and will soon provide access to the large West Corridor light rail station at Wadsworth and 13th Avenue.

WHY DID CDOT PREPARE THIS EA?

The National Environmental Policy Act (NEPA) requires that the environmental effects of federally funded roadway projects be considered before deciding on a course of action. The NEPA process provides an opportunity for CDOT to develop project alternatives that meet transportation needs while minimizing social, environmental, and community impacts. In the case of the proposed US 6/Wadsworth project, CDOT made numerous changes to the conceptual design plans to respond to community input and minimize impacts. The NEPA process also affords regulatory agencies, affected municipalities, and interested members of the public the opportunity to comment on the project before it is designed and constructed.

WHY DO WE NEED THIS PROJECT?

The proposed US 6/Wadsworth project is needed to meet existing and future transportation needs for Lakewood. The proposed project would provide additional roadway capacity, improve operational efficiency, improve safety, and provide additional travel options for pedestrians and bicyclists. It would also replace a structurally deficient bridge and address neighborhood concerns about cut-through traffic.

HOW DID CDOT COME UP WITH A PLAN FOR THE ROADWAY IMPROVEMENTS?

CDOT, the Federal Highway Administration (FHWA), Lakewood, area residents, businesses, and commuters have prioritized making improvements to fix the transportation problems in the study area through previous planning efforts. The US 6 and Wadsworth project is included in the Denver Regional Council of Government's fiscally constrained regional long-range transportation plan and is scheduled to be built before 2035.

Hundreds of people attended open houses and other briefings to learn about the US 6/Wadsworth study and provide input.

CDOT began working with FHWA, Lakewood, the Regional Transportation District, and other stakeholders in 2007 to develop alternatives for possible roadway improvements. After two levels of screening and evaluation, and consideration of more than 20 detailed criteria, an alternative was identified that could meet the purpose and need for the project and would best balance transportation benefits with environmental and community impacts. This alternative is called the Build Alternative in the EA. Public input was sought and received throughout the alternatives development process.

WHAT IS CDOT PROPOSING TO BUILD?

CDOT proposes to replace the existing US 6/Wadsworth interchange and widen Wadsworth between 4th and 14th Avenues. In addition to these roadway changes, CDOT would also improve drainage flows of McIntyre, Lakewood, and Dry Gulches, and realign and widen these gulches; extend noise walls along US 6 to approximately Garrison Street; and construct and maintain water quality ponds to filter roadway pollutants from stormwater runoff.

The interchange design, referred to as a tight diamond with loop, would be a diamond interchange with a loop ramp in the northwest quadrant of the interchange. The loop ramp would allow evening rush-hour traffic traveling west on US 6 to exit to southbound Wadsworth without stopping at a signal or yielding to through traffic. All of the interchange acceleration and deceleration lanes would be lengthened, all weave sections would be eliminated, and the structurally deficient bridge would be replaced. The operation of the interchange is illustrated on the following page.

Along Wadsworth, the Build Alternative would add a travel lane in each direction and a multi-use sidewalk on both sides of Wadsworth. A raised median would be added to the center of the roadway to direct left turns and U-turns.

Northwest Quadrant

Interchange

1. Reconstructed loop off-ramp from westbound US 6 to southbound Wadsworth.
2. A grade-separated or at-grade pedestrian crossing at on-ramp and loop ramp will be determined at final design.
3. New longer on-ramp from northbound and southbound Wadsworth to westbound US 6 provides adequate acceleration and merge distances for vehicles entering US 6.
4. Continuous lane on US 6 between on-ramp and Carr St. off-ramp provides safer merging conditions.

Frontage Road

5. Frontage road access is shifted north and changed to two-way traffic between the 6th Ave. Business Center and Wadsworth.
6. Channel improvements to Lakewood Gulch to reduce floodplain.

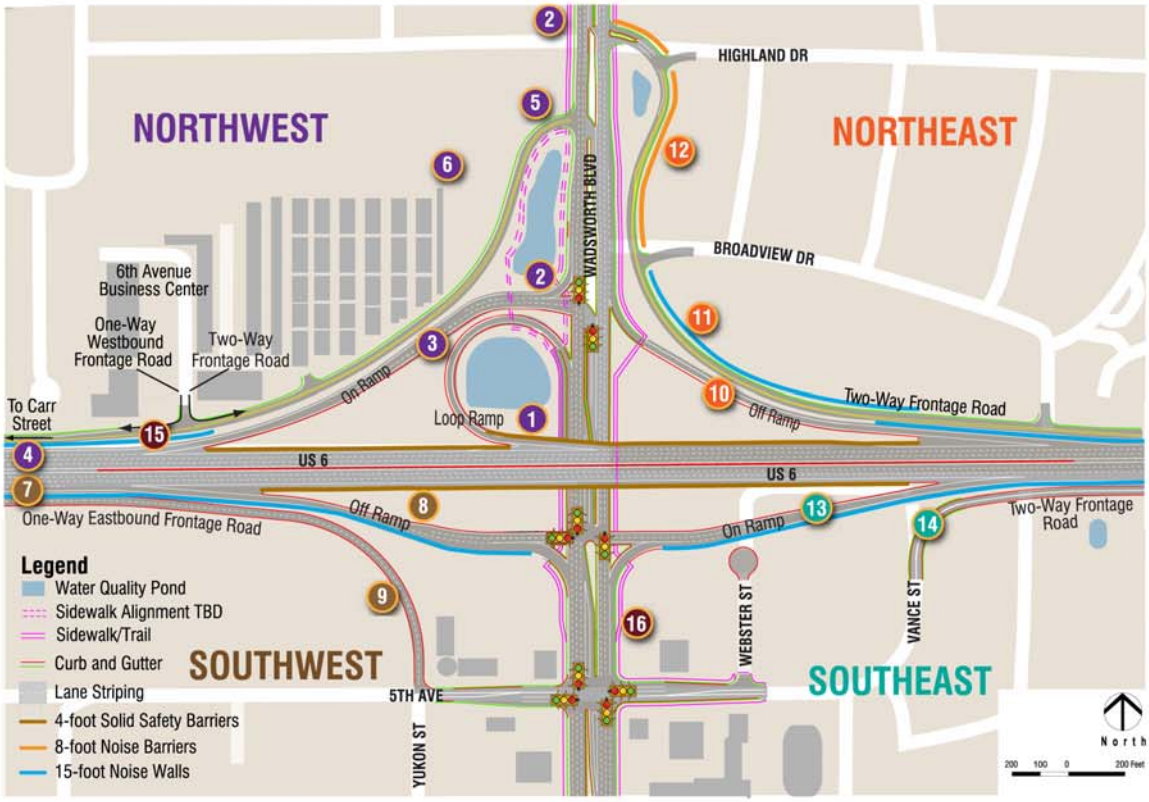
Northeast Quadrant

Interchange

10. New longer off-ramp from westbound US 6 to northbound Wadsworth provides adequate deceleration and vehicle queue distances for vehicles accessing Wadsworth. Free flow movement onto Wadsworth.

Frontage Road

11. Frontage road is reconfigured to provide access directly to Wadsworth. Provides two-way operation that reduces neighborhood cut-through traffic.
12. New 8-foot noise walls next to the frontage road.



Southwest Quadrant

Interchange

7. Continuous lane on US 6 between Carr St. on-ramp and Wadsworth off-ramp provides safer merging conditions.
8. New longer off-ramp from eastbound US 6 to northbound and southbound Wadsworth feeds into a multi-lane intersection that accommodates expected vehicle queues. Exiting vehicles wanting to travel east at the 5th Ave. intersection utilize the signalized intersection to make a hard right and vehicles destined farther south can use the adjacent right-turn yield lane to merge onto southbound Wadsworth.

Frontage Road

9. Frontage road remains one-way and continues to connect to 5th Ave. at Yukon St.

Southeast Quadrant

Interchange

13. New longer on-ramp from northbound and southbound Wadsworth to eastbound US 6 provides adequate acceleration and merge distance for vehicles entering US 6.

Frontage Road

14. Frontage road remains two-way and connects to 5th Ave. on Vance St. instead of Webster St.

Project Wide

15. New 15-foot noise walls between the frontage roads and US 6, west of Wadsworth.
16. Detached multi-use sidewalk along both sides of Wadsworth.

The reconstructed interchange would operate more efficiently, reduce congestion, and eliminate safety .concerns.

WHAT ARE THE SOCIAL AND ENVIRONMENTAL CONSEQUENCES OF THE PROPOSAL?

This EA evaluates the potential environmental consequences of implementing the proposed project (or Build Alternative). All environmental resources were reviewed for presence in the study area and assessed for potential impacts. Some resources are not evaluated in detail in this EA because they were not present in the study area, would not be impacted by the Build Alternative, or standard construction precautions would protect the resources from significant damage. Environmental issues or resources evaluated in detail include transportation, pedestrian and bicycle facilities, noise, right-of-way and relocations, socioeconomics, environmental justice, land use, historic properties, hazardous substances, floodplains, water resources and quality, and wetlands. Table ES-1 at the end of this summary outlines the impacts to these resources.

The proposed US 6/Wadsworth project would have mostly beneficial effects to social and natural resources in the study area.

The majority of impacts of the Build Alternative would be beneficial. Congestion would be reduced and general safety would improve for local and regional travelers, access to and from the numerous businesses along Wadsworth would be safer to navigate, and the safety and convenience of travel for pedestrians and bicyclists would be greatly improved. Improving drainage channels within the study area would reduce flooding hazards, enhance riparian habitat and wildlife migration, and provide an opportunity for wetlands to establish naturally. Water quality would be improved because stormwater runoff would be filtered to reduce pollutants being discharged into the South Platte River basin. Noise walls included in the Build Alternative would decrease noise levels dramatically at residences near US 6. Improved capacity on the major roadway network and reconfiguring the frontage roads surrounding the interchange would reduce neighborhood cut-through traffic, improve business and neighborhood access, and improve air quality around intersections. Right-of-way needs would require acquisition of property and displacement of businesses and residences. Four historic properties would be adversely affected, and three small wetland areas would be lost.

HOW MUCH PROPERTY DO YOU NEED TO ACQUIRE AND HOW HAVE YOU COORDINATED WITH AFFECTED PROPERTY OWNERS?

Approximately 30.5 acres of property would need to be acquired from 95 property owners from 113 parcels, including 42 residential, 58 commercial, and 13 vacant or publicly owned parcels. Property acquisitions would range from small slivers to entire parcels. A total of 14 residences and 27 businesses would need to be relocated. All acquisitions and relocations would comply fully with the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970.

CDOT is committed to maintaining open communication with property owners and stakeholders affected by the proposed project. The study team has held four public

meetings to present the progress and preliminary findings of the study, conducted one-on-one meetings with numerous property and business owners, and attended more than 20 meetings with neighborhood and business groups since the summer of 2007. Team members have contacted all owners of potentially affected properties and have met with many of these owners to explain the proposed action, understand its effect on owners' properties, and explain CDOT's right-of-way acquisition process and the rights owners and tenants have under the Uniform Act. CDOT continues to respond to owners and stakeholders who contact the study team with questions or comments, with the intent of maintaining open lines of communication and providing as much information as is known at the time.

WHAT HISTORIC PROPERTIES ARE IN THE STUDY AREA AND HOW WOULD THEY BE AFFECTED?

The Jefferson County Open School campus is one of three historic districts identified within the study area.

There are nine commercial and residential properties within the study area that are individually eligible for the National Register of Historic Places. In addition, three historic districts (a school complex and two residential neighborhoods) are located in or partially within the study area. None of the historic districts would be adversely affected by the Build Alternative, and adverse effects to five of the nine individual historic properties would be avoided.

Four historic homes located along the frontage road in the northeast quadrant of the interchange would need to be acquired. Despite extensive efforts to redesign or modify the interchange design, CDOT determined that avoiding these impacts would not be prudent and feasible. To mitigate for these losses, CDOT is working with the Colorado State Historic Preservation Office and local preservation groups to implement one or more historic preservation projects that would add to the local historical record.

WHERE ARE THE WETLANDS IN THE STUDY AREA AND WHY COULDN'T YOU DESIGN AROUND THEM?

Drainages in the study area have been heavily modified by past development. While the US 6/Wadsworth project would destroy several small wetlands, proposed widening of gulches would improve conditions for new wetlands and natural riparian areas to establish.

Three small wetlands comprising a total of 0.017 acre are located within the study area along the edges of McIntyre, Lakewood, and Dry Gulches. These wetlands are of low quality and would be destroyed by the realignment of the gulches. At least 0.017 acre of wetlands would be replaced to compensate for these losses.

Impacts to these wetlands could not be avoided because substantial realignment and widening of the drainage channels of the three gulches are needed. The channels are constrained, and their natural channels have been highly modified. They support little riparian habitat or wetlands because they are narrow, have high flows, and are subject to scour. The drainages are also considerably undersized to carry a 100-year flood. The proposed channel improvements would provide greater opportunity for wetlands to establish than under existing conditions.

WHAT HAPPENS IF CDOT DOES NOTHING?

Traffic congestion, inefficient roadway operations, and poor pedestrian and bicycle facilities characterize the US 6/Wadsworth project area.

This EA provides an analysis of the impacts of doing nothing (the No Build Alternative). Without a significant investment in roadway improvements, the existing transportation problems in the study area would worsen. Traffic would become increasingly congested, particularly in the morning and evening peak rush hours. Bus and pedestrian activity associated with the new Wadsworth light rail station at 13th Avenue will increase, but the surrounding roadway and sidewalk network would not support this demand.

Flooding during large storm events would continue, and the benefits of channel and culvert improvements would not be realized. Stormwater runoff would remain untreated, and polluted water would continue to be discharged into local waterways. Noise walls would not be constructed, and severe noise would persist for residences adjacent to US 6 west of Wadsworth.

The No Build Alternative would not require a large capital expenditure or require any property acquisition, and it would not affect historic properties or wetlands.

WHAT HAPPENS NEXT?

FHWA and CDOT are providing this EA for agency and public comment. A public hearing has been scheduled in Lakewood on June 24, 2009, from 5 to 7 p.m. at Lakewood Council Chambers (480 S. Allison Parkway, Lakewood, CO 80226). Newsletters announcing the public hearing will be sent to all individuals on the mailing list. The public hearing also will be advertised in newspapers, websites, neighborhood newsletters, and flyers distributed throughout the study area. Interested individuals can attend the public hearing to provide comments or learn more about the EA study and its recommendations. Written comments can be provided in person at the public hearing, on the project website at http://us6wadsworth.com/, or via mail, fax, or email to:

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After consideration of public comments, CDOT and FHWA will determine whether to issue a Finding of No Significant Impact (FONSI), revise the EA, or prepare an Environmental Impact Statement (EIS) to further analyze environmental impacts. If CDOT and FHWA determine that a FONSI is appropriate, CDOT would proceed with final design. Right-of-way acquisition and construction are dependent on funding and, if additional funds are not secured, these activities may not occur until 2015 or later.

EXHIBIT ES-1: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Transportation		
◊ Safety, capacity, and operational issues of the existing transportation network would not be addressed	◊ Capacity, safety, and operational efficiency would be enhanced for all modes of travel	◊ Roadway improvements will be coordinated with transit and other development needs
Pedestrian and Bicycle Facilities		
◊ Narrow, missing, or obstructed sidewalks, uncontrolled access, and traffic congestion create unsafe conditions for pedestrians and bicyclists	◊ New sidewalks and improved roadway crossings would enhance mobility and safety for pedestrians and bicyclists ◊ Several free-flow interchange ramp crossings would remain; pedestrians and bicycles would have difficulty crossing at these locations, particularly during rush hours. ◊ Pedestrian and bicycle routes could be disrupted during construction	◊ Final design will consider other measures to enhance safety of interchange ramp crossings ◊ Signage and access to pedestrian and bicycle routes will be provided during construction
Noise		
◊ High noise levels would persist for residences near US 6 west of Wadsworth where no noise walls are present	◊ Without noise mitigation, projected noise for residences along US 6 would increase 2 to 7 decibels ◊ Construction equipment and activities would intermittently generate loud noise	◊ Noise walls will be constructed to reduce noise noticeably at more than 330 residences ◊ Measures to reduce construction noise disturbance will be included in specifications
Right-of-Way and Relocations		
◊ No right-of-way (ROW) acquisition would be required, and no residential or business displacements would occur.	◊ Approximately 30.5 acres of property would be required from 95 ownerships. Acquisitions would range from small slivers of property to entire parcels ◊ 14 residences and 27 businesses would be displaced	◊ All acquisitions and relocations will comply fully with federal and state requirements, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended
Socioeconomics		
◊ Residences and businesses along Wadsworth would continue to be affected by cut-through traffic, limited pedestrian and bicycle connections, traffic noise, and indirect neighborhood access	◊ Community cohesion would be enhanced by better north-south and east-west pedestrian connections, improved pedestrian and vehicular access to neighborhoods and businesses, improved neighborhood traffic conditions, and reduced noise levels more compatible with residential areas ◊ Construction could disrupt access and travel through the project area for residents, businesses, and emergency service providers	◊ CDOT will provide advance notice of construction activities that are likely to result in traffic disruption
Environmental Justice		
◊ No disproportionately high and adverse impacts would occur in areas of minority or low-income populations	◊ No disproportionately high and adverse impacts would occur in areas of minority or low-income populations	◊ No mitigation measures are necessary

EXHIBIT ES-1: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Land Use		
◊ Traffic and pedestrian safety and mobility goals presented in adopted land use and neighborhood plans would not be advanced ◊ Future growth and implementation of planned land uses could be hampered by traffic congestion and limited sidewalk facilities	◊ Improvements would support land use goals for traffic management and safety, landscaping, recreational amenities, noise mitigation, multimodal connections and safety, and drainage improvements ◊ ROW acquisition would affect land use for some individual parcels but roadway changes would not influence regional land use patterns or induce growth	◊ Final design and ROW negotiations by CDOT will coordinate with Lakewood to address compatibility with land use plans and potential allowances for non-conforming properties that may result from ROW acquisition
Historic Properties		
◊ No historic properties would be affected	◊ Reconstruction of the interchange would require acquisition (and demolition) of four historic properties	◊ Mitigation measures will be identified and implemented with CDOT, FHWA, the Colorado SHPO, and other interested parties
Hazardous Materials		
◊ No effect on known sites of concern for hazardous materials	◊ Construction would affect sixteen sites of concern for environmental (petroleum-related) contamination ◊ Lead-based paint, asbestos, or other hazardous materials could be encountered when buildings or structures are demolished	◊ Further testing and survey of potentially contaminated properties ◊ Project specifications will be prepared and implemented to ensure worker and public safety when hazardous materials are encountered
Floodplains		
◊ Flood waters would continue to overtop Wadsworth during large storms	◊ CDOT roadways would be removed from the 100-year floodplain, and overtopping would not occur ◊ Wider and more natural channels would improve the natural values of floodplains	◊ During final design, CDOT will refine the drainage design and coordinate with the appropriate local and federal agencies to conduct hydraulic analysis and obtain necessary floodplain permits
Water Resources/Quality		
◊ Water from roadways that may contain petroleum, sediment, or other pollutants would continue to flow into streams/gulches untreated	◊ An increase of approximately 3 acres of impervious (paved) surfaces would, without water quality treatment, increase pollutant runoff and erosion into receiving waterways ◊ Construction activities would expose soils and could cause erosion or sedimentation of gulches	◊ Permanent water quality treatment features will be constructed and maintained to treat roadway runoff and improve water quality ◊ Required plans and permits will be prepared and followed during construction to minimize impacts to surface waters from erosion and sedimentation
Wetlands and Waters of the United States		
◊ No wetlands or waters of the United States would be affected	◊ Channel widening and realignment would disturb three small wetland areas in gulches ◊ Wider channels would provide an opportunity for wetlands and riparian habitat to establish	◊ Wetlands will be replaced at a 1:1 ratio, and a Section 404 permit will be obtained
Cumulative Impacts		
◊ The No Build Alternative would not take any action that could combine with other projects to create cumulative effects	◊ Beneficial cumulative effects to variety of environmental and community resources as redevelopment projects comply with current development requirements.	◊ No mitigation required.

CHAPTER 1
Purpose and Need

The Colorado Department of Transportation (CDOT), in cooperation with the Federal Highway Administration (FHWA) and other stakeholders, has prepared this Environmental Assessment (EA) to identify and assess potential transportation improvements at the interchange of US 6 (also referred to as 6th Avenue) and Wadsworth Boulevard (referred to as Wadsworth throughout this EA) and to Wadsworth north of the interchange. The study area, which is shown in Exhibit 1-1, includes US 6 from the eastern limit of the Wadsworth interchange ramps west to Garrison Street. On Wadsworth, the project limits are 4th Avenue to 14th Avenue. This area is a vital regional hub of the western Denver metropolitan area and the heart of the City of Lakewood.

1.1 PURPOSE OF THE PROPOSED ACTION

The purpose of the US 6/Wadsworth project is to improve traffic flow and safety, accommodate high traffic volumes, and increase multi-modal travel options and connections at the US 6 and Wadsworth interchange and along Wadsworth between 4th Avenue and 14th Avenue.

1.2 NEED FOR THE PROPOSED ACTION

The existing design and configuration of the interchange and roadway within the project limits have not kept pace with traffic and multi-modal travel demands. Improvements are needed to:

- Improve safety for motorists, pedestrians, and bicyclists
- Improve operational efficiency of the interchange and on Wadsworth
- Meet current and future traffic demands
- Support multi-modal connections

Exhibit 1-1 shows locations where these improvements are needed.

1.2.1 SAFETY

The proposed action is needed to improve traffic, pedestrian, and bicycle safety.

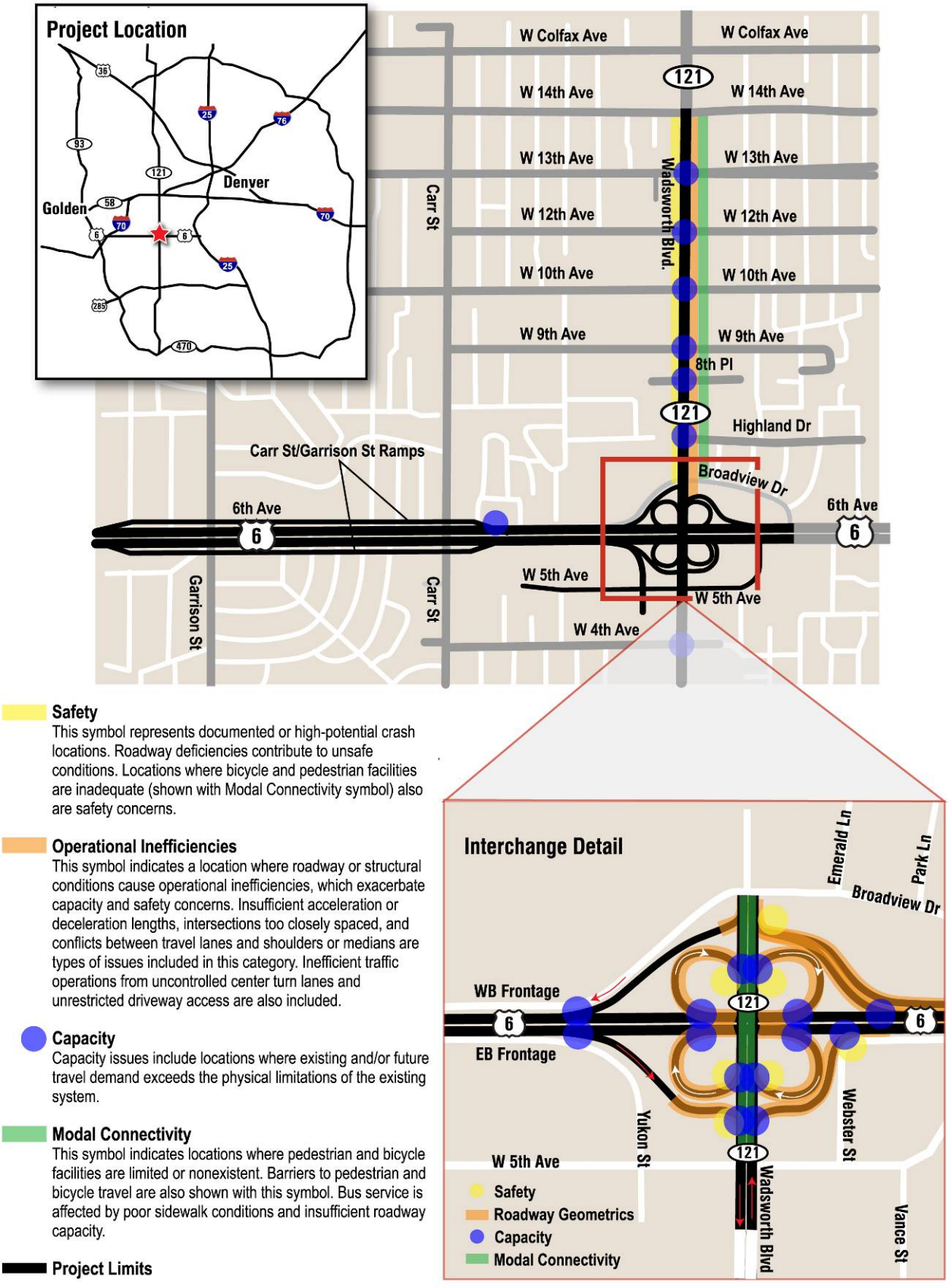
1.2.1.1 Traffic Safety

The US 6 and Wadsworth interchange is one of the highest accident locations in Lakewood. The interchange has been included on Lakewood's critical intersection list (for intersections with high potential for accidents) for every year between 2000 and 2006. In 2001 and 2003, the interchange topped Lakewood's list for most frequent accidents and was second for most severe accidents. Severe accidents include accidents with injuries or fatalities. The 13th Avenue intersection with Wadsworth also appeared on Lakewood's 2001 and 2003 critical intersection list.

Many of the accidents in the study area occur because of congestion and substandard roadway design features. The following list describes the most common accident types in the study area and their likely cause:

- Rear-end accidents – related to congestion and multiple access points
- Crashes with fixed objects – related to ramp curvature
- Sideswipes when both vehicles are moving in the same direction – related to short weaving and lane-changing zone maneuvers
- Rollover accidents – related to ramp curvature
- Left-turn accidents – related to multiple access points and ineffective or insufficient traffic control

EXHIBIT 1-1: PROJECT LOCATION AND AREAS NEEDING IMPROVEMENTS



- Head-on collisions and sideswipes when vehicles are traveling in opposite directions – related to side-by-side left-turn lanes and multiple access points

Accidents along Wadsworth between 4th and 14th Avenues also are frequent. Unrestricted access and uncontrolled center turn lanes increase the probability of accidents.

1.2.1.2 Pedestrian and Bicycle Safety

High traffic volumes, deficient sidewalks, and limited crossing locations create safety concerns for pedestrians and bicyclists traveling through the study area. The interchange area presents a particular challenge. Crossing of US 6 is limited to the east side because no sidewalk or path is present on the west side. Even where there is a sidewalk on the east side of Wadsworth, pedestrians and bicycles must cross four high-volume, free-flow on- and off-ramps in locations where drivers do not expect to encounter pedestrians or bicyclists, and visibility between them is poor. The high volumes of traffic, especially during peak periods, do not provide adequate gaps in traffic for pedestrians and bicyclists to cross the ramps.

The lack of access control along Wadsworth contributes to pedestrian and bicycle safety concerns. Along Wadsworth, pedestrians and bicyclists must cross many driveways, and drivers turning into and out of these driveways are often focused on entering or exiting Wadsworth traffic and are not attentive to potential pedestrian conflicts.

Many pedestrians make unsafe mid-block crossings because there are no signalized pedestrian crossings between 5th and 10th Avenues. These mid-block crossings are particularly hazardous because pedestrians often must cross one direction of traffic and wait in between side-by-side turn lanes for an adequate gap in traffic from the opposite direction.

Along Wadsworth, discontinuous and narrow sidewalks result in dangerous situations for pedestrians and bicyclists, sometimes even forcing them into the travel lanes (Exhibit 1-2). Sidewalk facilities are discussed in more detail in Section 1.2.4.1.

EXHIBIT 1-2: UTILITY POLES IN WALKWAY NEAR JEFFERSON COUNTY OPEN SCHOOL FORCE STUDENTS INTO TRAVEL LANES

1.2.2 CAPACITY AND OPERATIONS

US 6 carries approximately 122,000 vehicles daily as measured by traffic counts taken in 2007 (see Exhibit 1-3). Existing average daily traffic (ADT) south of US 6 on Wadsworth is approximately 65,700 vehicles, while north of US 6 the ADT is about 50,800 vehicles. Existing traffic operations in the study area were evaluated to determine the level of congestion during the morning and evening hours of peak traffic use (called peak hours). By 2035, the ADT on US 6 is projected to climb to approximately 153,000 vehicles.

EXHIBIT 1-3: EXISTING AND FORECAST DAILY TRAFFIC VOLUMES

Location	2007 ADT	Projected 2035 ADT
Wadsworth south of 10th Avenue	50,800	62,600
Wadsworth south of 5th Avenue	65,700	80,900
US 6 east of Wadsworth	123,000	153,900
US 6 west of Wadsworth	122,300	153,000

Congestion is measured by level of service (LOS) ratings. The highest level (LOS A) describes free-flow conditions in which vehicles experience minimal delay. The lowest level (LOS F) describes stop-and-go conditions in which long delays are experienced by most vehicles in the traffic stream.

1.2.2.1 Interchange Area

Most of the interchange ramps currently operate at unacceptable levels (LOS E or F) during peak hours. Vehicles do not have adequate distance to accelerate or decelerate when entering or exiting US 6, which causes slowing in the through lanes on US 6. The close proximity of the Carr/Garrison Street on/off-ramps and the on/off-ramps to the Wadsworth interchange does not allow adequate acceleration or deceleration at either location.

The US 6 and Wadsworth interchange was constructed in the early 1960s. Although it served the development and traffic conditions when it was constructed, its tight cloverleaf configuration can no longer effectively handle current or future traffic demands. In addition to a structurally deficient bridge deck that needs to be repaired, the interchange does not operate effectively because traffic volumes exceed its original design function.

The lengths of auxiliary lanes that allow vehicles to accelerate and decelerate when entering or exiting the highway (referred to as acceleration and deceleration lanes) for all exits and entrances to US 6 and Wadsworth are too short to allow cars to efficiently enter or exit high-speed traffic of US 6. Weaving conflicts (areas where two traffic streams must cross one another to enter or exit the road) between the loop ramps are an inherent problem with cloverleaf-type interchanges. This conflict zone is more pronounced in the US 6/Wadsworth interchange because of the high volume of traffic trying to make weaving maneuvers coupled with the very short distance (the length of the bridge) drivers have in which to make them.

The off-ramps do not provide adequate distance for cars to decelerate, and alignments limit visibility of queued cars (backup of stopped vehicles), which lead to increased probability for rear-end collisions. The ramp intersections do not provide adequate turning radii for buses or large trucks, which in certain cases causes the back wheels to “hop” the curb and encroach into sidewalk areas.

Close spacing between frontage road intersections and interchange ramps does not provide adequate distance or gaps for vehicles to merge or cross traffic on Wadsworth. Negotiating these conditions requires drivers to slow their speeds through the interchange area, which further limits the capacity of the interchange and adversely affects through traffic on both US 6 and Wadsworth.

1.2.2.2 Wadsworth

A lane imbalance exists on Wadsworth within the study area where there are four travel lanes between 4th and 14th Avenues, compared to the six travel lanes provided immediately north and south. Lane imbalance contributes to congestion in through lanes and poses safety concerns from lane changes.

The four-lane cross section on Wadsworth north of US 6 operates at an unacceptable service level (LOS E). Cross streets at most intersections also operate at poor LOS. Due to the heavy through traffic and poor operations on Wadsworth, vehicles on cross streets and driveways are forced to wait long periods and are often forced to pull into small gaps in traffic.

North of US 6, the large number of driveways and unrestricted medians encourage uncontrolled turns across Wadsworth that both increase potential for conflicts (and accidents) and disrupt traffic flow. Side-by-side opposing left-turn lanes introduce multiple conflict points and create confusion because of the uncertainty of when and where drivers will enter the median lane(s). In addition, vehicles stopped in the turn lanes block the view of traffic in the through lanes, resulting in drivers making unsafe turns across through traffic. All of these conditions contribute to turbulence in the mainline Wadsworth traffic flow and reduce its capacity.

Residents have voiced concern about traffic flow through neighborhoods and desire lower speeds and less traffic. Although traffic counts taken on surrounding neighborhood streets do not indicate a speeding problem or unduly high volumes, reducing neighborhood cut-through traffic is an important community value supported by the project. The configuration of the one-way frontage roads near the interchange limit access to commercial properties along the frontage roads and may contribute to cut-

through and higher-speed traffic on neighborhood streets.

1.2.3 MODAL CONNECTIVITY

Automobiles, trucks, pedestrians, bicyclists, and buses travel along Wadsworth, and Wadsworth lacks adequate facilities to accommodate safe and efficient travel.

1.2.3.1 Pedestrian and Bicycle Facilities

Local and regional plans identify the need for pedestrian and bicycle improvements to Wadsworth and its crossing of US 6. These needs will become more critical as the volume of pedestrian and bicycle travel increases after the opening of the West Corridor light rail transit (LRT) station. The need to improve pedestrian and bicycle conditions within the study area was one of the most frequently identified public concerns during the EA process.

Within the study area along Wadsworth, approximately 50 percent of the sidewalk on the east side and 85 percent of the sidewalk on the west side are nonexistent or in substandard condition. Substandard conditions include sidewalks that are too narrow, not buffered adequately from travel lanes, and contain obstacles such as curbs, signs, or utility poles in the traveled way.

The existing sidewalks in general are often too narrow to accommodate both pedestrian and bicycle use. Vehicular lanes are not conducive to bicycle travel because of the high traffic volumes and speeds, and lack of shoulders or bike paths. In spite of these deficiencies, Wadsworth is an important component of bicycle mobility in Lakewood because it offers the only opportunity for bicycles to cross US 6 in the 2.5-mile stretch between Sheridan Boulevard and Garrison Street.

The only pedestrian and bicycle crossing of US 6 is located on the east side of Wadsworth. There is no sidewalk on the west side.

1.2.3.2 Transit Operations

Existing transit service on US 6 and Wadsworth in the study area includes local, limited, and express bus routes operated by the Regional Transportation District (RTD). Once light rail is implemented, bus frequency on Wadsworth is expected to increase four-fold, from four buses per hour today to 16 buses hourly.

Buses, like other vehicles, will experience increased delays traveling through the study area as traffic volumes increase. Buses also contribute to congestion by regularly stopping in the outside through-traffic lane, causing a temporary reduction in roadway capacity.

Public Comments Support Project Needs

"Improve traffic flow onto and off of 6th Avenue. Avoid the circles to get onto 6th Avenue. That is pretty scary going west from Wadsworth at 7:15 [a.m.]."

"Improv[ing] bicycle/pedestrian access under 6th Avenue is of the utmost importance. A sidewalk adjacent to Wadsworth is inadequate – there needs to be a buffer zone between Wadsworth and the bike/pedestrian path."

"Left turns [across Wadsworth] are dangerous, and traffic sometimes prevents even right turns."

"Double yellow lines do not work to control illegal turns into multiple driveways."

CHAPTER 2
Alternatives Considered

This chapter describes the alternatives evaluated in this EA and explains how the Build Alternative was developed to address the purpose and need for the US 6/Wadsworth project, as described in Chapter 1. Additional information is presented in the *Alternatives Development and Screening Technical Memorandum* (CH2M HILL, 2008a) included in Appendix D to this EA. Public and agency input has helped shape the Build Alternative. Information on the public and agency involvement is detailed in Chapter 5.

2.1 PROCESS FOR DEVELOPING AND EVALUATING ALTERNATIVES

The Project Leadership Team (PLT), composed of CDOT, their consultant CH2M HILL, and FHWA, developed initial design alternatives for the interchange and Wadsworth after gathering background data and seeking input from Lakewood, RTD, other federal and state agencies, and the general public. The alternatives development and evaluation process was initiated in September 2007 after considering the input received from the public and agencies during the scoping period. The process comprised the following stages: establishing criteria by which to evaluate the alternatives (evaluation criteria); developing a range of alternatives for improvements to the interchange and Wadsworth; evaluating alternatives in a two-step process of initial screening and detailed evaluation; and refinement of the Build Alternative.

Evaluation criteria were established initially based on review of transportation problems and existing environmental conditions, as well as input received from the public and agencies during the scoping period. Two sets of evaluation criteria were established: Level 1 criteria to be used for initial screening of conceptual designs to eliminate options with "fatal flaws," and Level 2 criteria to be used to evaluate the relative effectiveness of the concepts passing the Level 1 screening.

As presented in Exhibit 2-1, eight interchange replacement concepts were studied during the Level 1 screening process. Four of these concepts were eliminated because they did not meet the project purpose and need, could not be implemented at a reasonable cost, or would result in unacceptable environmental or community impacts. Eleven Wadsworth concepts – which varied lane, median, and sidewalk features – were evaluated. Only one met the purpose and need for the project, so the Wadsworth portion of the Build Alternative was identified after Level 1 screening. A public open house was held in February 2008 to obtain input on the results of the Level 1 screening and help prioritize criteria to focus the Level 2 evaluation of the interchange.

The remaining four interchange design concepts were studied during Level 2 evaluation. After detailed evaluation of 20 criteria, the "tight diamond with loop" concept was determined to best balance transportation needs with environmental and community impacts. Elements of the Wadsworth alternative, such as travel lane and sidewalk widths, were evaluated during Level 2 evaluation to identify mitigation opportunities and finalize the basic cross section of the Wadsworth alternative. CDOT held public open houses in April and May 2008, and attended several neighborhood and business group meetings to present and obtain input on the results of

EXHIBIT 2-1: LEVEL 1 INTERCHANGE SCREENING RESULTS

Category	Level 1 Screening Criteria	NA No Action Full Cloverleaf	A Traditional Diamond	B Tight Diamond	C Tight Diamond w/Loop	D Single Point Urban Interchange	E Partial Cloverleaf	F Partial Cloverleaf w/Directional Ramp	G Full Cloverleaf with Collector/ Distributor Roads	H Diverging Diamond
										
Safety/ Design	Is the alternative feasible from an engineering perspective?	N/A	YES	YES	YES	YES	YES	YES	YES	YES
	Can this alternative accommodate safer bicycle and pedestrian travel through the interchange?	NO	YES	YES	YES	YES	YES	YES	NO	YES
	Does the alternative improve weaving/ merge conditions?	NO	YES	YES	YES	YES	YES	YES	YES	YES
Mobility/ Traffic Operations	Can the alternative meet current and future traffic needs?	NO	YES	YES	YES	YES	YES	YES	YES	YES
	Does the alternative address the interaction of the Wadsworth interchange and Carr/Garrison Street Ramps?	NO	YES	YES	YES	YES	YES	YES	YES	YES
Local Impacts	Does the alternative provide a means to access residences and businesses along the corridor?	YES	YES	YES	YES	YES	YES	YES	YES	YES
Environmental Impacts	Can environmental impacts be reasonably mitigated? Environmental impacts considered during Level 1 Screening include right-of-way (ROW), noise, water quality, and Section 4(f).	N/A	NO	YES	YES	YES	YES	NO	NO	NO
Cost Feasibility	Can the alternative be constructed within 150 percent of estimated costs (i.e., less than $67.5 million [in 2010 dollars])? Costs include the capital construction and ROW.	N/A	YES	YES	YES	YES	YES	NO	NO	YES
Implementation	Is the alternative compatible with established local plans and visions?	NO	YES	YES	YES	YES	YES	YES	NO	NO
SUMMARY OF RESULTS		**Carried Forward:** Baseline Comparison	**Eliminated:** ROW impacts	**Carried Forward:** Level 2 Evaluation	**Carried Forward:** Level 2 Evaluation	**Carried Forward:** Level 2 Evaluation	**Carried Forward:** Level 2 Evaluation	**Eliminated:** ROW impacts, noise, and cost	**Eliminated:** ROW impacts; bicyclist and pedestrian conflicts	**Eliminated:** ROW impacts, reduced travel speed, driver expectations

the Level 2 evaluation and selection of the Build Alternative. Comments received at these meetings indicated concurrence with the results, and public support for the Build Alternative. Public input and environmental mitigation measures shaped additional refinements to the Build Alternative discussed in Section 2.2.3.

2.2 DESCRIPTION OF ALTERNATIVES

Terminology used to describe the alternatives is defined in the Glossary in Appendix A.

2.2.1 NO BUILD ALTERNATIVE

The No Build Alternative does not meet the purpose and need, but is carried forward as a baseline against which the Build Alternative is compared. Like the Build Alternative, the No Build Alternative is evaluated under 2035 traffic conditions.

The No Build Alternative would not meet the project needs described in Chapter 1. CDOT would continue to maintain the existing transportation facilities, but no capital improvements or expansion of facilities would occur for the interchange, US 6, or Wadsworth.

2.2.2 BUILD ALTERNATIVE

The Build Alternative would replace the existing US 6/Wadsworth interchange, including the bridge and all entrance and exit ramps, and widen Wadsworth between 4th and 14th Avenues. The proposed design would address the project purpose and needs described in Chapter 1.

The proposed interchange design, referred to as the tight diamond with loop, is shown in Exhibit 2-2. It would be a diamond interchange with a loop ramp in the northwest quadrant of the interchange. The loop ramp was chosen for the northwest quadrant of the interchange to accommodate peak evening traffic moving from westbound US 6 to southbound Wadsworth. The loop would be constructed to improve speed transitions from US 6 to Wadsworth. A longer deceleration lane would be provided to allow vehicles to maintain a higher speed while exiting

EXHIBIT 2-2: PROPOSED INTERCHANGE DESIGN

Northwest Quadrant

Interchange

1. Reconstructed loop off-ramp from westbound US 6 to southbound Wadsworth.
2. A grade-separated or at-grade pedestrian crossing at on-ramp and loop ramp will be determined at final design.
3. New longer on-ramp from northbound and southbound Wadsworth to westbound US 6 provides adequate acceleration and merge distances for vehicles entering US 6.
4. Continuous lane on US 6 between on-ramp and Carr St. off-ramp provides safer merging conditions.

Frontage Road

5. Frontage road access is shifted north and changed to two-way traffic between the 6th Ave. Business Center and Wadsworth.
6. Channel improvements to Lakewood Gulch to reduce floodplain.

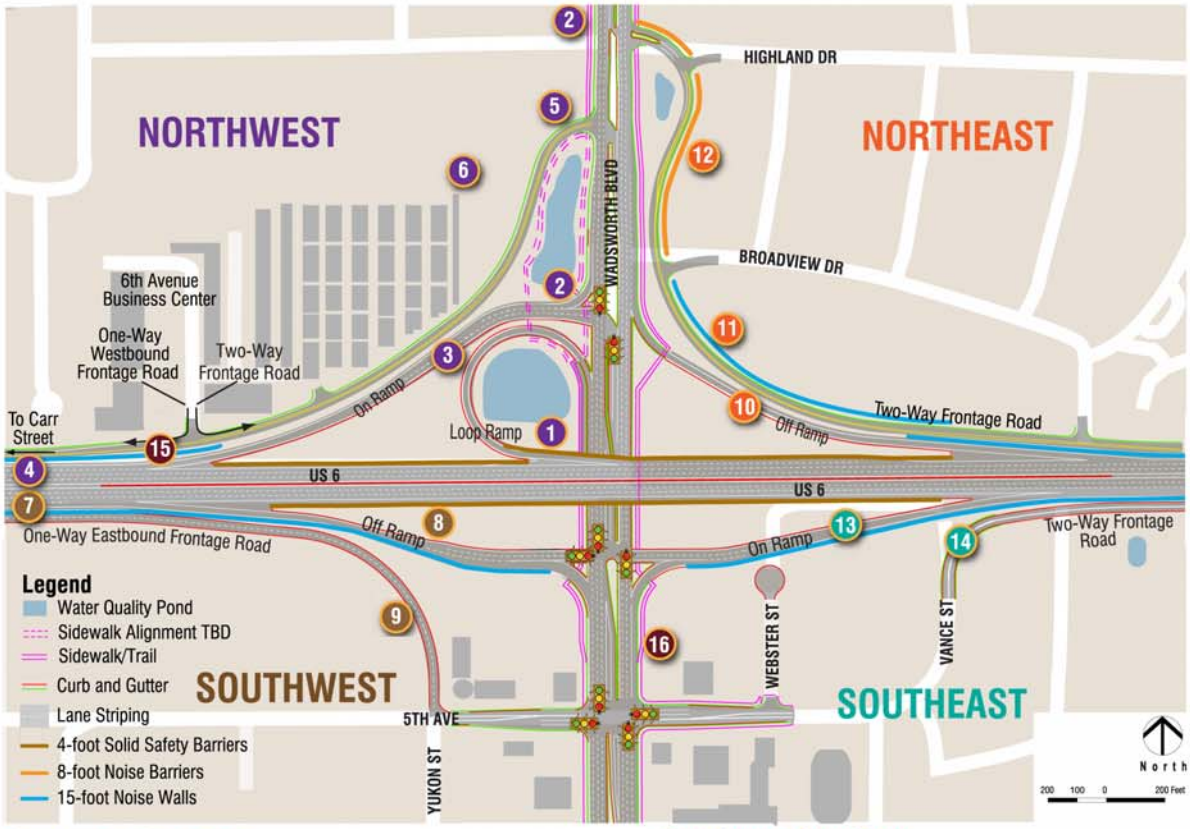
Northeast Quadrant

Interchange

10. New longer off-ramp from westbound US 6 to northbound Wadsworth provides adequate deceleration and vehicle queue distances for vehicles accessing Wadsworth. Free flow movement onto Wadsworth.

Frontage Road

11. Frontage road is reconfigured to provide access directly to Wadsworth. Provides two-way operation that reduces neighborhood cut-through traffic.
12. New 8-foot noise walls next to the frontage road.



Southwest Quadrant

Interchange

7. Continuous lane on US 6 between Carr St. on-ramp and Wadsworth off-ramp provides safer merging conditions.
8. New longer off-ramp from eastbound US 6 to northbound and southbound Wadsworth feeds into a multi-lane intersection that accommodates expected vehicle queues. Exiting vehicles wanting to travel east at the 5th Ave. intersection utilize the signalized intersection to make a hard right and vehicles destined farther south can use the adjacent right-turn yield lane to merge onto southbound Wadsworth.

Frontage Road

9. Frontage road remains one-way and continues to connect to 5th Ave. at Yukon St.

Southeast Quadrant

Interchange

13. New longer on-ramp from northbound and southbound Wadsworth to eastbound US 6 provides adequate acceleration and merge distance for vehicles entering US 6.

Frontage Road

14. Frontage road remains two-way and connects to 5th Ave. on Vance St. instead of Webster St.

Project Wide

15. New 15-foot noise walls between the frontage roads and US 6, west of Wadsworth.
16. Detached multi-use sidewalk along both sides of Wadsworth.

US 6, reducing the amount of deceleration required in the through lanes of US 6.

The auxiliary lane from the loop onto Wadsworth would extend through to 5th Avenue to allow a longer distance to merge with Wadsworth traffic. The remaining ramps would be constructed in a diamond configuration. All of the ramp tapers in the interchange area would be lengthened to provide adequate acceleration and deceleration distances for vehicles entering and exiting US 6.

US 6 would remain as a six-lane freeway corridor. The existing slip ramps at US 6 and Carr Street would remain, but the new interchange configuration would add auxiliary lanes between the Carr Street slip ramps and the west Wadsworth entrance/exit ramps to provide safer weaving distances between the Wadsworth and Carr Street ramps. The US 6 bridge over Wadsworth would be replaced, addressing the structural deficiency of the bridge deck.

The Wadsworth cross section, shown in Exhibit 2-3, would feature an additional travel lane in each direction, a raised median, and a multi-use sidewalk. The additional travel lanes would reduce congestion for vehicles traveling through the study area. The median would direct left turns and U-turns to intersections with cross streets and prevent mid-block turns. Exhibit 2-4 shows where left turns and U-turns would be allowed. By limiting left turns from cross streets, there would be fewer locations along Wadsworth where left-turning vehicles would conflict with through-traffic or pedestrians/bicyclists. In addition, an Access Management Plan would be developed and implemented to consolidate driveways and limit the number of locations where cars enter Wadsworth traffic. An 8-foot multi-use sidewalk, which would be detached or offset from the roadway in most locations, would be provided on both sides of Wadsworth, including in the interchange area. The detached sidewalk would provide a higher level of safety to pedestrians and bicyclists by separating them farther from vehicular traffic. Access to and

EXHIBIT 2-3: PROPOSED WADSWORTH CROSS SECTION

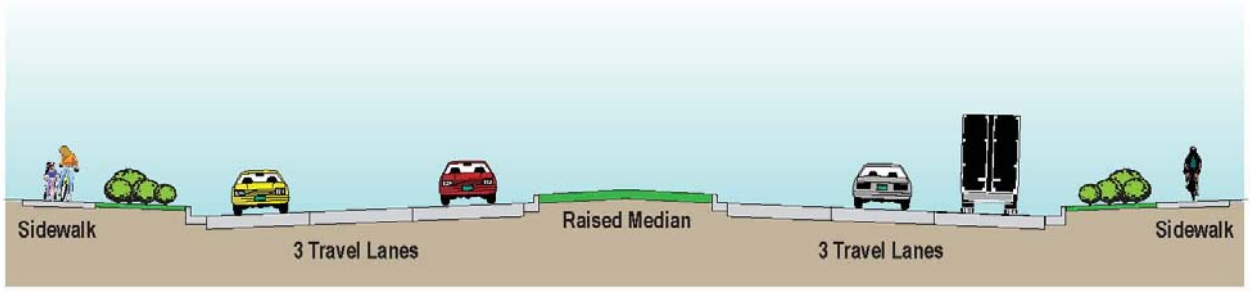
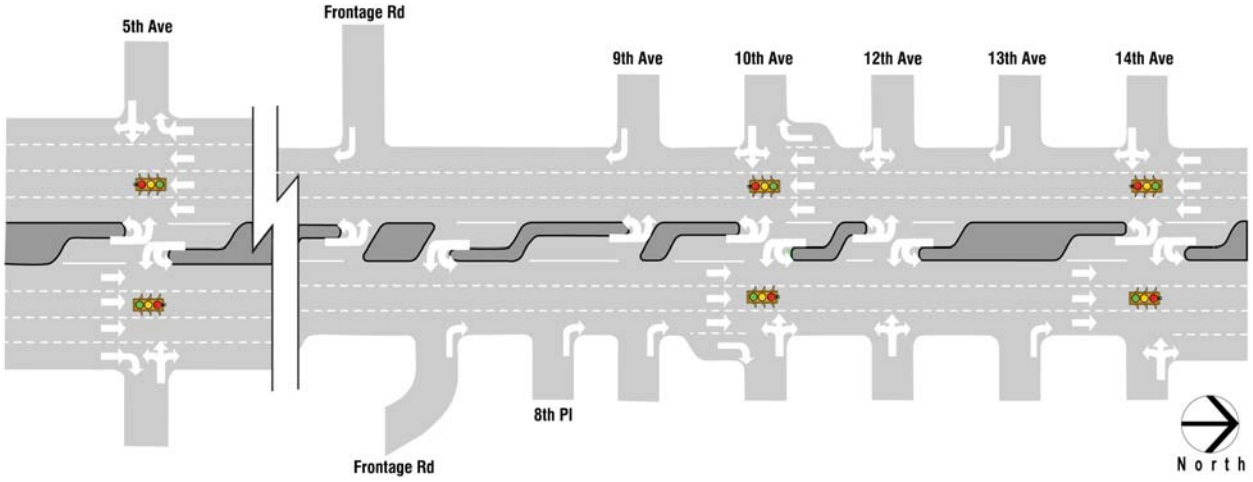


EXHIBIT 2-4: PROPOSED TURNING MOVEMENTS ON WADSWORTH



convenience of bus stop locations would be improved by the consistent sidewalks and increased distance from high-speed traffic.

McIntyre, Lakewood, and Dry Gulches would be widened and realigned to remove US 6 and Wadsworth from the floodplains, improve drainage flow, and reduce flooding in locations where the roadways cross the drainages. Riparian values along the banks would be enhanced.

The Build Alternative would also include water quality ponds to treat stormwater runoff and comply with federal and state water quality permitting requirements. As shown in Exhibit 3-20, seven ponds would be located in the study area. Locations, sizes, and configurations of planned ponds were designed to minimize property acquisition and take advantage of property remnants that would have no other economical function. The ponds would be sized to treat roadway runoff from existing and expanded paved areas. In some cases, the water quality ponds would also treat stormwater from non-roadway development that enters the roadways.

Finally, noise walls would be installed between US 6 and its frontage roads from the interchange west to near Garrison Street. Existing walls east of Wadsworth, and within the limits of the proposed improvements, would be reconstructed and extended farther west toward Wadsworth to improve noise mitigation for residents in the interchange area.

2.2.3 REFINEMENTS TO THE BUILD ALTERNATIVE

The Build Alternative was refined after the Level 2 evaluation to minimize property acquisitions and other environmental impacts. Changes to the Build Alternative were discussed with, and often initiated by, the public. Some of the refinements include:

- The sidewalk buffer area next to Wadsworth was removed, attaching the sidewalk to the roadway in some locations, if doing so allowed a property to remain (avoided a total acquisition).
- The width of the inside travel lanes (one in each direction) was reduced to 11 feet, rather than 12 feet, to minimize right-of-way (ROW) requirements.
- The 25-mile-per-hour (mph) design speed of the northwest loop ramp was maintained to reduce the radius of the ramp and minimize impacts to surrounding businesses.
- Nonconforming land uses, such as encroachments into setback requirements, that could otherwise turn partial property acquisitions into total acquisitions were identified; allowance of these nonconforming uses was discussed with Lakewood.
- The frontage road alignment and configuration on the north side of US 6 was changed to two-way near residences and businesses to improve business access and reduce neighborhood cut-through traffic.
- Water quality features were sited to be compatible with surrounding land use and provide productive use of “remnant” ROW parcels.

Other mitigation measures and design refinements incorporated to avoid or minimize impacts to community and environmental resources are discussed in Chapter 3 of this EA.

2.2.4 RTD WEST CORRIDOR

RTD and/or private developers may construct some sidewalk and intersection improvements on the north end of the project area associated with the West Corridor light rail project and recent transit mixed-use (TMU) zoning. Changes in traffic patterns associated with these improvements have been accounted for in both the No Build and Build Alternatives. The cumulative effects of these potential projects with the Build Alternative are factored into the cumulative impact analysis (Section 3.13).

2.2.5 COST

Costs associated with the No Build Alternative would be limited to general maintenance because no capital improvements would be initiated. Maintenance of the US 6 bridge over Wadsworth would become more

frequent and, therefore, costly as the condition of the bridge deck continues to worsen.

The Build Alternative is estimated to cost approximately $125 million to implement (in 2010 dollars). Costs, which include materials, labor, and ROW acquisition, would likely increase if construction is delayed.

2.2.6 FUNDING

The US 6/Wadsworth project is included in the Denver Regional Council of Governments (DRCOG) *Fiscally Constrained 2035 Regional Transportation Plan* (DRCOG, 2007). Like many projects in the current plan, funding for this project has been subject to declining tax revenue and volatile construction costs. Senate Bill 97-1 funds, which are allocated to high-priority strategic transportation projects, have been identified for construction of the Build Alternative. Because of budget shortfalls, these funds are not expected to be available until 2015 or later, and the funds that are expected would fall short of the full funding required to construct the Build Alternative. US 6/Wadsworth improvements remain a high priority for the region and the state, and CDOT and FHWA continue to work to secure full funding. The City of Lakewood has committed to participate in some project cost sharing and also is looking to identify additional local funding opportunities.

CHAPTER 3
Affected Environment and Environmental Consequences

An important goal of the US 6/Wadsworth EA is to create an EA document that follows the intent of the National Environmental Policy Act (NEPA) by concentrating on the issues that are truly significant to the proposed action, rather than "amassing needless detail" [Title 40 of the Code of Federal Regulations (CFR) Part 1500.1(b)]. To help define the appropriate scope for environmental analysis, the project team prepared an overview of existing environmental conditions in the study area (CH2M HILL, 2007a). For each environmental resource typically included in a CDOT NEPA study, the team collected and evaluated environmental data and provided a discussion of the presence/absence of each resource, its distribution, the relative importance of the resource in the study area, and, if applicable, recommendations for future activities to characterize the resource. The assessment of environmental issues consisted of a team of resource specialists conducting field reconnaissance site visits, discussion with knowledgeable individuals, and/or review of secondary data (for instance, U.S. Census Bureau data). These data were presented at agency and public scoping meetings to validate that the level of analysis was appropriate and to determine if any issues important to the public or resources agencies had been omitted or not given adequate consideration.

The analysis presented in this chapter is organized to focus on important issues identified through the scoping process. Transportation and pedestrian and bicycle facilities are analyzed first, as follow-on to the discussion of the project purpose and alternatives, with resources then discussed in descending order of expected degree of environmental effect. In some cases, complementary resources, such as floodplains, water resources, and wetlands, are grouped together for readability.

3.1 TRANSPORTATION RESOURCES

US 6 is a primary east-west six-lane freeway through the Denver metropolitan area. Its interchange with Wadsworth is a full cloverleaf configuration that serves Lakewood. As described in Chapter 1, the interchange does not operate efficiently to handle traffic volumes, and the design presents inherent safety concerns with inadequate acceleration and deceleration lanes, weaving conflicts, and small radius curves.

Wadsworth is a major regional arterial that connects C-470 with the City and County of Broomfield. Within the study area, Wadsworth has four through lanes between 4th and 14th Avenues and six travel lanes immediately north of 14th Avenue and south of 4th Avenue. As explained in Chapter 1, the four-lane section is congested during peak travel hours; congestion is primarily related to high traffic volumes but lane imbalance (narrowing from six to four lanes in the study area) and lack of access control contribute to traffic turbulence and reduced capacity. North of US 6, access is uncontrolled with numerous intersection crossings and driveways. The median is striped to provide two side-by-side continuous left-turn lanes, one in each direction, serving major intersections and driveway accesses. Because turning movements are unlimited and unpredictable, through traffic frequently stops or has to move around turning vehicles, creating an inconsistent travel pattern. The inconsistency of traffic operations contributes to congestion and further reduces the gaps in traffic for cars to enter Wadsworth.

Traffic conditions in the year 2035 were forecast using the DRCOG regional travel demand model. This regional model is a robust database of future land use characteristics, expected future roadway network improvements, planned transit expansion, and travel behavior. DRCOG uses data from local municipalities and agencies to help create the model. The model considers anticipated land use changes and takes into account travel patterns likely to result from planned projects in the study area, such as opening of the West Corridor LRT line, associated bus service expansion, and Lakewood's new higher-density TMU zoning around the LRT station.

A detailed inventory of transportation conditions and local and regional traffic analyses are documented in the *Traffic Study Report* (CH2M HILL, 2009a) included in Appendix D to this EA.

3.1.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

Impacts of the No Build Alternative on traffic capacity and operations, safety, and transit operations are discussed below.

3.1.1.1 Traffic Capacity and Operations

The existing configuration of the interchange and Wadsworth cannot accommodate existing traffic volumes. Unacceptable traffic operations would continue to deteriorate in the future as traffic volumes in the study area are forecast to increase 25 percent over existing conditions by 2035. This increase equates to approximately 1 percent annual growth, which is typical for an urban area. As a result of increased traffic volumes, unacceptable level of service (LOS) would continue and further deteriorate, with most locations in the study area operating at LOS F in one or both of the peak travel hours, as shown in red in Exhibit 3-1.

Interchange Area

The significant travel demand on US 6 would cause the highway to operate at unacceptable LOS in the area surrounding the interchange during peak hours. Due to the congestion on US 6 and operational inefficiencies of the cloverleaf interchange, the Wadsworth interchange ramps would also operate at unacceptable LOS.

Wadsworth

Existing poor traffic conditions along Wadsworth and at intersections would degrade further as traffic volumes increase by 2035. As shown in Exhibit 3-2, nearly all portions of Wadsworth and its intersections would operate at unacceptable LOS during peak hours, except for the intersection at 13th Avenue that will be modified by RTD as part of the West Corridor LRT project to allow only right-in, right-out turning movements. Fourth Avenue was improved recently by Lakewood and also would operate at acceptable LOS.

3.1.1.2 Safety

Under the No Build Alternative, accidents related to congestion and inefficient operations would continue to occur. The interchange would likely continue appearing on Lakewood's critical location list for both accident frequency and severity. As Wadsworth becomes more congested, drivers may take greater risks entering gaps or making turns across travel lanes, particularly at non-signalized intersections and driveways.

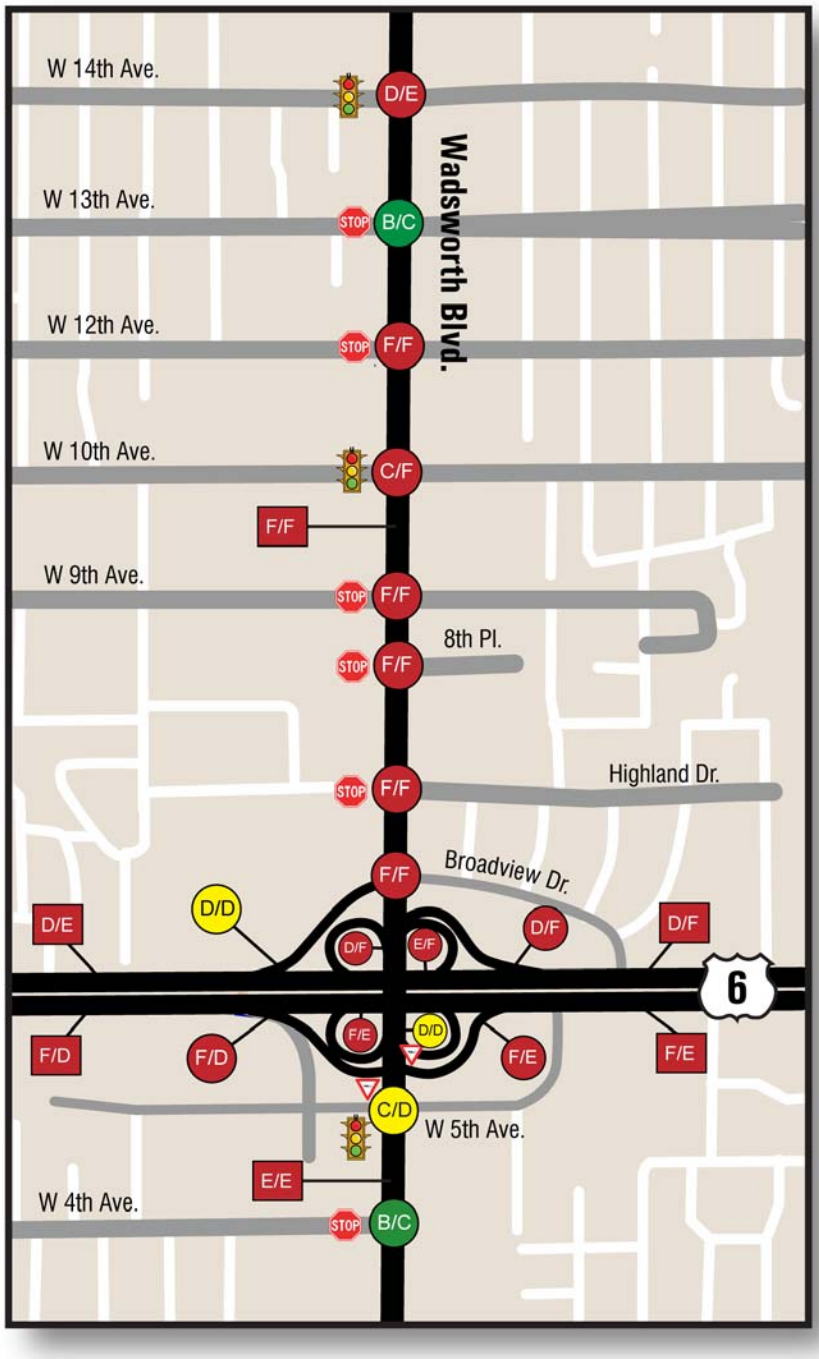
3.1.1.3 Transit Operations

As noted in Chapter 1, bus service along Wadsworth is projected to increase four fold by 2035. Continued congestion on Wadsworth would affect the timeliness of bus service and could affect timely transfers between buses and LRT. Increased local and regional bus service to and from the Wadsworth LRT station would contribute to congestion on Wadsworth. Pedestrian and bicycle facilities would not be improved, and pedestrian connections to bus service on Wadsworth would remain difficult.

3.1.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

Impacts of the Build Alternative on traffic capacity and operations, safety, and transit operations are discussed below. Construction impacts are also discussed.

EXHIBIT 3-1: YEAR 2035 NO BUILD ALTERNATIVE TRAFFIC CONDITIONS – WADSWORTH BOULEVARD AND US 6 INTERCHANGE



LEGEND

Signal

Stop

Yield

E/F = Through Traffic Level of Service During Peak Hours (AM/PM)

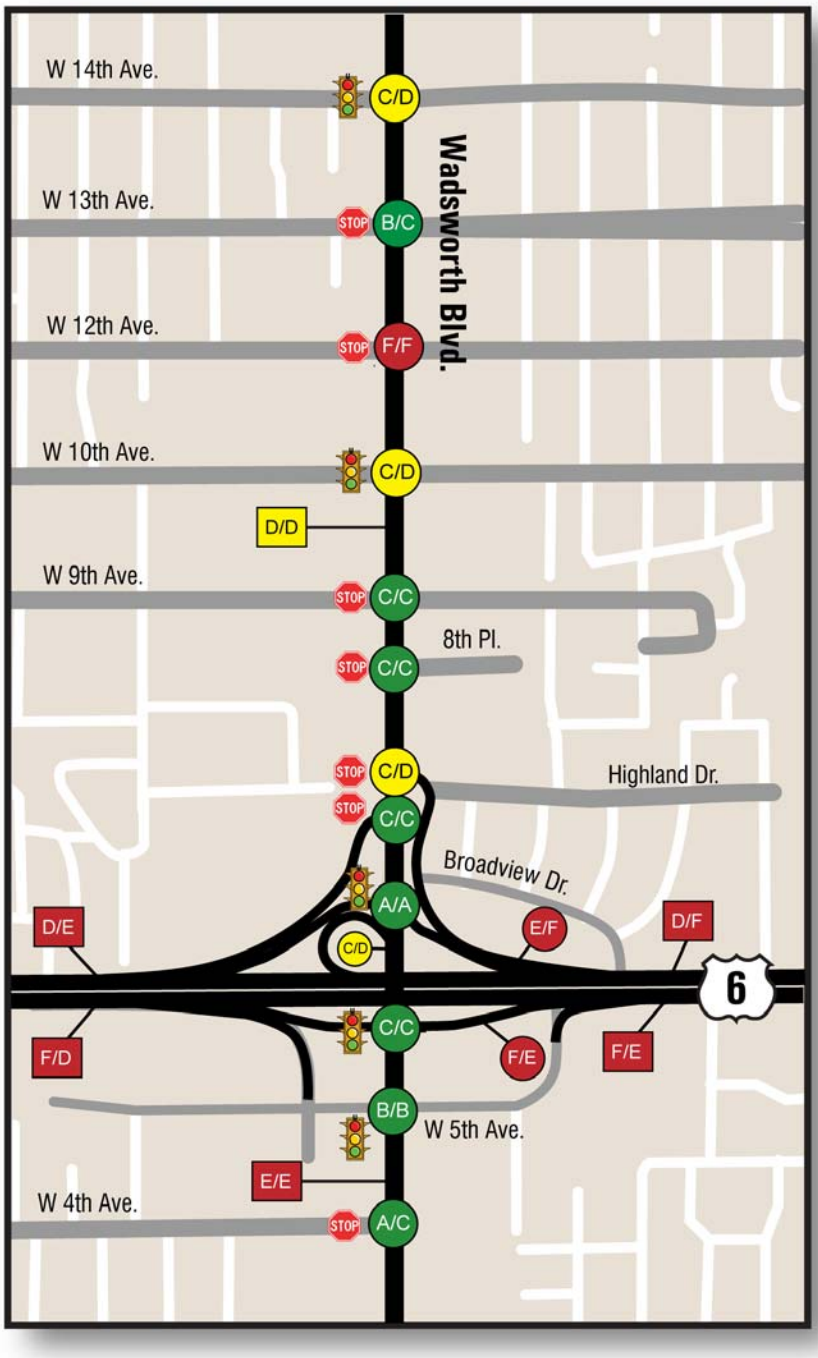
(E/F) = Intersection, Ramp, or Weave Level of Service During Peak Hours (AM/PM)*

*Note: Intersection LOS applies to traffic on cross streets, not through traffic on Wadsworth

ABC = Good D = Fair EF = Poor

North

EXHIBIT 3-2: YEAR 2035 BUILD ALTERNATIVE TRAFFIC CONDITIONS – WADSWORTH BOULEVARD AND US 6 INTERCHANGE



3.1.2.1 Traffic Capacity and Operations

In 2035, traffic volumes in the study area are forecast to increase 25 percent over existing conditions, and the Build Alternative would increase volumes an additional 10 percent beyond that as a result of latent demand. Latent demand represents travel that is desired but unrealized because of constraints. Cars wishing to travel on Wadsworth but currently traveling on adjacent corridors, such as Kipling and Sheridan, would shift back to traveling along Wadsworth under the Build Alternative because of its increased capacity and improved traveling conditions. The Build Alternative would not induce additional travel but instead should help operations on those other parallel facilities.

Under the Build Alternative, traffic operations would be improved over No Build conditions for nearly all elements of the study area. Acceptable LOS during peak hours are shown in green and yellow in Exhibit 3-2.

Interchange Area

Reconstructing the interchange to a tight diamond with loop would eliminate the low speeds and tight curves of the existing cloverleaf design, and remove all of the weave sections. Ramp acceleration and deceleration lengths would be increased to meet current design standards, reducing the potential for slowdowns in through lanes on US 6. The on- and off-ramps between Wadsworth and Garrison Street would be connected to form continuous auxiliary lanes between the two interchanges, improving traffic operations in these areas. The interchange ramps would continue to operate poorly because of congestion on US 6. If US 6 operated at an acceptable LOS, the ramps have adequate capacity to also operate at an acceptable LOS.

Wadsworth

The Build Alternative would increase capacity on Wadsworth by providing a consistent six-lane cross section that would match the cross section south of the interchange. Access control measures would allow left-turn movements only at intersections with cross streets and would consolidate driveway accesses. Together, the added capacity and access control would improve traffic operations over No Build conditions for Wadsworth and its intersections within the study area. One notable exception is the intersection of Wadsworth and 12th Avenue.

The 12th Avenue intersection would remain unsignalized and would continue to allow turns in all directions, which results in LOS F performance today and in the future. Because of the uncertainty of future development around the LRT station at 13th and Wadsworth and potential redevelopment plans for the Jefferson County Open School at 10th and Wadsworth, future travel demands at this intersection are difficult to predict. If traffic volumes warrant it, the intersection may be improved in conjunction with future redevelopment.

Neighborhood traffic patterns may change northwest and northeast of the interchange. The frontage road northwest of the interchange would become a two-way road between the 6th Avenue Business Center and Wadsworth, allowing business customers to return to Wadsworth without traveling through local residential streets to do so. The frontage road northeast of the interchange would allow access to and from Wadsworth in both the eastbound and westbound directions, eliminating the need for traffic to cut through the Green Acres neighborhood to access the eastbound frontage road.

3.1.2.2 Safety

The Build Alternative would reduce congestion and improve inefficient roadway operations that cause many of the accidents in the study area.

Adequate acceleration and deceleration lengths for vehicles entering and exiting the interchange would decrease the potential for rear-end accidents. Eliminating the weaving sections in the interchange would address sideswipe accidents, and improving the curvature of ramps would reduce the number of crashes into fixed objects and rollovers.

The additional capacity on Wadsworth would reduce congestion and decrease the potential for rear-end accidents. The existing side-by-side left-turn lanes that can lead to head on collisions, sideswipes, and left-turn accidents would be replaced with a raised

median. The raised median would reduce the potential for these types of accidents by separating southbound and northbound traffic, and eliminating mid-block left turns. The elimination of some turning movements from cross streets would also reduce the potential for left-turn and rear-end accidents.

3.1.2.3 Transit Operations

The Build Alternative would facilitate multimodal travel and connections in the study area. Continuous 8-foot sidewalks that are set back approximately 10 feet from the road would enhance both safety and mobility for pedestrians and bicycles, as discussed in Section 3.2, Pedestrian and Bicycle Facilities. Access to and the condition of bus stops would also be improved as a result of the new sidewalks, improving connections to bus service on Wadsworth.

Increased capacity on Wadsworth would provide better capacity for bus operations on Wadsworth by accommodating the increase in bus frequency, improving the timeliness of bus service, and facilitating timely transfers between buses and LRT. The bridge on US 6 over Wadsworth would be long enough to accommodate future transit options on Wadsworth without the need for reconstruction.

3.1.2.4 Construction

Construction phasing has not yet been identified so it is not certain whether the existing number of through travel lanes can be maintained at all times. If lanes are closed on Wadsworth or US 6 during construction, congestion in and surrounding the construction area would increase during times of lane closures. Increased congestion on Wadsworth or US 6 could lead to temporarily increased traffic volumes on parallel facilities, such as Colfax or Alameda and Kipling or Sheridan, as drivers find other travel routes to avoid construction congestion.

If road closures are required on any facilities, detours would be implemented that would temporarily increase traffic volumes on adjacent neighborhood streets and parallel facilities.

Lane closures, detours, and increased congestion during construction would all cause delays for the traveling public and inconvenience to residents in the area. Increased congestion in the study area could also delay buses and affect timely transfers between buses and light rail.

3.1.3 MITIGATION

CDOT will continue to work with RTD and Lakewood regarding development plans at and around the 13th Avenue LRT station to coordinate the design of the Build Alternative with the design of the LRT project.

CDOT will work with Lakewood to consider future improvements to the 12th Avenue intersection as the TMU zoning is implemented and the surrounding area redevelops around the LRT station.

CDOT will coordinate with RTD and Lakewood on the placement and aesthetics of bus stops and shelters. Bus shelters will be provided by others. CDOT will work with RTD to ensure access to bus stops during construction.

Construction phasing and other activities will be planned to minimize the impact to the traveling public and area residents and businesses. Any lane closures during construction will comply with CDOT's Lane Closure Strategy. Advance notice will be provided for extended lane closures. Detours will be identified with adequate signing to minimize out-of-direction travel.

3.2 PEDESTRIAN AND BICYCLE FACILITIES

As noted in Chapter 1, pedestrian and bicycle facilities are limited within the study area but the need for them is great. Additional information on pedestrian and bicycle conditions is presented in the *Traffic Study Report* (CH2M HILL, 2009a) included in Appendix D to this EA.

3.2.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

The No Build Alternative would not change pedestrian and bicycle facilities within the study area. The existing sidewalk system would remain in place, perpetuating a discontinuous facility that contains obstructions and does not conform to recommended safety standards. Sidewalks north of 10th Avenue, where the highest portion of missing or substandard

sections occurs, would be inadequate to support increased pedestrian and bicycle activity around the new LRT station at 13th Avenue.

US 6 would remain a barrier to north-south travel through the study area. Uncontrolled crossings of high-volume, free-flow loop ramps would persist on the east side of Wadsworth, and no crossings would be provided on the west side. Safety conditions of these crossings would continue to deteriorate as traffic volumes increase and resulting gaps for crossing get smaller.

Wadsworth would continue to be a barrier to east-west pedestrian and bicycle crossings, particularly between 5th and 10th Avenues where there are no signalized intersections. Uncontrolled access and traffic congestion on Wadsworth would continue to create unsafe conditions.

3.2.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

The Build Alternative would provide a continuous 8-foot-wide multi-use path on both sides of Wadsworth. The path would be separated from the road in most places by a 10-foot buffer. The path would comply with the Americans with Disabilities Act (ADA) requirements and would meet or exceed mobility and safety standards for multi-use paths.

The construction of a continuous pedestrian and bicycle path on both sides of Wadsworth between 4th and 14th Avenues would fulfill the project need for improved pedestrian and bicycle safety and would address community needs identified in adopted plans.

Safety of pedestrian and bicycle travel on Wadsworth would be improved by access control in the form of raised medians and driveway consolidation, as well as reduced traffic congestion on Wadsworth. No new signalized at-grade pedestrian crossings would be added on Wadsworth between 5th and 10th Avenues, which would continue to create out-of-direction travel or encourage unsafe mid-block crossings by pedestrians. The Lakewood Gulch box culvert at 8th Avenue would be reconstructed and replaced with a wider structure. The new box culvert also would include accommodations for a pedestrian/bicycle crossing. This provides an opportunity for a future east-west pedestrian and bicycle crossing between 5th and 10th Avenues. Connections between the box culvert and the paths along Wadsworth would need to be constructed by others.

Crossings of US 6 would be available on both sides of Wadsworth where new sidewalks would be provided. Safety concerns for pedestrian/bicycle traffic associated with crossings of loop ramps (due to curvature and poor visibility) would be removed.

One loop ramp crossing would remain on the west side of Wadsworth, and several unsignalized crossings of free-flow on- and off-ramps would remain on the east side of Wadsworth. In each of these instances, high volumes of traffic would provide few gaps for crossings during peak hours. Visibility between vehicles and pedestrians/bicyclists would be improved slightly by changes to the ramp curvature but would remain poor, especially on the loop ramp where the curvature of the ramp limits sight distance from vehicles on the ramp. Several measures will be considered during final design to improve the visibility and safety of these free flow ramp crossings, as described in the Section 3.2.3 below.

During construction, closure or rerouting of existing sidewalks may cause out-of-direction pedestrian and bicycle travel. It is likely that the existing crossing of US 6 would be obstructed for short durations to accommodate the reconstruction of the US 6 bridge over Wadsworth.

3.2.3 MITIGATION

During final design, CDOT will examine the feasibility of including a grade-separated pedestrian and bicycle crossing of the loop ramp in the northwest quadrant of the interchange. CDOT also will consider additional options, such as signing, lighting, and pavement treatments, to improve safety and visibility at the US 6 crossings of free-flow ramps on the east side of Wadsworth.

Temporary detour routes, pedestrian walkway structures, and advance signing will be provided

during construction to ensure safe pedestrian and bicycle travel during construction.

3.3 NOISE CONDITIONS

Traffic noise has long been an important issue to residents living near US 6 because the highway carries large volumes of high-speed traffic and is bordered primarily by residences. Noise walls are present along both sides of US 6 between Federal Boulevard and Wadsworth. Although noise walls west of Wadsworth are warranted, funding to construct them has not been available. Noise levels in neighborhoods along US 6 west of Wadsworth are extremely high, and public interest in noise issues associated with the US 6/Wadsworth project has been great.

Noise is measured in decibels (dB), and can range from 0 dB (threshold of human hearing) to 140 dB (where sound causes pain). An "A-weighted decibel," or dBA, is used for impact assessment because it corresponds to the human perception of noise. Noise levels of 40 to 50 dBA are typical of a quiet neighborhood, while 70 to 80 dBA might be heard adjacent to a busy urban street or highway. An increase or decrease in noise by 5 dBA is readily noticeable by most people. The human ear perceives an increase or decrease in noise by 10 dBA as twice or half as loud, respectively.

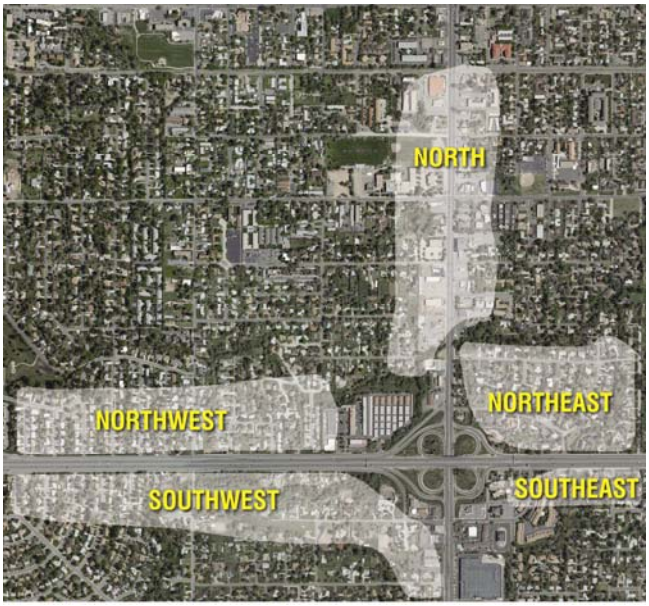
Under CDOT's Noise Abatement Criteria, noise mitigation, such as noise walls, is evaluated if noise levels during the loudest hour of the day at residences, parks, or schools (also called noise-sensitive receptors) equal or exceed 66 dBA, or if future noise levels are predicted to exceed existing levels by 10 dBA or more.

Traffic noise is loudest when there is a large volume of traffic traveling at relatively high speeds. When more traffic is added to the flow, noise levels will increase as long as there is no decrease in speed. At some point, the capacity of the highway will be exceeded, resulting in a decrease in speeds and noise levels. Therefore, the loudest hour occurs just before and just after periods of congestion.

A detailed noise analysis was conducted for the US 6 Wadsworth project. That analysis is summarized here. The complete noise analysis, *Noise Technical Memorandum* (Hankard Environmental, 2008), is available in Appendix D to this EA.

The noise analysis divided the study area into five subareas, representing the four quadrants of the interchange and the area along Wadsworth to the north, as illustrated in Exhibit 3-3. Noise monitors were placed at several locations within the study area for 1 week to measure existing noise levels. From these measurements, a noise model was constructed, calibrated, and used to approximate existing and future noise levels at residences located within approximately 700 feet of US 6 and Wadsworth.

EXHIBIT 3-3: NOISE STUDY SUBAREAS



Measured noise levels illustrated a daily pattern for traffic noise, with maximum levels occurring during the morning and evening rush hours, relatively high levels during the day, and lower levels at night. This pattern is expected given the heavy volume of traffic on US 6 and the frontage roads, the proximity of residences to roadways, and the speed of traffic on US 6.

As detailed in Exhibit 3-4, the noise model showed that the first row of homes adjacent to US 6 between Wadsworth and Garrison Street (northwest and southwest areas) – where no noise walls currently

exist – experiences average noise levels of 77 dBA during the loudest hour of the day. In contrast, the model results showed that noise levels at the first row of homes adjacent to US 6 east of Wadsworth (northeast and southeast) – where there are existing noise walls – are about 10 dBA lower, or approximately half as loud, confirming that the existing noise walls substantially reduce noise levels at homes adjacent to US 6. Throughout the study area, more than 100 residences experience noise at 66 dBA or greater.

EXHIBIT 3-4: EXISTING NOISE CONDITIONS

Area	Row[1]	2007 (dBA)	Number of Impacted Residences
North	All	57	1
Northeast	1st	67	
	2nd	62	8
	3rd	58	
Southeast	1st	68	
	2nd	60	7
	3rd	58	
Northwest	1st	77	
	2nd	72	54
	3rd	64	
Southwest	1st	77	
	2nd	72	45
	3rd	62	

Notes:
[1] Average of residences in each row.
[2] Impacted residences are those where noise levels exceed 66 dBA; number includes receptors throughout study area and is not correlated to rows (although houses closer to the roadway are generally noisier).
Source: Hankard Environmental, 2008.

3.3.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

Loudest-hour noise levels along US 6 and Wadsworth will not change appreciably in 2035 under the No Build Alternative because the highway is already at capacity during at least part of the typical day, and no additional capacity would be added to either roadway.

West of Wadsworth, where no noise walls are present, high noise levels at residences would persist. The No Build Alternative would not provide noise walls along US 6 west of Wadsworth because no construction would take place.

3.3.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

Without noise mitigation, projected loudest-hour noise levels under the Build Alternative in 2035 would increase slightly near ramps, as shown in Exhibit 3-5. Modeling for future noise takes into account the layout of the Build Alternative, including any acquired parcels that would expose second-row homes that were previously buffered by first-row homes. As with the No Build Alternative, noise would not increase significantly because the Build Alternative would not add capacity to US 6, which is the noise source. As discussed in Section 3.3.3 and noted in Exhibit 3-5, walls would mitigate traffic noise substantially for affected residences.

EXHIBIT 3-5: FUTURE NOISE CONDITIONS

			Build Alternative	
Area	Row	Existing Condition (dBA)	Without Walls	With Walls
North	All	57	59	NA[1]
Northeast	1st	67	72	63
	2nd	62	64	59
	3rd	58	61	54
Southeast	1st	68	75	63
	2nd	60	67	57
	3rd	58	64	57
Northwest	1st	77	77	66
	2nd	72	72	60
	3rd	64	64	54
Southwest	1st	77	77	66
	2nd	72	72	60
	3rd	62	62	55

Notes:
[1] Walls were not warranted or desirable along Wadsworth because residences are not impacted by noise above 66 dBA, and commercial businesses front the roadway and would be negatively affected by losing visibility behind a wall.

Wadsworth traffic does not result in noise impacts because traffic volumes and speeds are lower and most residences are buffered from the road by a row of commercial businesses on each side of Wadsworth.

During construction, noise from diesel-powered equipment would range from 80 to 95 dBA at a

distance of 50 feet. Impact equipment such as rock drills and pile drivers can generate louder noise levels. These levels of noise will be present at residences on an intermittent basis as different phases of construction begin and end.

3.3.3 MITIGATION

Because noise levels meet or exceed CDOT's Noise Abatement Criterion of 66 dBA at residences adjacent to US 6, mitigation was evaluated to determine if it was reasonable and feasible. Noise mitigation is considered **reasonable** when it can be constructed in a cost-effective manner and the community supports it, and **feasible** when it may be constructed without major engineering issues and will provide substantial noise reduction. The most effective and commonly used noise abatement measures are noise walls or earthen berms. The latter are usually not practical in urban areas with constrained ROW because of the large land area they require. Additional details about mitigation measures are provided in the *Noise Technical Memorandum* (Hankard Environmental, 2008) included in Appendix D to this EA.

Noise walls have been determined to be reasonable and feasible noise mitigation for the US 6/Wadsworth interchange. The existing walls east of the interchange will be extended closer to Wadsworth, and 15-foot-tall walls will be constructed along both sides of US 6 out to Garrison Street. In the northeast quadrant of the interchange, an 8-foot-tall wall will be extended along the reconfigured frontage road facing Wadsworth north to Broadview Drive to improve noise reduction for the Green Acres neighborhood. In addition, 4-foot-tall solid safety barriers will be placed along the US 6 bridge over Wadsworth. Heights of walls will be confirmed during final design. The general alignment of these walls is illustrated in Exhibit 2-2 in Chapter 2.

The walls will provide more than 330 residences with a noticeable reduction in traffic noise (3 dBA or more). Traffic noise levels at residences up to three rows from US 6 would decrease by an average of 10 dBA, or be about half as loud as they are presently.

Noise walls will be located between US 6 and its frontage roads to maintain a continuous barrier to traffic on US 6. Locating barriers nearest to the receptors (that is, next to the house) is preferable for noise mitigation but was not possible because of the numerous driveways located off the frontage roads. Locating a noise wall between homes and the frontage road would require gaps in the wall at every driveway, reducing its effectiveness.

During final design of the project, Lakewood and area residents will have the opportunity to provide input on design elements related to noise mitigation, including grading, landscaping, and color and material of noise walls, with the goal of constructing an aesthetically pleasing and economically viable project.

Construction noise impacts will be mitigated by limiting work to daytime hours (as described by CDOT and Lakewood requirements) when possible and requiring the contractor to use well-maintained equipment, particularly with respect to mufflers.

3.4 RIGHT-OF-WAY

Right-of-Way (ROW) is the land used for transportation facilities and their maintenance. The US 6/Wadsworth project is located in a developed urban area, and private property surrounds the state-owned ROW along the highways. Aside from the area within the existing cloverleaf loops, there is little area within CDOT's present ROW to expand its facilities.

The current ROW width for US 6 east and west of the interchange, including the frontage roads and all six lanes of traffic, varies between 105 and 170 feet. The average width of the US 6 ROW within the interchange is 780 feet. Commercial and residential properties surround the interchange. Most of the properties adjacent to US 6 are residential.

As shown in Exhibit 3-6, ROW along Wadsworth ranges from approximately 80 to 95 feet and, like the interchange area, there is little room to expand the transportation facilities. Properties adjacent to Wadsworth are primarily privately owned businesses ranging from office buildings and national chain retailers, to smaller independent retail and service

providers. Lakewood owns ROW adjacent to Wadsworth where drainage features and local streets cross the state highway. Jefferson County Public Schools owns the Jefferson County Open School property on the west side of Wadsworth between 10th and 12th Avenues.

EXHIBIT 3-6: WADSWORTH EXISTING ROW WIDTH (NORTH TO SOUTH)

Segment	Average Width
Colfax Avenue to 10th Avenue	80 feet
10th Avenue south quadrants	90 feet
Below 10th Avenue to 8th Avenue	80 feet
8th Avenue to 7th Avenue	95 feet
5th Avenue to 2nd Avenue	85 feet

Source: CDOT ROW Plans.

The public identified property acquisition as one of the most important issues to be addressed in this EA. Neighborhood groups, business associations, and interest groups expressed concern that property and business owners be informed of potential impacts to their properties, have an opportunity to provide input, and be treated fairly in evaluating property impacts. In response to these concerns, business and property owners were included on project mailings, and staff met personally with many owners and tenants. A survey of businesses was conducted to understand business operations and potential effects of property acquisitions and changes in roadway operations. CDOT ROW staff was available at each public open house to answer questions about the ROW process. Additional information on the outreach to property owners is included in Chapter 5.

3.4.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

Under the No Build Alternative, CDOT would not construct any new transportation facilities in the study area, and would not need to acquire any additional property.

3.4.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

Estimates of ROW acquisitions are based on preliminary design. Actual ROW acquisitions will be determined during final design and the ROW negotiation process.

For the purpose of the EA, properties are identified as total acquisitions when the proposed construction limits would directly impact the principal building on the property, such as a home or business, and the property would no longer be economically viable after the building is removed. Properties are also identified as total acquisitions if the existing use or operations would be altered so greatly that the property would become economically unviable.

Properties are typically identified as partial acquisitions when only a portion of a property would be affected by proposed construction but the remaining portion of the parcel would still be functional. In some cases, properties are identified as partial acquisitions even though construction limits would impact an improvement on the property, because the property could remain economically viable after the building is removed.

In some instances, more than one business or residence occupies a single parcel, so the number of entities displaced is not directly comparable to the number of acquisitions.

Easements are required for CDOT to access properties during construction and maintenance of facilities. Temporary easements are needed during the construction period, and permanent easements are needed for ongoing maintenance.

The Build Alternative would require approximately 30.5 acres of property, including permanent easements, from 95 ownerships through 113 acquisition parcels, as shown in Exhibit 3-7. The property acquired for new ROW would be maintained by CDOT and Lakewood. Acquisitions would range from small slivers of properties to entire parcels. Some would also involve the relocation of personal property not permanently attached to the site.

EXHIBIT 3-7: ESTIMATED TOTAL AND PARTIAL PARCEL ACQUISITIONS BY PROPERTY TYPE

Land Use	Type	Ownerships (# all types)	Relocations
Residential	17 Total Acquisitions (6.7 acres) 28 Partial Acquisitions (2.2 acres) Permanent Easements (2.1 acres)	39	14 Residential Displacements
Commercial	17 Total Acquisitions (6.8 acres) 47 Partial Acquisitions (10.6 acres) Permanent Easements (0.6 acres)	53	27 Business Displacements
Public	2 Total Acquisitions (0.6 acre) 2 Partial Acquisitions (0.7 acre) Permanent Easements (0.2 acres)	3	None

Source: CH2M HILL.

The Build Alternative would result in the displacement of 14 residences and 27 businesses, including one non-profit organization. Most of the displacements occur near the interchange, but displacements would occur throughout the study area.

In several cases, CDOT would likely need to acquire temporary construction easements from properties not affected by other ROW actions. Property owners would retain ownership of these areas, but use of these areas during construction would be restricted. Upon completion of the roadway project, property owners would have unrestricted use of these areas.

Impacts to private properties have been minimized through design modifications to the Build Alternative. For instance, the design team avoided displacement of three businesses by modifying the sidewalk design to remove the landscaped buffer between the sidewalk and the roadway in specific locations. CDOT and Lakewood also have discussed measures to avoid total acquisitions and displacements for zoning nonconformance. In some cases, the Build Alternative would impact a property such that the property would no longer conform to Lakewood's parking or setback requirements. It is Lakewood's intent to allow the businesses to remain whenever possible to avoid business displacements and maintain the economic viability of the area. These nonconforming properties, therefore, are identified as partial acquisitions but final details of variances would be discussed as design progresses.

3.4.3 MITIGATION

Actual ROW acquisitions will be determined during final design and the ROW negotiation process. Impacts to properties will be further minimized and avoided whenever feasible during final design.

All property acquisition and relocations will comply fully with federal and state requirements, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act). The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from federal or federally assisted programs or projects. It was created to provide for and ensure the fair and equitable treatment of all such persons. To further ensure that the provisions contained within this act are applied uniformly, CDOT requires Uniform Act compliance on any project for which it has oversight responsibility regardless of the funding source. Additionally, the Fifth Amendment of the U.S. Constitution provides that private property may not be taken for a public use without payment of just compensation. All impacted owners will be provided notification of the acquiring agency's intent to acquire an interest in their property including a written offer letter of just compensation specifically describing those property interests. A ROW specialist will be assigned to each property owner to assist them with this process (CDOT, 2008).

In certain situations, it may also be necessary to acquire improvements that are located within a proposed acquisition parcel. In those instances where

improvements are occupied, it becomes necessary to relocate those individuals from the subject property (residential or business) to a replacement site. The Uniform Act provides for numerous benefits to these individuals to assist them both financially and with advisory services related to relocating their residence or business operation. Although the benefits available under the Uniform Act are too numerous and complex to discuss in detail in this document, they are available to both owner occupants and tenants of either residential or business properties. In some situations, only personal property must be moved from the real property and this is also covered under the relocation program. As soon as feasible, any person scheduled to be displaced will be furnished with a general written description of the displacing agency's relocation program that provides, at a minimum, detailed information related to eligibility requirements, advisory services and assistance, payments, and the appeal process. It will also provide notification that the displaced person(s) will not be required to move without at least 90 days advance written notice. For residential relocatees, this notice cannot be provided until a written offer to acquire the subject property has been presented, and at least one comparable replacement dwelling has been made available. Relocation benefits will be provided to all eligible persons regardless of race, color, religion, sex, or national origin. Benefits under the Uniform Act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail by an assigned ROW Specialist (CDOT, 2008).

3.5 SOCIOECONOMIC RESOURCES

Socioeconomic resources are evaluated to determine the effects of a transportation action on a community and its quality of life. Because the study area is highly developed and suburban neighborhoods surround the US 6/Wadsworth interchange, socioeconomic resources are a greater consideration for this project than biological resources.

3.5.1 DEMOGRAPHIC AND NEIGHBORHOOD CHARACTERISTICS

Four neighborhoods surround the US 6/Wadsworth interchange: Eiber, Molholm/Two Creeks, North Alameda, and Creighton (Exhibit 3-8). Collectively, these neighborhoods make up 20 percent of Lakewood's population. Population is relatively stable and evenly distributed, except near the Lakewood Country Club, where single-family residential lots are larger and the population is slightly less dense. Lakewood's population was 144,428 in 2006, and an additional 7,882 residents are anticipated by 2020 (U.S. Census Bureau, 2008; Lakewood, 2008). Because much of the city is already developed, future growth will likely occur as infill development. Within the study area, limited areas for development are available but redevelopment at higher densities is projected due to transit-oriented development around the West Corridor LRT stations. Demographic characteristics are shown in Exhibit 3-9.

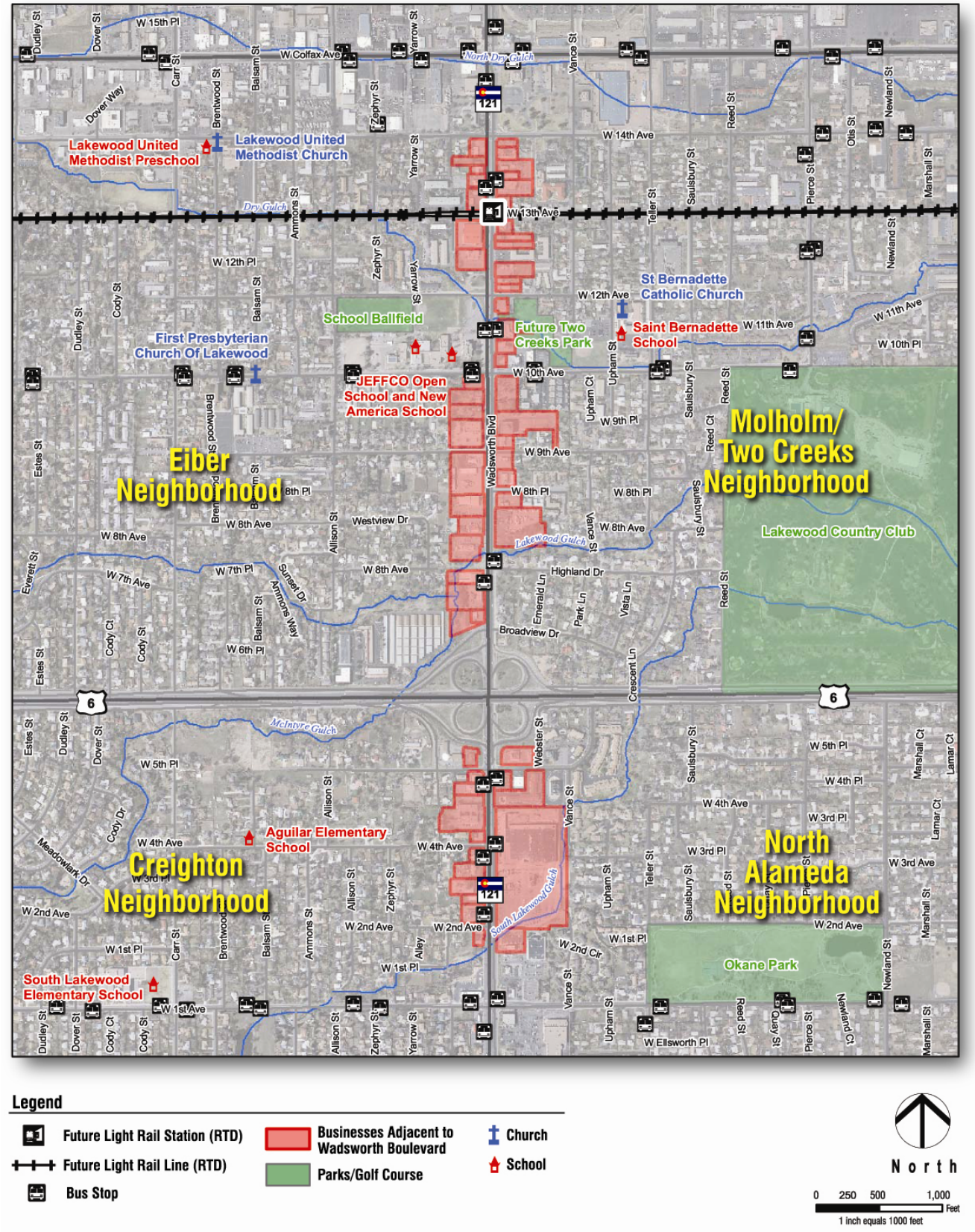
EXHIBIT 3-9: DEMOGRAPHIC CHARACTERISTICS, 1990-2000

	Lakewood			Neighborhoods Surrounding the US 6/Wadsworth Interchange		
	1990	2000	% Change 1990-2000	1990	2000	% Change 1990-2000
Population	126,481	144,089	14%	23,566	25,509	8%
Households	51,657	60,653	17%	9,672	10,399	8%
Median Household Income	$34,054	$48,109	41%	$28,846	$43,651	51%
Labor Force (civilian)	74,553	81,847	10%	12,597	13,863	10%
– Employment	70,987	79,034	11%	11,792	13,049	11%
– Unemployment	3,566	2,813	-21%	805	814	1%
Median Home Value	$91,200	$174,900	92%	$87,100	$166,220	91%

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3), 1990 and 2000.

1

EXHIBIT 3-8: COMMUNITY RESOURCES WITHIN 0.5 MILE OF THE PROPOSED PROJECT



The proposed project is surrounded by a mix of residences and businesses. Residential areas consist primarily of single-family housing with some multi-family housing in the northern portion of the project area. Neighborhoods are well established with active neighborhood associations, and all except Creighton have adopted neighborhood area plans. Transportation concerns identified by these groups include neighborhood cut-through traffic, traffic congestion and capacity along Wadsworth, increased growth and density of development, traffic noise, and safety.

The community has identified two issues that affect quality of life within the study area – severe noise levels (75 dBA or greater) in the northwest and southwest quadrants of the interchange and discontinuous or missing sidewalks throughout the study area. Noise is a community concern because it can be annoying, negatively affect property values, and interfere with sleep, work, and recreation. Residents are concerned about sidewalks because of safety, limited opportunities to connect with services along either side of Wadsworth, and access to existing and future transit.

3.5.2 ECONOMIC DEVELOPMENT

Wadsworth is a regionally important highway that connects communities throughout Jefferson and Broomfield Counties. It is a major north-south route through Lakewood and provides access to Lakewood's City Center and large commercial developments along Colfax Avenue and Wadsworth. Approximately 72 businesses are located along Wadsworth between 1st and 14th Avenues (Exhibit 3-8). Economic activity is expected to increase over the next 20 years as a result of redevelopment associated with the West Corridor light rail and station planned at Wadsworth and 13th Avenue.

The project team conducted a survey of businesses in the study area and met with business owners throughout the development of this EA to understand concerns related to the project. Primary concerns about the US 6/Wadsworth project identified by local businesses include access, parking, property acquisition, and visibility.

3.5.3 COMMUNITY RESOURCES

Six schools and three religious institutions are located within 0.5 mile of the proposed project. As shown in Exhibit 3-8, the New America School and Jefferson County Open School campus is located on Wadsworth between 10th and 12th Avenues. Students of Jefferson County Open School rely on area businesses for internship opportunities. Public transportation is important to the community. Several bus routes serve the area, and transit use is expected to increase with the opening of the West Corridor LRT.

The Lakewood Police and West Metro Fire Rescue provide police, fire, and emergency medical services in the project area. The project team conducted interviews with emergency service providers serving the study area. Wadsworth is a main route for emergency responders through the study area.

3.5.4 PARKS AND RECREATION RESOURCES

As shown in Exhibit 3-8, three existing and one planned park and recreational resource are located within 0.5 mile of the proposed project. Existing facilities include Lakewood Country Club, Okane Park, and the ball field associated with the Jefferson County Open School/New America School.

Two Creeks Park is a planned recreation facility located on the east side of Wadsworth between 10th and 12th Avenues, along the Dry Gulch drainage. Lakewood acquired the property in 2007 using Jefferson County Open Space funds. The property is not currently used for recreation or park purposes because it lacks infrastructure, and Lakewood does not have funds to develop the property in the next 5 years.

None of the parks or recreation facilities in the vicinity of the US 6 and Wadsworth project was constructed with grants from the Land and Water Conservation Fund. Therefore, a Section 6(f) evaluation is not required.

3.5.5 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

The No Build Alternative would not change socioeconomic conditions in the study area. No displacement of residences or businesses would occur.

Severe noise levels (75 dBA or greater) would persist in the northwest and southwest quadrants of the interchange, disturbing local residents, making property less desirable, and diminishing quality of life. Discontinuous and missing sidewalks would persist, perpetuating safety and mobility problems for pedestrians and bicyclists, particularly as traffic volumes increase.

3.5.6 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

The Build Alternative would improve the local transportation network, strengthening neighborhood integrity and community interaction through the provision of improved north-south and east-west pedestrian and bicycle connections, better access to neighborhoods and businesses, reduced congestion on Wadsworth, and a reduction in neighborhood cut-through traffic (achieved by improving capacity on Wadsworth and reconfiguring frontage roads that encourage through traffic to travel on major arterials and not on neighborhood streets). In addition, noise levels for neighborhoods and residences near US 6 would be greatly reduced, resulting in levels more compatible with residential neighborhood character. An 8-foot-wide multi-use sidewalk would be provided on both sides of Wadsworth. The sidewalk would be separated from the roadway by a landscaped buffer in most locations between US 6 and 14th Avenue, providing a higher level of safety for all users. Continuous sidewalks would improve quality of life for local residents and strengthen connections between neighborhoods and services. The raised median along Wadsworth would provide safer turning movements for traffic turning onto West 10th Avenue to access the New America School and Jefferson County Open School. The recreational value of the planned Two Creeks Park would be enhanced. Visibility of the planned park from Wadsworth would also be improved as a result of opening up the view by replacing a building and parking lot with a water quality pond at 12th and Wadsworth. Landscaping and planted medians would improve corridor aesthetics.

Interchange improvements would provide better north-south and east-west connections for the community. Noise walls would benefit more than 330 residences and reduce noise to be more consistent with residential neighborhood character, particularly in the portions of the Eiber and Creighton neighborhoods nearest to US 6. Noise levels would be reduced even in the neighborhoods to the east where noise walls exist now because the walls would be taller and extended farther toward Wadsworth. The frontage road configuration in the northeast quadrant of the interchange would allow southbound Wadsworth traffic to turn onto the frontage road, reducing neighborhood cut-through traffic. Both Highland and Broadview Drives would connect to the frontage road, allowing residents and emergency services easier access to and from Wadsworth. These features were developed in response to concerns expressed by local residents.

The Build Alternative supports community development by accommodating higher population densities, traffic volumes, and changes in travel patterns anticipated from the 13th Avenue LRT station and associated transit-oriented development.

Relieving congestion on Wadsworth would improve emergency response times. Emergency service providers have some concerns about the effect raised medians could have on response times and requested that if raised medians are constructed, openings be provided at cross streets to eliminate the need for emergency vehicles to make U-turns.

The Build Alternative would require the relocation of 14 residences and 27 businesses. Eighteen businesses would be affected by access revisions, four of which would lose access from Wadsworth, and 19 businesses would lose some parking (ranging from one to nine parking spaces). The New America School would lose approximately 12 parking spaces along Wadsworth. Refer to the *Socioeconomic*

Conditions Technical Memorandum, (CH2M HILL, 2009b) for details regarding property acquisition, access, and parking impacts.

During construction, temporary detours, out-of-direction travel, access revisions, and construction-related noise would affect local residents, businesses, regional commuters, and emergency providers. Impacts would be greatest for residents and businesses adjacent to the proposed project.

3.5.7 MITIGATION

CDOT will coordinate with emergency service providers to identify possible locations for emergency access breaks in the medians. During construction, CDOT will provide advance notice to emergency service providers, the community, and residents regarding road delays, access, and special construction activities.

Public access will be maintained for existing uses at all times. New access will be provided for properties where existing accesses are removed by the Build Alternative. To avoid disruption of business activities, the new access will be provided before the existing access is removed. Lakewood will install, irrigate, and maintain any landscaping in medians or other areas. Landscaping will comply with clear zone requirements. CDOT will continue to maintain any non-irrigated areas in the interchange area.

Mitigation commitments for pedestrian and bicycle facilities and noise are detailed in Sections 3.2.3 and 3.3.3, respectively.

3.6 ENVIRONMENTAL JUSTICE

Environmental justice is the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies. Information on outreach to minority and low-income populations is presented in Section 5.3.3, Specialized Outreach to Minority and Low-Income Populations.

The study area for environmental justice includes the communities adjacent to the proposed project and is bounded by 1st and Colfax Avenues from south to north and by Garrison and Pierce Streets from west to east. The study area was extended farther west than east to encompass effects of proposed noise walls adjacent to US 6 west of the interchange.

The analysis presented in Sections 3.6.3 and 3.6.4 determines whether any disproportionately high and adverse effects on minority and low-income populations would occur. Adverse effects are considered disproportionate if, after accounting for impact avoidance and minimization efforts, mitigation measures, and offsetting benefits, the net adverse effects would be predominantly borne by a minority or low-income population, or would be appreciably more severe or greater in magnitude to minority or low-income populations compared to the effects on non-minority or non-low-income populations. For additional information, refer to the *Environmental Justice Technical Memorandum* (CH2M HILL, 2009c) in Appendix D.

3.6.1 MINORITY AND LOW-INCOME POPULATIONS

Minority populations[1] were identified initially using Census 2000 data at the block level. For this analysis, the percentage of minorities in each census block within the study area was compared to the percentage of minorities in Lakewood (21 percent). Of the 241 blocks in the study area, 81 contained minority populations higher than Lakewood's average. The distribution of these blocks is shown in Exhibit 3-10.

Low-income populations were initially identified using CDOT's recommended approach of deriving a low-income threshold from a combination of average household size (from Census data) and low-income household thresholds set annually by the U.S. Department of Housing and Urban Development (HUD).[2] The low-income threshold for this study is $20,000. In Lakewood, 13 percent of households fall below this threshold. As shown in Exhibit 3-10, six of

[1] FHWA defines a minority as a person who is Black, Hispanic, Asian American, American Indian, or Alaska Native (FHWA Order 6640.23).

[2] These thresholds are based upon household income as a percentage of median household income (in this case, 30 percent of the Median Family Income).

the 10 block groups in the study area contain a higher percentage of low-income households than Lakewood.

The location of low-income households in the interchange area was refined using data obtained through interviews with school principals and field observations. The data indicate that although the Census block group in the northeast quadrant is classified as low-income (using CDOT's methodology) and extends to US 6, low-income households are concentrated on the northern boundary of the block group. Households immediately adjacent to the northeast quadrant of the interchange are more similar to those in other quadrants of the interchange, which are predominantly single-family and are not considered low-income. Data obtained through interviews at Molholm Elementary School (located at West 9th Avenue and Harlan Street) confirmed that low-income households in the block group comprising the northeast quadrant are concentrated in apartment complexes and subsidized housing units along 12th Avenue, more than 0.5 mile from US 6.

Based on this additional information, households immediately adjacent to the northeast quadrant of the interchange do not fall within the definition of low-income and will not be considered as such in the analysis that follows. Households north of 12th Avenue are included in the environmental justice study area and could be affected by Wadsworth widening and changes in access, which are assessed in the impact analysis below.

Project newsletters, meeting invitations, and advertisements have been provided to the community in both English and Spanish. Although translation services have been offered at all public meetings, no requests for translation have been made.

3.6.2 MINORITY-OWNED BUSINESSES

The Colorado Minority Business Office (MBO) maintains a listing of minority-owned business enterprises that register with the office in Colorado. The state database identified two minority-owned businesses within 0.5 mile of US 6 and Wadsworth. Services provided by these businesses consist of real estate lending and video rental.

3.6.3 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

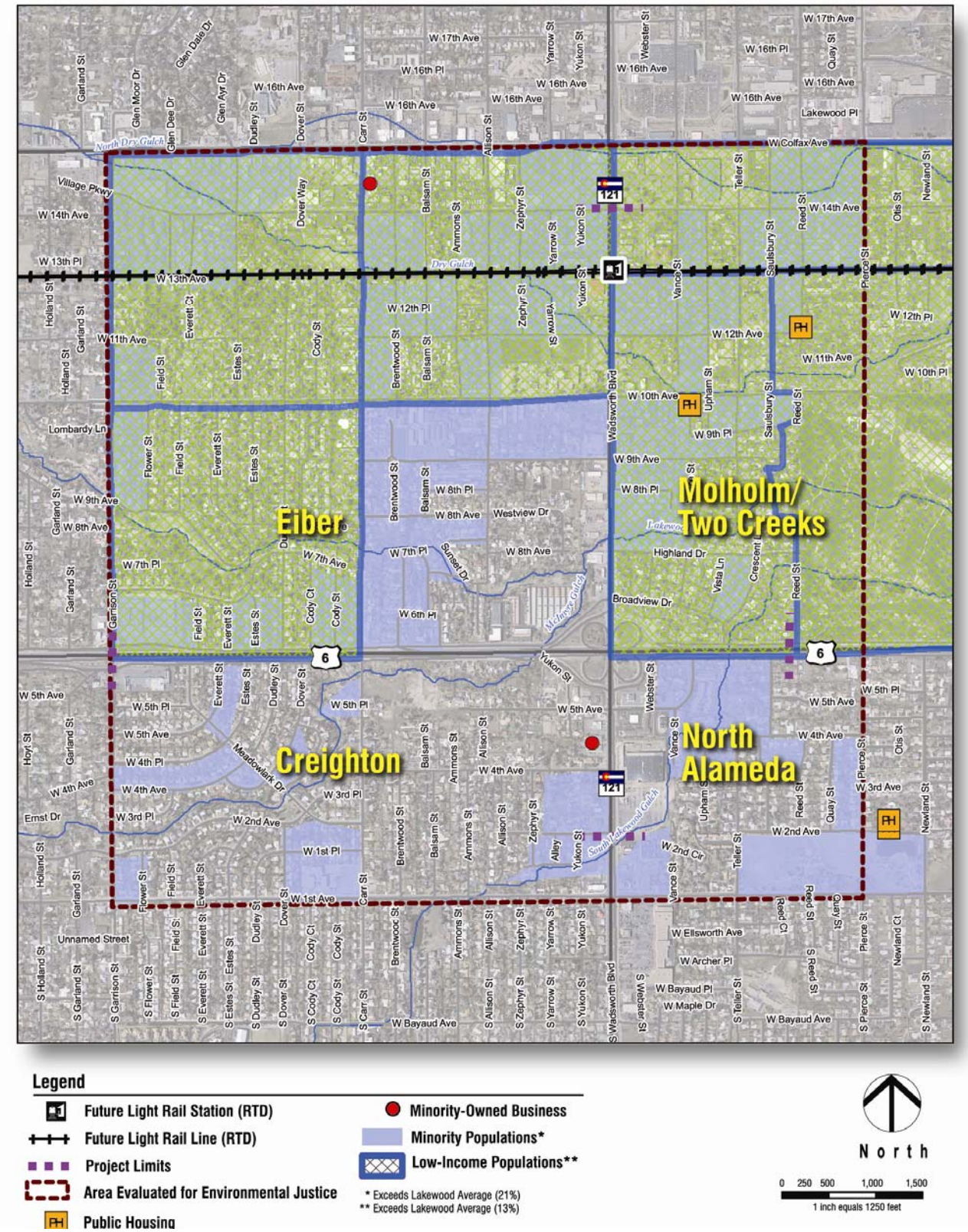
Impacts associated with the No Build Alternative would be distributed across the community and would not result in disproportionately high and adverse impacts to minority and/or low-income populations. There would be no displacement of minority or low-income residents, businesses, or employees. Impacts from construction would not occur. The No Build Alternative does not address transportation problems in the corridor. Traffic congestion would worsen in the study area, hindering access to housing, businesses, community facilities, and the provision of emergency services for minority and low-income populations as well as for the overall community. Severe noise levels (75 dBA or greater) would persist in the northwest and southwest quadrants of the interchange.

3.6.4 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

The Build Alternative would result in adverse impacts to resources that could also affect minority or low-income populations. These impacts are associated with land acquisition, the displacement of residential and business occupants, community impacts during construction, and the acquisition of cultural properties. The ways in which these impacts affect minority and low-income populations are examined below.

The Build Alternative would require the relocation of 14 residences and 27 businesses. The majority of the residences (nine) are immediately adjacent to the interchange, where neither minority nor low-income populations are present in higher-than-average numbers. None of the affected businesses was identified as being minority-owned and there is no evidence to suggest that these businesses have any particular connection to a minority or low-income community or provide employment, goods, and/or services uniquely important to minority or low-income populations.

EXHIBIT 3-10: MINORITY AND LOW-INCOME POPULATIONS IDENTIFIED USING CENSUS 2000 AND HUD 2008 DATA



Sources: U.S. Census Bureau, 2000; U.S. Department of Housing and Urban Development, 2008.

Adverse effects would occur to four historic properties. These properties are immediately adjacent to the interchange, where neither minority nor low-income populations are present in higher-than-average numbers. The affected properties include three residences and one business. These properties are located at the southern and western edges of the Green Acres neighborhood and are not associated with a minority or low-income community. Loss of these properties would not impact community cohesion.

Noise walls, recommended in all four quadrants of the interchange, would benefit more than 330 residences. The greatest benefit would be to households along US 6 between Carr and Garrison Streets, where there are currently no noise walls. Of the 90 benefited households in this area, 49 are in minority and/or low-income areas.

The Build Alternative would benefit minority and low-income residents as well as the overall community by improving mobility, safety, and access to businesses, residences, and community facilities and services. The frontage road configuration in the northeast quadrant of the interchange would reduce neighborhood cut-through traffic and allow residents and emergency services easier access to and from Wadsworth. Sidewalks would provide a higher level of safety for minority and low-income residents as well as the overall community.

The Build Alternative would result in temporary impacts to the overall community (including minority and low-income residents) from increased dust, dirt, noise, traffic, and access disruptions during the construction process. Construction impacts would be greatest immediately adjacent to the interchange, where neither minority nor low-income populations are present in higher-than-average numbers. These impacts would be short term and would be mitigated with best management practices (BMPs) for construction such as limiting work to daytime hours, covering trucks when transporting materials, and providing the community with advanced notification for activities that are likely to result in traffic disruptions.

As described above, impacts associated with the Build Alternative would not be predominantly borne by minority and/or low-income populations. Therefore, the Build Alternative would not result in disproportionately high and adverse impacts to minority or low-income populations.

3.6.5 MITIGATION

No mitigation measures are necessary because no disproportionate adverse impacts to minority or low-income communities would result.

3.7 LAND USE

Wadsworth is a developed urban corridor, marked by commercial and industrial uses, producing both regional and neighborhood draw, and surrounded by residential uses. US 6 within the study area is abutted by primarily residential uses with some commercial and industrial development surrounding the interchange.

Parcels along Wadsworth consist of mostly commercial zone districts. Several parcels are zoned Office and Planned Development. Residential zoning extends along US 6 east and west of Wadsworth, ranging from low-density, single-family zoning to higher-density multi-family zoning.

A Lakewood-initiated zoning amendment adopted in 2007 created the TMU zone district, encompassing the proposed RTD light rail station areas around Wadsworth and 13th Avenue. This zone district encourages higher-density development with complementary transit- and pedestrian-oriented uses.

The northern portion of the study area has been identified by Lakewood as an area that will undergo substantial changes in character and land use as a result of recent zoning changes and in anticipation of the West Corridor light rail line. This change will likely be assisted by redevelopment projects north and south of the study area, such as Creekside to the north and continued development of Belmar to the south, and the future transit station at 13th Avenue. Lakewood is also considering rezoning Colfax Avenue to promote pedestrian- and bicycle-oriented

development, which may encourage redevelopment of properties along Wadsworth near Colfax.

Several adopted land use plans provide goals and action steps for land use, transportation, and other planning elements within the study area. Planning documents relevant to the study area are listed below:

- DRCOG *2035 Metro Vision Regional Transportation Plan* (DRCOG, 2007)
- *City of Lakewood Comprehensive Plan* (Lakewood, 2003)
- City of Lakewood *Wadsworth Boulevard Strategic Plan* (Lakewood, 1997)
- City of Lakewood *Wadsworth Boulevard Station Area Plan* (Lakewood, 2006)
- *City of Lakewood Bicycle System Master Plan* (Lakewood, 2005)
- *City of Lakewood Neighborhood Plans*
  - *North Alameda Area Plan* (Lakewood, 1998)
  - *Molholm Area Plan* (Lakewood, 1996)
  - *Eiber Neighborhood Plan* (Lakewood, 2001)

These planning documents are all supportive of transportation improvements, particularly around the interchange.

3.7.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

Under the No Build Alternative, land uses are likely to remain unchanged. Existing residential and commercial uses would be unaffected by ROW acquisition or land conversion. The No Build Alternative does not address transportation needs in the corridor and would not accommodate the additional traffic associated with planned growth and development in the study area. This alternative would be inconsistent with many of the primary goals of the land use plans relevant to the study area. It would not provide any congestion relief or improve safety or mobility for automobiles, pedestrians, or bicyclists. The No Build Alternative would not support the vision for the study area as defined in land use plans but would not specifically preclude future improvements that could fulfill these plans' visions.

3.7.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

The Build Alternative would result in the direct conversion of commercial and residential land to transportation uses. In areas of partial ROW acquisitions along Wadsworth, commercial buildings would be closer to the new edge of roadway due to the elimination of parking areas at some businesses along Wadsworth. Some of these properties would no longer conform to Lakewood's zoning regulations as a result of this change. However, Lakewood has indicated a willingness to work with CDOT and property owners during the ROW acquisition process to allow non-conforming uses to avoid total property acquisitions that would result in residential or business displacements.

Some of the businesses that currently buffer the residential neighborhoods from Wadsworth and the interchange would be removed, exposing previously buffered homes to highway noise and traffic. This would not be inconsistent with land use in the area because residences already front US 6 throughout much of the study area and several locations along Wadsworth. The Build Alternative would be consistent with future planned land uses and likely would not serve as an impetus for change in overall land use patterns. The Build Alternative would, however, accommodate the additional traffic associated with forecasted growth and planned development in the study area by adding capacity to Wadsworth and the US 6/Wadsworth interchange, and facilitating connections between urban centers.

The Build Alternative would be consistent with the goals and objectives identified in adopted land use and neighborhood plans. It would specifically support goals for traffic management and safety, multimodal connections, landscaping, recreational amenities, and noise mitigation. The Build Alternative would also address neighborhood concerns about flooding by widening the drainageways that cross under US 6 and Wadsworth.

Construction would temporarily affect access to the different land uses within the study area. Construction would not permanently change land uses or land use planning in the project area.

3.7.3 MITIGATION

As discussed under mitigation for ROW impacts, CDOT and Lakewood have discussed measures to avoid total acquisitions and displacements for zoning nonconformance. CDOT will continue to work with Lakewood to allow zoning nonconformance to avoid business displacements and maintain the economic viability of the area. If nonconforming properties are redeveloped, Lakewood would require the new site development plan to conform to current zoning requirements, such as setback and parking.

A combined sound and privacy wall in the northeast quadrant of the interchange will provide mitigation for the removal of the existing structures on Wadsworth for the newly exposed residences.

3.8 HISTORIC PROPERTIES

Historic properties are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). A property is eligible for the NRHP if it possesses historic integrity (such as maintaining original materials and design) and meets one or more of the following four criteria:

- Criterion A — Is associated with important historical events or patterns
- Criterion B — Is associated with lives of persons significant in our past
- Criterion C — Embodies distinctive characteristics of an architectural type, period, or method of construction
- Criterion D — Has yielded or is likely to yield information important in prehistory or history

Section 106 of the National Historic Preservation Act of 1966, as amended, requires projects proposed or funded by federal agencies to identify and assess effects to historic properties listed on or eligible for inclusion in the NRHP. Agencies must consult with the State Historic Preservation Office (SHPO). In addition to the SHPO, Jefferson County and the Lakewood Historical Society accepted invitations to be consulting parties to the Section 106 process for the US 6/Wadsworth study.

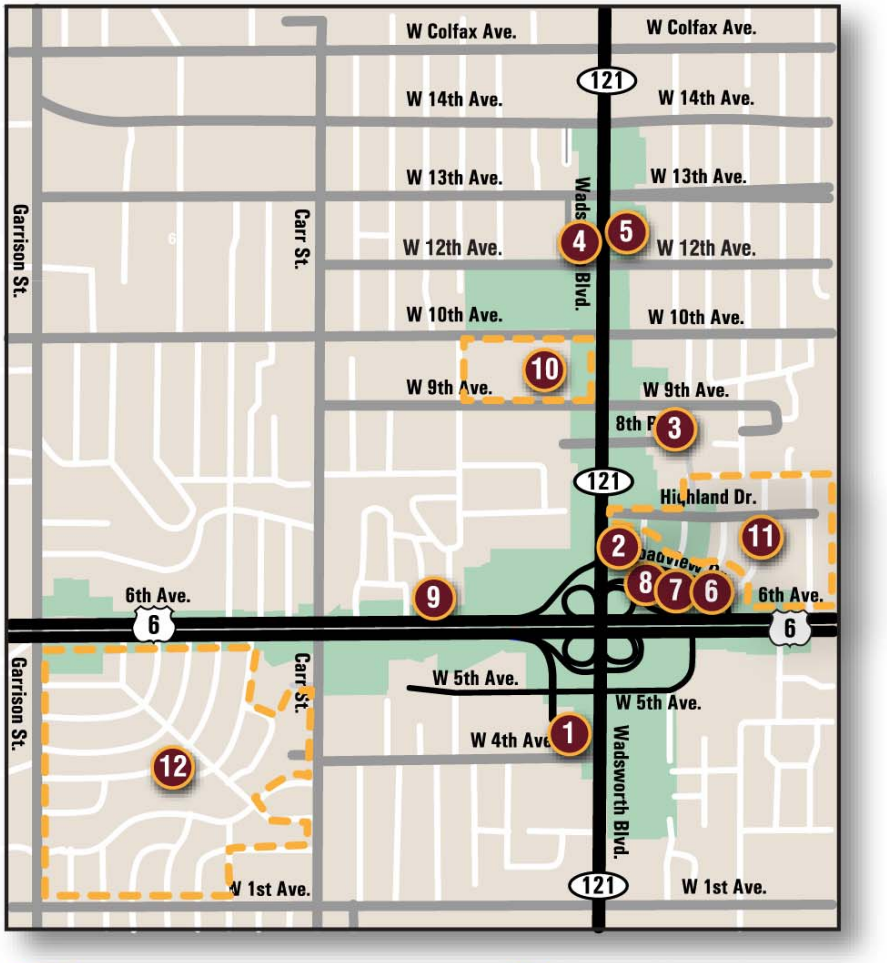
Field surveys identified nine historic architectural resources and three historic districts within or partially within the US 6/Wadsworth project area. Exhibit 3-11 shows the location of properties individually eligible for the NRHP and NRHP-eligible historic districts. Additional information about all of the resources surveyed is available in the *Historic Resources Survey, US 6 and Wadsworth Boulevard, Lakewood, Colorado* (TEC, 2008), included in Appendix D to this EA.

3.8.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

Under the No Build Alternative, the US 6/Wadsworth interchange would remain in its current configuration, Wadsworth would not be widened, and there would be no direct effect to historic properties.

Noise walls east of Wadsworth would continue to reduce traffic noise and have a beneficial impact to the residential settings of these properties adjacent to the US 6 frontage roads east of Wadsworth. No noise walls would be provided west of Wadsworth along US 6, and the beneficial effects to the residential character of historic properties located in these neighborhoods west of US 6, such as the Meadowlark Hills Historic District, would not be realized.

EXHIBIT 3-11: HISTORIC PROPERTIES LOCATED WITHIN STUDY AREA



- Historic District Boundary
- Survey Area
- 1 401 Wadsworth (5JF4586)
- 2 700 Wadsworth Boulevard (5JF4536)
- 3 7558 W 9th Ave (5JF3554)
- 4 1215 Wadsworth (5JF4511)
- 5 1230 Wadsworth (5JF4513)
- 6 7395 W 6th Ave (5JF3548)
- 7 7423 W 6th Ave (5JF3549)
- 8 7433 W 6th Ave (5JF4542)
- 9 8125 W 6th Ave (5JF4563)
- 10 Lakewood School Historic District
- 11 Green Acres Historic District
- 12 Meadowlark Hills Historic District

3.8.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

Of the nine individually eligible historic properties, the Build Alternative was determined to have the following effects: one No Historic Properties Affected, four No Adverse Effects, and four Adverse Effects. The three historic districts received No Adverse Effect determinations. Effect determinations are presented in Exhibit 3-12 on the following page.

Determination of effects to historic properties was undertaken in consultation with the SHPO and other consulting parties. The SHPO concurred with all effect determinations in a letter dated December 19, 2008. Consulting parties were afforded an opportunity to comment and did not express objections. Detailed documentation supporting these determinations is presented in the *Determination of Effects to Historic Properties* (CH2M HILL et al., 2008b) included in Appendix D to this EA.

The Build Alternative would result in unavoidable impacts to four historic residences located along the frontage road in the northeast quadrant of the interchange. CDOT considered numerous options to minimize effects to these but ultimately had no other option that met safety, traffic, and community needs without demolishing historic properties 5JF3548, 5JF3549, 5JF4536, and 5JF4542.

A brief discussion of these properties and the effects of the Build Alternative is included below. Further details about these effects and the options that CDOT considered to avoid impacting historic properties can be found in the *Determination of Effects to Historic Properties* (CH2M HILL et al., 2008b) included in Appendix D to this EA.

3.8.2.1 7395 West 6th Avenue Frontage Road (5JF3548)

The building at 7395 W. 6th Ave. Frontage Road is an English Norman Cottage-style, one-story, single-family house built in 1946 that is clad in blonde brick (Exhibit 3-13). It is eligible for listing in the NRHP under Criterion C because the house is representative of the English Norman Cottage architectural style. The detached, two-car brick garage located northwest of the house contributes to the house's historical setting and is a contributing historic feature of the property.

EXHIBIT 3-13: 5JF3548 (7395 W. 6TH AVENUE FRONTAGE ROAD)

CDOT would need to acquire the house and its detached garage under the Build Alternative. The proposed off-ramps for westbound US 6 to northbound Wadsworth and roadway slope would run through the house. Although the garage would not be directly affected, it would not retain historic integrity or residential function if disconnected from the residence. The removal of the house and garage would result in a direct impact and an Adverse Effect to this historic property.

3.8.2.2 7423 West 6th Avenue Frontage Road (5JF3549)

The building at 7423 W. 6th Ave. Frontage Road is a stucco-clad, Mediterranean Revival-style, one-story, single-family residence built in 1939 (Exhibit 3-14). It is eligible for listing in the NRHP under Criterion C for its representative architecture. The house's detached garage located northwest of the house is also clad in stucco, and is a contributing historic feature of the property.

EXHIBIT 3-12: EFFECTS TO HISTORIC PROPERTIES AND DISTRICTS

Site No. Map ID	Address	Description	Date	NRHP Eligibility (Criteria)	Impact	Effect	Criteria of Adverse Effect
5JF4586 1	401 Wadsworth Blvd.	Gas Station	1958	Officially Eligible (C)	Sidewalk replaced in front of property but no change to historic features, setting, or use	No Adverse Effect	n/a
5JF4536 2	700 Wadsworth Blvd.	Ranch residence converted into a business	1947	Officially Eligible (C)	Demolition of structure (total acquisition)	Adverse Effect	i. Physical destruction of property
5JF3554 3	7558 W. 9th Ave.	Art Deco single-family residence	1939	Officially Eligible (C)	No direct or indirect impact (no change to setting)	No Historic Properties Affected	n/a
5JF4511 4	1215 Wadsworth Blvd.	Dutch Colonial Revival single-family residence	1918, 1948-1949	Officially Eligible (A)	Partial acquisition of historic property frontage	No Adverse Effect	n/a
5JF4513 5	1230 Wadsworth Blvd.	Craftsman Bungalow residence converted into a business	1928	Officially Eligible (C)	Acquisition of portion of property that does not contribute to historic significance	No Adverse Effect	n/a
5JF3548 6	7395 W. 6th Ave. Frontage Rd.	English Norman Cottage single-family residence	1946	Officially Eligible (C)	Demolition of structure (total acquisition)	Adverse Effect	i. Physical destruction of property
5JF3549 7	7423 W. 6th Ave. Frontage Rd.	Mediterranean Revival single-family residence	1939	Officially Eligible (C)	Demolition of structure (total acquisition)	Adverse Effect	i. Physical destruction of property
5JF4542 8	7433 W. 6th Ave. Frontage Rd.	Minimal Traditional single-family residence	1940	Officially Eligible (C)	Demolition of structure (total acquisition)	Adverse Effect	i. Physical destruction of property
5JF4563 9	8125 W. 6th Ave. Frontage Rd.	Craftsman single-family residence	1918	Officially Eligible (C)	No direct or indirect impact (no adverse change to setting); beneficial noise reduction	No Adverse Effect	n/a
Lakewood School Historic District 10	Located west of Wadsworth between 10th and 12th Avenues	School complex comprising the New America School and Jefferson County Open School.	1927-1977	Officially Eligible Historic District (A and C)	Acquisition of portion of parking lot along eastern edge of the historic district; parking area is noncontributing to the significance of the historic district	No Adverse Effect	n/a
Green Acres Historic District 11	Bounded by Emerald Lane and Reed Street from US 6 to 9th Place	Post World War II residential subdivision	late 1940s to early 1960s	Officially Eligible Historic District (A and C)	Construction of sound wall near south and west boundaries of the district; minor property acquisition from corner of one contributing property; beneficial effects of restoration of neighborhood roads and reduction in traffic noise	No Adverse Effect	n/a
Meadowlark Hills Historic District 12	Bounded by West 6th Avenue/Frontage Road to the north, Carr Street to the east, West 1st Avenue to the south, and Garrison Street to the west	Post World War II residential subdivision	1953 to 1956	Officially Eligible Historic District (A and C)	Construction of sound wall across frontage road near district's northern boundary; beneficial effects of reduction in traffic noise	No Adverse Effect	n/a

EXHIBIT 3-14: 5JF3549 (7423 W. 6TH AVENUE FRONTAGE ROAD)

As with 5JF3548, 5JF3549 would need to be acquired because the ramp and frontage road encroach onto the property and directly affect the historic home.

3.8.2.3 7433 West 6th Avenue Frontage Road (5JF4542)

The building at 7433 W. 6th Ave. Frontage Road is a one-story, single-family house built in 1940 (Exhibit 3-15). It is eligible for listing on the NRHP under Criterion C because it is representative of the Minimal Traditional architectural style.

EXHIBIT 3-15: 5JF4542 (7433 W. 6TH AVENUE FRONTAGE ROAD)

As with 5JF3548 and 5JF3549, 5JF4542 would need to be acquired because the ramp and frontage road encroach onto the property and directly affect the historic home.

3.8.2.4 700 Wadsworth Boulevard (5JF4536)

The building at 700 Wadsworth Blvd. is a one-story, Ranch-style house with Usonian characteristics (Exhibit 3-16). It was constructed in 1947 and is clad in ashlar stone masonry. It is eligible for listing on the NRHP under Criterion C because it is a good example of a late 1940s residence that blends the Ranch and Usonian architectural styles.

EXHIBIT 3-16: 5JF4536 (700 WADSWORTH BLVD.)

The property is located along the tight curve of the existing off-ramp from westbound US 6 to northbound Wadsworth. In addition to the close horizontal distance to both the ramp and Wadsworth, the property is elevated 10 to 15 feet from the surrounding roadways. Not accounting for the grade difference (which exacerbates options to avoid the property), the auxiliary lane on Wadsworth impacts the house to the west, and the frontage road affects the building to the east, and, therefore, the property would need to be removed under the Build Alternative. CDOT would, therefore, acquire this property and demolish the historic residence.

3.8.3 MITIGATION

A Memorandum of Agreement (MOA) will be negotiated among CDOT, FHWA, and the Colorado SHPO to identify measures CDOT will undertake to mitigate adverse effects to historic properties. The Lakewood Historical Society, Lakewood, and Jefferson County will be provided an opportunity to participate in the MOA. Mitigation measures being considered include additional historical survey in the study area, signage, and historic preservation training and education. Historic American Building Survey

(HABS) Level 2 documentation is also being considered.

Aesthetics of noise walls will consider compatibility with neighborhood history and may include treatments to support neighborhood history.

Any new historic documentation that is developed as part of the MOA will be provided to interested local historic preservation groups (CDOT has already provided historic survey information for properties and neighborhoods inventoried as part of this project.)

3.9 HAZARDOUS MATERIALS

Hazardous materials include materials that are regulated as solid waste, hazardous waste, and other wastes contaminated with petroleum fuels, toxic substances, pollutants, or radioactive materials. The presence of sites containing hazardous materials within a project area can result in project delays and increase the cost of construction; therefore, it is important to identify properties that may contain contamination prior to ROW acquisition and construction.

The properties along Wadsworth have historically been used for commercial purposes, including service stations, auto repair shops, dry cleaners, print shops, and other businesses that often use hazardous materials during daily operations. A database review revealed more than 50 sites with potential contamination, mostly related to petroleum releases, within a half-mile radius of the project corridor. A reconnaissance review of properties within the construction footprint of the Build Alternative supplemented the database search. These sites and the potential effect of the Build Alternative on these sites is described in Section 3.9.3.

3.9.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

The No Build Alternative would have no effects on known hazardous material sites.

3.9.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

The Build Alternative could affect 16 sites of potential environmental concern through property acquisition or construction near potentially contaminated soils or water. The sites of potential concern and the actions affecting them are shown by location in Exhibit 3-17 and described in Exhibit 3-18.

EXHIBIT 3-17: LOCATION OF HAZARDOUS MATERIALS SITES

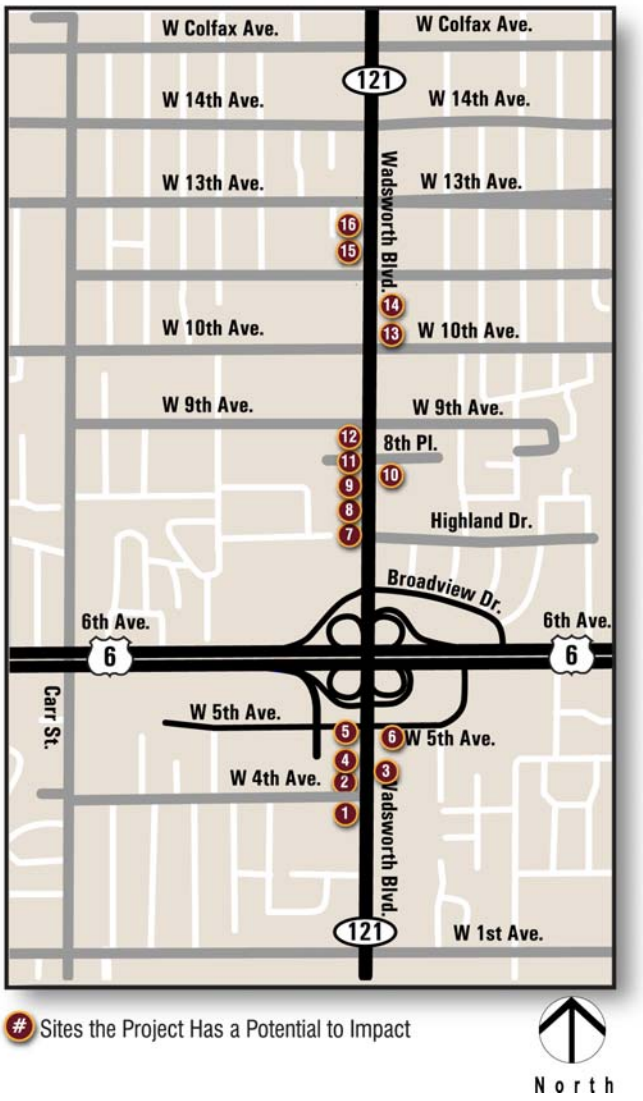


EXHIBIT 3-18: HAZARDOUS MATERIALS SITES WITH THE POTENTIAL TO IMPACT THE PROJECT

Map ID	Site	Address	Reason for Concern	Impact
1	Grease Monkey	395 Wadsworth Blvd.	Operating auto repair, possible petroleum, solvents and heavy metal contamination	Partial acquisition, construction would occur near this parcel.
2	Merchants Oil, Inc. (aka. Bradley)	401 Wadsworth Blvd.	Operating service station, listed as a tank leak facility, possible petroleum contamination	Partial acquisition, construction would occur near this parcel.
3	Wal-Mart	440 Wadsworth Blvd.	Wal-Mart service center and listed as a closed tank leak in July 1997, possible petroleum contamination	Partial acquisition, construction would occur near this parcel.
4	Beauty College	441 Wadsworth Blvd.	Chemicals used in nail salons are classified as hazardous substances. Depending on handling practices, site could be impacted. Depending on sand trap maintenance, site could be impacted.	Partial acquisition, construction would occur near this parcel.
5	Circle S Mini Mart (aka Boonshow Gas)	495 Wadsworth Blvd.	Operating service station, listed as a tank leak facility, possible petroleum contamination	The Build Alternative would require full acquisition of this property.
6	Summit Lakewood	7576 West 5th Avenue	Previous motorcycle sales, and possible repair. Possible petroleum, solvent and heavy metal contamination	Partial acquisition, construction would occur near this parcel.
7	Former 7-Eleven (currently a multi-suite office building)	699 Wadsworth Blvd.	Tank facility-tanks removed and clean-up complete, possible residual petroleum contamination	The Build Alternative would require full acquisition of this property.
8	Diamond Shamrock (aka Western Convenience)	715 Wadsworth Blvd.	Operating service station, listed as a tank leak facility, possible petroleum contamination	The Build Alternative would require full acquisition of this property.
9	Longs Peak Equipment	815 Wadsworth Blvd.	May repair and service equipment, possible petroleum, solvent and heavy metal contamination.	Partial acquisition, construction would occur near this parcel.
10	U-Haul	820 Wadsworth Blvd.	May repair and service equipment, possible petroleum, solvent and heavy metal contamination.	Partial acquisition, construction would occur near this parcel.
11	Fling's Auto Repair/Corvette Specialists	829 and 831 Wadsworth Blvd.	Two active auto maintenance shops operating on the same property, possible petroleum, solvents and heavy metal contamination	Partial acquisition, construction would occur near this parcel.
12	Former Pine Cove Greenhouse (currently Jensen's Flowers)	845 Wadsworth Blvd.	Listed as having a historical tank leak, possible petroleum contamination	Partial acquisition, construction would occur near this parcel.
13	Lakewood Muffler & Brake	1000 Wadsworth Blvd.	Operating automotive company, possible petroleum and solvent contamination	The Build Alternative would require full acquisition of this property.
14	Car Wash	1080 Wadsworth Blvd.	Sand traps associated with car washes can collect petroleum and other pollutants.	Partial acquisition, construction would occur near this parcel.
15	Beauty College(currently an unoccupied site)	1225 Wadsworth Blvd.	Chemicals used in nail salons are classified as hazardous substances. Depending on handling practices, site could be impacted. Depending on sand	Partial acquisition, construction would occur near this parcel.
16	Motorcycle/Scooter Sales	1251 Wadsworth Blvd.	May repair and service vehicles, possible petroleum, solvent and heavy metal contamination.	Partial acquisition, construction would occur near this parcel.

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Twelve of the 16 sites identified would not be fully acquired. However, there may be partial acquisition of these parcels, and some construction activities, such as pavement removal and replacement, would occur. Given the historical operations at these facilities, it is unlikely that contamination would be encountered in the upper foot of soil, the anticipated depth of excavation.

Several alternatives were evaluated for shifting the alignment to avoid total acquisition of contaminated properties; however, that was not feasible because of the proximity of those properties to existing roadways. For three of the sites that would be acquired, cleanup is either complete or is ongoing. The responsible party would continue to be required to pay for any remediation required. At the other sites, no investigation work has been completed, and the extent of contamination, if any, is unknown. It is not possible to estimate those costs at this time; however, CDOT is aware of the potential impact.

Buildings and structures, such as traffic poles, could be painted with lead based paint (LBP). LBP can be hazardous to workers if it is disturbed during construction. Lead is also an environmental toxin, and requires disposal as a hazardous waste if concentrations exceed the Colorado Department of Public Health and Environment (CDPHE) limits.

Based upon the overall age of the transportation facilities and property acquisitions, asbestos-containing building materials would likely be present, in buildings and possibly on the bridge structure. Prior to demolition of any structures, asbestos surveys will be required. Asbestos-containing building materials must be abated prior to demolition activities.

3.9.3 MITIGATION

Protective measures will be taken before, during, and after construction to minimize the risk of encountering petroleum products and petroleum-contaminated soils. A full Phase I Environmental Site Assessment (ESA) according to American Society of Testing and Materials (ASTM) 2005 standards will be completed prior to any full property acquisition. Given the possibility of multiple property transactions, more than one ESA may be required. Phase II ESAs will be required to characterize, manage, and remediate contaminated properties. Phase II ESA recommendations will be finalized on the basis of Phase I results.

A *Materials Handling Plan* to address contaminated soil and groundwater according will be developed to CDOT standards. The Materials Management Plan will include a section on dealing with unanticipated contamination. Project specifications will be prepared and implemented during construction to ensure worker and public safety on or near contaminated sites, as directed by the findings of Phase I assessments. CDOT's *Environmental Safety Management Specifications,* Section 250, will be followed in the transportation, handling, monitoring, and disposal of any hazardous materials encountered during construction.

If painted surfaces are disturbed during construction or demolition and disposed of separately, they will need to be tested using Toxicity Characteristic Leaching Procedure (TCLP) to determine proper disposal methods. Moreover, workers will be required to follow the U.S. Occupational Safety and Health Administration (OSHA) "Lead in Construction Standard" (OSHA, 29 CFR 1926.26), if the LBP is going to be disturbed.

Based on the U.S. Environmental Protection Agency (EPA) and CDPHE regulations, an asbestos survey and demolition permit are required prior to the demolition of a bridge. Any asbestos-containing material that is friable or will be friable during construction and demolition activities must be removed prior to demolition by a licensed abatement contractor. This includes demolition of any acquired properties.

3.10 FLOODPLAINS

A floodplain is the low land adjacent to a stream that is inundated with water during a flood event. Federal law requires agencies to minimize the impact of highway actions that adversely affect the floodplain and make efforts to restore and preserve natural and beneficial floodplain values.

The 100-year floodplain (the area of land that would be covered by the 100-year flood) is the regulatory standard used to administer flood management programs.

The 100-year floodplains have been delineated by the Federal Emergency Management Agency (FEMA) for four gulches in the study area: McIntyre Gulch, Lakewood Gulch, South Lakewood Gulch, and Dry Gulch (Exhibit 3-19). US 6 and Wadsworth both encroach on these floodplains where the gulches cross under the roadways in culverts. In all cases, the culverts are too small to convey large flood waters underneath the roadway. When culverts are undersized, flood waters back up at the culvert entrance and can cause increased flooding of surrounding properties. In the cases of Lakewood Gulch and Dry Gulch, the backed-up flood waters overtop Wadsworth as well, near Highland Drive and 12th Avenue, respectively.

3.10.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

The No Build Alternative would not modify the floodplains in the project area. The existing locations where US 6 and Wadsworth cross floodplains associated with McIntyre, Lakewood, South Lakewood, and Dry Gulches would continue to encroach on these floodplains, limiting the capacity of the floodplains to carry a 100-year flood. The floodplain boundaries would remain unchanged and flooding of surrounding properties and overtopping of Wadsworth would continue.

3.10.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

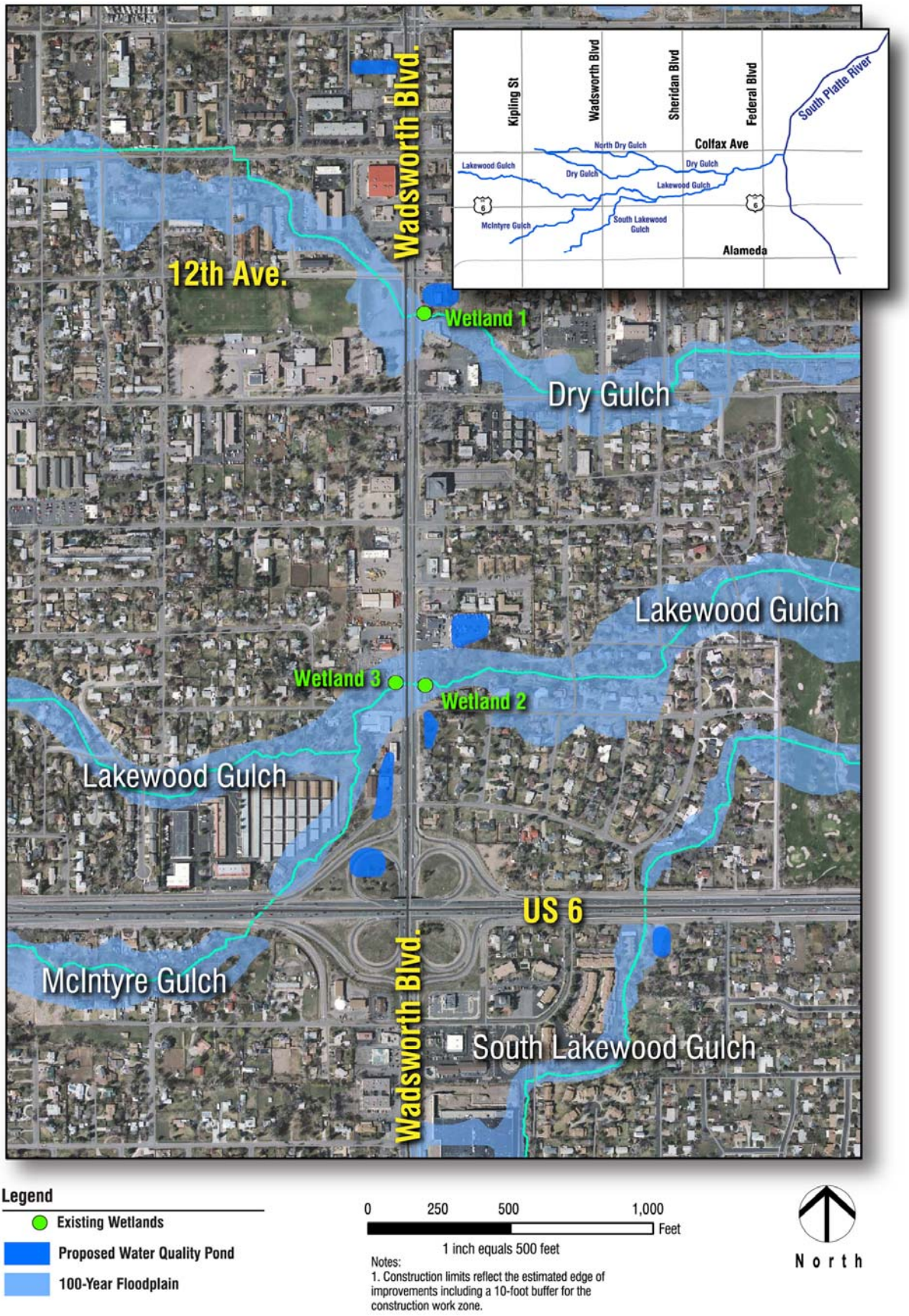
The Build Alternative would reduce flooding in the project area by widening and realigning channels and by constructing culvert crossings large enough to convey flood waters under US 6 and Wadsworth. The existing crossings of McIntyre, Lakewood, and Dry Gulches would be replaced with larger structures, reducing flooding on surrounding properties, and eliminating flood water overtopping of Wadsworth at Lakewood Gulch and Dry Gulch. The crossing of South Lakewood Gulch under US 6 would be reconstructed; however, a larger structure would not be provided because the channel downstream lacks capacity to convey the larger volume of water that would result from a larger crossing.

The Build Alternative would encroach on floodplains in the project area. The proposed interchange reconstruction would encroach into the McIntyre Gulch floodplain and require extending and upsizing the existing culvert an additional 600 feet underneath the interchange and its associated ramps and frontage roads. The widening of Wadsworth would encroach into the Lakewood and Dry Gulch floodplains by 10 to 20 feet on each side of Wadsworth. The interchange reconstruction would encroach into the South Lakewood Gulch floodplain by approximately 10 feet on each side of US 6. In each of these cases, new larger culverts would not only convey flood waters underneath the newly encroaching roadways but would also improve the conveyance of flood waters underneath existing roadways by replacing the existing undersized culverts.

Major modifications to the channels and their roadway crossings would improve flood conveyance and reduce flooding risks in the project area.

The Build Alternative would widen and realign portions of McIntyre Gulch and Lakewood Gulch, and would widen Dry Gulch (at entrance and exit portions of the new culvert) to provide adequate conveyance of flood waters within the project area. In the area near the confluence of McIntyre and Lakewood Gulches, channel widening was required to avoid flooding of Wadsworth. The channel was so narrow in this location that if the channel were not widened, waters would overtop the floodplain (and Wadsworth) before reaching the new culvert. The realigned channel would have beneficial effects to the natural and beneficial floodplain values in the area. The changes at McIntyre, Lakewood, and Dry Gulches would reduce flooding risks for surrounding properties.

EXHIBIT 3-19: WATERWAYS AND 100-YEAR FLOODPLAINS IN STUDY AREA



The Build Alternative would also control the rate of water flowing from storm drains into the gulches during flood events. Storm drains would outfall into new water quality treatment ponds, where water would be stored and filtered before flowing into adjacent channels. Water is typically released from ponds over a 40-hour period. The delay in stormwater flow rate into the gulches would contribute to the reduction of flooding risks in the project area.

Temporary construction disturbance would occur when the channels of McIntyre and Lakewood Gulches are widened and realigned, and when the channel of Dry Gulch is widened. Temporary construction disturbance would also occur when the crossing structures are reconstructed at each gulch crossing of US 6 and Wadsworth.

3.10.3 MITIGATION

The proposed improvements to the channels and culvert crossings will be designed to convey 100-year flows, and will follow CDOT recommendations for the 50- to 100-year flood event capacity. An independent hydraulics report entailing the details of all hydrology analysis and hydraulics designs will be part of the final design for the Build Alternative. This report details all of the mitigating requirements related to floodplains. CDOT will work closely with Lakewood on the proposed changes to the gulches and its roadway crossings, and will adhere to both Lakewood and CDOT hydraulic design criteria for major and minor storm drainage.

During final design, CDOT will coordinate with the appropriate local and federal agencies to conduct hydraulic analysis and obtain required floodplain permits. Floodplain permits, including a floodplain development permit, Conditional Letter of Map Revision (CLOMR), and Letter of Map Revision (LOMR) will be acquired for modifications to the floodplain. This process will follow the requirements of 23 CFR 650 and 44 CFR 1.

Sediment traps, check dams, sediment basins, or other BMPs will be installed to slow runoff and run-on during construction of drainage improvements in gulches. Specific BMPs will be determined during final design.

3.11 WATER QUALITY

Transportation projects can impact water quality during both the construction and maintenance/ operation phases of a project. During construction, soils are exposed, increasing wind and water erosion and potential for sediment to enter water bodies. Roadways also collect pollutants, such as sediments, metals, and petroleum compounds that can enter water bodies in the form of stormwater runoff. CDOT evaluates the potential for water quality impacts to ensure the quality of stormwater runoff is protected while its roadways are constructed, operated, and maintained.

The study area is located in the Upper South Platte River Basin. The main channel of the South Platte River, the primary drainage near the project, is located 4.6 miles east of the study area. Portions of the South Platte River do not currently meet water quality standards for nitrate, fecal coliform, and *E. coli*. Discharges from wastewater facilities are considered the primary source of contamination. Several smaller creeks and drainages in or adjacent to the study area are tributaries to the South Platte River. As shown in Exhibit 3-19, several of these tributaries (Dry Gulch, Lakewood Gulch, and McIntyre Gulch) cross under Wadsworth north of US 6. South Lakewood Gulch crosses US 6 east of Wadsworth.

Although portions of the South Platte River have water quality concerns, all of the gulches in the study area are within a segment of the Upper South Platte River Basin (classified by CDPHE as Segment 16c) that meets water quality standards. Waters in the study area are not capable of sustaining a wide variety of aquatic life but are suitable for irrigation and recreation. No special water quality protection is required for these waters.

Grass swales and depression areas currently lie along some of the US 6 frontage roads and provide a small amount of water quality treatment in these areas. No existing water quality systems store and filter stormwater runoff in the study area.

Runoff from the existing road carries some sediment and petroleum-related contaminants into the gulches. Estimated pollutant loads for highway runoff were calculated using the FHWA-approved Driscoll model for estimating mass loads from project sites. A limited analysis was conducted because many of the site-specific parameters required for a complete analysis were not available, and no monitoring wells are near enough to the project site to be relevant.

Water quality impacts are summarized below. Additional information about water quality monitoring, characterization, and modeling results are included in the *Water Quality Technical Memorandum* (CH2M HILL, 2009d) in Appendix D to this EA.

3.11.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

The No Build Alternative would not construct any additional impervious surface or cause additional stormwater runoff. Impervious surfaces are hard surfaces such as asphalt, concrete, rooftops, and highly compacted soils. Unlike pervious areas where soil and vegetation absorb rainwater, impervious surfaces are areas that water cannot penetrate. Land cover that is impervious prevents rainwater from entering into the soil and forces it to travel along the ground, carrying with it pollutants that are then discharged directly into a water body. Surface runoff into South Lakewood Gulch, Lakewood Gulch, McIntyre Gulch, and Dry Gulch contributes roadway pollutants, such as metals and petroleum-based products, to these drainages and to the South Platte River.

The existing roadway areas contain approximately 37 acres of impervious surface area. No systems would be constructed to filter stormwater runoff, and untreated runoff would continue to discharge into adjacent water bodies. Although no new impervious areas would be added under the No Build Alternative, higher future traffic volumes would increase pollutant concentrations in stormwater runoff, and cause further water quality degradation in surrounding water bodies.

3.11.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

The Build Alternative would increase the existing impervious surface area of US 6 and Wadsworth by 3 acres (from 37 acres to a total of 40 acres) and would result in an increased volume of stormwater runoff from the highway.

The Driscoll model predicted that, without treatment, concentrations of metals and petroleum-related contaminants would increase from the existing condition by between 1 to 27 percent under the Build Alternative. This prediction is based primarily on the increase in impervious surface area (because that was the main project-specific input available for the model). During construction, soil-disturbing activities and the placement of new fill would expose surfaces subject to erosion. Erosion can lead to high amounts of sediments entering waterways and can destroy riparian areas surrounding the waterways. Gulch realignment would have short-lived, immediate turbidity effects (the waters would lose their transparency with an increase in sediments), but could effectively isolate the flowing stream from in-stream construction disturbance. Other construction activities, such as the demolition of existing structures, placement of new structures, dewatering for foundations, and storage and fueling of equipment, also have the potential to release water contaminants.

3.11.3 MITIGATION

Permanent water quality treatment features will be included in the final design to treat roadway runoff associated with the Build Alternative and improve water quality for receiving waters. Water quality ponds will be provided to capture and treat 100 percent of the stormwater that would run off the roadways during a 2-year storm event. The conceptual drainage design determined that seven water quality facilities were needed to provide the necessary water quality capture volume (WQCV). The locations of these facilities are shown in Exhibit 3-19.

A Colorado Discharge Permit System - Stormwater Construction Permit (SCP) will be required for this project. A Stormwater Management Plan will be

developed in accordance with the conditions of the SCP. Erosion and sediment control BMPs will be implemented in accordance with *CDOT Standard Specifications for Road and Bridge Construction* and the revised provisions for water quality outlined in the Consent Order with CDPHE and incorporated into Section 107.25 (Water Quality) and Section 208 (Erosion Control). This project will also require obtaining a Construction Dewatering Permit.

3.12 WETLANDS

Wetlands, also called bogs, swamps, and marshes, provide many benefits including water quality improvements, food and habitat for fish and wildlife, flood control and river bank erosion control, and recreation. In urban areas, wetlands serve a particularly important function of controlling increases in the rate and volume of stormwater runoff.

Wetlands are a valuable and declining resource and as such are protected in certain ways under the Clean Water Act. Section 404 of the Clean Water Act provides protection for America's wetlands, streams and other waters by requiring a permit from the U.S. Army Corps of Engineers (USACE) for any actions that may dredge or fill streams or wetlands. In general, to obtain a Section 404 permit, applicants must demonstrate that dredging or filling streams or wetlands under the jurisdiction of the USACE (jurisdictional wetlands and other waters of the United States) would not significantly degrade the nation's waters and no practicable alternatives less damaging to the aquatic environment exist.

Wetlands and other waters of the United States (WUS) were evaluated in the summer of 2007 in accordance with the *USACE Wetland Delineation Manual* (USACE, 1987). Wetland determination was based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. WUS include wetlands, lakes, rivers, and streams (intermittent and perennial) and their tributaries, under the jurisdiction of the United States and the State of Colorado. For additional information, refer to the *Wetland Delineation Report of US 6 and Wadsworth Boulevard* (Pinyon Environmental, 2008) in Appendix D.

Three wetland sites totaling 0.02 acre are located within the study area in portions of Dry Gulch and Lakewood Gulch adjacent to Wadsworth; these wetlands are shown in Exhibit 3-19. Wetland types are palustrine emergent (non-tidal wetlands dominated by grasses, sedges, and forbs) and contain a variety of wetland plant species including emory's sedge (*Carex emoryi*), reed canary grass (*Phalaris arundinacea*), and smooth brome (*Bromus inermis*), with an overstory of Siberian Elms (*Ulmus pumila*), peachleaf willow (*Salix amygdaloides*), and prairie cottonwood (*Populus deltoides*). As shown in Exhibits 3-20 and 3-21, wetlands in the project area are generally low quality and provide limited habitat for wildlife species. Three WUS are located within the study area: Dry Gulch, Lakewood Gulch, and McIntyre Gulch (Exhibit 3-19). These gulches have been channelized and redirected to accommodate past development, and in their current configurations, are not adequate to convey the flow of the 100-year flood event. The USACE has declined to make a jurisdictional determination for wetlands and WUS in the study area at this time. The impact analysis and mitigation analyzed in this EA assumes that waters and wetlands within the study area are jurisdictional and subject to Section 404 requirements. Correspondence with the USACE is included in Appendix C to this EA.

EXHIBIT 3-20: DRY GULCH CROSSING AT WADSWORTH

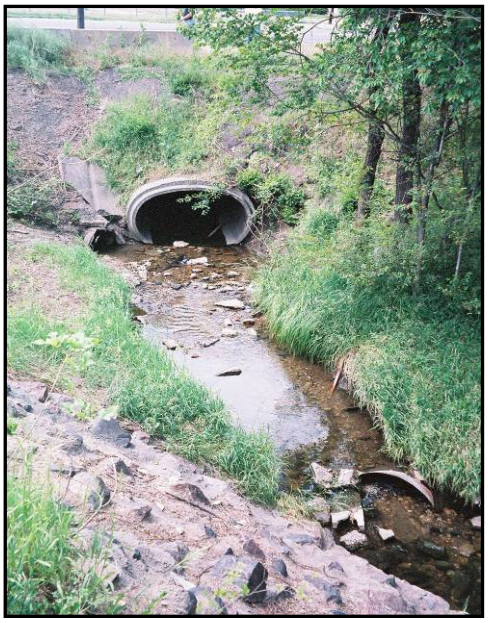


EXHIBIT 3-21: LAKEWOOD GULCH WEST OF WADSWORTH

3.12.1 ENVIRONMENTAL CONSEQUENCES OF THE NO BUILD ALTERNATIVE

No wetlands or WUS would be permanently impacted by the No Build Alternative.

3.12.2 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVE

All three wetland sites would be removed as a result of the Build Alternative, resulting in a direct permanent impact to 0.02 acre of wetlands. There were no options to avoid disturbing these wetlands because they are located along confined drainages that need to be expanded and regraded.

Channel improvements included in the Build Alternative would widen drainage areas and stabilize embankments. The wider channel would provide a greater opportunity for riparian vegetation and wetlands to re-establish. The wider drainage channels also would distribute and dissipate flows to reduce scour and erosion in the channels, which would reduce sedimentation and improve the quality of WUS.

Approximately 0.27 acre of WUS associated with Dry Gulch, Lakewood Gulch, and McIntyre Gulch would be temporarily impacted during construction. While the WUS areas would be disturbed during construction, they would be permanently enlarged as a result of widening the gulches from the Build Alternative. The adverse impact, therefore, is temporary during construction, while the permanent, long-term impact would be beneficial as the WUS areas would be substantially increased. A summary of the impacts to WUS is presented in Exhibit 3-22. All three gulches would be realigned and/or widened to accommodate the new interchange and reconfigured to convey 100-year flows. The project team has coordinated with Lakewood and the Urban Drainage and Flood Control District. Each has contributed to the design of the project and recommends the drainage improvements included in the Build Alternative.

EXHIBIT 3-22: SUMMARY OF BUILD ALTERNATIVE IMPACTS TO WETLANDS AND WATERS OF THE UNITED STATES

Feature	Area Impacted Acres	Impact Description
Wetland 1	0.002	Permanent
Wetland 2	0.01	Permanent
Wetland 3	0.001	Permanent
Wetland Total	**0.02**	**Permanent**
Dry Gulch	0.02	Temporary
Lakewood Gulch	0.21	Temporary
McIntyre Gulch	0.04	Temporary
WUS Total	**0.27**	**Temporary**

Realignment of these gulches represents a minor impact to WUS, especially when weighed against the benefits associated with improved system function, flood conveyance, bank stability, and riparian habitat potential. Widening the channels represents a net benefit to WUS, which would be permanently increased in size.

3.12.3 AVOIDANCE AND MINIMIZATION

Total permanent impacts to jurisdictional wetlands and other WUS would be 0.02 acre. The project team evaluated placing walls around wetlands to avoid permanent impacts. However, this action would have conflicted with the realignment and widening of Dry Gulch and Lakewood Gulch. The realignment of Dry Gulch, Lakewood Gulch, and McIntyre Gulch would restore the gulches to a more natural flow and improve flood control at crossings at US 6 and Wadsworth.

3.12.4 MITIGATION

A wetland finding will be completed during final design and will include a final assessment of impacts and a detailed plan for mitigation.

CDOT will obtain a Section 404 permit from the USACE for impacts to wetlands and WUS. Because total permanent impacts to jurisdictional wetlands and other WUS would be minor, and there is a net benefit associated with the realignment the gulches, the project would qualify for streamlined permitting under the General Nationwide Permit (NWP) #14 for Linear Transportation Projects and NWP #27, Aquatic Habitat Restoration, Establishment, and Enhancement Activities. General permits are often issued by USACE for categories of activities that are similar in nature and have only minimal individual or cumulative adverse environmental effects. The USACE has confirmed informally that the Build Alternative could be permitted under a NWP, and an individual permit would not be required; final permit applications will be filed later in the design phase.

CDOT requires compensatory mitigation at a 1:1 ratio for all wetlands permanently impacted by project activities. Unavoidable impacts to wetlands resulting from the Build Alternative will be mitigated on a one-for-one basis in accordance with CDOT policy, resulting in no net loss of wetlands.

3.13 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency (federal or non-federal) or person who undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7).

The study area for cumulative impacts (Exhibit 3-23) is defined by the largest geographic scope of the resources that could be affected by cumulative impacts. In this case (and for most highway projects), the largest area of influence extends to the area of influence on traffic levels of the proposed project (FHWA, 1992). The time frame established for the analysis extends from 1940 to 2035. These dates were based upon growth and development that occurred between World War II and the project horizon.

3.13.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

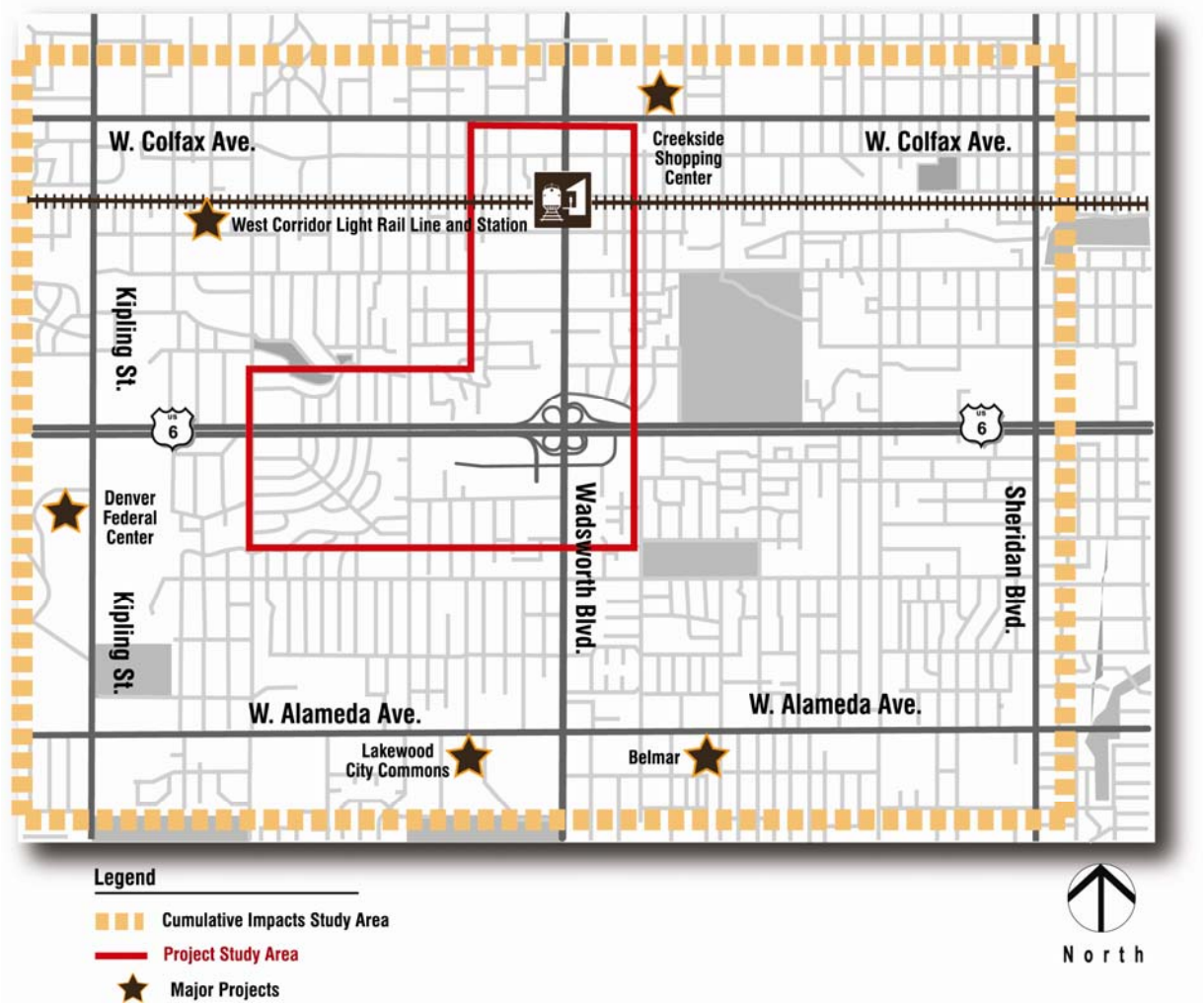
A key component of the cumulative impacts analysis is the identification of past, present, and reasonably foreseeable future actions that incrementally impact resources affected by the Build Alternative.

Lakewood started as a small farming community 5 miles west of Denver. By 1940 the area had grown into a suburban city filled out by neighborhood subdivisions. Past projects contributing to growth and land use change in the study area include the construction of early railroads and east-west roadways connecting Denver to Lakewood (Colfax Avenue and US 6), development of manufacturing operations during World War II (followed by the Denver Federal Center in 1950), establishment of post-World War II residential subdivisions, construction of Wadsworth and the US 6/Wadsworth interchange in 1961, and other infrastructure expansion to support this development. These projects transformed Lakewood from largely agricultural and open space areas to chiefly developed urban areas with pockets of open spaces.

The increase in impervious surfaces, modification of natural drainages, and conversion of habitat areas have degraded fish and wildlife habitat, water resources, air quality, and floodplains. Economic and neighborhood development have strengthened community and civic systems within Lakewood

Projects completed more recently in the vicinity of the proposed project include the Creekside Shopping Center, Lakewood City Commons, Belmar, and other smaller residential and commercial developments. Large planned projects include construction and operation of RTD's West Corridor light rail line and transit station, future phases of the Belmar development, redevelopment of the Denver Federal Center, and other smaller developments. Future development around the West Corridor Wadsworth

EXHIBIT 3-23: PAST, PRESENT, AND REASONABLY FORESEEABLE LAND DEVELOPMENT PROJECTS



station is expected but no specific proposals are under review or development, so detailed information that could be evaluated for cumulative impacts is not available. Past, present, and future projects considered are described in the *Land Use Existing Conditions Summary Technical Memorandum* (CH2M HILL, 2007c), contained in Appendix D to this EA. Major recent and planned developments are shown by location in Exhibit 3-23.

3.13.2 CUMULATIVE IMPACTS

Cumulative impacts analysis focuses on specific resources that are directly or indirectly affected by the Build Alternative. If the Build Alternative has no direct or indirect effect on a resource, then it would not contribute to cumulative effects upon that resource, regardless of the effects of other past, present, or future projects. No impacts associated with the Build Alternative have been identified for land use or environmental justice. The No Build Alternative does not have any effects on resources so is not included in the cumulative effects analysis.

While past and recent development has altered the environmental and social resources within the study area, trends do not indicate that any resources are diminished to be especially susceptible to cumulative effects. Agency scoping did not identify any resources of concern for cumulative effects within the study area. Direct and indirect effects of the Build Alternative discussed earlier in this chapter are identified with consideration of the existing conditions of each resource (and the past and present actions that have the potential to affect those resources).

This analysis considers the potential for impacts of the Build Alternative to interact with impacts of future projects by others to accumulate and result in adverse impacts to resources. The relevant future projects include development and operation of the West Corridor light rail line and Wadsworth station, continued development of Belmar, and redevelopment of the Denver Federal Center.

The Build Alternative would result in beneficial impacts to floodplains, riparian habitat and wetlands, pedestrian and bicycle facilities, noise, socioeconomic conditions, transportation, water quality, and hazardous wastes. Other projects would have similar effects that would result in beneficial cumulative impacts for the study area.

- The West Corridor project would construct water quality and storm detention facilities, clean up contaminated properties acquired for the project, and construct new sidewalks and bicycle paths near the light rail line and stations. Intersection improvements around the Wadsworth light rail station are also planned to improve traffic flow and safety.
- Future phases of the Belmar development would include treatment of stormwater, sidewalk and roadway improvements, and improved community facilities and connections.
- The redevelopment of the Denver Federal Center would provide improved pedestrian, bicycle, and transit connections associated with the expanded Cold Spring Park-n-Ride and light rail station, and improved roadway capacity and circulation from the reconnection of roadways closed when the Denver Federal Center was originally constructed. The continued remediation of contaminated sites on the property would improve environmental conditions and reduce risks to human health and the environment.

The following beneficial cumulative impacts would be expected:

- Improved flood conveyance and floodplain values
- Opportunities for riparian habitat and wetlands to establish
- Remediation of contaminated properties
- Improved pedestrian and bicycle facilities
- Improved neighborhood integrity and community connections
- Improved mobility, safety, and additional roadway capacity
- Surface water runoff detention and treatment

The Build Alternative would result in adverse effects to historic properties and wetlands. Other projects do not affect historic properties; therefore, no cumulative impacts are anticipated. None of the properties around 13th Avenue has been identified as listed or eligible for listing on the NRHP; other than impacts to a historic rail line, the West Corridor project is not anticipated to affect historic properties. According to the *Denver Federal Center Final Master Site Plan and Environmental Impact Statement* (EDAW/AECOM, 2008), redevelopment of the Denver Federal Center would not result in adverse effects to historic properties. Belmar's buildings are recent, and no historic properties would be affected by continued development of the site.

The Build Alternative would permanently impact 0.02 acre of jurisdictional wetlands. The incremental effect of this impact is so small that it would not result in meaningful impacts. Because CDOT requires mitigation on a one-for-one basis for any wetland impact (regardless of jurisdictional status), there would be no net loss of wetlands as a result of CDOT actions.

- No wetlands are present within the portion of the West Corridor light rail line or station in the study area. RTD will mitigate for wetlands impacted by the light rail project outside of the immediate study area by following the requirements of the Section 404 permitting process.
- No wetlands would be affected by continued infill development of Belmar because the property is a former mall that did not contain wetlands.

- Wetlands present on the Denver Federal Center would be incorporated into the designated open space areas and would be protected (EDAW/ AECOM, 2008). No adverse cumulative effects to wetlands are anticipated.

If construction of multiple projects occurs at the same time, there could be negative short-term impacts to traffic operations and congestion in Lakewood. Impacts would include air emissions, noise, access disruptions, and congestion.

3.13.3 MITIGATION

The Build Alternative, when added to past, present, and reasonably foreseeable actions, would not result in long-term adverse cumulative impacts to environmental resources. In many cases the incremental impact of the Build Alternative would be positive and would contribute beneficially to environmental resources. Project contributions to cumulative impacts will be mitigated in the ways already described as mitigation for direct and indirect adverse effects of the Build Alternative.

3.14 OTHER RESOURCES

After consideration of data obtained from literature and field reviews, the following resources are not evaluated in detail in this EA because they were not present in the study area, would not be affected by the Build Alternative, or would experience negligible impacts after application of standard construction precautions: Archaeological Resources, Paleontological Resources, Native American Consultation, Air Quality, Energy, Geologic Resources and Soil, Farmlands, Fish and Wildlife, Threatened and Endangered Species, Vegetation and Noxious Weeds, Visual Resources, and Utilities. A brief background on these resources and the reason for their dismissal is included below.

Additional information about these resources and the recommendations for analysis are available in the *Summary of Existing Conditions, US 6 and Wadsworth Boulevard Area* (CH2M HILL, 2007a) and *Existing Conditions Report of Engineering Design Elements* (CH2M HILL, 2007d) in Appendix D to this EA. In some cases, additional analysis was conducted to inform the decisions about impact analysis, and this analysis is included in separate memorandums, also included in Appendix D and referenced below.

3.14.1 ARCHAEOLOGICAL RESOURCES

The study area is highly developed and most natural areas have been disturbed, making it unlikely that any important, intact archaeological resources are present. A file and literature search conducted with the Colorado Historical Society Office of Archaeology and Historic Preservation (OAHP) confirmed that no archaeological resources had been previously recorded in the study area, and no undisturbed areas with archaeological potential were discovered during a field survey (TEC, 2008). In the unlikely event that cultural deposits are discovered during construction, CDOT would follow its standard practice of ceasing work, consulting with the CDOT archaeologist, and evaluating materials in consultation with the Colorado SHPO to determine if mitigation is required.

3.14.2 PALEONTOLOGICAL RESOURCES

To assess the paleontological sensitivity of the area, literature and museum records were reviewed, and a field survey was conducted to inspect the study area for paleontological resources (RMP, 2007). No record or presence of fossils was revealed in the study area.

The Denver Formation is present within the study area and could be affected by construction excavations. To ensure that important paleontological remains are not destroyed during construction, the CDOT Staff Paleontologist will examine final plans to determine whether construction monitoring is required. Furthermore, prior to construction, the CDOT Staff Paleontologist will examine existing Denver Formation bedrock exposure that could not be examined previously because of snow cover at the time of original survey. If any scientifically significant fossil localities are discovered during that survey, CDOT will perform mitigation of construction impacts by systematic salvage of a statistically representative sample of the fossils found there, either prior to or during construction. If any subsurface bones or other potential fossils are found anywhere within the study

area during construction, the CDOT Staff Paleontologist will assess their significance and make further recommendations.

3.14.3 NATIVE AMERICAN CONSULTATION

Section 106 of the National Historic Preservation Act (as amended) and the Advisory Council on Historic Preservation regulations (36 CFR 800.2[c][2][ii]) mandate that federal agencies coordinate with interested Native American tribes in the planning process for federal undertakings. Consultation with Native American tribes recognizes the government-to-government relationship between the United States government and sovereign tribal groups. In that context, federal agencies must acknowledge that historic properties of religious and cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands beyond modern reservation boundaries. Consulting tribes are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. If it is found that the project will impact properties that are eligible for inclusion on the NRHP and are of religious or cultural significance to one or more consulting tribes, their role in the consultation process may also include participation in resolving how best to avoid, minimize, or mitigate those impacts. By describing the proposed undertaking and the nature of any known cultural sites, and consulting with the interested Native American community, FHWA and CDOT strive to effectively protect areas important to American Indian people.

In September 2007, FHWA contacted 14 federally recognized tribes with an established interest in Jefferson County, Colorado, and invited them to participate as consulting parties. Only the Northern Cheyenne Tribe responded in writing to the solicitation, declining the invitation to consult. None of the remaining tribes elected to reply, and therefore no tribal governments participated in the project under the auspices of the National Historic Preservation Act. As a result of these actions, FHWA has fulfilled its legal obligations for tribal consultation under federal law.

3.14.4 AIR QUALITY

Air quality analysis, detailed in the *Air Quality Technical Memorandum* (CH2M HILL, 2009e), indicates that the Build Alternative would not result in long-term or permanent adverse effects to air quality. The project is included in the air quality conforming *2035 Metro Vision Regional Transportation Plan* (DRCOG, 2007) and the conforming *2008-2013 Transportation Improvement Program* (DRCOG, 2008), which means that the project has been factored into the larger, regional air quality conformity determination for the Denver Metropolitan Area. Regional conformity indicates that transportation activities within the region will not cause new air quality violations, worsen existing violations, or delay timely attainment of National Ambient Air Quality Standards (NAAQS).

CDOT also conducts project-level conformity analysis in non-attainment or attainment/maintenance areas to assess localized effects of traffic growth in the air quality planning process. Project-level analyses indicated that carbon monoxide (CO) would not exceed NAAQS. CO emissions are projected to decrease by the design year (2035) as a result of reduced congestion and other regional actions not related to this project. The Build Alternative would not be likely to cause or contribute to any new localized violations of ozone (O_3) or particulate matter less than 10 microns in diameter (PM_{10}), or increase the frequency or severity of any existing violations.

No appreciable difference in regional mobile source air toxics (MSAT) emissions is anticipated between the No Build Alternative and the Build Alternative, and, in both cases, emissions in 2035 would likely be lower than present levels as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020.

Air pollutants would increase temporarily during construction as a result of the operation of heavy equipment, lower traffic speed, earth excavation, and paving activities. These impacts would be addressed by the implementation of BMPs during construction as

specified in Appendix B, *Summary of Mitigation and Monitoring Commitments*.

3.14.5 ENERGY

A slight decrease in fuel usage would be expected under the Build Alternative because decreased traffic congestion would result in more efficient fuel use by vehicles in the study area. Improved access to transit also may reduce regional vehicle miles traveled (VMT). Expected increases in vehicle fuel economy, unrelated to the project, could also contribute to fuel use reductions.

During construction, CDOT will require contractors to follow standard specifications for reducing energy consumption, such as limiting the idling of construction equipment, locating construction staging areas close to the work site, minimizing motorist delays and vehicle idling with effective traffic management, and coordinating general maintenance activities during construction outside of peak commuting hours.

3.14.6 GEOLOGICAL RESOURCES AND SOIL

No major geologic hazards were identified in the study area that would restrict construction. No important mineral resources were identified in the study area.

3.14.7 FARMLANDS

The study area is located within the Denver-Aurora Census 2000 urbanized area; all soils within this area are excluded from protection under the Farmland Protection Policy Act of 1981.

3.14.8 FISH AND WILDLIFE

The study area is highly developed and most natural areas have been disturbed. Biologists from CH2M HILL and CDOT conducted a field review of the study area and concluded that limited wildlife habitat is present; wildlife observed consisted of common urban wildlife species, including foxes, skunks, raccoons, coyotes, and squirrels (CH2M HILL, 2007e). Wildlife habitat is provided primarily by Lakewood Gulch and Dry Gulch, stream drainages that cross under Wadsworth. These drainages are highly constrained and do not provide quality habitat for fish. No bird nests were identified within the study area along the two gulches, and no swallow nests were observed in the culverts.

Wildlife would benefit from widened box culverts under Wadsworth at Lakewood Gulch and Dry Gulch that would improve wildlife movement along the gulches. In addition, widened drainage channels would provide an opportunity for riparian habitat and wetlands to establish in the study area, improving wildlife habitat.

Adverse impacts to wildlife would be limited to minor habitat loss as a result of vegetation removal during construction. Project construction activities would be carried out in accordance with CDOT's standard revegetation requirements, and compliance with requirements of the Migratory Bird Treaty Act of 1918 and Senate Bill 40 certification as specified in Appendix B, *Summary of Mitigation and Monitoring Commitments*.

3.14.9 THREATENED AND ENDANGERED SPECIES

Federally threatened, endangered, or candidate species, state threatened and endangered (T&E) species, and state species of special concern are either not present or are unlikely to occur in the study area (CH2M HILL, 2007e and CH2M HILL, 2009f). The study area lacks suitable habitat to support the wildlife appearing on the U.S. Fish and Wildlife Service (USFWS) list of federally threatened and endangered species for Jefferson County. The project occurs within the Denver metropolitan block clearance area for Preble's meadow jumping mouse, within which the USFWS has determined that the species is not likely to exist.

3.14.10 VEGETATION AND NOXIOUS WEEDS

A field review of the study area was conducted in July 2007 (CH2M HILL, 2007e). Natural vegetation within the study area is concentrated along the Lakewood and Dry Gulch drainages near Wadsworth. Vegetation consists of an overstory of native trees (plains cottonwood, peachleaf willow, and box elder), non-native trees (Chinese elm and green ash), and an

understory comprising weedy grasses and forbs. Noxious weeds occur in both of these drainages. Refer to the *6th Avenue/Wadsworth Boulevard Biological Field Review* (CH2M HILL, 2007e) in Appendix D of this EA for additional information.

Natural vegetation and noxious weeds would be disturbed during construction of the Build Alternative. To minimize impacts to natural vegetation and limit the spread of noxious weeds in the construction area, vegetation removed during construction will be replaced with native vegetation, which will be established as soon as feasible. Prior to construction, a noxious weeds survey will be conducted, and, if needed, an Integrated Noxious Weed Management Plan will be developed and implemented during construction. The plan will contain specific BMPs, such as managing open soil surfaces and topsoil that is stockpiled for reuse, to control the establishment of noxious weeds.

3.14.11 VISUAL RESOURCES

Current views in the study area are limited by mature trees, walls, and large buildings, and the study area generally lacks visual focus (Civitas, 2007). No important views requiring protection or preservation are present in the study area. Refer to the *Aesthetic and Visual Context Technical Memorandum* in Appendix D of this EA for additional information. A raised median, roadside buffers, and buried utilities would provide opportunities for landscaping and visual continuity on Wadsworth. Noise walls would not block any significant views, and views from US 6 to the mountains would not change.

The new interchange would provide the opportunity to establish visual distinction and a sense of gateway for Lakewood. Lakewood has developed an aesthetic vision for the project and will have the opportunity to work closely with CDOT during the final design phase of the project to weigh in on the aesthetics of design elements. CDOT will also work closely with Lakewood on aesthetics related to noise walls, including grading, landscaping, and color and material of noise walls, with the goal of constructing an aesthetically pleasing project. By creating continuity on both the east and west sides of the corridor, the new interchange has the potential to establish visual distinction and a sense of gateway for Lakewood.

Lakewood will install, irrigate, and maintain any landscaping in medians or other areas. Landscaping will comply with clear zone requirements. CDOT will continue to maintain any non-irrigated areas in the interchange area.

3.14.12 UTILITIES

A review of existing utilities was conducted during the scoping phase of the EA (CH2M HILL, 2007d). The review included contacting the Utility Notification Center of Colorado to identify private utilities and municipalities with facilities in the study area, reviewing USGS topographic mapping, and conducting a reconnaissance field review. Utilities in the study area include overhead electric transmission lines, buried fiber optic lines, high pressure gas lines, water lines, sanitary sewer, and irrigation ditches. The Build Alternative design has been reviewed, potential conflicts with known utilities have been identified, and utility relocation costs have been included in the conceptual cost estimate for the Build Alternative. During final design, utilities will be avoided through design modifications or, where conflicts cannot be avoided, utilities will be relocated. Impacts to buried utilities may be avoided by protecting them with encasements. CDOT will coordinate utility impacts with Lakewood and private and public utility providers throughout project design and construction.

3.15 SUMMARY OF IMPACTS AND MITIGATION

Exhibit 3-24 summarizes the impacts of the No Build and Build Alternative and identifies mitigation measures CDOT will include in the project to minimize impacts of the Build Alternative. The impacts and mitigation are presented for the thirteen environmental and social resources analyzed in detail in this EA. CDOT also has committed to mitigation for other resources (that is, those discussed in Section 3.14); Appendix B contains a complete listing of all mitigation and monitoring commitments included for the Build Alternative.

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Transportation		
◈ The four-lane section on Wadsworth operates at an unacceptable level of service during peak hours; traffic operations are projected to deteriorate further as traffic volumes increase. ◈ Anticipated increases in bus frequency on Wadsworth would add to congestion in travel lanes and could affect transit transfers at the 13th Avenue light rail transit (LRT) station. ◈ The existing cloverleaf interchange at US 6 has low ramp speeds, short weaving sections, and tight curves that result in unacceptable LOS during peak hours. ◈ Rear-end collisions related to sight distance and congestion, and sideswipe collisions related to lane changes and merges are the most frequent accident types in the study area. Operational inefficiencies at the interchange and along Wadsworth contribute to accidents. ◈ As traffic volumes increase on Wadsworth, turning in and out of businesses and neighborhoods adjacent to Wadsworth would become more difficult, and neighborhood cut-through traffic may increase. ◈ Cross street intersections with Wadsworth operate an unacceptable LOS; long delays (several minutes) at non-signalized intersections would get worse as traffic volumes increase. ◈ One-way frontage roads in the interchange area on the north side of US 6 would continue to encourage neighborhood cut-through traffic to access businesses along the frontage road.	◈ An additional travel lane in each direction and access control measures, such as raised medians and driveway consolidation, would increase capacity on Wadsworth. ◈ Traffic operations would be acceptable for all but one of the intersections (12th Avenue) on Wadsworth. Intersection improvements at 12th Avenue are not included due to uncertainty with land use changes/future development plans. ◈ Transit operations at the LRT station could be integrated with surrounding roadway operations. ◈ Eliminating the existing cloverleaf design and increasing ramp lengths to meet current design standards would increase capacity at the interchange. However, the additional capacity could only be fully realized with capacity improvements to US 6. ◈ Improving the operation of the US 6 and Wadsworth interchange would improve traffic flow on neighborhood streets and the surrounding major roadway network, including Wadsworth, Kipling, Sheridan, and US 6. ◈ Traffic volumes on Wadsworth would increase an additional 10 percent (beyond 2035 No Build projections) because some traffic would shift to Wadsworth from adjacent corridors, such as Kipling and Sheridan. This would not induce additional travel but instead should help operations on those other parallel facilities. ◈ Access to and conditions of bus stops would be improved with improved sidewalks. ◈ Reduced congestion, access control, fewer vehicle conflicts, and improving operational efficiency of outdated transportation facilities would improve safety.	◈ CDOT will continue to coordinate with the Regional Transportation District (RTD) and City of Lakewood regarding development plans at and around the 13th Avenue LRT station. ◈ CDOT will coordinate with RTD and City of Lakewood on the placement and aesthetics of bus stops and shelters. Bus shelters would be provided by others. ◈ CDOT will Coordinate with RTD to ensure access to bus stops during construction.

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Pedestrian and Bicycle Facilities		
◈ The existing sidewalk system lacks continuity, contains various obstructions, and does not meet needs of pedestrians and bicyclists (including Americans with Disability Act standards). North of 10th Avenue, 85 percent of the sidewalk system is missing or substandard and would not support pedestrian and bicycle activity around the new light rail station at 13th Avenue. ◈ US 6 would remain a barrier to safe pedestrian and bicycle travel as a result of uncontrolled crossings of high-volume, free-flow cloverleaf ramps with few gaps in traffic, limited sidewalks, and poor visibility between vehicles and pedestrians/bicyclists. ◈ The lack of traffic signals between 5th and 10th Avenues limits safe crossings of Wadsworth between these intersections and may encourage pedestrians to make unsafe mid-block crossings. ◈ Uncontrolled access and traffic congestion would continue to create unsafe conditions for pedestrians and bicyclists traveling along Wadsworth. ◈ Pedestrian- and bicycle-related crashes would likely increase due to increased vehicular traffic volumes, increased pedestrian and bicyclist activity, and the lack of adequate sidewalks.	◈ The sidewalk crossing of US 6 would be improved; three of four loop ramps would be eliminated in the interchange, removing safety concerns for pedestrian/bicycle traffic associated with crossings of loop ramps (due to curvature and poor visibility). ◈ The loop ramp in the northwest quadrant could be a barrier to pedestrian and bicycle crossing because high traffic volumes do not provide adequate gaps for pedestrian crossings, and the curvature of the ramp does not provide vehicles adequate advance visibility of pedestrians or bicycles crossing the ramp. ◈ Several unsignalized crossings of free-flow on- and off-ramps, which also provide inadequate gaps for crossings in peak hours, would remain on the east side of Wadsworth. ◈ Medians and lack of traffic signals at intersections between US 6 and 10th Avenue would create out-of-direction travel for pedestrians and bicyclists or result in unsafe mid-block crossings of Wadsworth. ◈ Pedestrian and bicycle improvements would meet or exceed mobility and safety standards for multi-use paths ◈ Detached paths along Wadsworth would provide continuous, separated areas for pedestrians and bicycles to move north-south through the impact area and would support pedestrian and bicycle activity around the new light rail station at 13th Avenue. ◈ Access control and reduced traffic congestion would improve safety for pedestrians and bicyclists traveling along Wadsworth. ◈ Pedestrian and bicycle routes could be disrupted during construction.	◈ Intelligent Transportation Systems (ITS) options, such as signing, lighting, and pavement treatments, will be considered in final design to improve safety of pedestrian and bicycle crossings of US 6 ramps on the east side of Wadsworth. ◈ A grade-separated pedestrian/bicycle crossing to remove conflicts between bicycles and pedestrians at the loop ramp on the west side of Wadsworth will be examined further in final design. ◈ Signage and designated pedestrian and bicycle routes will be provided during construction. ◈ Any lane closures during construction will comply with CDOT's Lane Closure Strategy. Advance notice will be provided for extended lane closures. Detours will be identified with adequate signing to minimize out-of-direction travel.

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Noise		
◈ High noise levels would persist in the northwest and southwest quadrants of the interchange where no noise walls are present. ◈ More than 100 residences would experience noise above CDOT Noise Abatement Criteria (66 dBA or higher).	◈ Without noise mitigation, projected noise would increase 2 to 7 dBA over the No Build baseline. (The noise conditions do not change dramatically because the highway is already at capacity and no additional capacity would be added to US 6, which is the primary noise source.) ◈ Noise studies did not indicate a need for noise mitigation on Wadsworth because traffic volumes are lower and residences are located farther from the roadway (buffered by commercial businesses). ◈ During construction, intermittent noise from diesel-powered equipment would range from 80 to 95 dBA at a distance of 50 feet. Impact equipment such as rock drills and pile drivers can generate louder noise levels.	◈ New noise walls will be constructed between the frontage roads and US 6 west of Wadsworth to Garrison Street. Noise walls to east will be reconstructed and would be more effective than current walls. Noise walls are predicted to reduce noise to below impact levels for 106 residences that would otherwise experience noise levels above CDOT Noise Abatement Criteria. ◈ Noise walls will provide more than 330 residences with a noticeable reduction in traffic noise (3 dBA or more). Traffic noise levels at residences up to three rows from US 6 would decrease by an average of more than 10 dBA, or be about half as loud as they are presently. ◈ Noise analysis will be conducted during final design to confirm noise wall heights and alignments ◈ During final design of the project, the City of Lakewood will have the opportunity to provide input on design elements related to noise mitigation, including grading, landscaping, and color and material of any noise walls, with the goal of constructing an aesthetically pleasing and economically viable project. ◈ Construction noise impacts will be mitigated by limiting work to daytime hours (as described by CDOT and City of Lakewood requirements) when possible and requiring the contractor to use well-maintained equipment, including muffler systems.
Right-of-Way and Relocations		
◈ No right-of-way (ROW) acquisition, residential or business relocations, or permanent or temporary easements would be required.	◈ The Build Alternative would require acquisition of approximately 30.5 acres of property from 95 ownerships through 113 parcels, including 45 residential, 64 commercial, and four vacant or publicly owned parcels. Acquisitions would range from small slivers of property to entire parcels. ◈ 14 residences and 27 businesses would be displaced. ◈ Temporary construction easements (to allow temporary access to the property during construction or to the construction area from the property) would be required on 18 properties not otherwise affected by ROW acquisition needs.	◈ All acquisitions and relocations will comply fully with federal and state requirements, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Socioeconomics		
◈ The No Build Alternative would not accommodate anticipated increases in traffic volumes and changes in traffic patterns. Worsening congestion would make it increasingly difficult to access businesses, residences, and community facilities within the study area. ◈ Traffic, safety, and access problems would increase the number of traffic incidents, increase emergency response times, and create unfavorable conditions for local businesses as traffic volumes increase. ◈ Discontinuous and missing sidewalks would persist, perpetuating safety and mobility problems for pedestrians and bicyclists, particularly as traffic volumes increase. ◈ Noise is a community concern because it can be annoying, negatively affect property values, and interfere with sleep, work, and recreation. Residents are concerned about sidewalks because of safety, limited opportunities to connect with services along either side of Wadsworth, and access to existing and future transit.	◈ Community cohesion would be enhanced by: - Better north-south and east-west pedestrian connections. - Improved access to neighborhoods and businesses in the project area through improved roadway operations (access, capacity, and safety) and addition of sidewalks. - Reduced neighborhood cut-through traffic due to improved capacity on Wadsworth, restoration/ reconnection of roadways, and separation of frontage road traffic from neighborhood streets. - Reduced noise levels, which are more compatible with residential neighborhood character. ◈ Emergency response times should improve with improved capacity on Wadsworth but medians may result in out-of-direction travel that could add time to some trips ◈ Higher traffic volumes and changes in travel patterns anticipated from the 13th Avenue LRT station and higher population densities allowed by TMU zoning would be accommodated. ◈ Consistent sidewalks provide improved pedestrian access to the Jefferson County Open School and planned Two Creeks Park. ◈ Some temporary impacts would occur during construction such as delays, detours, out-of-direction travel, construction-related noise and air emissions, and temporary access changes.	◈ CDOT will coordinate with emergency service providers to identify possible locations for emergency access breaks in the medians. ◈ CDOT will provide advance notice to emergency service providers, local schools, residents, and local businesses of upcoming construction activities that are likely to result in traffic disruption. This will be accomplished through direct contact, radio and public announcements, flyers, newspaper notices, onsite signage, and the use of the Lakewood and CDOT websites.
Environmental Justice		
◈ No disproportionately high and adverse impacts would occur in areas of minority or low-income populations. - No displacement of minority or low-income residents, businesses, or employees would be anticipated. - Traffic congestion would worsen in the impact area, hindering access to housing, businesses, community facilities and the provision of emergency services for minority and low-income populations as well as for the overall community. - No mitigation for noise would be provided; CDOT lacks funding to provide noise barriers for existing roadways without an identified construction project. Benefits associated with noise mitigation would not be received by the overall community, including minority and low-income populations.	◈ No disproportionately high and adverse impacts would occur in areas of minority or low-income populations. - Property acquisitions and construction-related impacts would not be predominantly borne by minority or low-income residents. - Minority and low-income residents, as well as the overall community, would benefit from improved mobility, safety, and access to businesses, residences, and community facilities and services. - Noise walls would reduce noise levels, benefiting the overall community, including minority and/or low-income households. - Bicycle and pedestrian facilities would improve connections to transit.	◈ No mitigation measures are necessary.

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Land Use		
◈ The No Build Alternative would be inconsistent with the traffic and pedestrian safety and mobility goals presented in adopted land use and neighborhood plans. ◈ The existing interchange would be unable to accommodate traffic growth and planned land use changes in the study area. ◈ Additional travel lanes and sidewalks would not be added to Wadsworth, which could hamper future growth and implementation of planned land uses.	◈ The Build Alternative would be consistent with adopted land use and neighborhood plans. It would support goals for traffic management and safety, landscaping, recreational amenities, noise mitigation, multimodal connections and safety, and drainage improvements. ◈ ROW acquisition would affect land use for some individual parcels: - Full property acquisitions would result in direct conversion of commercial and residential land to transportation, drainage, and water quality uses. - Partial property acquisitions would result in some nonconforming uses related to parking, landscaping, and setback requirements. ◈ Changes to the interchange and Wadsworth alone are not expected to influence regional land use patterns or induce growth. Additional travel lanes, sidewalks, and access control would support (but not cause) planned future land use changes, including the newly adopted TMU zoning between 10th and 14th Avenues.	◈ Final design and ROW negotiations by CDOT will coordinate with the City of Lakewood to address compatibility with land use plans and the allowance of nonconforming properties that may result from ROW acquisition.
Historic Properties		
◈ The No Build would result in No Historic Properties Affected.	◈ Adverse Effects for four properties individually eligible for the National Register of Historic Places (NRHP) along the westbound to northbound frontage road and ramps; the properties must be removed to accommodate the new interchange design. ◈ No Adverse Effect for three buildings individually eligible for the NRHP and three NRHP-eligible historic districts (including all of the contributing resources within those districts). ◈ No Historic Properties Affected for one building individually eligible for the NRHP.	◈ Mitigation measures will be part of a Memorandum of Agreement (MOA) negotiated among CDOT, FHWA, and the Colorado SHPO. The Lakewood Historical Society, City of Lakewood, and Jefferson County will be provided an opportunity to participate in the MOA. Mitigation may include additional historical survey in the study area, signage, and historic preservation training and education. ◈ Aesthetics of noise walls will consider compatibility with neighborhood history and may include treatments that support neighborhood history. ◈ Any new historic documentation that is developed as part of the MOA will be provided to interested local historic preservation groups

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Hazardous Materials		
◈ There would be no effect on known hazardous material or waste sites.	◈ Construction impacts would affect sixteen sites of concern for environmental (petroleum-related) contamination. - Four properties with potential environmental contamination would be acquired. - Partial acquisition and construction activities (ground disturbance) would affect twelve properties with potential environmental contamination. ◈ Buildings and structures, such as traffic poles painted with lead based paint (LBP) could be disturbed during construction ◈ Based upon the overall age of the transportation facilities and property acquisitions, asbestos-containing building materials would likely be present.	◈ Protective measures will be taken before, during, and after construction to minimize the risk of encountering petroleum products and petroleum-contaminated soils. A full Phase I Environmental Site Assessment (ESA) according to American Society of Testing and Materials (ASTM) 2005 standards will be completed prior to any total property acquisition. Phase II ESAs will be conducted to characterize, manage, and remediate contaminated properties identified as concern in Phase I ESAs. ◈ A *Materials Handling Plan* will be prepared to address contaminated soil and groundwater that may be encountered as directed by the findings of Phase I assessments. The plan will be prepared according to CDOT standards. ◈ Painted surfaces disturbed during construction or demolition and disposed of separately will be tested, handled, and disposed of properly. ◈ An asbestos survey will be conducted and a demolition permit will be obtained prior to the demolition of bridges or buildings. Any asbestos-containing material that is friable or will be friable during construction and demolition activities will be removed prior to demolition by a licensed abatement contractor.

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Floodplains		
◈ Existing encroachments of US 6 and Wadsworth roadways on the floodplains associated with Lakewood Gulch, McIntyre Gulch, and Dry Gulch would persist. ◈ Drainage facilities under Wadsworth would continue to provide inadequate conveyance capacity, and flooding of Wadsworth and surrounding properties at Lakewood Gulch and Dry Gulch crossings during large storm events would be expected to continue. ◈ Flooding immediately upstream and downstream of the McIntyre Gulch crossing of US 6 would continue.	◈ Conveyance and natural values of floodplains in the impact area would be improved. - Adequately-sized drainage structures and channels would be provided under Wadsworth and US 6 to remove roadways from the floodplain and reduce flooding risks for properties surrounding gulches within the impact area. - Lakewood Gulch/McIntyre Gulch confluence would be realigned to remove existing encroachments (highway and other development), provide a more natural channel grading, and improve the floodplains' natural values. ◈ Culvert and channel improvements will be designed to convey 100-year flows, and will follow CDOT recommendations for the 50- to 100-year flood event capacity. ◈ The Build Alternative would remove CDOT roadways from the 100-year floodplain within the impact area.	◈ Sediment traps, check dams, sediment basins, or other best management practices (BMPs) will be installed to control sedimentation during construction of drainage improvements in gulches. Specific BMPs will be determined during final design. ◈ During final design, CDOT will coordinate with the appropriate local and federal agencies to conduct hydraulic analysis and obtain necessary floodplain permits.
Water Resources/Quality		
◈ Water from roadways that may contain petroleum, sediment, or other pollutants would continue to flow into streams/gulches untreated.	◈ An increase of approximately 3 acres of impervious (paved) surfaces would, without water quality treatment, increase pollutant runoff into receiving waterways. ◈ Grading and earthmoving for road construction, bridge construction, dewatering activities, and temporary stream diversions may cause erosion or sedimentation of gulches within the impact area, particularly during periods where bare surfaces are exposed.	◈ Permanent water quality treatment features will be included in the final design to collect and treat roadway runoff by filtering pollutants before discharging stormwater into area waterways. ◈ A Colorado Discharge Permit System - Stormwater Construction Permit (SCP) will be required for this project. A Stormwater Management Plan will be developed in accordance with the conditions of the SCP. ◈ A construction dewatering permit will be obtained. ◈ Erosion and sediment control BMPs will be implemented in accordance with CDOT Standard Specifications for Road and Bridge Construction and the revised provisions for water quality outlined in the Consent Order with CDPHE and incorporated into Section 107.25 (Water Quality) and Section 208 (Erosion Control).

EXHIBIT 3-24: SUMMARY OF IMPACTS AND MITIGATION, US 6/WADSWORTH ENVIRONMENTAL ASSESSMENT (CONT.)

Impacts of the No Build Alternative	Impacts of the Build Alternative	Mitigation Measures for the Build Alternative
Wetlands and Waters of the United States		
◈ No wetlands or waters of the United States (WUS) would be affected. ◈ Drainages would continue to be confined and channelized, providing little opportunity for wetlands to establish along riparian areas.	◈ The realignment/expansion of McIntyre, Lakewood, and Dry Gulches to convey 100-year flows would result in temporary disruption of flow to 0.27 acre of WUS and fill of 0.02 acre of associated wetlands.	◈ CDOT will obtain a Section 404 permit from the USACE for impacts to wetlands and WUS. USACE has confirmed informally that a Nationwide Permit would be applicable. ◈ A wetland finding will be completed during final design and will include a final assessment of impacts and a detailed plan for mitigation. ◈ Unavoidable impacts to wetlands resulting from the Build Alternative will be mitigated on a one-for-one basis
Cumulative Impacts		
◈ Because CDOT would not take any action under the No Action Alternative, effects of its actions cannot combine with other projects to create cumulative effects. (Other foreseeable projects would be implemented.)	◈ Beneficial cumulative impacts to floodplains, riparian habitat and wetlands, pedestrian and bicycle facilities, noise, socioeconomic conditions, transportation, water quality, and hazardous wastes from US 6/Wadsworth project combined with other development/ redevelopment projects in the study area, including the West Corridor LRT, future phases of Belmar development, and the redevelopment of the Denver Federal Center.	◈ No mitigation necessary.

CHAPTER 4
Section 4(f) Evaluation

4.1 INTRODUCTION

This evaluation assesses impacts of the proposed US 6/Wadsworth project on parks and historic properties. It was prepared in compliance with Section 4(f) of the Department of Transportation Act and is supplemented by other analyses in this EA and the following reference documents: *Alternatives Development and Screening Technical Memorandum* (CH2M HILL, 2008a), *Historic Resources Survey: US 6 and Wadsworth, Lakewood, Colorado* (TEC, 2008), and *Determination of Effects to Historic Properties* (CH2M HILL et al., 2008b). Reference materials are available in Appendix D to the EA.

4.2 SECTION 4(f)

Section 4(f) of the Department of Transportation Act of 1966, as amended, and codified in 49 United States Code (U.S.C.) § 303, declares that "[i]t is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites."

Section 4(f) prohibits FHWA from approving the use of a publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of a historic site of national, state, or local significance unless:

- A determination is made that 1) there is no feasible and prudent avoidance alternative to use of land from the property, AND 2) the action includes all possible planning to minimize harm to the property resulting from such use, OR
- The use of the property, including any measures to minimize harm, will have a *de minimis* impact on the property.

There are three types of Section 4(f) uses: direct use, temporary use, and constructive use. Because this project would not result in any temporary or constructive uses, they are not discussed further.

4.2.1 DIRECT USES

A direct use takes place when the land is permanently incorporated into a transportation facility.

4.2.2 *DE MINIMIS* IMPACTS

Certain uses of Section 4(f) land may have a minimal or *de minimis* impact on the protected resource. When this is the case, FHWA can make a *de minimis* impact determination. Properties with a *de minimis* determination do not require an analysis of avoidance alternatives or a least harm analysis (23 CFR 774.17[5]; FHWA, 2005a).

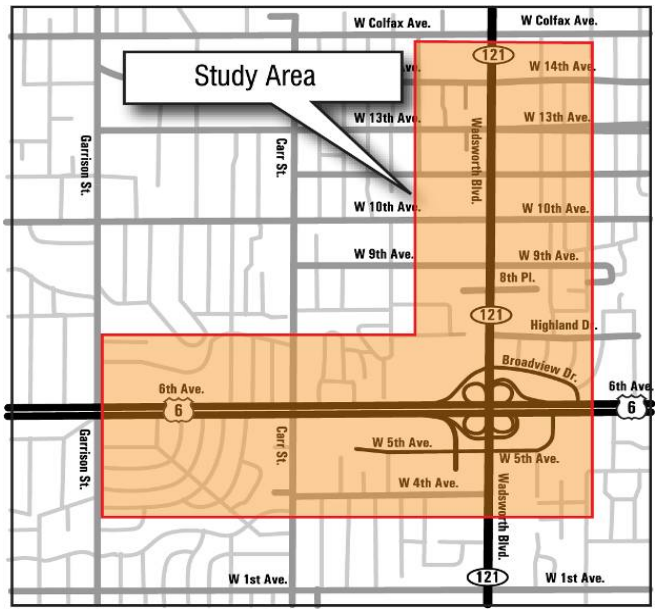
The *de minimis* impact criteria and associated determination are different for historic sites than for parks, recreation areas, and wildlife and waterfowl refuges.

- For publicly owned parks, recreation areas, and wildlife and waterfowl refuges, *de minimis* impacts are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource. The public must be afforded an opportunity to review and comment on the findings.
- For historic sites, *de minimis* impacts are defined as the determination of either "no adverse effect" or "no historic properties affected" in compliance with Section 106 of the National Historic Preservation Act. FHWA must notify SHPO of its intent to make a *de minimis* finding.

4.3 PURPOSE AND NEED

The purpose of the US 6 and Wadsworth project is to improve traffic flow and safety, accommodate high traffic volumes, and increase multi-modal travel options and connections at the US 6 and Wadsworth interchange and along Wadsworth between 4th Avenue and 14th Avenue. The project is located entirely within central Lakewood in Jefferson County, Colorado (see Exhibit 4-1).

EXHIBIT 4-1: PROJECT LOCATION



Improvements are needed to:

- Improve safety for motorists, pedestrians, and bicyclists
- Improve the operational efficiency of the interchange
- Meet current and future traffic demands
- Support multi-modal connections

Chapter 1 of the EA provides additional details about the purpose and need for this project.

4.4 FEASIBLE AND PRUDENT ALTERNATIVES

The first test under Section 4(f) is to determine which alternatives are feasible and prudent. An alternative is feasible if it is technically possible to design and build.

The second part of the standard involves determining whether an alternative is prudent. According to FHWA regulations (23 CFR 774.17), an alternative may be rejected as not prudent for any of the following reasons:

i) It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
ii) It results in unacceptable safety or operational problems;
iii) After reasonable mitigation, it still causes:
   a) Severe social, economic, or environmental impacts;
   b) Severe disruption to established communities;
   c) Severe disproportionate impacts to minority or low-income populations; or
   d) Severe impacts to environmental resources protected under other federal statutes;
iv) It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
v) It causes other unique problems or unusual factors; or
vi) It involves multiple factors in paragraphs (3)(i) through (3)(v) of this definition, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

Where sufficient analysis demonstrates that a particular alternative is not feasible and prudent, the analysis or consideration of that alternative as a viable alternative comes to an end. If an alternative is identified that avoids the use of Section 4(f) properties, it must be selected. No prudent and feasible avoidance alternative was identified for this project.

The US 6/Wadworth project considered 14 interchange alternatives. Five of these were determined to be feasible and prudent but none of the feasible and prudent alternatives avoided Section 4(f) resources, as summarized in Exhibit 4-2. Additional details on these alternatives are available in reference documents included in Appendix D to the EA (CH2M HILL, 2008a; CH2M HILL et al., 2008b; CH2M HILL, 2009h).

EXHIBIT 4-2: SUMMARY OF FEASIBLE AND PRUDENT ALTERNATIVES

Alternative	Feasible and Prudent?[1]	Avoids 4(f) Use?
No Build Alternative; no reconstruction of interchange	**No**. Not prudent (i). Does not meet purpose and need to improve safety, capacity, interchange operations, multimodal connections.	**Yes**
Tight Diamond with Loop Interchange (Build Alternative); similar to the Tight Diamond (see below) except it maintains a loop ramp in the NW quadrant of the interchange, and there would be no traffic signal at the intersection of the loop ramp with Wadsworth; maintains off-ramp and frontage road in NE quadrant	**Yes**	**No**. Requires use of four historic properties (5JF4536, 5JF4542, 5JF3549, and 5JF3548).
Traditional Diamond Interchange; most common interchange type with one entrance and one exit in each direction; on- and off-ramps meet at two signalized intersections; ramps form a diamond shape when viewed from the air; maintains off-ramp and frontage road in NE quadrant	**Yes**	**No**. Requires use of four historic properties (5JF4536, 5JF4542, 5JF3549, and 5JF3548).
Tight Diamond Interchange; like a traditional diamond, except entrance and exit ramps are shifted closer to the freeway; maintains off-ramp and frontage road in NE quadrant	**Yes**	**No**. Requires use of four historic properties (5JF4536, 5JF4542, 5JF3549, and 5JF3548).
Single Point Urban Interchange; similar to a diamond interchange but with all ramps controlled by a single set of traffic signals; maintains off-ramp and frontage road in NE quadrant	**Yes**	**No**. Requires use of four historic properties (5JF4536, 5JF4542, 5JF3549, and 5JF3548).
Partial Cloverleaf Interchange; uses loop ramps for two of the left-turn movements and straight ramps to handle the other two left-turn movements; maintains off-ramp and frontage road in NE quadrant	**Yes**	**No**. Requires use of four historic properties (5JF4536, 5JF4542, 5JF3549, and 5JF3548).
Partial Cloverleaf with Flyover Ramp Interchange; like the partial cloverleaf except the highest-volume traffic movement (in NW quadrant) is handled on an elevated ramp; maintains off-ramp and frontage road in NE quadrant	**No**. Not prudent (iii). Would result in cumulatively severe impacts. Would result in unacceptable social impact from increased noise in a community already severely affected by traffic noise. Would result in increased community disruption from nearly twice as many relocations as compared with other alternatives. Would increase construction costs by more than 20 percent, which would be excessive given transportation budget constraints.	**No**
Full Cloverleaf Interchange with Collector-Distributor Roads; enlarges the four loop ramps to meet current design standards and expands the frontage road system between ramps to eliminate weaving conflicts on mainline US 6; maintains off-ramp and expands frontage road in NE quadrant	**No**. Not prudent (i). Does not meet purpose and need to improve pedestrian and bicycle safety because pedestrians and bicycles would still need to cross free-flow loop ramps in all quadrants of the interchange. Would result in highest number of relocations and greatest cost of options considered.	**No**
Diverging Diamond Interchange; rare interchange type that would remove left turns in the intersection by requiring Wadsworth drivers to briefly cross opposite lanes of traffic at two crossover intersections; maintains off-ramp and frontage road in NE quadrant	**No**. Not prudent (i). Does not meet purpose and need for improved capacity on Wadsworth. Although it does not add signals, drivers would need to slow down to negotiate crossing opposing traffic. Confused drivers also would likely slow down because crossing into opposite travel lane violates expectations.	**No**
Folded Diamond Interchange; folds westbound US 6 to northbound Wadsworth onto loop ramp in NW quadrant for westbound US 6 to southbound Wadsworth traffic; maintains existing frontage road but removed off-ramp in NE quadrant	**No**. Not prudent (i). Does not meet purpose and need. Would increase congestion along US 6 and at the US 6/Wadsworth interchange because all northbound and southbound Wadsworth traffic would exit at one location, and the deceleration lane would not be long enough to handle queues. Operational efficiency of the consolidated loop ramp exit would be compromised to the point that the loop ramp would not function as a free-flow ramp. A signal would be required for northbound Wadsworth, and a double-lane exit ramp would be inefficient and potentially confusing to drivers.	**Yes**
Close frontage road in NE quadrant and reconstruct interchange; maintains an off-ramp in the NE quadrant but removes the frontage road and uses the frontage road area for off-ramp	**No**. Not prudent (iii). Would result in severe community disruption, as all properties along the frontage road, including historic properties, would need to be acquired because they would have no access.	**No**
Improve Kipling and/or Sheridan interchanges to divert Wadsworth traffic; maintains existing Wadsworth interchange and focuses capacity improvements on the adjacent US 6 interchanges	**No**. Not prudent (i). Does not meet purpose and need for safety improvements at the Wadsworth interchange. Would not address traffic demands for access to destinations along Wadsworth or for north-south regional travel.	**Yes**

[1] As noted in Section 4.4, alternatives are defined as not prudent based on standards contained in 23 CFR 774.17. Where an alternative is deemed not prudent in Exhibit 4-2, the standard is noted. For instance if an alternative does not meet purpose and need, it is presented as "Not prudent (i)."

Because all feasible and prudent alternatives use land from Section 4(f) resources, the next step in the evaluation is to determine which alternative results in the least overall harm to the 4(f) resources. The discussion of least harm is presented in Section 4.6.4.

4.5 PARKS AND RECREATION RESOURCES

4.5.1 DESCRIPTION OF 4(f) RESOURCES

There is one Section 4(f) park resource within the construction limits of the Build Alternative. Two Creeks Park is a planned 3.35-acre recreational facility located east of Wadsworth between 10th and 12th Avenues. Only a small "finger" of the property associated with the confined Dry Gulch drainage channel is adjacent to Wadsworth. Dry Gulch runs through the southern portion of the property. The boundaries of the park are outlined in black in Exhibit 4-3.

EXHIBIT 4-3: BOUNDARIES OF TWO CREEKS PARK

The City of Lakewood acquired the Two Creeks Park property in 2007. The acquisition was funded by Jefferson County Open Space for the express use as a park. The City Parks Manager identifies the planned park as a significant recreation resource and envisions developing trails and providing picnic tables to support recreational use of the property (CH2M HILL, 2009g).

The property is not currently used for recreation or park purposes, and Lakewood has neither a specific plan nor funds to develop the property in the next 5 years. The park is not reflected either in Lakewood's Comprehensive Plan or the adopted Neighborhood Plan, yet both plans identify the need for a park in the area. Although not formally designated in planning documents as a park, FHWA determined that the Two Creeks Park does qualify as a Section 4(f) recreation resource because the property acquisition is recent, the need for a park in the area is documented in land use plans, the acquisition is expressly for a park, and budgetary limitations, not intent, require development of the park to be phased.

4.5.2 *DE MINIMIS* IMPACTS

Impacts to the proposed park area are associated with replacing the Dry Gulch box culvert under Wadsworth. The existing culvert (Exhibit 4-4) is undersized to carry a 100-year flood and must be widened; it must also be lengthened to accommodate the widened Wadsworth roadway section.

EXHIBIT 4-4: DRY GULCH CULVERT

The new culvert would extend farther into the park property, incorporating an additional 0.11 acre of the drainage channel, resulting in a Section 4(f) use. These impacts would not adversely affect the future activities, features, or attributes of the planned Two Creeks Park. The affected land could not support an active recreation purpose because of the confinement of the channel.

4.5.3 CONSULTATION AND COORDINATION

The project team has coordinated with Lakewood and the Urban Drainage and Flood Control District. Each contributed to the design of the Build Alternative and recommended drainage improvements in the area of the planned Two Creeks Park. Lakewood concurs that expansion of the culvert would not adversely affect the

activities, features, and attributes that qualify Two Creeks Park for protection under Section 4(f).

Public comments on the impacts to the planned park will be solicited at the EA public hearing. After consideration of public input, FHWA will make a final determination on this *de minimis* finding.

4.6 HISTORIC RESOURCES

The US 6/Wadsworth project would require use of property from eight Section 4(f) historic resources.

4.6.1 *DE MINIMIS* IMPACTS

As summarized in Exhibit 4-5, the Build Alternative would result in *de minimis* impacts to two individual historic properties and two historic districts. Based on concurrence with the determinations of No Adverse Effect for these four Section 4(f) resources, FHWA has informed SHPO of its intent to make *de minimis* impact determinations.

4.6.2 DIRECT USES

Under all feasible and prudent alternatives, four historic homes would be directly used. Photographs of these resources are presented in Exhibit 4-6. They are described briefly below, with additional details available in the *Historic Resources Survey, US 6 and Wadsworth Boulevard, Lakewood, Colorado* (TEC, 2008), included in Appendix D to this EA.

- **Property 5JF3548** (7395 W. 6th Ave. Frontage Road) is a one-story, single-family house built in 1946. It is eligible for listing in the NRHP under Criterion C for its representative English Norman Cottage architecture.
- **Property 5JF3549** (7423 W. 6th Ave. Frontage Road) is a one-story, single-family residence built in 1939. It is eligible for listing in the NRHP under Criterion C because it is representative of the Mediterranean Revival architectural style.
- **Property 5JF4542** (7433 W. 6th Ave. Frontage Road) is a one-story, single-family house built in 1940. It is eligible for listing in the NRHP under Criterion C because it is representative of the Minimal Traditional architectural style.
- **Property 5JF4536** (700 Wadsworth Blvd.) is a one-story residence that has been converted to commercial use. It was constructed in 1947 and is eligible for listing in the NRHP under Criterion C because it is a good example of a late 1940s residence that blends the Ranch and Usonian architectural styles.

EXHIBIT 4-5: SUMMARY OF *DE MINIMIS* IMPACTS FOR SECTION 4(f) HISTORIC RESOURCES

Site Number	Address	Date	Description	NRHP Eligibility	Impact
5JF4511	1215 Wadsworth Blvd.	1918, 1948/ 1949	Dutch Colonial Revival single-family residence	Officially eligible, Criterion A, association with Lakewood's agricultural history	Partial acquisition (0.08 acre) of historic property frontage
5JF4513	1230 Wadsworth Blvd.	1928	Craftsman Bungalow residence converted into a business	Criterion C, representative architecture	Acquisition of portion of property (0.03 acre) that does not contribute to historic significance
Lakewood School Historic District	West of Wadsworth to Allison Street between 10th and 12th Avenues	1927 to 1977	Public school complex	Officially Eligible Historic District, Criteria A and C as early public school campus in Jefferson County, association with community development, period architecture	Acquisition of a portion of property adjacent to Wadsworth (0.20 acre) that does not contribute to historic significance; no buildings or contributing landscape features affected
Green Acres Historic District	North of US 6 to 9th Place between Emerald Lane and Reed Street	Late 1940s to early 1960s	Post-World War II residential subdivision	Officially Eligible Historic District, Criteria A and C for association with the development of Lakewood and as a representative post-World War II subdivision	Construction of sound wall near south and west boundaries of the district; permanent easement required from corner of one contributing property; beneficial effects of restoration of neighborhood roads and reduction in traffic noise


5JF3548


5JF3549


5JF4542


5JF4536

EXHIBIT 4-6: SECTION 4(F) HISTORIC PROPERTIES

As summarized in Exhibit 4-7, all feasible and prudent interchange design concepts require use of these four historic properties. The use is the same for all because they share two primary features: the need for a longer deceleration lane for the westbound off-ramp on US 6 and the need for an improved frontage road connection to Wadsworth in the northeast quadrant of the interchange.

The three historic properties currently located on the frontage road (5JF3548, 5JF3549, and 5JF4542) would need to be acquired under each of the five options due to the requirements for the off-ramp design. The traditional diamond has the greatest encroachment into the historic properties because it shifts the ramp intersection with Wadsworth farther north. Although all alternatives require relocation of the primary residence, the tight diamond and single-point urban interchange (SPUI) alternatives have a greater encroachment into the properties than the tight diamond with loop or partial cloverleaf alternatives because these designs require a signal at Wadsworth and, therefore, need a wider, multi-lane intersection for vehicle storage on the ramp.

Site 5JF4536 (at the intersection of the frontage road and Wadsworth) would need to be acquired to widen Wadsworth and add an auxiliary lane for merging, which are features common to all of the alternatives.

4.6.3 LEAST HARM ANALYSIS

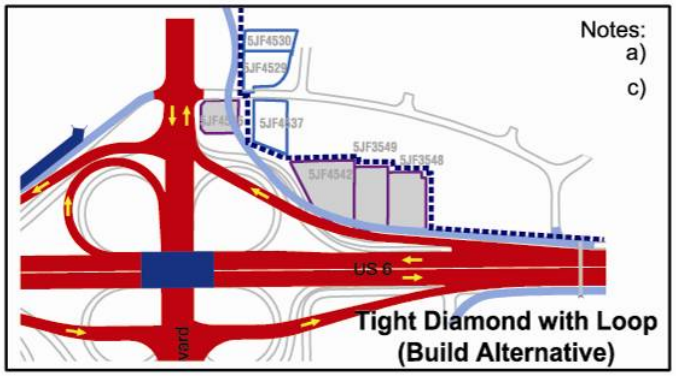
The Section 4(f) regulation states that, if there is no feasible and prudent alternative that avoids use of Section 4(f) properties, FHWA "may approve only the alternative that causes the least overall harm in light of the statute's preservation purpose." The "least overall harm" is determined by balancing the relative magnitude of Section 4(f) impacts, including, among other factors, the importance of affected Section 4(f) resources and the relative effectiveness of the alternatives to meet the project's purpose and need.

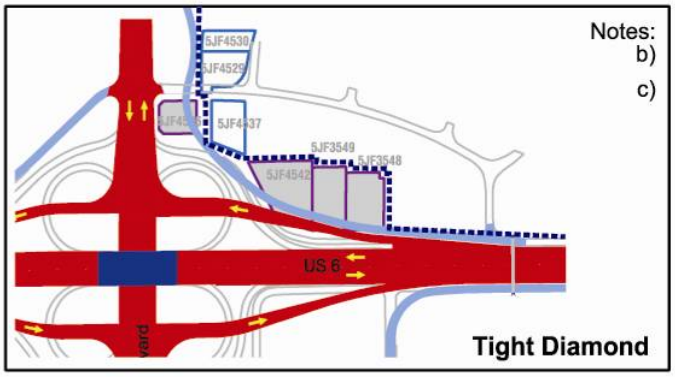
Exhibit 4-8 summarizes the uses associated with the remaining alternatives. The direct use of Section 4(f) properties as similar. In determining the alternative with the overall least harm, the preservationist purpose of Section 4(f) must be balanced against the impact to other resources and the ability of the project to meet the purpose and need, the costs associated with the alternative, and the views of the officials with jurisdiction over the Section 4(f) properties. In comparing the remaining alternatives, there is not any single consideration, or cumulative factors that would argue that any one alternative has less harm than any of the others. In such a case, FHWA can consider any of the remaining alternatives, and the Tight Diamond with Loop has been identified as the least overall harm alternative.

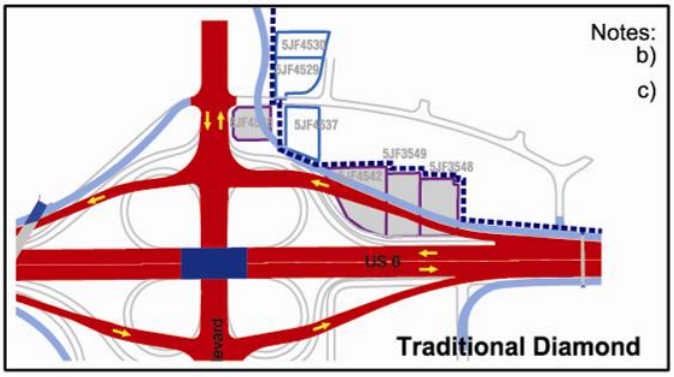
EXHIBIT 4-7: SUMMARY OF DIRECT USES OF SECTION 4(f) HISTORIC RESOURCES

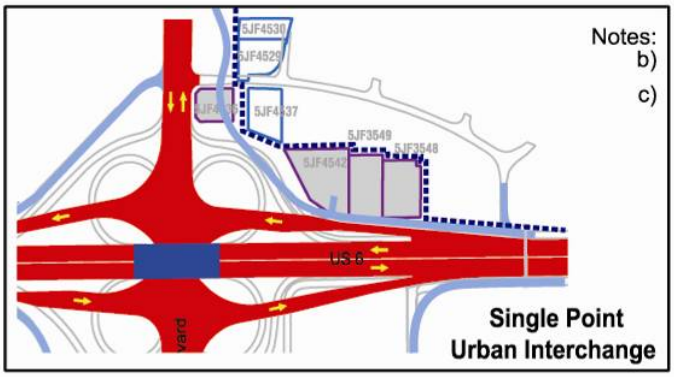
Historic Property	Tight Diamond with Loop	Traditional Diamond	Tight Diamond	SPUI	Partial Cloverleaf	Relative Net Harm
5JF3548	Full acquisition and demolition of building	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Equal
5JF3549	Full acquisition and demolition of building	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Equal
5JF4542	Full acquisition and demolition of building	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Equal
5JF4536	Full acquisition and demolition of building	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1	Equal

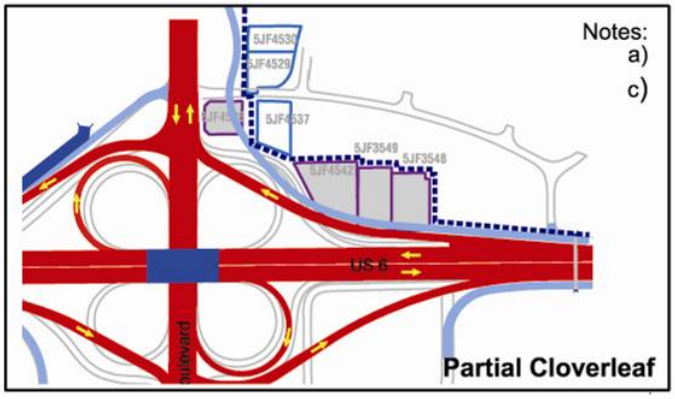
EXHIBIT 4-8: LEAST HARM ANALYSIS











LEGEND

- New Structure
- Existing Structure/Road
- Interchange
- New Frontage Road
- Contributing to Historic District
- Individually Eligible for the NRHP
- Acquisition

a) Yield condition and lack of signal at Wadsworth (because left turns for southbound traffic are handled through the loop ramp and the auxiliary lane allows free-flow right turns for northbound traffic) requires single lane to intersection, resulting in a narrower footprint in the vicinity of historic properties.

b) Multi-lane intersection off ramp required for vehicle queuing at Wadsworth traffic signal has larger footprint and encroaches farther into Section 4(f) properties. Need for wider intersection pushes frontage road through properties.

c) Widening of Wadsworth and need to add auxillary merging lane requires acquisition of 5JF4536 regardless of frontage road configuration.

4.6.4 MEASURES TO MINIMIZE HARM

After selecting the Tight Diamond with Loop as the Build Alternative, interchange design elements were considered to determine if impacts to historic properties could be minimized, while still maintaining a design that meets safety, capacity, and multimodal needs. As illustrated in Exhibit 4-9, the location and width of the following design elements were considered carefully to minimize impacts to historic properties:

- Location of the gore area (the area needed for cars to recover if they miss the exit) for the westbound US 6 off-ramp;
- Taper for the off-ramp;
- Distance between the frontage road and off-ramp; and
- Length of the deceleration lane for the loop ramp.

The design team also considered removing the acceleration lane on Wadsworth associated with the northeast off-ramp. As described in Exhibit 4-9, none of these options could be incorporated into the Build Alternative without compromising the purpose and need for the project.

In addition to modifying design elements, the project team evaluated moving the houses at historic properties 5JF3548, 5JF3549, and 5JF4542 farther back on their existing lots and maintaining the properties in residential use rather than demolishing the buildings. After evaluating this option, CDOT determined that moving the houses is not a practicable avoidance or minimization measure. Moving the properties would diminish the historic integrity of the resources to the point that they would no longer be eligible for listing in the NRHP (and thus, the properties would no longer qualify for Section 4(f) protection). In addition, the cost, complexity, and administration of a conservation easement and difficulty in finding a new owner familiar with and willing to accept the restrictions of this agreement would create significant challenge to executing this action in a timely manner.

While measures to avoid, minimize, or reduce impacts to the four historic properties could not be incorporated into the project, compensatory mitigation measures for demolishing the properties are being evaluated and will be contained in a Memorandum of Agreement (MOA) among CDOT, FHWA, and the Colorado SHPO. Mitigation measures will focus on those that will add to the local historical record and support Lakewood's historic preservation goals.

EXHIBIT 4-9: DESIGN FEATURES OF THE TIGHT DIAMOND WITH LOOP INTERCHANGE AND CONSIDERATION OF IMPACTS TO SECTION 4(f) RESOURCES

Fourth lane add for Wadsworth between off ramp and Highland Drive

The fourth northbound lane on Wadsworth is needed to receive the dedicated right turn lane from the westbound to northbound exit ramp to ensure safety and avoid traffic operation issues on US 6 and Wadsworth.

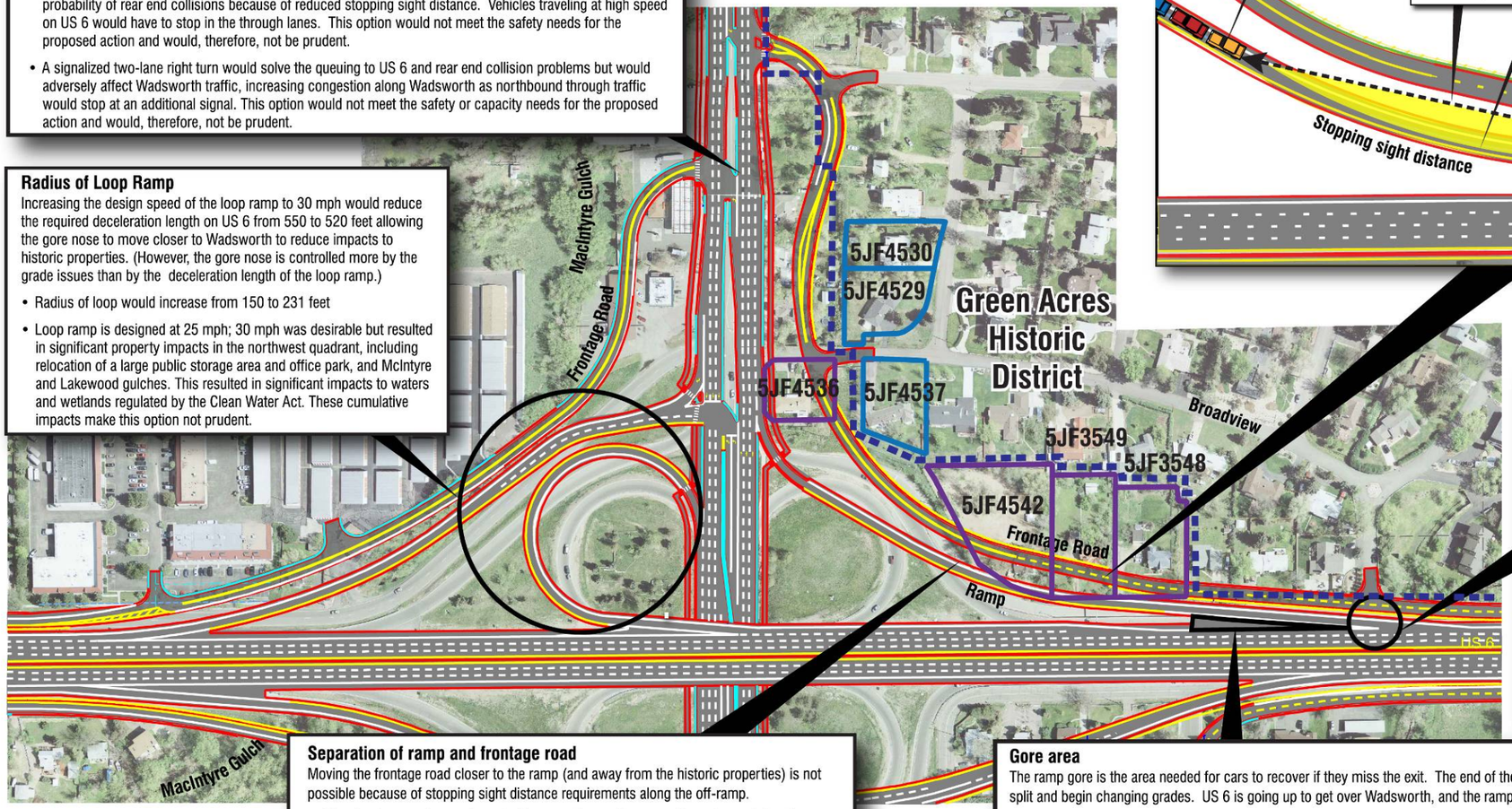
Without a fourth northbound receiving lane:

- A single lane yield would create a queue on the ramp that extends to US 6 mainline. It would increase the probability of rear end collisions because of reduced stopping sight distance. Vehicles traveling at high speed on US 6 would have to stop in the through lanes. This option would not meet the safety needs for the proposed action and would, therefore, not be prudent.
- A signalized two-lane right turn would solve the queuing to US 6 and rear end collision problems but would adversely affect Wadsworth traffic, increasing congestion along Wadsworth as northbound through traffic would stop at an additional signal. This option would not meet the safety or capacity needs for the proposed action and would, therefore, not be prudent.

Radius of Loop Ramp

Increasing the design speed of the loop ramp to 30 mph would reduce the required deceleration length on US 6 from 550 to 520 feet allowing the gore nose to move closer to Wadsworth to reduce impacts to historic properties. (However, the gore nose is controlled more by the grade issues than by the deceleration length of the loop ramp.)

- Radius of loop would increase from 150 to 231 feet
- Loop ramp is designed at 25 mph; 30 mph was desirable but resulted in significant property impacts in the northwest quadrant, including relocation of a large public storage area and office park, and McIntyre and Lakewood gulches. This resulted in significant impacts to waters and wetlands regulated by the Clean Water Act. These cumulative impacts make this option not prudent.



Taper for off-ramp

The length of the taper is controlled by deceleration length requirements and alignment constraints.

- Deceleration length is based on the mainline US 6 design speed of 70 mph to ramp design speed of 50 mph.
- The angle of deflection and location of taper is based on horizontal geometric constraints created by US 6 increasing in elevation to go over Wadsworth. Because of the need to elevate US 6 bridge over Wadsworth, moving the Wadsworth offramp departure west, shortens the distance for the ramp to meet Wadsworth grade and results in either too steep a grade or extending the ramp into northbound Wadsworth traffic lanes (essentially eliminating any fourth add lane). The fourth lane is necessary to meet capacity needs on Wadsworth. This option would not be feasible and prudent because it cannot be designed without eliminating a key requirement of the project purpose and need.

Contributing to Green Acres Historic District

Individually eligible for the NRHP

Historic District Boundary

Separation of ramp and frontage road

Moving the frontage road closer to the ramp (and away from the historic properties) is not possible because of stopping sight distance requirements along the off-ramp.

- If the frontage road were closer to the ramp, the roadway would create an obstruction blocking the line of sight for drivers exiting US 6 (see stopping sight distance illustration). This option would not meet the safety needs for the proposed action and would, therefore, not be prudent.
- Ramp could be moved closer to US 6 at the west end but not enough to save the historic properties, the gore nose location still controls the eastern end of the ramp (where 5JF 3548 is located). This option would therefore, not avoid or minimize use of historic properties

Gore area

The ramp gore is the area needed for cars to recover if they miss the exit. The end of the gore, or gore nose, is the point where the ramp and the mainline split and begin changing grades. US 6 is going up to get over Wadsworth, and the ramp is going down to meet Wadsworth.

- The off-ramp has been designed to minimize impacts to 5JF3548. Moving the gore west would raise its elevation and require a longer ramp to get back down to Wadsworth and move the merging intersection with Wadsworth north, decreasing the merge distance of the fourth lane. Reducing the merge distance would not meet the capacity needs of Wadsworth and, therefore, does not meet the project purpose and need.
- Moving the gore nose to the west also would impact the deceleration length for the westbound US 6 to southbound 25 mph Wadsworth loop ramp. Shortening the deceleration length would not meet the capacity needs of the interchange and would affect mainline US 6 traffic. This option, therefore, would not meet purpose and need. Shortening the deceleration length would be possible if the loop was a higher design speed but the higher speed requires a larger loop creating significant additional property impacts (see Radius of Loop Ramp discussion).

CHAPTER 5
Consultation and Coordination

This chapter describes the communications and coordination that have occurred with stakeholders during the EA process. Coordination with stakeholders has focused on early identification of issues, cooperative resolution of issues, and open and honest communication. The *Stakeholder Involvement Plan* (CH2M HILL, 2007g) is available in Appendix D to this EA.

5.1 AGENCY CHARTER

To achieve better and more timely participation with the agencies involved in the project, the team established a charter agreement on June 15, 2007, with the five primary project participants: FHWA, CDOT, RTD, Lakewood, and CH2M HILL. At its foundation, the charter established the purpose of the study: to deliver a NEPA decision document that is endorsed and supported by the public and stakeholders. The charter also identified goals and values for the project and team interactions, formally articulated the roles and responsibilities of participants for the study, and provided a structured decision process where team members would provide concurrence at key milestones in the NEPA process. The team also agreed to implement streamlining techniques into this EA that could be tested and potentially applied to future projects.

5.2 AGENCY COORDINATION

Resource and regulatory agencies outside of the charter team and other departments within CDOT and FHWA have been consulted as part of the agency coordination process. As described in the *Scoping Summary Report* (CH2M HILL, 2007f), 23 agencies, listed in Exhibit 5-1, were invited to a formal scoping meeting on August 16, 2007, to identify issues of concern. Other CDOT and FHWA departments were also invited to this meeting. Each participant was provided a copy of two reports in advance of the scoping meetings. The *Existing Conditions Report of Engineering Design Elements* (CH2M HILL, 2007d) provided background information on the transportation problems and "geometric health" of the existing transportation system, which informed the purpose

EXHIBIT 5-1: AGENCIES CONSULTED ON US 6/WADSWORTH STUDY

Local Agencies
City of Lakewood
Denver Regional Council of Governments
Jefferson County Administration
Jefferson County Department of Health and Environment
Jefferson County Division of Highways and Transportation
Jefferson Economic Council
Regional Air Quality Council
Regional Transportation District
Urban Drainage and Flood Control District
State Agencies
Colorado Department of Local Affairs
Colorado Department of Public Health and Environment, Air Pollution Control Division
Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division
Colorado Division of Local Government
Colorado Division of Wildlife
Colorado State Parks
State Historic Preservation Office
Federal Agencies
Department of Interior, Office of Environmental Policy and Compliance
Department of Housing and Urban Development
Federal Emergency Management Agency
Federal Transit Administration
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

Source: CH2M HILL.

and need for the US 6/Wadsworth project. The *Summary of Existing Conditions Report* (CH2M HILL, 2007a) outlined the important environmental resources that would need to be fully evaluated in the EA, identified resources of less importance in this project context that would not be analyzed in detail, and provided recommendations about methodologies to be used for impact analysis.

Scoping input received from resource agencies indicated agreement with the identified purpose and need and recommended level of environmental analysis. Letters were sent to the same agencies in February 2008 and June 2008 to inform them of study progress at key milestones. The agencies have received a copy of this EA and will have the opportunity to comment on its findings during the 45-day review period and at an upcoming agency review meeting, discussed in Section 5.4.

Formal consultation with the Colorado SHPO has been conducted to fulfill the requirements of Section 106 of the National Historic Preservation Act. In addition to the scoping meeting and letters sent to all agencies, described above, consultation has included the following additional steps: consultation on the boundaries of the area of potential effect (APE), which resulted in no objections from the SHPO; submittal of the determination of eligibility of historic resources, which resulted in concurrence from the SHPO; and submittal of the determination of effects to historic resources, which also resulted in concurrence from the SHPO. Negotiations regarding mitigation for adverse effects to historic properties is under way and will be completed before CDOT and FHWA sign a decision document. Records of meetings and communications with each agency can be found in Appendix C to this EA.

Formal consultation with the USACE has been conducted to fulfill the requirements of Section 404 of the Clean Water Act. In addition to the agency scoping meeting and letters sent to all agencies, described above, consultation with the USACE has included the following additional steps: submittal of the *Wetland Delineation Report* and jurisdictional determinations and informal coordination regarding potential impacts and permitting requirements. The consultation with the USACE resulted in the recommendation that a Section 404 NWP 14 be obtained for impacts to wetlands and WUS. Coordination with the USACE will continue through final design and permitting.

5.2.1 AGENCY COORDINATION ACTIVITIES

Exhibit 5-2 lists the agency coordination activities that have occurred with local, state, and federal agencies. In addition to the activities listed in Exhibit 5-2, nine Technical Leadership Team meetings have been held to date with Lakewood and RTD to discuss study progress, come to consensus on key decisions, and fulfill the goals of the charter agreement.

EXHIBIT 5-2: AGENCY COORDINATION ACTIVITIES

Activity	Date
Lakewood project kickoff meeting	5/14/2007
NEPA training for Lakewood staff	6/6/2007
Lakewood planning meeting	6/14/2007
Agency chartering meeting	6/15/2007
DRCOG travel demand modeling meeting	8/8/2007
Agency scoping meetings	8/16/2007
Section 106 Consultation letters mailed to Native American tribes	9/14/2007
Lakewood City Council briefing	9/17/2007
UDFCD drainage coordination meeting	9/25/2007
SHPO area of potential effects meeting	11/15/2007
Area of potential effects consultation letter and memorandum mailed to SHPO and consulting parties	12/12/2007
SHPO letter documenting no objections to area of potential effects	12/26/2007
Progress letter mailed to agencies	2/18/2008
DRCOG traffic operations meeting	3/28/2008
Lakewood traffic review meeting	4/1/2008
Lakewood ROW impacts meeting	4/4/2008
Lakewood traffic review meeting	5/13/2008
Lakewood noise wall coordination meeting	6/30/2008
Progress letter mailed to agencies	6/18/2008
Lakewood City Council briefing	6/21/08
Determination of Eligibility consultation letter and report mailed to SHPO and consulting parties	7/2/2008
Lakewood/UDFCD drainage coordination meeting	7/9/2008

EXHIBIT 5-2: AGENCY COORDINATION ACTIVITIES (CONT.)

Activity	Date
Lakewood ROW impacts meeting	7/9/2008
Lakewood Development Assistance Team presentation	7/10/2008
Request from SHPO for additional information on historic resource eligibility	8/7/2008
Lakewood funding approaches meeting	8/15/2008
Lakewood ROW impacts meeting	9/5/2008
Submittal of *Wetland Delineation Report* and jurisdictional determinations to USACE	9/18/2008
Response to request for additional information and *Final Historic Resources Survey Report* sent to SHPO	10/10/2008
SHPO concurrence with determination of eligibility of historic resources	10/21/2008
USACE e-mail correspondence regarding wetland impacts and permitting	11/20/2008
Historic resource effects determination submitted to SHPO and consulting parties	12/9/2008
SHPO effects determination review meeting	12/9/2008
SHPO concurrence with determination of effects to historic resources	12/19/2008

Source: CH2M HILL.

5.2.2 KEY ISSUES RAISED

This section summarizes the key issues raised by agencies and the actions taken to address them.

Scoping Issues

Issue: The City of Lakewood should consider the impacts of zoning compliance on ROW acquisition. If zoning compliance is required of all affected properties, ROW acquisition could become an even more significant project cost and impact.
Action: Subsequent meetings were held with Lakewood to discuss this issue and determine level of nonconformity allowed.

Issue: Current NWP regulations for impacts to wetlands and waters of the United States may not provide coverage for project impacts, and an individual 404(b)(1) permit may be required.
Action: Subsequent coordination with USACE determined that NWP 14 can be applied to project impacts.

Issue: Coordination needs to occur with the Urban Drainage and Flood Control District (UDFCD) regarding flood improvements upstream of the project area.
Action: Subsequent meetings identified other improvements, which were incorporated into the modeling for project drainage improvements.

Post-Scoping Issues

Issue: CDOT should pay close attention to the height and aesthetic treatment of the noise wall proposed along the frontage road northeast of the interchange.
Action: CDOT has committed to consulting with Lakewood on the design of noise walls during final design.

Issue: CDOT should carefully consider how to manage excess ROW from parcels fully acquired.
Action: CDOT has explained to Lakewood and interested property owners the ROW policy that addresses disposal of excess property and parties entitled to first right of refusal. CDOT ROW policies also allow owners the ability to maintain ownership of uneconomic remnants if they desire.

5.3 PUBLIC INVOLVEMENT

Public involvement activities were crafted to identify community concerns, provide opportunities for input, and achieve public endorsement and support for the project. Public involvement activities have focused on building a high degree of public trust in the study and decision process. To build and maintain this trust, the project team established the following goals: develop a project that is compatible with community and municipal visions for the corridor; maintain open and honest communications; and thoroughly identify important community issues early in the planning process.

Numerous and timely communications with stakeholders have been essential to achieving these goals. A variety of outreach methods has been used to reach, engage, and inform stakeholders. The sections below describe the outreach efforts and involvement activities that have been conducted, and the important community issues that have been identified through these activities.

The public involvement activities conducted to date have helped build public trust in project decision makers and create widespread public support for the planning process and Build Alternative.

5.3.1 PUBLIC MEETINGS

Exhibit 5-3 lists the meetings that have occurred with public stakeholders. Meetings with individual groups were advertised by those groups to their members. Public meetings were advertised by: a) direct mailings to the project mailing list; b) flyers mailed and hand delivered to businesses and community centers; c) advertisements in the *Denver Post* and *Lakewood Sentinel*; and d) informational postings on Lakewood's Channel 8 and the project and local organization websites. Attendance at public meetings increased throughout the project; 70 people attended the first open house (public scoping meeting), 92 were in attendance at the second open house, and 127 attended the third open house.

EXHIBIT 5-3: PUBLIC MEETINGS

Activity	Date
Eiber Neighborhood Organization meeting	7/19/2007
Two Creeks Neighborhood Organization meeting	7/21/2007
West Colfax Community Association meeting	8/15/2007
Public Scoping Meeting	8/21/2007
Lakewood on Parade booth	8/25/2007
O'Kane Park Neighborhood Association meeting	8/28/2007
Alameda Gateway Community Association meeting	9/5/2007
Mid Lakewood Civic Association annual meeting	9/25/2007
Morse Park Neighborhood Organization meeting	10/11/2007
Informational meetings with schools	9/11/2007 – 10/4/2007
Business owner interviews	10/30/2008 – 12/5/2008
Public Open House #2 – present range of design concepts	2/12/2008
Eiber Neighborhood Organization meeting	3/13/2008
West Alameda Kiwanis meeting	4/2/2008
Two Creeks Neighborhood Organization meeting	4/19/2008
Eiber Neighborhood Organization meeting	4/22/2008
Public Open House #3 – present preferred alternative	4/29/2008
O'Kane Park Neighborhood Association meeting	4/29/2008
Public Open House #3, makeup date	5/21/2008
Noise Assessment and Mitigation meeting	6/4/2008
Property owner meetings	6/23/2008 – 7/8/2008
Two Creeks Neighborhood Organization meeting	6/21/2008
Alameda Gateway Community Association meeting	7/2/2008
West Colfax Community Association meeting	7/16/2008
Mid Lakewood Civic Association meeting	10/2/2008

Source: CH2M HILL.

5.3.2 PUBLIC OUTREACH EFFORTS

In addition to meeting with stakeholders, CDOT used other outreach activities to distribute project information. Some of those activities are described below. A complete listing of outreach activities is available in the *Stakeholder Involvement Plan* (CH2M HILL, 2007g) in Appendix D to this EA.

Direct mailings were sent to the entire mailing list, including: a) letter introducing the study and inviting recipients to the public scoping meeting; b) the January 2008 newsletter; c) the April 2008 newsletter; and d) the fall 2008 postcard update on study progress. As the study progressed, the mailing list expanded from an initial list of 550 addresses within three blocks of the project area to 3,700 addresses surrounding the project area between Garrison and Otis Streets.

Mailings and solicitations for interviews were sent to specific groups, including businesses and commercial property owners; area schools; and owners of potentially affected properties. Interviews with businesses along the corridor provided an opportunity to understand commercial operations within the study area; establish a line of communication if potential

property or business impacts are identified; clarify the scope of the NEPA study; and dispel rumors about the project, particularly related to the decision-making process and potential use of eminent domain. The business survey process also led to more than 100 new businesses being added to the mailing list. Meetings and discussions with owners of potentially affected properties provided similar benefits and established strong lines of communication with many of the property owners.

Regular updates were posted to the project website, www.US6Wadsworth.com.

Study updates were provided to neighborhood and business groups for publication in their quarterly newsletters.

5.3.3 SPECIALIZED OUTREACH TO MINORITY AND LOW-INCOME POPULATIONS

Specialized outreach efforts were employed to identify and engage minority and low-income stakeholders in the decision-making process.

Newsletters and the public scoping meeting invitation were mailed in both English- and Spanish-language versions to all addresses on the project mailing list.

English- and Spanish-language project fact sheets were placed in the registration packets of six area schools in August 2007 to introduce the study to the public.

An informational insert, printed in English and Spanish, was included in the Jefferson High School October 2007 newspaper, which was distributed to 3,000 families located in a geographic area containing identified minority and low-income populations. The insert provided basic project information and gave instructions for joining the mailing list.

Interviews were conducted with business owners throughout the project area to gather more information about possible minority or low-income employee populations.

Spanish translation has been offered at all public meetings. Newspaper advertisements and press releases have included telephone numbers for Spanish translation and information.

No requests for Spanish-language translation were received during the study, and no noticeable minority or low-income populations have become involved in the study. There are identified minority and low-income populations in the neighborhoods surrounding the project area; however, communications to date with the residents and businesses immediately adjacent to the project area indicate that those who would be most affected by the project do not fall into either category.

5.3.4 KEY ISSUES RAISED

Primary topics of interest have been noise, safety, pedestrian and bicycle access, traffic operations, accommodation of future transit, property acquisition, and construction staging.

Many other issues, from traffic signal timing to roadway maintenance concerns, have been prevalent in public discussions as well. CDOT has addressed many of these in the planning process and proposed design. Summaries of public discussion at the initial scoping meeting and subsequent open houses can be found in the meeting summary reports contained in Appendix D to this EA. Meeting minutes are available upon request. This section summarizes predominant issues raised consistently throughout the study and the actions taken to address them.

Issue: Provide noise mitigation on US 6 west of Wadsworth. Consider quiet pavement and absorptive wall materials for further noise reduction.
Action: Noise walls are proposed along US 6 between Wadsworth and Garrison Street. CDOT will consider various materials for walls during final design.

Issue: The design of the interchange and the unlimited access on Wadsworth lead to many accidents in the area.
Action: The proposed changes address the design deficiencies of the interchange and provide access control on Wadsworth, creating safer conditions for vehicles and other travel modes.

Issue: Provide dedicated pedestrian and bicycle facilities that meet ADA requirements for the length of Wadsworth through the project area. Provide safe pedestrian and bicycle crossings of US 6 on Wadsworth.
Action: The need for adequate pedestrian and bicycle facilities was incorporated into the purpose and need for the project, and these facilities are a critical component of the proposed action.

Issue: Cut-through traffic in neighborhoods is a concern. Consider land use changes and traffic impacts that will result from light rail and associated redevelopment.
Action: Changes to the design of frontage roads north of US 6 have been made in response to concerns about cut-through traffic. The traffic projections used for modeling future conditions take into account the light rail line and associated land use changes that are likely to occur.

Issue: Accommodate future transit on Wadsworth.
Action: The ability to accommodate future transit on Wadsworth was one of the criteria used to evaluate the project alternatives. The preferred alternative would provide a bridge on US 6 over Wadsworth that is long enough to accommodate future transit.

Issue: Desire to know how much ROW would be required and how many properties would be affected.
Action: CDOT mailed letters to owners of potentially affected properties providing information on potential impacts and the ROW acquisition process, and inviting property owners to contact CDOT to discuss potential impacts.

Issue: Coordinate construction with RTD West Corridor light rail and other planned project construction so that traffic impacts are manageable. Start construction as soon as possible.
Action: CDOT has taken note of these comments and will plan construction phasing in coordination with other projects, if a construction project is approved and funded.

Issue: Flooding on Wadsworth at Lakewood Gulch is a problem.
Action: Drainage improvements are proposed at all four gulches that cross the project area. The improvements would be substantial and would decrease surface water elevations so that the floodplain would no longer encroach upon the roadways.

5.4 REMAINING PUBLIC AND AGENCY INVOLVEMENT

During the EA review period, three types of activities are planned. A public hearing will be held to present the information in the EA and take formal public comments on the document. An agency review meeting will be held to present the impacts and proposed mitigation for the resources studied, and to receive comments from the agencies on the document. Presentations at neighborhood and business group meetings are also anticipated.

After the review period ends, all comments will be addressed in a formal response, which will be issued with the final decision on the project. A newsletter will be mailed to the entire mailing list at the end of the study to inform stakeholders of the study's conclusion. Agencies will receive notice of the availability of the final decision issued by FHWA.

CHAPTER 6
References

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Appendix A Glossary

The following terms and acronyms may be encountered in technical reports, plans, data, informational materials, or conversations about the US 6 and Wadsworth Environmental Assessment.

Access – Driveways, median openings, and intersections on a road. Entrance and exit ramps on a freeway.

Acceleration Lane – An auxiliary lane that allows vehicles to accelerate when entering the through-travel lane of the road or freeway.

Area of Potential Effect (APE) **–** the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

Arterial – A major road in a city or urban area that collects traffic and may be connected to the freeway system. Wadsworth Boulevard is an arterial.

Auxiliary Lanes – Lanes to the right or left of through-travel lanes that allow vehicles to accelerate or decelerate when entering or exiting the road or freeway. Auxiliary lanes help reduce slowdowns on the road or freeway and improve safety.

Average Daily Traffic (ADT) – The average number of vehicles two-way passing a specified point during a 24-hour period.

Best Management Practices (BMP) – Common sense actions, activities, prohibitions, and practices that protect or maintain the quality of a variety of resources during and after a construction project.

Capacity – The maximum flow rate at which vehicles can be expected to move on a given road segment, measured in vehicles per hour or passenger cars per hour.

Centerline – A line that is equidistant from the sides of a road. The centerline typically shows the horizontal alignment of a road.

Cloverleaf Interchange – An interchange design that provides free-flowing movements between a road and a freeway by using loop ramps to handle left turns onto or off of the freeway. A cloverleaf interchange typically contains four loop ramps. The existing US 6/Wadsworth Boulevard interchange is a cloverleaf interchange.

Collector-Distributor (CD) Road – Freeway travel lanes on the far right that are physically separated from through-travel lanes to provide access to and from the freeway. Collector–distributor roads provide better flow for the through traffic by separating it from the merging and weaving vehicles at entrance ramps and exit ramps.

CDOT – The Colorado Department of Transportation, which manages the network of highways within the state.

Conflict Point – Any point where the paths of two through or turning vehicles diverge, merge, or cross.

Curb and Gutter – A curb is the raised edge built along the edge of a road. It connects with a gutter, which is the low area that carries water to the storm sewer.

dBA – The abbreviation for A-weighted decibel, the unit used to measure “weighted” sound levels. Noise levels are generally weighted to reflect the fact that the human ear responds differently to sounds of various levels and frequencies.

Deceleration Lane – An auxiliary lane that allows vehicles to decelerate when leaving the through-travel lane of the road or freeway.

Design Speed – The maximum speed at which a vehicle can be operated safely on a road in perfect conditions.

Diamond Interchange – The most common interchange design, usually consisting of four ramps (two entrance ramps and two exit ramps). Diamond interchanges have a diamond shape when viewed from

the air. Examples near the project area include US 6 and Indiana Street, and US 6 and Sheridan Boulevard.

Eastbound (EB) – Traveling or heading east.

Entrance Ramp – Also called an on-ramp, this is a road segment of one or two lanes used by traffic to move from the surface streets to connect to the freeway.

Environmental Assessment (EA) – A public document produced as part of the federal National Environmental Policy Act (NEPA) process that evaluates potential impacts of transportation projects in order to determine whether an Environmental Impact Statement (EIS) is necessary.

Environmental Impact Statement (EIS) – A public document produced as part of the NEPA process required for "major Federal actions that significantly affect the quality of the human environment" (NEPA Section 102[c]) to inform decision makers and the public of the proposed action, reasonable alternatives, and their environmental impacts.

Exit Ramp – Also called an off-ramp, this is a road segment of one or two lanes used by traffic to move off of the freeway to connect to the surface streets.

External Intersection – Intersection that is not part of the interchange. In the US 6/Wadsworth study area, this includes intersections of Wadsworth Boulevard with frontage roads or other cross streets.

Federal Highway Administration (FHWA) – The branch of the federal Department of Transportation that oversees the national highway system. The FHWA works with CDOT on projects affecting national highways in Colorado (such as US 6).

Floodplain – An area adjacent to a stream or river that is inundated periodically by high flows.

FONSI – A Finding of No Significant Impact, or FONSI, is a public decision document by a federal agency under NEPA that briefly presents the reasons why an action will not have a significant effect on the human or natural environment and for which an EIS, therefore, will not be prepared.

Freeway – A divided highway facility having two or more travel lanes in each direction for the exclusive use of through traffic and full access control. US 6 is a freeway.

Frontage Road – A road that parallels a major transportation facility such as a freeway. It serves to collect and distribute local traffic adjacent to the major facility without impeding traffic flow on the facility. Frontage roads are also referred to as "access," "feeder," and "service" roads.

Gore – The area needed for cars to recover if they miss their exit.

Gore Nose – The end of the gore and the point at which the ramp and the mainline split and begin changing grades.

Grade Separation – Use of different levels. Grade separation of an intersection carries traffic over or under another road. Grade separation of a pedestrian or bicycle path carries pedestrians and bicyclists over or under a road.

Hazardous Materials – Materials that pose a risk to human health or the environment.

High Volume Movement – The portion of an interchange that carries the most traffic. High-volume movements at the US 6/Wadsworth Boulevard interchange are northbound Wadsworth Boulevard to eastbound US 6, and westbound US 6 to southbound Wadsworth Boulevard.

Intelligent Transportation Systems (ITS) – Also referred to as Intelligent Traffic Systems, Travel Demand Management, and Transportation Systems Management, ITS apply communications and information technology to provide solutions to congestion and other traffic control issues. ITS include such techniques as providing real-time information about traffic conditions and coordinating traffic signals. Specific ITS strategies being considered for this project include ramp metering, arterial variable messaging system (VMS), closed-caption television to support corridor surveillance and VMS, and accident monitoring and reporting.

Interchange – A grade-separated (bridge) junction of a freeway and another road used to provide access connectivity.

Latent Demand – Travel that is desired but unrealized because of constraints such as congestion. The source of latent demand in the US 6/Wadsworth study area is traffic diverted from other routes, as opposed to new travel that would not otherwise have occurred.

Level of Service (LOS) – A qualitative term used by transportation engineers to indicate that traffic is moving at ideal, average, or poor efficiency and measured on a grade scale of "A" through "F.""

Loop Ramp – A one-way entrance or exit ramp that loops 270 degrees to the right and merges onto the intersecting road or freeway

Mainline – The primary through road or freeway, as distinct from ramps, auxiliary lanes, and collector-distributor roads.

Median – A painted or raised area in the center of a road that separates opposing travel lanes and consolidates left turns.

Merge – A traffic movement in which two separate lanes of traffic combine to form a single lane.

Mobility – The ability of traffic or other travel modes to move unimpeded through a highway or other transportation facility.

MS4 – The abbreviation for Municipal Separate Storm Sewer System, a system used for collecting or conveying stormwater that is not a combined sewer or part of a publicly owned treatment works.

NEPA – The National Environmental Policy Act, established by Congress in 1969, requires a federal agency to document the environmental impact of its actions, including an evaluation of alternatives.

Noise Barrier – A barrier, usually a wall or earthen berm, separating the highway from adjacent areas to reduce road noise.

Partial Property Acquisition – A property acquisition that occurs when only a portion of a property would be affected by proposed construction but the remaining portion of the parcel would still be functional.

Partial Cloverleaf Interchange – An interchange design that uses loop ramps for two of the left-turn movements onto or off of the freeway, and straight ramps to handle the other two left-turn movements onto or off of the freeway. An example in the Denver area is the US 36 and Federal Boulevard interchange.

Peak-Hour Traffic – The hour in which the maximum traffic demand occurs on a facility. On most roads, higher traffic volumes occur in the evening and in the morning because of work-related trips.

Permanent Easement – A non-possessory permanent interest to use property in possession of another person for a stated purpose. Permanent easements are required for CDOT to conduct ongoing maintenance after construction.

Ramp Meter – A traffic signal located on an entrance ramp that controls the flow rate of vehicles onto a freeway. Ramp meters control the frequency and spacing of merging vehicles, which helps to improve the traffic flow on the mainline.

Ramp Terminal – The intersection of entrance and exit ramps with a connecting surface street.

Retaining Wall – A wall used to retain soil. Retaining walls can be used to minimize the footprint of a slope.

Right-of-Way (ROW) – The land owned by CDOT for the purpose of operating and maintaining a highway.

Scoping – A process initiated at the beginning of a study to solicit public and agency input on the scope of the study.

Shoulder – A portion of the road at the outside or inside of the travel lanes that accommodates stopped vehicles and emergency use.

Signal Timing – The coordinated timing of a sequence of traffic signals that allows vehicles to progress along an arterial or cross an arterial. The goal of signal timing is to minimize delay (the time a vehicle must wait at a signal) at intersections.

Single Point Urban Interchange (SPUI) – An interchange design similar to the diamond interchange, but with all ramps controlled by a single set of traffic signals. An example in the Denver area is the I-25 and University Boulevard interchange.

Stopping Sight Distance – The distance that allows a driver traveling at the design speed to stop before hitting an observed object.

Temporary Easement – A non-possessory temporary interest to use property in possession of another person for a stated purpose. Temporary easements are required for CDOT to access properties during construction.

Tight Diamond Interchange – An interchange design that shifts the entrance and exit ramps closer to the freeway than in a traditional diamond interchange. This interchange type requires less land than a traditional diamond interchange.

Tight Diamond Interchange with Loop – The tight diamond with loop is similar to the tight diamond except that a loop ramp would be maintained in the northwest quadrant of the interchange and there would be no traffic signal at the intersection of the loop ramp with Wadsworth.

Total Property Acquisition – A property acquisition that occurs when the proposed construction limits would directly impact the principal building on the property, such as a home or business, and the property would no longer be economically viable after the building is removed.

Transportation Demand Management (TDM) – A general term for actions that encourage a decrease in the demand for the existing transportation system.

Typical Section – A cross section that is representative of the roadway design throughout the project area.

Variable Messaging System (VMS) – An electronic traffic sign used on roads to give travelers information about traffic congestion, accidents, incidents, work zones, or other events.

Vehicle Storage – Length of travel lanes (such as left-turn lanes or through lanes) where vehicles can queue while waiting to proceed through a traffic signal.

Volume-to-Capacity (V/C) ratio – The ratio of flow rate to capacity. The V/C ratio is a measure of capacity sufficiency, that is, whether or not the physical geometry of a road provides sufficient capacity for the subject movement. Low V/C ratios depict relatively free-flow conditions. High V/C ratios depict more congested conditions. A V/C ratio of 1.0 indicates that the road is at its capacity.

Weaving – The crossing of two or more traffic streams traveling in the same direction. For example, weaving occurs when an interchange entrance ramp is followed by an exit ramp.

Wetland – An area sufficiently inundated by surface or groundwater to support a predominance of vegetation adapted for life in saturated soil conditions.

Westbound (WB) – Traveling or heading west.

APPENDIX B: SUMMARY OF MITIGATION AND MONITORING COMMITMENTS

Resource	Mitigation and Monitoring Commitments	Where to Include in BID Package	Implementation Responsibility	Comments/Status[1]
Air Quality	▪ Contractors will be required to reduce fugitive dust emissions during construction by implementing best management practices (BMPs), such as spraying exposed soils, covering trucks when transporting materials, minimizing mud tracking by vehicles, controlling vehicle speeds on construction access roads, and stabilizing construction entrances per CDOT M-208-1 requirements.	Specification	Contractor	
	▪ Contractors will be required to comply with BMPs to reduce air emissions from construction vehicles, such as reducing idling time of equipment and vehicles and using newer construction equipment or equipment with add-on emission controls.	Specification	Contractor	
Archaeology	▪ In the unlikely event that cultural deposits are discovered during construction, CDOT would follow its standard practice of ceasing work, consulting with the CDOT archaeologist, and evaluating materials in consultation with the State Historic Preservation Office (SHPO) to determine if mitigation is required.	Specification	CDOT/ Contractor	
Cumulative Impacts	▪ No mitigation necessary.	NA	CDOT/Lakewood	
Energy	▪ Measures to reduce energy consumption will include limiting the idling of construction equipment, locating construction staging areas close to the work site, minimizing motorist delays and vehicle idling, and coordinating general maintenance activities during construction to avoid excessive queuing and construction delays during peak hours.	Plan/Specification	Contractor	
Environmental Justice	▪ No mitigation measures are necessary.	NA	NA	
Farmlands	▪ No mitigation measures are necessary.	NA	NA	

1 To be updated as project is implemented.
2 Not applicable in plan sheets or project specifications; to be completed in advance of or in conjunction with design efforts

Resource	Mitigation and Monitoring Commitments	Where to Include in BID Package	Implementation Responsibility	Comments/Status[1]
Fish and Wildlife	▪ Obtain Senate Bill 40 Permit from CDOW.	Permit/Plan	FHWA/CDOT (Design Consultant)	
	▪ Conduct surveys for bird nests before April 1 and remove any unoccupied nests in advance of construction.	Specification	Contractor	
	▪ Trees will not be removed between April 1 and August 15 to avoid impacts to migratory birds.	Permit	Contractor	
Floodplains	▪ Sediment traps, check dams, sediment basins, or other best management practices (BMPs) will be installed to control sedimentation during construction of drainage improvements in gulches. Specific BMPs will be determined during final design.	Plan/Specification	Contractor	
	▪ During final design, CDOT will coordinate with the appropriate local and federal agencies to conduct hydraulic analysis and obtain necessary floodplain permits.	Plan/Permit	FHWA/CDOT (Design Consultant)	
Geological Resources and Soils	▪ No mitigation measures are necessary.	NA	NA	
Hazardous Materials	▪ Protective measures will be taken before, during, and after construction to minimize the risk of encountering petroleum products and petroleum-contaminated soils. A full Phase I Environmental Site Assessment (ESA) according to American Society of Testing and Materials (ASTM) 2005 standards will be completed prior to any total property acquisition. Phase II ESAs will be conducted to characterize, manage, and remediate contaminated properties identified as concern in Phase I ESAs.	NA	FHWA/CDOT (Design Consultant)	
	▪ A *Materials Handling Plan* will be prepared to address contaminated soil and groundwater that may be encountered as directed by the findings of Phase I assessments. The plan will be prepared according to CDOT standards.	Plan		
	▪ Painted surfaces disturbed during construction or demolition and disposed of separately will be tested, handled, and disposed of properly.	Plan/Specification		
	▪ An asbestos survey will be conducted and a demolition permit will be obtained prior to the demolition of bridges or buildings. Any asbestos-containing material that is friable or will be friable during construction and demolition activities will be removed prior to demolition by a licensed abatement contractor.	Plan/Specification/Permit		

Resource	Mitigation and Monitoring Commitments	Where to Include in BID Package	Implementation Responsibility	Comments/Status[1]
Historic Properties	▪ Mitigation measures will be part of a Memorandum of Agreement (MOA) negotiated among CDOT, FHWA, and the Colorado SHPO. The Lakewood Historical Society, City of Lakewood, and Jefferson County will be provided an opportunity to participate in the MOA. Mitigation may include additional historical survey in the study area, signage, and historic preservation training and education.	NA	FHWA/CDOT	
	▪ Any new historic documentation that is developed as part of the MOA will be provided to interested local historic preservation groups	N/A	CDOT	
	▪ Aesthetics of noise walls will consider compatibility with neighborhood history and may include treatments to support neighborhood history.	Plan	FHWA/CDOT (Design Consultant)	
Land Use	▪ Final design and right-of-way negotiations by CDOT will coordinate with the City of Lakewood to address compatibility with land use plans and the allowance of non-conforming properties that may result from right-of-way acquisition.	NA	FHWA/CDOT/ Lakewood	
Noise	▪ New noise walls are constructed between the frontage roads and US 6 west of Wadsworth to Garrison Street. Preliminary design and noise modeling indicates that 15-foot walls are required for properties adjacent to US 6, 8-foot walls are appropriate along the reconfigured frontage road in the NE quadrant (Green Acres neighborhood), and 4-foot safety barriers should be included along the US 6 bridge	Plan	FHWA/CDOT (Design Consultant)	
	▪ Noise analysis will be conducted during final design to confirm noise wall heights and alignments	NA	FHWA/CDOT (Design Consultant)	
	▪ During final design of the project, the City of Lakewood will have the opportunity to provide input on design elements related to noise mitigation, including grading, landscaping, color and material of any noise walls, with the goal of constructing an aesthetically pleasing and economically viable project.	Plan	FHWA/CDOT (Design Consultant)	
	▪ Construction noise impacts will be mitigated by limiting work to daytime hours (as described by CDOT and City of Lakewood requirements) when possible and requiring the contractor to use well-maintained equipment, including muffler systems.	Specification	Contractor	

Resource	Mitigation and Monitoring Commitments	Where to Include in BID Package	Implementation Responsibility	Comments/Status[1]
Paleontology	▪ The CDOT Staff Paleontologist will examine final plans to determine whether construction monitoring is required.	NA	CDOT	
	▪ Prior to construction, the CDOT Staff Paleontologist will examine the existing Denver Formation bedrock exposure that could not be examined previously because of snow cover at the time of original survey. If any scientifically significant fossil localities are discovered during that survey, CDOT will perform mitigation of construction impacts by systematic salvage of a statistically representative sample of the fossils found there, either prior to or during construction.	N/A	CDOT	
	▪ If sub-surface bones or other potential fossils are found during construction, work will cease. The CDOT Staff Paleontologist will assess the significance and make further recommendations.	Specification	Contractor	
Pedestrian and Bicycle Facilities	▪ Intelligent Transportation Systems (ITS) options, such as signing, lighting, and pavement treatments, will be considered in final design to improve safety of pedestrian and bicycle crossings of US 6 ramps on east side of Wadsworth.	Plan	FHWA/CDOT (Design Consultant)	
	▪ A grade-separated pedestrian/bicycle crossing to remove conflicts between bicycles and pedestrians at the loop ramp on the west side of Wadsworth will be examined further in final design.	Plan	FHWA/CDOT (Design Consultant)	
	▪ Signage and designated pedestrian and bicycle routes will be provided during construction.	Specification	Contractor	
Right of Way and Relocations	▪ All acquisitions and relocations will comply fully with federal and state requirements, including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.	NA	CDOT	
Section 4(f) and 6(f) Resources	▪ No mitigation necessary for Section 6(f) resources (none present)	NA	NA	
	▪ See Historic Resources for Section 4(f) mitigation			
	▪ No mitigation necessary for non-historic Section 4(f) resources			
Socioeconomics	▪ CDOT will coordinate with emergency service providers to identify possible locations for emergency access breaks in the medians.	Plan	FHWA/CDOT (Design Consultant)	
	▪ CDOT will provide advance notice to emergency service providers, local schools, residents, and local businesses of upcoming construction activities that are likely to result in traffic disruption. This will be accomplished through direct contact, radio and public announcements, flyers, newspaper notices, onsite signage, and the use of the Lakewood and CDOT websites.	Specification	Contractor	

Resource	Mitigation and Monitoring Commitments	Where to Include in BID Package	Implementation Responsibility	Comments/Status[1]
Threatened/Endangered Species	▪ No mitigation measures are necessary.	NA	NA	
Transportation	▪ Continue to coordinate with the Regional Transportation District (RTD) and City of Lakewood regarding development plans at and around the 13th Avenue LRT station.	NA	CDOT	
	▪ Coordinate with RTD and City of Lakewood on the placement and aesthetics of bus stops and shelters. Bus shelters would be provided by others.	Plan	FHWA/CDOT (Design Consultant)	
	▪ Coordinate with RTD to ensure access to bus stops during construction.	Specification	Contractor	
	▪ Comply with CDOT Lane Closure Strategy for any lane closures during construction. Provide advance notice for extended lane closures, and identify detours with adequate signing to minimize out-of-direction travel.			
Utilities	▪ Utility impacts will be mitigated through close coordination with CDOT, City of Lakewood, and utility providers.	NA	CDOT	
	▪ Relocations may be avoided by placing encasement for protection over buried utilities or through design modifications to avoid major utility impacts, such as the use of retaining walls, roadway profile variations, and/or horizontal alignment shifts. For those situations where impacts cannot be avoided, utilities will be relocated.	Plan	FHWA/CDOT (Design Consultant)	
Vegetation and Noxious Weeds	▪ Vegetation removed during construction will be re-established as soon as feasible.	Specification	Contractor	
	▪ Establishment of noxious weeds will be controlled by BMPs such as managing open soil surfaces and topsoil that is stockpiled for reuse.	Specification	Contractor	
	▪ Prior to construction the impact area will be surveyed for presence of noxious weeds.	Specification	Contractor	
	▪ An Integrated Noxious Weed Management Plan may be developed and implemented to prevent the spread of noxious weeds during construction.	Specification	Contractor	

Resource	Mitigation and Monitoring Commitments	Where to Include in BID Package	Implementation Responsibility	Comments/Status[1]
Visual/Aesthetics	▪ CDOT will coordinate with Lakewood with regard to the aesthetics of the Build Alternative.	NA	CDOT	
	▪ City of Lakewood will install, irrigate, and maintain any landscaping in medians or other areas. Landscaping will comply with clear zone requirements.	NA	Lakewood	
	▪ CDOT will continue to maintain any non-irrigated areas in the interchange area.	NA	CDOT	
Water Resources/Quality	▪ Permanent water quality treatment features will be included in the final design to collect and treat roadway runoff by filtering pollutants before discharging stormwater into area waterways.	Plan	FHWA/CDOT (Design Consultant)	
	▪ A Colorado Discharge Permit System - Stormwater Construction Permit (SCP) will be required for this project. A Stormwater Management Plan will be developed in accordance with the conditions of the SCP.	Specification/Plan	CDOT/Contractor	
	▪ A construction dewatering permit will be obtained.	Permit	Contractor	
	▪ Erosion and sediment control BMPs will be implemented in accordance with CDOT Standard Specifications for Road and Bridge Construction and the revised provisions for water quality outlined in the Consent Order with CDPHE and incorporated into Section 107.25 (Water Quality) and Section 208 (Erosion Control).	Specification/Plan	CDOT/Contractor	
Wetlands and Waters of the US	▪ CDOT will obtain a Section 404 permit for impacts to wetlands and WUS. The U.S. Army Corps of Engineers (USACE) has confirmed informally that a Nationwide Permit (14 and/or 27) would be applicable.	Plan/Permit	CDOT	
	▪ A wetland finding will be completed during final design and will include a final assessment of impacts and a detailed plan for mitigation.	Plan/Specification	CDOT/Contractor	
	▪ Unavoidable impacts to wetlands resulting from the Build Alternative will be mitigated on a one-for-one basis in accordance with CDOT policy, resulting in no net loss of wetlands.			