South Wadsworth/ Waterton Road Intersection

FEASIBILITY STUDY

JACOBS

South Wadsworth Boulevard/Waterton Road Intersection Feasibility Study

Jefferson County, Colorado

In Cooperation with:

Douglas County, Colorado &

Lockheed Martin Corporation

Prepared by:

JACOBS

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AM	Ante Meridiem (morning)
APE	Area of Potential Effect
ASGD	Audubon Society of Greater Denver
AST	Aboveground Storage Tank
BMPs	Best Management Practices
C.R.S.	Colorado Revised Statute
CCD	City and County of Denver
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
COGCC	Colorado Oil and Gas Conservation Commission
CSS	Context Sensitive Solutions
CWA	Clean Water Act
DCE	Documented Categorical Exclusion
DPOR	Colorado Department of Natural Resources Division of State Parks and Outdoor Recreation
DRCOG	Denver Regional Council of Governments
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
FACWet	Functional Assessment of Colorado Wetlands
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FTA	Federal Transit Administration
HCP	Habitat Conservation Plan
JeffCo	Jefferson County
LOS	Level of Service
LQG	Large Quantity Generator
LUST	Leaking Underground Storage Tank
MBTA	Migratory Bird Treaty Act
MOEs	Measures of Effectiveness
mph	Miles per Hour
MS4	Municipal Separate Storm Sewer System

MUTCD	Manual for Uniform Traffic Control Devices
NEPA	National Environmental Policy Act of 1969
NFA	No Further Action
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OPS	Division of Oil and Public Safety
PEL	Planning and Environmental Linkages
PIP	Public Involvement Program
PM	Post Meridiem (afternoon)
PMJM	Preble's Meadow Jumping Mouse
RCRA	Resource Conservation Recovery Act
RPWT	Roxborough Park Wastewater Treatment
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Officer
SSC	State Species of Concern
TES	Threatened, Endangered, and Sensitive (Species)
TMDL	Total Maximum Daily Load
TSDF	Treatment, Storage, Disposal Facilities
U.S.C	United States Code
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
VMS	Variable Message Sign
WQCC	Water Quality Control Commission
WRIS	Wildlife Resources Information Systems

Chapter 1.0 Purpose and Need

1.1 Introduction

Jefferson County (JeffCo), Douglas County, and Lockheed Martin Corporation, Inc. (Lockheed Martin) (Project Team), in cooperation with the Colorado Department of Transportation (CDOT) and Federal Highway Administration (FHWA), are evaluating improvements to the South Wadsworth/Waterton Road intersection to address the transportation problems in the area of this critical intersection. The Project Team prepared this Feasibility Study using a planning and environmental linkage (PEL) approach considering environmental factors during the planning stage. This process helps minimize duplication of effort, promote environmental stewardship, and reduce delays in project implementation. The FHWA Colorado Division PEL Questionnaire that demonstrates how this approach was used on this project is included in **Appendix A**.

1.2 Study Area Location and Description

The South Wadsworth/Waterton Road intersection project study area (Study Area) is located in Jefferson County, Colorado in the southwestern metropolitan Denver area. The Study Area extends approximately 300 feet north of the Platte River, through the intersection with South Wadsworth Boulevard and continues up Wadsworth for another 1,800 ft. Adjacent to the corridor on the east side of the roadway the Study Area includes Denver Water property and the Audubon Center/Discovery Pavilion and on the west side extends along the roadway leading to the Lockheed Martin guard station (see **Figure 1-1**).

Wadsworth Boulevard is a four-lane state highway (also known as CO 121) that runs north-south through Jefferson County, from the Broomfield County Line in the north to the Waterton Road intersection just north of the Douglas County line. South Wadsworth Boulevard tapers to two lanes near its intersection with Waterton Road, with a turn lane to accommodate left-turn movements onto Waterton Road. Past the intersection, South Wadsworth Boulevard turns westward and, after approximately another 1,000 feet, reaches the Lockheed Martin Campus entrance station, where it becomes a private road used only by Lockheed Martin employees and guests.

Waterton Road is a two-lane road that begins at the intersection with South Wadsworth Boulevard and extends south across the Platte River into Douglas County. It then turns eastward and extends approximately one mile to its terminus at Rampart Range Road.

The land surrounding the intersection and within the Study Area is primarily open and publicly accessible (see **Figure 1-2**). It includes United States Army Corps of Engineers (USACE) land associated with Chatfield Reservoir, and Denver Water property. The Denver Water property includes the former Kassler Water Plant (now called the Kassler Center), which is subleased by the Thorne Ecological Institute for environmental education programs.

Figure 1-1: Vicinity Map

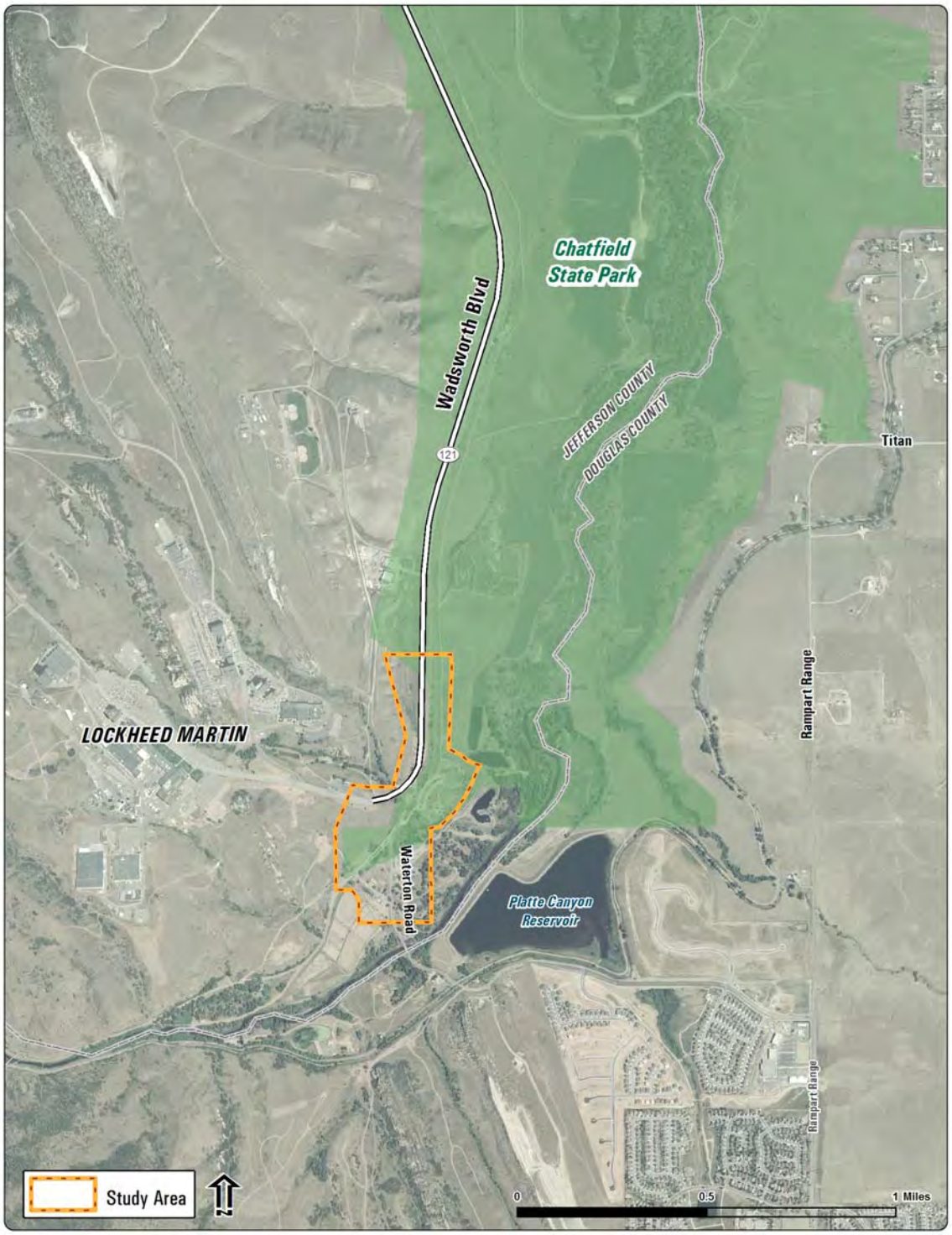


Figure 1-2: Project Study Area

The Denver Parks and Recreation Department leases 750 acres of the USACE property located west of South Wadsworth Boulevard for the Denver Botanic Gardens at Chatfield State Park. The Colorado State Department of Natural Resources, State Parks Division leases 5,378 acres located on the east side of South Wadsworth Boulevard for Chatfield State Park. The Audubon Society of Greater Denver (ASGD) subleases a portion of land within Chatfield State Park directly adjacent to the South Wadsworth Boulevard/Waterton Road intersection. The remaining land in the Study Area is privately owned, most of which is owned by Lockheed Martin.

1.3 Project Background

In the mid 1980s, Lockheed Martin conducted a traffic analysis of the intersection over a three- to four-year period. That study resulted in several recommendations, which included signage improvements and intersection alternatives.

Over the last five years, Douglas County has developed preliminary plans for a four-lane roadway from the intersection into Douglas County, and options for intersection improvements. The county developed these plans in response to ongoing Douglas County development and required access improvements for new developments in the immediate vicinity.

JeffCo initiated this Feasibility Study to identify a Preferred Alternative to address the transportation problems associated with the intersection, as described in Section 1.5, Project Need. This study identifies potential environmental impacts that may result from implementation of the Preferred Alternative in a manner that is consistent with environmental documentation required by the National Environmental Policy Act of 1969 (NEPA) to move the project into to the final design and construction phases.

1.4 Project Purpose

The purpose of this project is to improve the safety and operational deficiencies of the South Wadsworth Boulevard and Waterton Road Intersection.

1.5 Project Need

The Project Team formed a Stakeholder Team to provide input throughout the study on issue identification, public involvement, existing and future conditions review, and alternatives selection. Stakeholder Team members included representatives from JeffCo, USACE, Douglas County, Denver Water, Lockheed Martin, ASGD, CDOT, and Colorado State Parks (see Section 4.2 for more information about the Stakeholder Team). The Stakeholder Team identified the following transportation needs for this project:

1. **Address existing and projected traffic congestion:** South Wadsworth Boulevard and Waterton Road within the Study Area are important regional travel corridors. These roads serve many users, including commuters who live in Douglas County and recreationists who use Chatfield State Park, the ASGD, the Colorado Trail, and other nearby amenities.

South Wadsworth Boulevard provides access to Lockheed Martin, which is the second largest employer in Jefferson County. Congestion, roadway design, and safety issues at the intersection impact local mobility and reduce travel times.

The intersection is approaching capacity, and congestion occurs during peak travel times. Most weekday congestion occurs during morning and afternoon peak hours, when Lockheed Martin employees travel to and from work. Employees leave Lockheed Martin in the evenings roughly when southbound traffic peaks on South Wadsworth Boulevard, which complicates left turns onto Waterton Road.

The Denver Regional Council of Governments (DRCOG) projections indicate that traffic volumes on South Wadsworth Boulevard and Waterton Road will increase by 85 and 105 percent, respectively, by 2035. Congestion will worsen as traffic increases.

2. **Correct roadway deficiencies:** Sight distances at the intersection are limited from all directions, which reduce decision times for motorists. Also, roadway grades are almost 8 percent on South Wadsworth Boulevard near the Lockheed Martin guard gate. Severe weather worsens problems caused by these steep grades in the intersection area.

3. **Improve safety for users of all modes:** Observations indicated that drivers tend to take risks when making turns during congested periods, and near collisions were observed during peak hours. Accident data support these observations. From May 2001 to September 2005, 15 crashes were reported at the intersection, including six rear-end collisions between August 2001 and December 2004. Also, speeds of 58 mph north of the intersection and 49 mph south of the intersection have been observed (posted speed limits are 45 mph north of the intersection and 35 mph south of the intersection). The relatively high speeds, accelerating and decelerating through traffic along South Wadsworth Boulevard near the intersection, the downgrade for eastbound traffic, and limited sight distance approaching the intersection combine to create potentially unsafe conditions at the intersection.

   Several educational and recreational facilities are located within the Study Area, including the Colorado Trailhead. Most trail users park on the east side of Waterton Road, then cross Waterton Road via the at-grade pedestrian crossing to access the Colorado Trail on the west side. This creates conflicts between motorists, bicyclists, and pedestrians, especially during heavy travel periods. These safety issues would worsen with projected traffic increases.

4. **Improve access control:** Access control is lacking in the vicinity of the intersection, and needs to be improved to allow safe and intuitive access to the variety of activity points in the area. These include Lockheed Martin, Audubon Nature Center, Chatfield State Park, Colorado Trail, South Platte River, Kassler Center, and other amenities.

1.6 Project Goals

The Stakeholder Team developed project goals to guide the alternative development and evaluation process. The goals indicated desired outcomes that were secondary to meeting the Purpose and Need, but were viewed by the stakeholders as important to project success. The goals helped differentiate between the transportation improvements identified to meet the transportation needs identified above, and therefore helped guide the alternatives development and screening process. The Stakeholder Team identified the following project goals:

- Provide practical and financially realistic transportation improvements.
- Incorporate Context Sensitive Solutions (CSS) into the planning and design.
  - CSS is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, historic, and environmental resources while maintaining safety and mobility.
- Avoid and minimize adverse impacts to the natural and human environments.
- Minimize disruption to adjacent land uses, including large utilities.
- Meet Lockheed Martin's transportation requirements which include:
  - ensuring around the clock access for national security reasons, and
  - accommodating vehicles that are 140 feet long and 30 feet wide, with a 170-foot inside turning radius and an 18-foot to 20-foot clearance.
- Be consistent with adopted local plans, including land use, park, transportation, and facility plans, such as Douglas County's projected growth and the Thorne Ecological Institute expansion.

Chapter 2.0 Alternatives

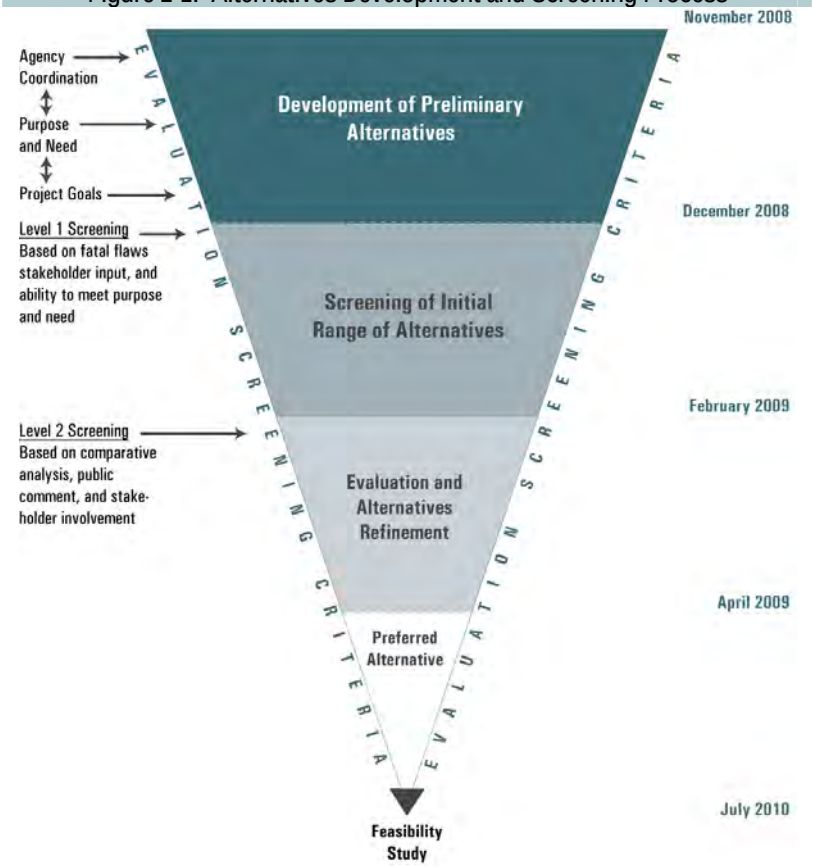
2.1 Introduction

The Stakeholder Team developed, evaluated, and screened alternatives using a process consistent with National Environmental Policy Act of 1969 (NEPA). This process objectively evaluated those project alternatives deemed practical and feasible from a technical and economical standpoint, and achieved the Purpose and Need for the project. A No-Action Alternative was included to serve as a basis for comparison. This chapter describes the alternatives considered for this study and the process used to identify and screen them.

2.2 Alternatives Development and Screening Process

The Stakeholder Team used a four-step alternatives development and screening process to identify the preliminary alternatives to be evaluated (see **Figure 2-1**). The process was inclusive, and considered public and agency input. The process started in November 2008 and resulted in a Preferred Alternative by June 2009. A year-long refinement of the Preferred Alternative followed, culminating in completion of this feasibility study.

Figure 2-1: Alternatives Development and Screening Process



2.2.1 Development of Evaluation Criteria

The Stakeholder Team developed project evaluation criteria and Measures of Effectiveness (MOEs) to ensure that alternatives advanced through the screening process met the project's Purpose and Need and project goals. MOEs helped to define the evaluation criteria and were used to screen the alternatives.

Environmental factors were also a consideration throughout the alternatives development and screening process. These were reflected in the need to meet federal and state requirements as well as through the stated Project Goals including:

- incorporating context sensitive solutions into planning and design,
- avoiding and minimizing adverse impacts to the natural and human environments,
- minimizing disruption to adjacent land uses, and
- consistency with adopted local plans, including land use, park, transportation, and facility plans.

2.2.2 Development of Preliminary Alternatives

The Stakeholder Team developed preliminary alternatives that included options considered in the past by JeffCo and CDOT, as well as new alternatives developed by the design and engineering team during this study. The preliminary alternatives are summarized below (refer to the *Alternatives Development Technical Memorandum* (Jefferson County, 2010) for more detail).

- **No-Action Alternative**: The existing intersection and immediate transportation network surrounding it would remain unchanged. No programmed projects are currently planned for the Study Area.
- **Alternative 1 – Signal:** Would install a traffic signal at the South Wadsworth Boulevard/Waterton Road intersection.
- **Alternative 2 – Lockheed Martin "T" Intersection and Signal**: Would straighten the convergence of South Wadsworth Boulevard and Waterton Road and realign the Lockheed Martin entrance to meet at a signalized "T" intersection.
- **Alternative 3 – Lockheed Martin "T" Intersection, "S" Curve and Signal**: Would be similar to Alternative 2, except it would provide an "S" curve on the Lockheed Martin entrance. The "S" curve would improve safety and lower the grade for the Lockheed Martin exit.
- **Alternative 4 – Roundabout**: Would reconfigure the existing intersection to a roundabout configuration.

- **Alternative 5 – Waterton/Golf & Turf**: Would add a new signalized intersection at the Colorado Golf & Turf entrance, which would separate Lockheed Martin traffic at that point from other South Wadsworth Boulevard/Waterton Road traffic.
- **Alternative 6 – Grade-Separated Southbound Wadsworth**: Would connect South Wadsworth Boulevard to Waterton Road via a grade-separated road.
- **Alternative 7 – Grade-Separated Loop**: Would use a grade-separated loop for connections from southbound South Wadsworth Boulevard to Waterton Road, and northbound Waterton Road traffic to the Lockheed Martin entrance.
- **Alternative 8 – Grade-Separated Northbound Wadsworth/Waterton Through**: Would grade separate existing Lockheed Martin traffic heading northbound on South Wadsworth Boulevard and provide priority turn movements to Waterton Road through traffic.
- **Alternative 9 – Grade-Separated Northbound Wadsworth/Lockheed Martin Through:** Would be similar to Alternative 8, but would provide a different configuration that would allow Lockheed Martin traffic priority on turn movements at the intersection.
- **Alternative 10 – Ridge Road and Signal:** Would add a new intersection north of Colorado Golf & Turf that would connect to a new roadway at the location of an existing dirt road that runs from behind the Colorado Golf & Turf to the Lockheed Martin access road.

2.2.3 Screening of Initial Range of Alternatives (Level 1)

The Stakeholder Team comparatively evaluated the preliminary alternatives to eliminate infeasible or unsuitable alternatives, and alternatives that would not meet the project's Purpose and Need and project goals. At this screening level, comparisons were made using qualitative information.

- **No-Action Alternative**: The intersection currently functions at LOS F for the southbound left turn onto Waterton Road in the PM and the left turn from Waterton Road to Lockheed Martin in the AM. The intersection LOS would continue to decline in the future as traffic levels increase. This alternative was advanced through all screening for comparison purposes.
- **Alternative 1 – Signal:** This alternative was advanced to Level 2 screening because of its relative low cost and ability to meet the Purpose and Need without peripheral impacts. It could also be easily refined to address additional issues, such as vertical grade concerns.
- **Alternative 2 – Lockheed Martin "T" Intersection and Signal**: Elements of this alternative and Alternative 3 (below) were combined into a single alternative named "Alternative 2" and advanced to Level 2 screening.

- **Alternative 3 – Lockheed Martin "T" Intersection, "S" Curve and Signal**: Elements of this alternative and Alternative 2 (above) were combined into a single alternative named "Alternative 2" and advanced to Level 2 screening.
- **Alternative 4 – Roundabout (Dismissed)**: This alternative was dismissed at Level 1 screening because it did not meet the Purpose and Need as well as the other alternatives, and it would not effectively accommodate large Lockheed Martin vehicles.
- **Alternative 5 – Waterton/Golf & Turf (Dismissed)**: This alternative was dismissed at Level 1 screening because it would not address the Purpose and Need and potentially impact the Denver Water Conduit No. 10.
- **Alternative 6 – Grade-Separated Southbound Wadsworth**: This alternative was advanced to Level 2 screening because it scored high under all the Level 1 criteria and had no fatal flaws.
- **Alternative 7 – Grade-Separated Loop (Dismissed)**: This alternative was dismissed at Level 1 screening because of the large cut required and possible access limitations.
- **Alternative 8 – Grade-Separated Northbound Wadsworth/Waterton Through**: This alternative was advanced to Level 2 Screening because it scored high under all the Level 1 criteria and would provide the additional benefit of accommodating future capacity needs.
- **Alternative 9 – Grade-Separated Northbound Wadsworth/Lockheed Martin Through:** This alternative was advanced to Level 2 Screening because it scored relatively high under all the Level 1 criteria and would provide the additional benefit of accommodating future capacity needs.
- **Alternative 10 – Ridge Road and Signal (Dismissed):** This alternative was dismissed at Level 1 screening because it would result in unacceptable impacts to the Lockheed Martin property.

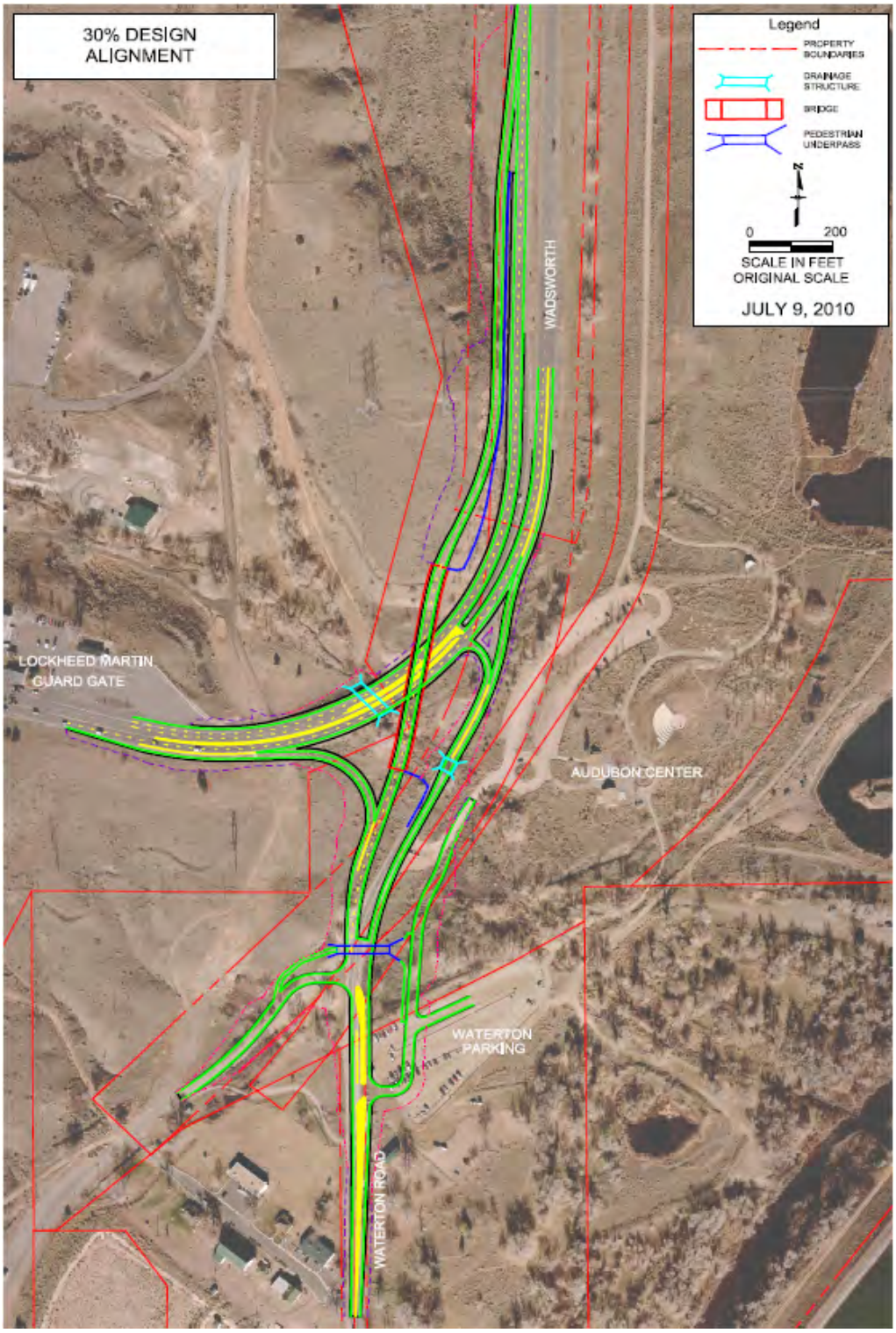
2.2.4 Evaluation and Alternatives Refinement (Level 2)

The Stakeholder Team evaluated the alternatives advanced from Level 1 screening. They conducted a general assessment of the alternatives for environmental impacts, transportation impacts, current and future levels of service (and other operational performance measures), and socioeconomic impacts. At this screening stage, design issues and opportunities, and planning level engineering feasibility were considered, and quantitative comparative information was prepared for some of these MOEs to allow for detailed comparison. Level 2 screening results are summarized below:

- **Alternative 1 – Signal (Dismissed):** This alternative was dismissed at Level 2 screening because sight distance would remain an issue, and the intersection would reach LOS D by 2015 to 2020 in the PM peak, with the left turn to Waterton Road being the critical movement.

- **Alternative 2 (combination of Alternatives 2 and 3 evaluated at Level 1) (Dismissed):** This alternative was dismissed at Level 2 screening because it would provide less capacity for outgoing Lockheed Martin traffic, the intersection would reach LOS D by 2015 to 2020 in the PM peak with the southbound through lane being the critical movement, and it would be more expensive than the other signal alternative.
- **Alternative 6 – Grade-Separated Southbound Wadsworth**: The Stakeholder Team selected Alternative 6 as the Preferred Alternative because it would address the current safety concerns and provide the best LOS at the intersection for the longest period of time. Also, minimal reconstruction would be required to accommodate a future four-lane facility on Waterton Road, if and when it is deemed necessary in the future. The Preferred Alternative is shown on **Figure 2-2**Error! Reference source not found. and described in detail in Section 2.3.
- **Alternative 8 – Grade-Separated Northbound Wadsworth/Waterton Through (Dismissed):** This alternative was dismissed at Level 2 screening because it would result in high flood pool impacts. Since the study area lies within the designated flood pool of the Chatfield Dam, the cut and fill work for the project would need to be balanced consistent with USACE requirements. Also, the bridge would shadow Lockheed exit to southbound Waterton Road, creating potential road icing problems, and the intersection would reach LOS D by 2025-2030, with the unsignalized left turn from Waterton Road to Lockheed Martin being the critical movement. Creating an acceptable long-term solution for that critical movement would be difficult without introducing a signal, which would impact southbound South Wadsworth Boulevard to Waterton Road traffic. Based on this consideration, this alternative was rated lower than Alternative 6. The southbound diverge point before the intersection would also reach LOS D in the same timeframe. Also, there was a concern with the cost and limitations on traffic volumes at the merge between Lockheed Martin and South Wadsworth Boulevard, and the southbound conflicts with traffic turning from Waterton Road to Lockheed Martin.
- **Alternative 9 – Grade-Separated Northbound Wadsworth/Lockheed Martin Through (Dismissed):** This alternative was dismissed at Level 2 screening because the double-lane right turns would not function well, it would introduce more traffic conflicts at intersection under the bridge (a signal could be necessary), it would result in high flood pool impacts, and the bridge would shadow the Lockheed Martin exit to southbound Waterton Road creating potential road icing problems. Further, the intersection would reach LOS D by 2020 to 2025, with the left turn to Waterton Road being the critical movement.

Figure 2-2: Preferred Alternative



- **Alternative 11 – Grade-Separated Northbound Wadsworth, Lockheed Through Roadway (Dismissed)**: This alternative was developed during Level 2 screening, and would include installation of a metering traffic signal on Lockheed Martin property. This alternative was dismissed at Level 2 screening because it would not improve road grades entering the intersection, the metering traffic signal would impede heavy outbound traffic from Lockheed Martin, and it would not effectively address the future four-lane section on Waterton Road. Also, the metering signal concept was deemed unacceptable because it would not comply with the Manual for Uniform Traffic Control Devices (MUTCD) since it would not be located at a conflict area.
- **Pairing of Alternatives (Dismissed)**: The Stakeholder Team determined that funding issues may not allow the higher-cost flyover alternatives to be constructed in the near future. Therefore, a potential option was identified that would combine a non-flyover alternative with a flyover alternative as the preferred alternative. The initial phase would construct the non-flyover elements, and the final phase would construct the flyover. As a result, Alternative 1 was paired with Alternative 6, and Alternative 2 was paired with Alternative 8, and both pairings were evaluated as phased solutions to funding issues. Analysis indicated that both paired alternatives would not result in a cost savings by constructing the alternatives in two phases. For example, if Alternative 1 were built as phase one, the resulting grade-separated structure for Alternative 6 as phase two would need to be much higher. As such, a longer approach grade would be required, which would increase the cost. Since they would not provide cost efficiency, both paired alternatives were dismissed.

2.3 Preferred Alternative Detailed Description

The Preferred Alternative would provide a grade-separation at the existing intersection. It would include some minor widening on existing South Wadsworth Boulevard from Lockheed Martin to the north. Northbound Waterton Road traffic would continue to use the existing roadway alignment and would have a long acceleration and merge lane onto northbound South Wadsworth Boulevard. A separate left turn lane and protected (barrier separated) acceleration lane would be provided for the northbound Waterton Road onto southbound South Wadsworth Boulevard movement into Lockheed Martin. Southbound traffic on South Wadsworth Boulevard to Waterton Road would exit one-third mile north of the current intersection, and continue on a flyover ramp over South Wadsworth Boulevard. Traffic exiting Lockheed Martin wishing to go south on Waterton Road will merge onto the descending raised portion of the flyover which will be separated from the northbound Waterton traffic by an eighteen-foot median and continue until they merge just north of the Platte Canyon/Denver Water access road (see **Figure 2-2**).

The Preferred Alternative would combine the separate entrances for the Waterton parking lot and the Audubon Nature Center into one intersection with a new access road constructed on Denver Water, Jefferson County, and USACE property that connects those two parking lots. A median deceleration lane would be provided for southbound Waterton Road to separate left

turns from through traffic at this access. The Preferred Alternative also includes a pedestrian underpass north of the Waterton parking lot to improve safety for Waterton Canyon/Colorado Trail users and visitors to the Kassler Center and Denver Water property amenities.

The Preferred Alternative best addresses safety for the two turning movements that currently cause congestion. First, it would eliminate the movement requiring traffic to turn left from southbound South Wadsworth Boulevard to Waterton Road by providing that movement via the new flyover ramp. Second, the Preferred Alternative improves the left-turn movement from northbound Waterton Road into Lockheed Martin by removing the southbound Wadsworth to Waterton traffic from the mix and providing a protected acceleration lane on Southbound Wadsworth for those making the left turn from Waterton towards the Lockheed Martin entrance.

In summary, the Preferred Alternative would effectively address all elements of the project Purpose and Need, meet project goals, and would provide the best short-term and long-term solution to achieve Jefferson and Douglas counties' long-term vision for the corridor.

Chapter 3.0 Affected Environment and Impacts

3.1 Introduction

This chapter presents information on select environmental resources within the Study Area, and potential impacts that may result from implementation of the Preferred Alternative. The Project Team assessed impacts based on preliminary design of the Preferred Alternative. Impacts to resources would be avoided or mitigated to the extent possible. Mitigation measures are described under each resource.

For purposes of this study, data were obtained and impacts assessed only for the following environmental resources that were determined most likely to influence alternative selection:

- Wildlife and Fisheries
- Vegetation and Noxious Weeds
- Threatened and Endangered, Sensitive, and Rare Species
- Water Resources/Quality
- Floodplains
- Wetlands
- Recreation Resources
- Historic Properties
- Hazardous Materials
- Section 4(f) Resources
- Cumulative Effects

Coordination with FHWA and CDOT indicated that a Documented Categorical Exclusion (DCE) would be the appropriate class of National Environmental Policy Act of 1969 (NEPA) action for this project. Additional environmental resources that will be assessed in the DCE are listed below. The process for future environmental documentation is described more fully in the PEL questionnaire included in **Appendix A**.

- Farmland
- Land Use
- Air Quality
- Noise
- Visual Resources

- Paleontological Resources
- Socioeconomic Conditions and Environmental Justice

3.2 Transportation

This section presents the traffic analysis process, results, and recommendations for a preferred alternative. The information presented here was derived from the *South Wadsworth Boulevard/Waterton Road Intersection Traffic Analysis Technical Memorandum* (2009), which assessed the four advanced alternatives developed from the alternative analysis process. Traffic forecasts were developed and analyzed to assess the operational effectiveness of the Preferred Alternative, and a review of existing safety conditions was conducted.

Intersection traffic forecasts were developed using the following information sources:

- AM and PM peak hour turning movement counts collected in November, 2008.
- The projected number of additional employees that are expected long term at Lockheed Martin.
- The approximate number of existing and anticipated single-family homes accessing Waterton Road between Rampart Range Road and South Wadsworth Boulevard.
- AM and PM peak hour forecasts included in the Traffic Impact Study prepared for the proposed Sterling Ranch development in Douglas County.

3.2.1 Existing Conditions

Roadway Network

Figure 3-1 shows the existing lane configurations and traffic control for the existing intersection. The intersection is a "T" configuration with two through lanes in each direction along South Wadsworth Boulevard, a southbound left-turn lane from South Wadsworth Boulevard to Waterton Road, a right turn from northbound South Wadsworth Boulevard onto Waterton Road, and separate left- and right-turn lanes from Waterton Road to South Wadsworth Boulevard. The left turn from Waterton Road is stop sign-controlled with a short storage for two to three vehicles. The right turn is effectively a continuous movement during non-peak traffic periods because of the length of the acceleration lane.

Current Safety Conditions

Between May 2001 to September 2005, 15 crashes occurred at the intersection, including six rear-end collisions between August 2001 and December 2004. Five crashes that occurred between March 2005 and September 2006 potentially could have been avoided if the intersection had been traffic signal-controlled. At least three of those crashes involved vehicles making a left turn from Waterton Road.

Figure 3-1: Existing Lane Configuration

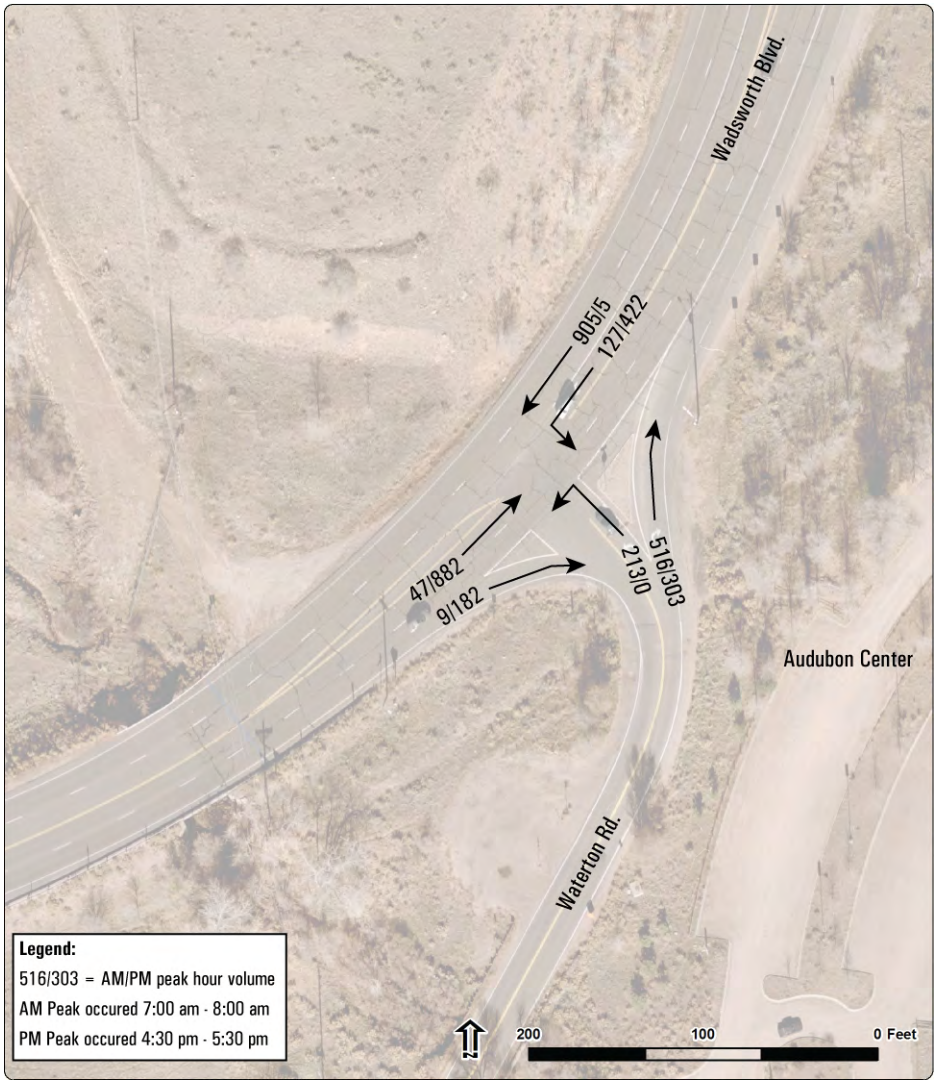
Repeated observations of the intersection indicated that drivers tend to take risks when making turns during congested periods, and near collisions were often observed during peak hours. Observed 85th percentile speeds approaching the intersection were 58 mph southbound 285 feet north of the intersection (where the posted speed is 45 mph), and approximately 49 mph 250 feet south of the intersection (where the posted speed is 35 mph). The relatively high speeds, accelerating and decelerating through traffic along South Wadsworth Boulevard near the intersection, the downgrade for eastbound traffic, and the visibility approaching the intersection contribute to potentially hazardous conditions.

Few other crash patterns were identified near the intersection. Although one-third of all collisions along South Wadsworth Boulevard between the intersection and C-470 over the six-year period examined were wildlife collisions (43 total), only two locations had more than two collisions within less than one-tenth of a mile.

Existing Traffic Volumes

Intersection AM and PM peak hour turning movements were counted in November, 2008 (see **Figure 3-2**). At that time, vehicle queues often in excess of 30 vehicles were observed during most of the PM peak for the southbound left turn onto South Wadsworth Boulevard. In May 2009, the traffic signal timing on the Lockheed Martin site was changed by adding a ten-second all-red interval between both phases at the signal. This provided gaps in traffic that reduced those queue lengths to five to ten vehicles, with much shorter delays throughout the peak hour. It also improved the Level of Service (LOS) for that movement from LOS F to LOS C.

Figure 3-2: Existing Traffic Volumes



3.2.2 Impacts

No-Action Alternative

Under the No-Action Alternative, current congestion, safety, and access problems would continue to worsen, and intersection LOS would decline as traffic volumes continue to increase.

Preferred Alternative

An objective of the traffic analysis was to assess the operational lifespan of the Preferred Alternative by determining an approximate timeframe when a specific movement within the intersection would reach LOS D. LOS was assessed using existing volumes to forecast the performance of the Preferred Alternative on opening day.

The Preferred Alternative would perform at LOS B in the AM peak hour and LOS A in the PM peak hour on opening day. The intersection would decline to LOS D by 2025 to 2030 in the PM peak hour, with the left turn from Waterton Road being the critical movement. The southbound ramp diverge approaching the intersection would decline to LOS D by 2025 to 2030.

During construction, overnight closure of South Wadsworth Boulevard may be required for bridge construction, depending upon the specific bridge design and the particular construction techniques required.

3.3 Wildlife

Wildlife information was obtained from the Colorado Division of Wildlife (CDOW), Colorado State Parks, Douglas County Planning and Community Development, Natural Diversity Information Source, Colorado Natural Heritage Program, U.S. Fish and Wildlife Service (USFWS), Wildlife Resources Information System (WRIS), U.S. Army Corps of Engineers (USACE), and previous biological resources reports.

Photo 1: View north toward Brush Creek

Several federal and state statutes, regulations, and policies have been developed to protect wildlife. The Migratory Bird Treaty Act (MBTA) protects migratory birds, including their nests and eggs. No formal raptor field surveys were conducted for this feasibility study.

The Fish and Wildlife Coordination Act, as amended, is a federal law that requires consultation with the USFWS to prevent loss of and damage to wildlife resources for projects that may impound, divert, control, or otherwise modify the waters of any stream or other water body. The law includes a provision for the USFWS to determine the effects of environmental changes

and human activities. This law is relevant to the assessment of wildlife and wildlife habitat for this project because of its potential effects on wildlife and wildlife habitat. The project's potential effects to wildlife resources were evaluated in compliance with this requirement.

The Colorado Wildlife Commission, under the authority of the Colorado State Revised Statutes 33-1, 33-4, and 24-4, protects nongame species in addition to administering laws governing hunting and possession of wildlife. Potential impacts to wildlife and wildlife habitat were evaluated to determine if game or nongame species would be affected by the project. In addition, the CDOW was consulted for input on potential impacts and mitigation opportunities.

3.3.1 Wildlife Existing Conditions

Migratory birds are presumed to use the Study Area because of its proximity to open grassland, riparian cover, and river and lake water sources. Chatfield State Park is located along a major neotropical migratory route that follows the mountain ranges from South America to North America (USACE 2002), and contains populations of great blue herons, double-crested cormorants, and various raptors. Potential raptor species in the area include Bald eagle (*Haiaeetus leucocephalus*) and Golden eagle (*Aquila chrysaetos*).

Photo 2: View south at Brush Creek Bridge

Riparian habitat exists along the South Platte River and in drainage areas such as Brush Creek, which flows from the north into the South Platte River and crosses the Study Area. A small flow of water was observed in Brush Creek in 2009 and 2010 during summer field reviews. Brush Creek normally carries water intermittently throughout the year. The plains cottonwood/sandbar willow vegetation community adjacent to Brush Creek provides a migration corridor, cover, and feeding areas for large mammals, migratory birds, reptiles, and amphibians.

Grassland and scrubland habitat exists within the Study Area on upland areas adjacent to Brush Creek and the South Platte River. Existing roadways and parking areas within the Study Area have disturbed these zones, creating areas of noxious weeds and thicker pockets of woody species cover. Native and ornamental plant species exist adjacent to the Audubon Nature Center and the Study Area, and provide additional wildlife habitat, nesting area, and forage areas. Numerous migratory songbirds occur in the vicinity of the Audubon Nature Center and in the understory shrub and grass areas adjacent to Brush Creek.

Please refer to Section 3.5.1 for a discussion of vegetation identified in the Study Area.

3.3.2 Wildlife Impacts

No-Action Alternative

The No-Action Alternative would not result in new impacts to wildlife.

Preferred Alternative

Impacts to native vegetation as a result of the Preferred Alternative would be most concentrated at Brush Creek near the proposed ramps and retaining walls. Shrub vegetation would be permanently impacted at the new ramp and bridge abutment areas in the western portion of the Study Area, and at the new connection road between the Audubon Nature Center access and the Waterton parking area. Temporary impacts to vegetation would occur in construction areas at Brush Creek (bridge extension), at the flyover, and at all new roadway areas.

The existing species that use affected habitats are adapted to human presence and development, and are tolerant of some degree of disturbance. The Preferred Alternative would have negligible effects on food sources and nesting areas, but could temporarily impact wildlife travel corridors. Habitat fragmentation was minimized by using a 500-foot southbound flyover that would span South Wadsworth Boulevard and Brush Creek. This design would limit riparian vegetation impacts at Brush Creek and maintain the existing wildlife travel corridor. Extensions to the existing Brush Creek Bridge at South Wadsworth Boulevard and the new concrete box culvert under the existing northbound roadway of the Waterton Canyon Road would temporarily impact wildlife activities during construction, but would not permanently impact wildlife travel corridors.

Photo 3: View northwest at proposed flyover

3.3.3 Wildlife Mitigation

JeffCo will employ mitigation measures to avoid impacts to migratory birds, such as conducting vegetation removal between August 15 and April 1. Mitigation measures, such as replacement of native vegetation, will be implemented within the drainage and wildlife travel corridor connecting Brush Creek with the South Platte River. Mitigation measures to offset and minimize impacts to vegetation are discussed in more detail in Section 3.5.3. JeffCo will use Best Management Practices (BMPs) to mitigate impacts to vegetation and noxious weeds, and include revegetation using native grasses and forbs species to provide natural habitats and displace potential noxious weed invasions. Roadway slopes and drainage areas will be revegetated as soon as practicable after construction to mitigate removal of vegetation and temporary loss of wildlife habitat within existing right-of-way areas.

Permanent loss of native vegetation would occur in areas of new roadway, bridge abutment, and access road. Vegetation mitigation opportunities exist in temporarily impacted areas of the project as well as adjacent disturbed landscapes. Native vegetation enhancements will be used to mitigate permanent disturbances to existing vegetation and landscape.

If raptor species are found to nest within the buffer areas established by the CDOW, seasonal restrictions and recommended buffer zones will be implemented to protect nesting sites.

Photo 4: View south toward proposed unpaved road access

Specific BMPs will be included in the Vegetation and Noxious Weed Management Plan to reduce the potential for the introduction, spread, and establishment of noxious weeds during construction (see Sections 3.5.3 and 3.5.6)+.

3.4 Fisheries

3.4.1 Fisheries Existing Conditions

Although land development activities have impacted the South Platte River upstream of Chatfield Reservoir, it supplies suitable habitat for rainbow and brown trout (Foster Wheeler 2000). Other nearby tributaries, such as Plum Creek and Deer Creek, have limited game fish populations because of low water flows during the summer. Brush Creek, which is the only watercourse within the Study Area, also has little to no flow during the summer, with intermittent flows throughout the year.

3.4.2 Fisheries Impacts

No-Action Alternative

The No-Action Alternative would not result in new impacts to fisheries.

Preferred Alternative

The Preferred Alternative is located approximately 700 feet from the South Platte River, and would not directly impact the South Platte River. Indirect impacts from erosion and sedimentation may occur during construction.

3.4.3 Fisheries Mitigation

Section 3.7.5 and 3.9.3 include BMPs that will avoid and minimize indirect impacts to South Platte River fisheries during construction activities.

3.5 Vegetation and Noxious Weeds

This section summarizes findings from the July 2009 field survey, which included a vegetation and noxious weed survey of the Study Area. Natural vegetation communities and impact areas also were identified through aerial photography interpretation.

3.5.1 Existing Vegetation Conditions

The Environmental Protection Agency (EPA) has categorized habitat types across the state as a way to generalize resource types, vegetation communities, land uses, and wildlife species distributions. The Study Area is located at the edge of two sub-ecoregions: sub-ecoregion 21d (Foothill Shrublands) and sub-ecoregion 25l (Front Range Fans), as defined by EPA. Foothill Shrublands are typically dominated by sagebrush and mountain mahogany shrublands, pinyon-juniper woodlands, scattered scrub-oak shrublands, and grasslands. Front Range Fans are typified by grasslands, but have been converted mostly to rangeland, croplands, and developed areas.

Along with the generalized vegetation communities described above, riparian vegetation exists along Brush Creek, the historic Last Chance Ditch, and parts of the South Platte River corridor. For the purposes of this study, natural vegetation communities within the Study Area can be generalized into two categories: grassland/scrubland and riparian. **Table 3-1** shows the common vegetation identified in the Study Area during the July 2009 survey.

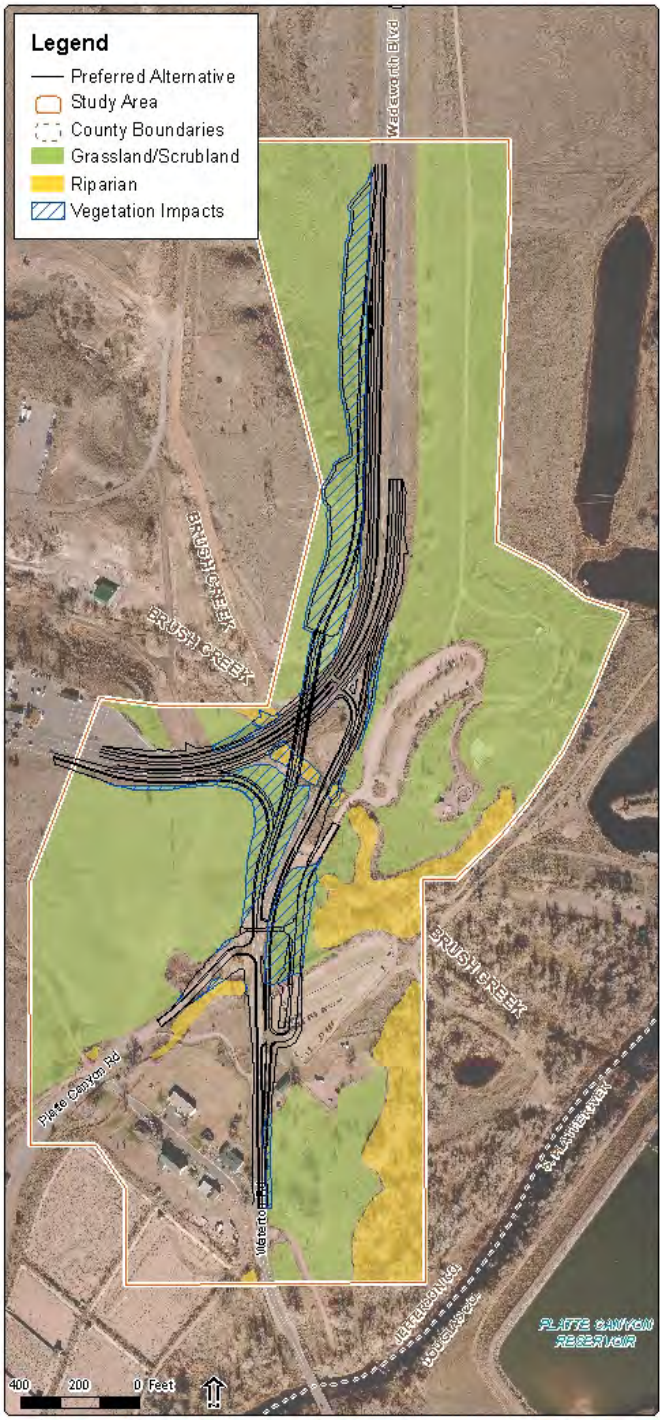
Table 3-1: Common Vegetation within the Study Area

Common Name	Scientific Name
Blue grama	*Bouteloua gracilis*
Boxelder	*Acer negundo*
Buffalograss	*Buchloe dactyloides*
Chokecherry	*Prunus virginiana*
Golden currant	*Ribes aureum*
Green ash	*Fraxinus pennsylvanica*
Narrowleaf cottonwood	*Populus angustifolia*
Peachleaf willow	*Salix amygdaloides*
Plains cottonwood	*Populus deltoides*
Redtwig dogwood	*Cornus stolonifera*
Sandbar willow	*Salix exigua*
Siberian elm	*Ulmus pumila*
Sideoats grama	*Bouteloua curtipendula*
Snowberry	*Symphoricarpos occidentalis*
Western wheatgrass	*Pascopyrum smithii*

The Study Area is dominated by the rights-of-way for South Wadsworth Boulevard and Waterton Road, the parking lots for the Audubon Nature Center and Waterton Canyon/Colorado trails, and several hiking trails. Areas adjacent to the roadway are infested by several noxious weed species, discussed in greater detail in Section 3.5.4, Existing Noxious Weed Conditions.

Areas with extensive noxious weed infestation have impaired function as natural vegetation communities, and generally exhibit characteristics of highly disturbed areas. **Figure 3-3** shows areas of natural vegetation communities and impact areas within the Study Area.

Figure 3-3: Vegetation Communities and Impacts



3.5.2 Vegetation Impacts

No-Action Alternative

The No-Action Alternative would not directly affect existing vegetation resources. However, with increasing traffic and congestion, nonpoint source pollution from runoff would increase, which could eliminate areas of established vegetation communities and increase the possibility for noxious weed invasion.

Preferred Alternative

The Preferred Alternative would result in the removal of vegetation as a result of construction activities. **Figure 3-3** shows areas of direct impacts to vegetation communities within the Study Area.

The Preferred Alternative would result in the removal of 0.35 acre of riparian habitat associated with Brush Creek, and removal of 6.42 acres of grassland/scrubland habitat. The majority of roadway improvements would occur within existing right-of-way, and the natural vegetation communities that would be converted have a history of disturbance.

The riparian corridor associated with Brush Creek is considered potential habitat for the Preble's Meadow Jumping Mouse, a federally threatened species (see Section 3.6 for more information).

Indirect Impacts

The Preferred Alternative would increase impervious surfaces which, without mitigation, would increase runoff and expose the surrounding vegetation to higher levels of pollutants. Soil disturbance from construction equipment would also create favorable conditions for weedy species to further establish in the Study Area.

Other indirect impacts include the decrease or elimination of upland tree and/or shrub buffers between the proposed roadway improvements adjacent to Brush Creek waterways. Vegetative buffers provide valuable wildlife habitat and allow for infiltration of runoff, which filters pollutants before they reach water resources.

Many of the existing vegetation communities currently experience indirect effects from the existing roadway and maintenance activities. Because the Preferred Alternative would generally follow the existing roadway alignments, it would not introduce new types of indirect effects, but it would increase the magnitude of existing indirect effects to vegetation communities in those areas.

3.5.3 Vegetation Mitigation

JeffCo will follow all appropriate revegetation BMPs and guidelines to ensure adequate revegetation of the Study Area. Specific BMPs will be determined during final design, and will include:

- Minimize amount of disturbance and limit the amount of time that disturbed areas are allowed to remain non-vegetated.
- Implement an Integrated Noxious Weed Management Plan.
- Avoid existing trees, shrubs, and vegetation to the extent possible, especially riparian and wetland plant communities.
- Salvage weed-free topsoil for use in revegetation efforts.
- Implement temporary and permanent erosion control measures to limit erosion and soil loss. Use erosion control blankets on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Roughen slopes at all times and contain concrete washout.
- Schedule vegetation removal outside of the nesting season, as stipulated in the MBTA.
- Revegetate all disturbed areas with native grass and forb species. Apply seed, mulch, and mulch tackifier in phases throughout construction.

3.5.4 Existing Noxious Weed Conditions

Noxious weeds are invasive, non-native plants introduced to Colorado by accident or that spread after being planted for another purpose and result in lands with decreased economic and environmental value. The Colorado Noxious Weed Act (35-5.5-101 through 119, C.R.S.) recognizes that "certain undesirable plants constitute a present threat to the continued economic and environmental values of the lands of the state and if present in any area of the state must be managed." The legislation places all public and private lands in Colorado under the jurisdiction of local governments to manage noxious weeds. According to the Act, a noxious weed meets one or more of the following criteria:

- Aggressively invades or is detrimental to economic crops of native plant communities.
- Is poisonous to livestock.
- Is a carrier of detrimental insects, disease, or parasites.
- Results in direct or indirect impacts that are detrimental to the environmentally sound management of natural or agricultural ecosystems (Colorado Department of Agriculture, 2006 A).

The State Department of Agriculture has implemented a Noxious Weed Management Program. The program is aimed at preventing the introduction of new invasive plant species, eradication of species with limited or isolated populations, and containing and managing invasive species already well established and widespread in Colorado.

Table 3-2 lists the noxious weeds (Colorado Department of Agriculture, 2006B) present in the Study Area during the July 2009 survey. Weedy and noxious species are present in isolation throughout much of the Study Area; however, areas were identified where the concentration of weeds is greater. **Figure 3-4** shows areas of dense concentration of the weeds species listed in **Table 3-2**. Eleven areas were identified during the weed survey as having greater patch size and density of listed noxious species.

Table 3-2: Listed Weed Species Observed in the Study Area

Common Name	Species	Jefferson County Weed List	State Noxious Weed List
Canada Thistle	*Cirsium arvense*	Yes	B
Cheatgrass	*Bromopsis tectorum*	Yes	C
Common teasel	*Dipsacus fullonum*	Yes	B
Field Bindweed	*Convolvulus arvensis*	No	C
Houndstongue	*Cynoglossum officinale*	Yes	B
Spotted Knapweed	*Centaurea maculosa*	No	B

- **Area 1:** In the sand filtration facility southwest of the Denver Water office complex, a 2.0-acre area is infested with common teasel and Canada thistle, which account for approximately 15 percent and 5 percent ground cover, respectively.
- **Area 2:** North and adjacent to the Denver Water access road, north of the Denver Water office complex, a 0.14-acre area is infested with field bindweed and Canada thistle, which account for 40 percent and 2 percent ground cover, respectively.
- **Area 3:** South of Area 2, across the Denver Water access road, a 0.03-acre area is infested with field bindweed, which accounts for approximately 15 percent ground cover.
- **Area 4:** East of Area 3, adjacent to a pedestrian path, a 0.04-acre area is infested with Canada thistle, which accounts for approximately 5 percent ground cover.
- **Area 5:** Between Waterton Road and the pedestrian path to the west, a 0.45-acre area is infested with field bindweed and Canada thistle, which account for approximately 10 percent and 5 percent ground cover, respectively.
- **Area 6:** Southwest of the pedestrian path near the Denver Water office complex, a 0.06-acre area is infested with field bindweed, which accounts for approximately 15 percent ground cover.
- **Area 7:** Along the northern edge of the Waterton parking area, a 0.36-acre area is infested with Canada thistle (which accounts for approximately 80 percent of ground cover), houndstongue (which accounts for approximately 3 percent ground cover), and spotted knapweed (which accounts for approximately 3 percent ground cover).
- **Area 8 :** East of Waterton Road, between the Waterton parking lot and the entrance to the Audubon Nature Center, a 0.82-acre area is infested with Canada thistle (which accounts for approximately 20 percent of ground cover), spotted knapweed (which accounts for approximately 5 percent ground cover), and houndstongue (which accounts for approximately 3 percent of ground cover).
- **Area 9:** North of the entrance to the Audubon Nature Center, a 0.08-acre area is infested with Canada thistle, which accounts for approximately 20 percent of ground cover.
- **Area 10:** North of a parking area adjacent to Waterton Road, a 0.17-acre area is infested with Canada thistle and common teasel, which account for approximately 20 percent and 5 percent ground cover, respectively.
- **Area 11:** West of Waterton Road, across from the entrance to the Audubon Nature Center, a 0.21-acre area is infested with common teasel (which accounts for approximately 5 percent of ground cover), Canada thistle (which accounts for approximately 5 percent ground cover), field bindweed (which accounts for approximately 20 percent ground cover), and cheatgrass (which accounts for approximately 5 percent ground cover).

3.5.5 Noxious Weed Impacts

No-Action Alternative

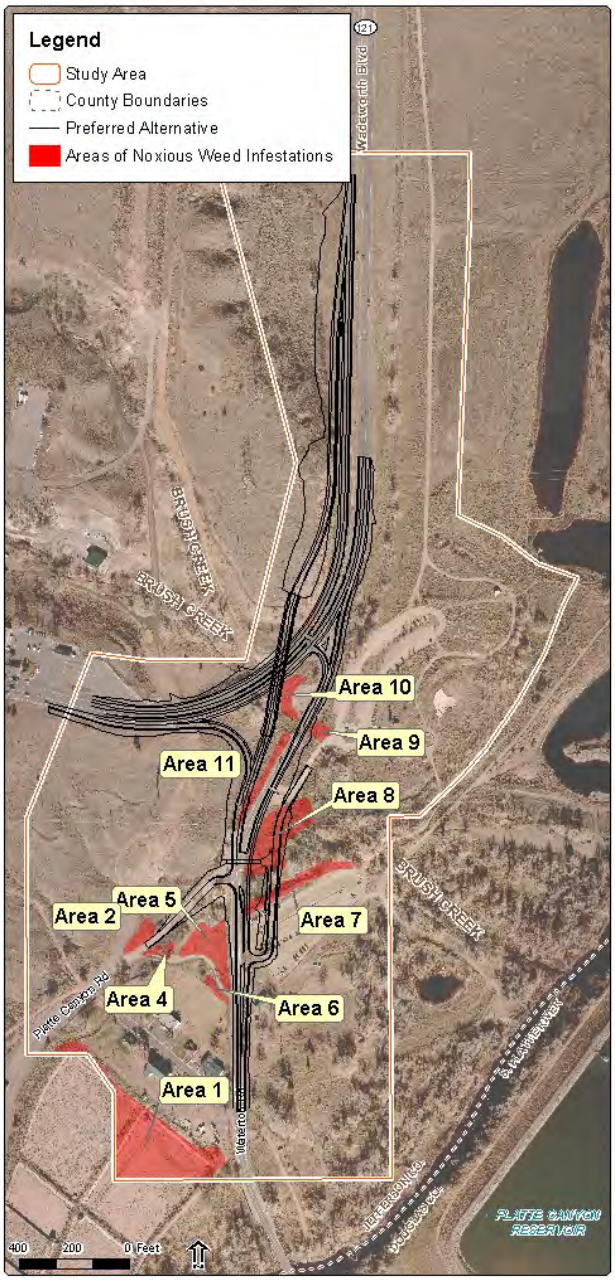
The No-Action Alternative would not contribute to the spread of noxious weeds. However, because the No-Action Alternative would not include new BMPs, impacts from roadway pollution and sediment runoff may increase as traffic and congestion increase. This could eliminate sections of established vegetation communities and increase the possibility for noxious weed invasion.

Preferred Alternative

Construction of the Preferred Alternative would disturb areas that are already inhabited by weeds and would disturb areas that currently have a relatively minor weed cover. This would result in the potential for the introduction and spread of weeds into those areas. Temporary work areas would be susceptible to weed invasion.

Soil disturbance associated with construction of the Preferred Alternative is anticipated to provide further conditions for invasion of new noxious weed species, as well as noxious weeds currently in the Study Area, especially Canada thistle. Possible effects from increased noxious weed populations could include loss of economic value for lands containing weed infestations, loss of habitat for native vegetation, and degradation of habitat for wildlife species, especially within the riparian corridor.

Figure 3-4: Areas of Noxious Weed Infestation



3.5.6 Noxious Weed Mitigation

JeffCo will incorporate a management plan for noxious weeds into the project design and implement it during construction. JeffCo will require the contractor to employ specific BMPs

during construction to reduce the potential for introduction and spread of noxious weed species. Jeffco's contractor will:

- Conduct detailed weed mapping of the Study Area during the design phase. Mapping will be prepared by a weed specialist, and will be included in the construction documents along with appropriate control methods for noxious weeds.
- Identify all existing noxious weed infestations within the Study Area during the design phase. Periodically inspect areas of impact identified in the design process during construction and during post-construction weed monitoring for invasion of noxious weeds.
- Prepare an Integrated Noxious Weed Management Plan prior to construction, if required.
- Select appropriate herbicides and timing of herbicide spraying, and use of a backpack sprayer.
- Use certified weed-free hay and/or mulch in all revegetated areas.
- Not allow fertilizers on the project site.
- Not salvage topsoil that is contaminated by noxious weeds or seeds. Do not import topsoil onto the project site unless it is weed-free.
- Minimize soil disturbance. Areas most vulnerable to invasive infestations are those that have recently been cleared of vegetation.
- Not introduce equipment into weed-infested areas until those areas are treated. All equipment will be cleaned of soil and vegetative plant parts prior to arriving on the project site to avoid introducing additional invasive species.
- Use native plant species for revegetation purposes.
- Coordinate weed management efforts with local jurisdictional agencies and adjacent landowners to the extent possible.
- Add supplemental noxious weed control measures during the design process and construction planning.

3.6 Threatened, Endangered, and Sensitive Species

Threatened, endangered, and other sensitive (TES) species include:

- Species federally listed as threatened or endangered, and species proposed or candidates for listing,
- Species state-listed as threatened or endangered, other sensitive species that include state species of concern (SSC),

- Species considered rare or imperiled in the state by the Colorado Natural Heritage Program (CNHP).

The regulations and policies associated with the assessment of federally and state-listed threatened, endangered, proposed, candidate species, and state species of special concern include the Endangered Species Act and the Colorado Revised Statutes 33-1, 33-4 and 24-4, as amended. The Colorado Wildlife Commission, under the authority granted by the Colorado statutes cited above, has published lists of endangered and threatened species and species of special concern. The Colorado Division of Wildlife (CDOW) has developed state-listed threatened and endangered animal species under Statute 33-2-105 [CNHP (1999)]. Native animal species can also be listed as SSC if they have been removed from state listing as threatened or endangered within the last five years, are proposed for federal listing, are federal candidates, or have a decrease in numbers or distribution in Colorado.

3.6.1 Existing Conditions

Data obtained from the USFWS, CDOW, and CNHP were compiled to identify TES species that potentially exist in the Study Area. The Jefferson County list of TES species for the Study Area is shown in **Table 3-3**. Of the 11 species listed**,** only one species, Preble's Meadow Jumping Mouse (PMJM), occurs in the Study Area. The PMJM is discussed in more detail in Section 0.

Table 3-3: Jefferson County List of Federally Listed, Candidate and Proposed Species and Potential to Occur in the Study Area

Species	Status*	Habitat Requirements	Potential for Occurrence
Fish			
Pallid sturgeon *Scaphirhynchus albus*	FE	Meandering, braided channels and backwaters in the Missouri River.	Does not occur near the Study Area. Project would not impact water sources that are part of the South Platte River.
Birds			
Least tern (interior population) *Sternula antillarum*	FE, SE	Nesting habitat is on sandy or pebbly beaches around lakes and reservoirs or on sandy soil sandbars in river channels.	Breeding grounds in Colorado in southeastern part of state. The project would not impact suitable habitat.
Mexican spotted owl *Strix occidentalis lucida*	FT, ST	Rocky canyons or forested mountains below 9,500-foot elevation. Nests in standing snags and hollow trees.	Does not occur in the Study Area; no suitable habitat.
Piping plover *Charadrius melodus*	FT, ST	Beaches, lake shores, marshes and other wetland areas that contain sparse vegetation and sandbars.	The project would not impact wetlands or areas of suitable habitat.
Whooping crane *Grus americana*	FE, SE	Wintering area in Texas and nesting area in Canada, migratory through Colorado.	The project would not impact wetlands or areas of suitable habitat.
Mammals			
Preble's meadow jumping mouse *Zapus hudsonius preblei*	FT, ST	Riparian areas with lush vegetation.	Known to occur adjacent to the Study Area.

Table 3-3: Jefferson County List of Federally Listed, Candidate and Proposed Species and Potential to Occur in the Study Area

Species	Status*	Habitat Requirements	Potential for Occurrence
Canada lynx *Lynx canadensis*	FT, SE	Dense sub-alpine forest and willow-choked corridors along mountain streams.	The project would not impact areas of suitable habitat.
Gunnison's prairie dog *Cynomys gunnisoni*	C	Montane habitat (80% of range) mountain meadows and grass-shrub in low valleys at higher elevations and intermountain valleys.	The project would not impact areas of suitable habitat.
Plants			
Colorado butterfly plant *Gaura neomexicana spp. Coloradensis*	FT	Adapted to periodically disturbed, sub-irrigated stream channels with short vegetative cover.	The project would not impact wetlands or areas of suitable habitat.
Ute ladies'-tresses orchid *Sprianthes diluvialis*	FT	Modifications to riparian habitat have reduced populations to very small and specific areas.	The project would not impact wetlands or areas of suitable habitat.
Invertebrates			
Pawnee montane skipper *Hesperia leonardus montana*	FT	Dry, open Ponderosa pine forest with sparse understory at elevations of 6,000 to 7,500 feet.	The project would not impact woodlands or areas of suitable habitat.

*Status Codes: FE=Federally Endangered, FT=Federally Threatened, SE=State Endangered, ST=State Threatened, SC=State Special Concern, C=Candidate for Listing
Species that do not exist in the Study Area are not discussed further in this study.

3.6.2 Threatened & Endangered, Sensitive, and Rare Species Impacts

No-Action Alternative

The No-Action Alternative would not result in new impacts to threatened and endangered, sensitive, and rare species.

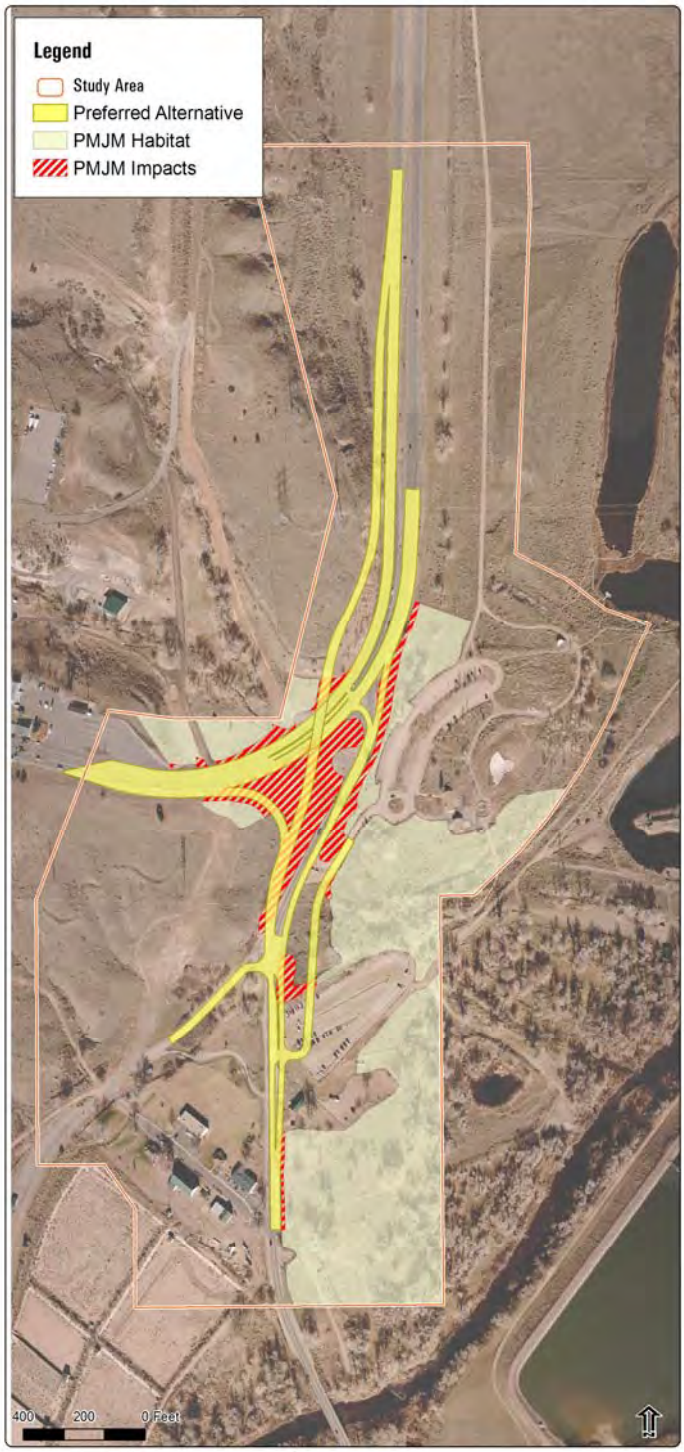
Preferred Alternative

The USFWS has proposed revised designated critical habitat for the PMJM along the South Platte River upstream of Chatfield Reservoir (USFWS, 2009). The critical habitat designation for PMJM is an approximate 330-foot width outward from the 100-year floodplain and includes suitable upland habitat. Critical habitat is proposed on USACE lands adjacent to the Study Area. The Study Area is immediately adjacent to designated critical habitat for PMJM, and the presence of

Photo 5: View of Brush Creek from Waterton Road

PMJM is assumed in regard to this project. Permanent and temporary impacts to potential PMJM habitat, developed based on consultation with the USPS would occur in areas shown in **Figure 3-5**.

Figure 3-5: Preble's Meadow Jumping Mouse Habitat Impacts



The Preferred Alternative would permanently impact shrub and grass vegetation adjacent to riparian habitat along Brush Creek and also in heavily vegetated areas east of the roadway in the area of the proposed relocated unpaved access. Paved roadway, bridge retaining walls, and relocated unpaved roads are located in areas outside of the riparian zone, but in areas that could provide suitable habitat for PMJM movement between riparian shrub zones and upland grassland habitats.

The Preferred Alternative would temporarily impact PMJM habitat in areas that would be revegetated after construction, including roadway embankments, bridge flyover, and bridge extensions at Brush Creek. Temporary impacts to PMJM travel corridors would occur during construction at the Brush Creek Bridge, but the major existing PMJM travel corridor from Brush Creek to the South Platte River floodplain would not be permanently impacted. This existing travel corridor, which connects the upland area north of South Wadsworth Boulevard with the South Platte River corridor, now includes the Brush Creek Bridge, a culvert under Waterton Road, and a drainage pipe under the unpaved access road to the Audubon Nature Center. Coordination with the USFWS will continue throughout the NEPA process for this project, and will include preparation and submittal of a

Biological Assessment to the USFWS for their review and subsequent issuance of a Biological Opinion. Threatened and Endangered Species Mitigation
Section 7 of the Endangered Species Act prohibits destruction or adverse modification of a critical habitat by any activity that is funded, authorized, or carried out by any federal agency, and federal agencies proposing actions affecting areas designated as critical habitat must consult with the USFWS on the effects of their proposed actions, pursuant to Section 7(a) (2) of the Act (USFWS 2009).

Photo 6: View north at Brush Creek Bridge

Douglas County's habitat conservation plan (HCP), *Habitat Conservation Plan and Environmental Assessment for Douglas County and the Towns of Castle Rock and Parker* (2006), has been approved by the USFWS and may be used to mitigate impacts to potential PMJM habitat, and would cover the incidental take of PMJM. JeffCo will reference the HCP for planning and construction of BMPs and revegetation activities associated with the Preferred Alternative.

The HCP only covers PMJM. No other threatened and/or endangered species have been found to occur within the Study Area. JeffCo will mitigate temporary and permanent riparian vegetation impacts on site, and will follow the vegetation guidelines outlined in the Douglas County HCP.

Special management considerations and protection will be required in addition to Section 7 Consultation and the Douglas County HCP. Specific protection measures will be determined during the NEPA study and final design, Jeffco or it's contractor and will:

- Schedule construction activities and vegetation removal outside of the PMJM hibernation period.
- Use additional cover materials during site restoration to provide PMJM travel corridors and sufficient cover during PMJM active season.
- Install and maintain erosion controls, such as silt fencing, erosion control logs, and plastic fencing.
- Minimize and delineate construction zones to reduce impacts to adjacent habitat, and revegetate disturbed areas.
- Not allow construction personnel, materials, or equipment beyond the work area.
- Use of direct lighting during nighttime construction at the construction zone.

- Not allow materials into riparian habitat during demolition Activities.
- Restore areas temporarily disturbed during construction by reseeding disturbed native grass habitat, and replanting willows in riparian habitat and upland shrubs on upland sites.
- Restore wildlife travel corridor functionality of Brush Creek through enhancement of native plant materials and the design of drainage structures and bridge culverts.

3.7 Water Resources/Quality

Information regarding water resources and water quality within the Study Area was obtained from JeffCo, Douglas County, and from publicly accessed internet sources of federal, state, and county agencies. Data from the US Geological Survey National Hydrography Dataset were used to identify surface water features within the Study Area, including rivers, streams, ponds, reservoirs, and lakes. Brush Creek is the only surface water within the Study Area.

Water resources within the Study Area are managed by several federal, state, and local regulations that establish the standards and management actions necessary to protect their physical, chemical, and biological integrity. The primary regulations governing surface water and groundwater resources are the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA). The Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Commission (WQCC) has the authority to establish and enforce water quality standards within the state.

The primary water quality concern from the Preferred Alternative relates to the discharge of stormwater to receiving waters. As part of the CWA, entities with stormwater discharges are regulated under the National Pollutant Discharge Elimination System (NPDES) permit program.

Municipal Separate Storm Sewer Systems (MS4) that are owned and maintained by municipalities and CDOT are required to obtain Colorado Discharge Permit System (CDPS) permits for stormwater discharges. The permit requires CDOT to develop and implement a stormwater management program to maintain and protect water quality conditions from their stormwater discharges. A major program element is the development and implementation of BMPs, which are defined as activities, procedures, and other practices that prevent or reduce water pollution. As part of their respective MS4 programs, CDOT and Jeffco are required to design, construct, and maintain permanent BMPs to protect aquatic resources. The stormwater management program also requires CDOT and Jeffco to develop, implement, and enforce a program to reduce pollutants in stormwater runoff for any construction activity that would result in a land disturbance greater than or equal to one acre.

While the entire project must comply with the CDPHE-WQCC rules and regulations, the MS4 permit requirements are only applicable in designated MS4 areas. The CDOT MS4

requirements and specifications comply with the FHWA regulation "Erosion and Sediment Control on Highway Construction Projects".

Surface Water Classifications

The CDPHE-WQCC has established the following regulations that classify the designated uses and water quality standards that apply to the surface water bodies within the Study Area:

- **Regulation 31:** Basic Standards and Methodologies for Surface Water
- **Regulation 38:** Classification and Numeric Standards for South Platte River basin; Laramie River Basin; Republican River Basin; Smoky Hill River Basin

Colorado has four designated uses for surface water bodies: agriculture, water supply, recreation, and aquatic life. These designated uses have their own unique water quality standards that are either numeric (quantitative thresholds) or narrative (visual/aesthetic). Surface water classifications do not apply to water that is conveyed in man-made structures, such as ditches. Streams that do not meet established water quality standards ("impaired streams") are placed on the Colorado 303(d) List and are required to go through a process to help improve water quality. The process results in the development of a Total Maximum Daily Load (TMDL), which is a total amount of pollutant loading that a surface water system can assimilate without exceeding water quality standards. Surface waters that require additional monitoring and evaluation to determine if water quality standards are being met are placed on the Colorado 303(d) Monitoring and Evaluation List.

3.7.1 Surface Water

Water resources within the vicinity of the Study Area help maintain the local ecosystem of the South Platte River floodplain and support local economic vitality. The resources include the South Platte River and Chatfield Reservoir and associated tributaries, which to varying degrees support floodplains, water supplies, recreation, wildlife, aquatic life and habitat, and water quality of the surrounding Front Range communities.

The Study Area is located within the Chatfield Watershed, which includes Plum Creek, Deer Creek, and the South Platte River and its tributaries between Strontia Springs Reservoir in the foothills above the Study Area to Chatfield Reservoir northeast of the Study Area.

The South Platte River is directly adjacent to the Study Area. Designated uses for this segment of the South Platte River, as classified by the EPA and CDPHE, include aquatic life habitat, recreation, water supply, and agriculture.

The segment of the South Platte River adjacent to the Study Area is considered the tailwaters of Chatfield Reservoir, which is located approximately 1.25 miles from the northern limits of the Study Area. The USACE constructed the Chatfield Reservoir in response to flooding events

along the Front Range, and it provides flood control and water supply to Front Range communities.

The Study Area is bisected by Brush Creek, an intermittent stream that flows southeast under South Wadsworth Boulevard to its confluence with the South Platte River. Designated uses for Brush Creek include aquatic life, recreation, and agriculture.

The historic Last Chance Ditch is also located within the Study Area, although it has been fragmented by roadway and water line construction and currently carries only runoff flows from stormwater events. Ditches located on either side of South Wadsworth Boulevard and along the northern side of the Waterton parking lot carry stormwater flows as well.

3.7.2 Groundwater

Groundwater resources in Colorado range from non-tributary aquifers to shallow alluvial or tributary aquifers. The Study Area is underlain by the Denver Basin aquifer system, characterized by Cretaceous and Tertiary sandstone, conglomerate, and shale formations. The Denver Basin aquifer system is a consolidated-rock aquifer, as an enclosed system underlain by the nearly impermeable Pierre Shale formation. The South Platte River Valley acts as a surficial aquifer throughout the region, and serves as an area of recharge for the Denver Basin aquifer system.

3.7.3 Water Quality

The CDPHE established the Chatfield Watershed Authority in 1984 to implement point source, nonpoint source, and stormwater controls. The Chatfield Watershed Authority promotes protection of water quality in the Chatfield Watershed for recreation, fisheries, drinking water supplies, and other beneficial uses.

Overall, water quality in the Chatfield Watershed, including the relevant reach of the South Platte River and its tributaries, is good. However, Chatfield Reservoir is subject to elevated levels of phosphorous and chlorophyll, which can result in algal blooms.
The Roxborough Park Wastewater Treatment (RPWT) facility, located approximately 0.3 mile southwest of the Study Area, was decommissioned in 2006, when the Roxborough Park development connected to the Littleton/Englewood Wastewater Treatment Plant. Wastewater treatment facilities on the Lockheed Martin property were also consolidated and diverted. This eliminated the discharge of treated wastewater into the South Platte River upstream from Chatfield Reservoir, improving water quality conditions.

3.7.4 Water Resources and Water Quality Impacts

No-Action Alternative

The No-Action Alternative would not directly impact water resources or water quality. Increased traffic within the area may increase runoff and associated pollutants.

Preferred Alternative

Brush Creek flows beneath South Wadsworth Boulevard and Waterton Road within a large box culvert. The Preferred Alternative would widen this culvert. Potential impacts to water resources in Brush Creek include increased sedimentation as a result of the erosion of soils disturbed during roadway construction and culvert widening.

Direct impacts are most likely to occur where temporary access roads are established for bridge construction. These impacts are expected to be temporary and greatly reduced by the implementation of permanent and temporary BMPs.

Stormwater discharges generated by runoff from land and impervious areas often contain sediment and/or pollutants in quantities that could adversely affect water quality. Types and concentration of pollutants in roadway runoff are highly variable and can be affected by such factors as traffic volumes, climate, maintenance practices, urbanization, vegetation and soil type in the right-of-way. A direct effect of sediments into receiving waters is the increase in turbidity and the concentration of suspended solids.

The volume of stormwater runoff carrying pollutant loads and non-point source pollutants increases proportionately with the amount of impervious surface area. Currently, there are approximately 5.32 acres of impervious surfaces within the proposed limits of construction of the Preferred Alternative. The Preferred Alternative would increase the impervious surface by approximately 2.71 acres, which represents an increase of 50.9 percent over the existing impervious surface area.

Without mitigation the increase in impervious surface area from the Preferred Alternative would lead to additional runoff and increased sedimentation. However, runoff generated from the Preferred Alternative would be directed to detention structures prior to being released to ditches and drains flowing into Brush Creek or the South Platte River.

3.7.5 Water Resources and Water Quality Mitigation

The use of standard erosion and sediment control BMPs in accordance with *Erosion Control and Storm Water Quality Guide*, CDOT, 2002 will be included in the final design plans. All work on this project will conform with Section 107.25 (Water Quality Control) and Section 208 (Erosion Control) of the *CDOT Standard Specifications for Road and Bridge Construction*. The design shall also comply with Executive Order 11990 regarding impacts to wetlands.

Water quality mitigation will adhere to the MS4 Phase II Stormwater Regulations. As part of the Stormwater Management Program, BMPs will be established for each of the required six minimum control measures: public education and outreach, public involvement/participation, illicit discharge detection and elimination, construction site storm water runoff control, post-construction storm water management, and pollution prevention/good housekeeping.

JeffCo and CDOT hold MS4 permits in the Study Area. The criteria developed for each of these permits will need to be reviewed prior to final design and construction. Because these permits may overlap geographically and in content, close coordination between the agencies holding MS4 permits will be required to identify and implement the most appropriate elements of the permits.

In addition to MS4 control measures, the following BMPs from the *Erosion Control and Storm Water Quality Guide* will be applied during construction to reduce construction-related and/or long-term operation impacts to water resources and water quality, as appropriate:

- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch, and mulch tackifier will be applied in phases throughout construction.
- Disturbed areas will have mulch and mulch tackifier applied to prevent erosion in areas where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months).
- Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes will be roughened at all times and concrete washout contained.
- Temporary erosion control blankets will have flexible natural fibers.
- Erosion bales, erosion logs, silt fence, or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways, and at inlets where appropriate.
- Sediment catch basins will be included during construction and put in place permanently with continual maintenance to minimize the loss of sand from the road surface during winter sanding operations.
- Slope drains will be used where appropriate to convey concentrated runoff from top to bottom of the disturbed slopes. Slope and cross-drain outlets will be constructed to trap sediment.
- Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain.
- Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales.
- Work areas will be limited as much as possible to minimize construction impacts to vegetation.
- Temporary detention ponds (during construction) will be used to allow sediment to settle out of runoff before it leaves the construction area. These ponds may be combined with permanent detention ponds.

- Structural BMPs may include extended detention basins with sediment forebays, grass swales, and grass buffers to retain sediment and roadway pollutants resulting from winter sanding, chemical deicing, and normal traffic operations.
- Non-structural BMPs may include litter and debris control, and landscaping and vegetative practices.
- Settling ponds for effluent from dewatering operations will be used if needed.

Water used for construction and/or irrigation will be derived through municipal sources. Therefore, allocations will not exceed the upper Colorado River Basin threshold.

If contaminated groundwater is encountered during the dewatering process, mechanisms will be in place to analyze groundwater for contaminants and effectively treat this groundwater pumped discharge as necessary per the Section 402 Permit requirements.

3.8 Floodplains

Executive Order 11988, Floodplain Management, requires Federal agencies "to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." The base floodplain (100-year flood) is the regulatory standard used by federal agencies and most states to administer floodplain management programs. As described in the 23 CFR 650, Subpart A, floodplains provide natural and beneficial values serving as areas for fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural flood moderation, water quality maintenance, and groundwater recharge.

3.8.1 Floodplains Existing Conditions

A review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) shows that much of the Study Area is located within a FEMA-mapped flood zone. Most of the area, including Waterton Road and portions of South Wadsworth Boulevard within the Study Area, are located in Flood Zone A, as designated by FEMA. Flood Zone A is defined as "areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies." (FEMA, 2010) As such, this area is part of the regulated 100-year floodplain. **Figure 3-6** shows the floodplain within the Study Area.

In addition to FEMA regulations, the USACE has a Land Development Guidance Guideline for projects at reservoir sites. The purpose of the guidance is to require review of land development proposals that modify landforms and surface characteristics of lands within areas operated by the USACE for flood control.

The proposed project falls within the Chatfield Flood Pool, and, therefore, improvements are governed by the USACE guidance. The Preferred Alternative is anticipated to impact Zones 4 and 5. See **Figure 3-7** for an illustration of the flood pool elevation zones.

Figure 3-6: Floodplain Impacts

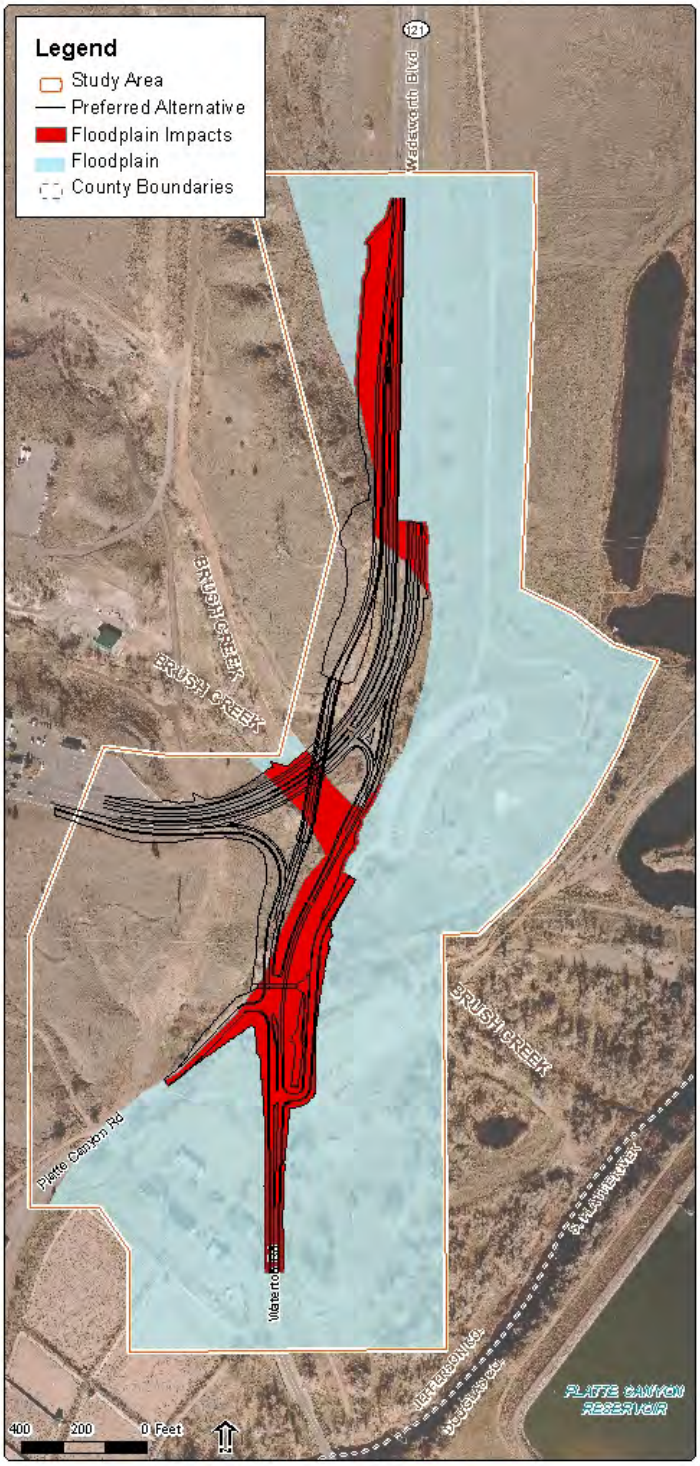
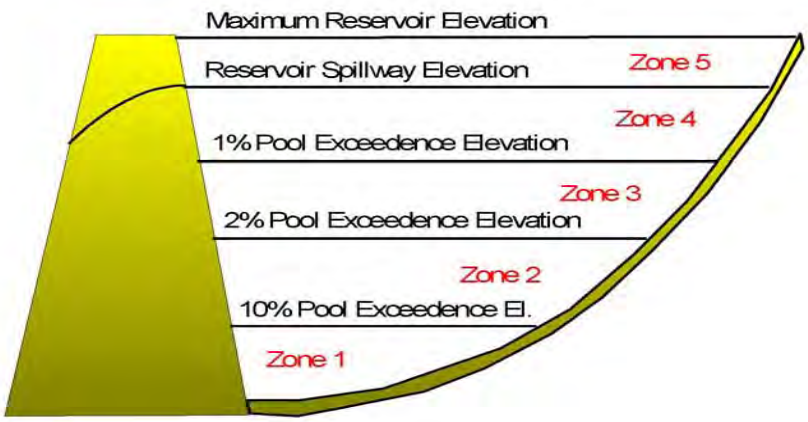


Figure 3-7: Flood Pool Elevation Zones



Elevations of Zones associated with the Chatfield Reservoir Flood Pool are as follows:

- Zone 4 = 5481.0 to 5500.0
- Zone 5 = 5500.0 to 5521.6

3.8.2 Floodplains Impacts

No Action Alternative

The No Action Alternative would result in no new encroachment on the 100-year floodplain.

Preferred Alternative

The Preferred Alternative would result in a minimal floodplain encroachment as defined by 23 CFR 650.105(q). There would be encroachment into the regulated floodplain, but the impacts on human life, transportation facilities, and natural and beneficial floodplain services can be resolved through the use of BMPs and design criteria. No regulated floodways would be impacted. Figure 3-7 shows the areas of encroachment within the FEMA-designated Zone A floodplain.

During project development, the volume of fill within each USACE-defined flood pool elevation zone required for the Preferred Alternative must be balanced with an equal volume of excavation. Since construction of the Preferred Alternative would require fill to develop the new interchange, locations for an equal volume of excavation would need to be identified

during preliminary and final design. This Feasibility Study has identified some locations where this mitigation may occur, but more would be required and identified in final design. During project development, a hydraulic study would be prepared to analyze hydrologic factors that may affect the floodplain within the study area crossed by the proposed project.

3.8.3 Floodplains Mitigation

JeffCo will develop specifc BMPs to reduce temporary and permanent floodplain impacts.during final design. Mitigation measures will include:

- Adherence to CDOT hydraulic design criteria for major and minor storm drainage during final design.
- Coordination with the Urban Drainage and Flood Control District and USACE regarding encroachments on the floodplain, and adherence to hydraulic design criteria.
- Acquiring any necessary floodplain development permits,
- Adhere to USACE flood pool elevation zone excavation requirements.
- Avoid any changes in historical flow paths.
- Adhere to all FEMA requirements during final design, and conform to the requirements of 23 CFR 650 for all hydraulic design.

JeffCo will design all improvements to convey 100-year flows, and will follow CDOT recommendations for the 50- to 100-year flood event capacity.

3.9 Wetlands

This section describes existing wetland resources in the Study Area. Wetlands were delineated in July 2009 following the guidelines and criteria of the *USACE 1987 Wetland Delineation Manual* (Environmental Laboratory, 1987) based on characteristics of vegetation, hydrology, and soils. According to the 1987 Manual, wetlands are those areas inundated and saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances/conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetland systems vegetated with trees, shrubs, or persistent emergent plant species are classified as palustrine (Cowardin, et al., 1979). The palustrine system includes all non-tidal wetlands dominated by trees, shrubs, vascular plants, and non-vascular plants. Palustrine wetland classes include emergent (grass, sedge, and forb dominated) and scrub-shrub (small tree or shrub dominated).

Wetland functions and values were determined using the Functional Assessment of Colorado Wetlands (FACWet) methodology.

3.9.1 Wetlands Existing Conditions

One wetland site totaling 0.16 acre is located within the Study Area (shown as Wetland 1 on **Figure 3-8)**. It is a scrub-shrub wetland dominated by cattail (*Typha angustifolia*), Peachleaf willow (*Salix amygdaloides*), and sandbar willow (*Salix exigua*). Soils in the wetland were characterized by low-chroma and redox features. Standing water was present at the time of survey. Given its topographical location, it is assumed that the wetland receives its hydrology from a spring or seep on the adjacent hillslope.

Figure 3-8: Wetlands Within the Study Area

A culvert carries flow from this wetland underneath South Platte Canyon Road and drains into the historic Last Chance Ditch. Because Last Chance Ditch is no longer used to carry flows, it

can be assumed that this wetland has no significant nexus to a water of the U.S. The USACE will determine the jurisdictional status of the wetland during the permitting stage.

3.9.2 Wetlands Impacts

No-Action Alternative

No wetlands would be permanently impacted as a result of the No-Action Alternative.

Preferred Alternative

Based on preliminary design plans, the Preferred Alternative would result in 500 – 1,000 square feet of permanent impacts to Wetland 1. These impacts are a direct result of construction of a bike and pedestrian path connecting the pedestrian underpass to South Platte River Road.

3.9.3 Wetlands Mitigation

JeffCo has attempted to avoid and minimize wetland impacts under the Preferred Alternative, and will explore ways to further avoid and minimize impacts during final design. Wetlands, as well as their associated functions, permanently impacted by construction of the Preferred Alternative will be mitigated at a 1:1 ratio unless directed otherwise by the USACE. JeffCo will use all appropriate BMPs to prevent temporary impacts to wetlands during construction, including:

- Sediment control measures will be installed where needed to prevent sediment from filling wetlands.
- Fertilizers or hydro-mulching will not be allowed within 50 feet of a wetland.
- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch, and mulch tackifier will be applied in phases throughout construction.
- Where permanent seeding operations are not feasible because of seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion.
- Wetland areas not permanently impacted by the project will be protected from construction activities by temporary and/or construction limit fencing.
- Erosion bales, erosion logs, silt fence, or other sediment control devices will be used as sediment barriers and filters adjacent to wetlands, surface waterways, and at inlets where appropriate.
- Where appropriate, slope drains will be used to convey concentrated runoff from top to bottom of the disturbed slopes. Slope and cross-drain outlets will be constructed to trap sediment.
- Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain.

- Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales.

With proper BMPs for stormwater runoff and construction disturbances, minimal sediment should reach wetland areas. The toes of new construction will be stabilized with silt fence or erosion logs.

Section 404 permitting requirements will be discussed with the USACE.

3.10 Recreation Resources

Parks and recreation facilities are the most prevalent land use in the Study Area. The Denver Parks and Recreation Department and the Colorado Department of Natural Resources Division of State Parks leases property owned by the USACE located adjacent to South Wadsworth Boulevard. Also, Denver Water property at the south end of the Study Area contains many public recreation opportunities

3.10.1 Existing Conditions

Information on existing resources was obtained from discussions with relevant officials associated with the lands, websites managed by the responsible organizations, and the USACE Master Plan for Chatfield Lake, Colorado (updated January 2002).

Chatfield State Park
Chatfield State Park consists of 5, 378 acres, including Chatfield Reservoir and the lands surrounding it located east of South Wadsworth Boulevard. The property is owned by the USACE and managed through a lease by the Colorado Department of Natural Resources; Division of State Parks. Facilities include paved and natural trails for hiking and biking, user facilities, boat launches and a marina, campgrounds, horse stables and trails, model airplane field, picnic areas, a swim-beach, and volleyball courts.

Audubon Society of Greater Denver/Discovery Pavilion
The ASGD is a non-profit, environmental conservation organization that operates a facility (the Discovery Pavilion) at Chatfield State Park under a sublease from Colorado State Parks. The Discovery Pavilion, partially funded through Lockheed Martin donations, offers environmental education programs about managing lands for habitat and recreational uses. It includes two structures that have been refurbished for use as classrooms and exhibit space; an outdoor amphitheater; and a trailhead and interpretive area that serves the Highline Canal Trail, the Colorado Trail, and the Platte River Trail. Future plans include construction of a new visitor center and classroom.

Denver Botanic Gardens at Chatfield
The Denver Parks and Recreation Department leases lands west of South Wadsworth Boulevard from the USACE for the Denver Botanic Gardens at Chatfield (DBG). DBG is a 750-acre nature preserve located on the west side of South Wadsworth Boulevard on property owned by the

USACE. All recreation facilities are concentrated in the northern portion of the property: the portion within the Study Area is dedicated to vegetation management. Facilities include nature trails, a wildlife observation area, display gardens, educational exhibits, a historic farm, a 19th century one-room schoolhouse, working beehives, and picnic areas.

Denver Water Property
In response to increased demand for recreation in the area of the South Platte River, Denver Water developed limited recreation facilities for public use on their property located south of Chatfield State Park on both sides of Waterton Road. Facilities include trails, trailheads, parking and user facilities, fishing ponds, and picnic areas. The Kassler Water Treatment Plant is also located on the property, but is no longer in use as a treatment facility. It is now known as the Kassler Center, which hosts environmental education programs through the Thorne Ecological Institute.

Recreation Usage
Recreation and educational facilities within the Study Area experience an extremely high number of users. Waterton Canyon receives an estimated 250,000 recreation visits per year. The Waterton Canyon area is well known for Big Horn Sheep observation, and the lower areas are used for Blue Heron and other bird-watching activities. The ASGD uses the area as part of their annual bird count.

The Kassler Center provides several education programs that involve classroom and field work, including Thorne and other environmental educational programs; USFS education programs; individual elementary, middle, and high school classes; and fishing events, such as the annual "Take a Family Fishing" event, which attracts hundreds of visitors in one day. The Kassler Center holds two to three classes weekly from May through October, with 25 to 35 participants per class.

Since the development of Lake Lehow through Federal "Fishing is Fun" grants, Lake Lehow is open to several angler education programs, including Boy Scouts, Cub Scouts, Girl Scouts, church groups, elderly groups, Jacob's Journey (program for handicapped children), and other programs. Fishing is also a popular activity in this area.

3.10.2 Recreation Resources Impacts

No-Action Alternative

Under the No-Action Alternative, current congestion, safety, and access problems would continue to worsen, which would adversely affect user access to recreation resources within the Study Area. Bicyclists, hikers, fishermen, and pedestrians crossing at the at-grade crossing on Waterton Road would experience increased traffic.

Preferred Alternative

The Preferred Alternative would convert some property owned by the USACE and Denver Water to a transportation use, resulting in minor impacts to recreation facilities. The Preferred Alternative would improve safety and access for travelers to and from resources in the area. For example, the new pedestrian underpass would provide a safer crossing for trail users and Kassler Center visitors.

Entrances to the ASGD and Waterton parking lots would be combined into one entrance located between the two existing lots. The two lots would then be connected by a new roadway that would be partially located on Chatfield State Park land. This would introduce a new non-natural feature to the area. The land t be impacted by the proposed access road is currently open with no established recreation resources. The change in access would require moving the existing entrance signs to the ASGD/Discovery Pavilion, and would improve access to the recreation resources and improve safety for users.

The project would impact approximately 2.3 acres of land located east and west of existing Waterton Road that is associated with Chatfield State Park and the ASGD/Discovery Pavilion. Those impacts would result from the addition of fill required to raise the road grade as it approaches South Wadsworth Boulevard as well as land impacted by the new access road connecting the Waterton and ASGD parking lots. The land impacted at Chatfield State Park is currently passive recreation land and contains no established recreation resources. The affected land west of Waterton Road is separated from the main park area and other uses by the existing roadway.

Approximately 0.75 acres of Denver Water property would be impacted by the reconstruction and widening of Waterton Road and the increased fill needed to raise the road grade as it approaches the intersection. In addition, the Preferred Alternative would construct a new entrance to the existing Waterton parking lot as well as the access road discussed above.

During construction, the parking would be reconfigured to provide enough space for visitors to the area and the trailhead and other recreation resources in the area would remain open. Noise-sensitive recreation uses, such as outdoor educational programs of the type that occur at the Kassler Center and the ASGD/Discovery Pavilion, wildlife observation, hiking, and picnicking, may be impacted by construction noise. However, these impacts would be temporary and limited to areas located near construction activities. Fugitive dust caused by construction activities would potentially affect some recreation activities.

3.10.3 Recreation Resources Mitigation

There will be no net loss of parking opportunities in the area as a result of the project. The Waterton parking will be reconfigured and additional areas will be formalized for parking that are currently not used. The Preferred Alternative will include construction of a pedestrian underpass for Waterton Road that will improve safety of trail users for the Waterton

Canyon/Colorado Trail. During construction, mitigation measures will be used to control dust, and access to recreation resources will be maintained.

3.11 Historic Properties

Historic properties, including both historic and archaeological resources, are protected under the National Historic Preservation Act (NHPA) of 1966 (as amended through 2006) and other statutes, as well as Section 4(f), as amended and codified in the United Stated Department of Transportation (USDOT) Act of 1966, 49 USC 303 (c).

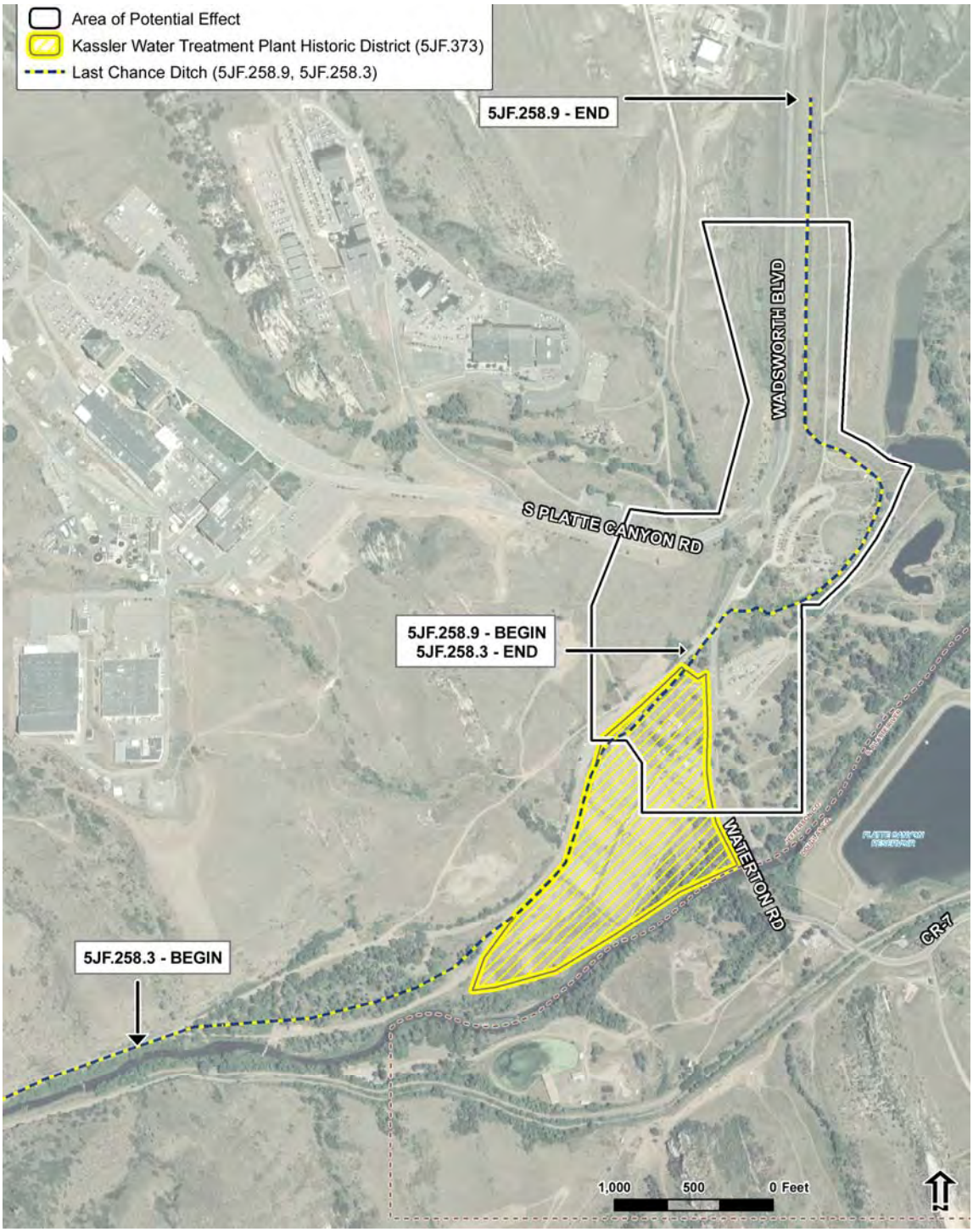
An Area of Potential Effect (APE) was determined to analyze historic properties based on the extent of potential impacts from the Preferred Alternative. The APE includes about 0.6 mile of South Wadsworth Boulevard and Waterton Road within the Study Area, and includes all parcels fronting both sides of those roads (see **Figure 3-9**).

A field survey and historic research were conducted from January 2009 to July 2009 to identify significant historic properties within the APE that may be eligible for listing on the National Register of Historic Places (NRHP). Historic research was conducted at Jefferson County, the Office of Archaeology and Historic Preservation Compass database at the Colorado Historic Society, the NRHP, the State Register of Historic Properties, and the Denver Public Library Western History Collection.

The four main criteria used to determine if a property is eligible for the NRHP include:

- **Criterion A:** Associated with events that have made a significant contribution to the broad pattern of our history;
- **Criterion B:** Associated with the lives of persons significant in our past;
- **Criterion C**: Embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or that possess high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction; or
- **Criterion D**: Has yielded, or may be likely to yield, information important in history or prehistory.

Figure 3-9: Area of Potential Effect and Historic Properties



3.11.1 Existing Conditions

Historic research indicated that the three historic properties identified within the Study Area had been previously surveyed; two have been officially determined to be eligible for the NRHP, and one has been rejected for listing to the State Register of Historic Properties. A fourth property was newly evaluated for this study and is recommended as non-supporting of the eligibility of the overall resource of which it is a part. These properties are summarized in **Table 3-4.** The NRHP-eligible properties are shown on **Figure 3-9**. Please refer to the *Historic Resources Survey Report, South Wadsworth/Waterton Road Intersection, Jefferson County, Colorado,* July 2, 2009 for more detail.

Table 3-4: Properties Evaluated for Historic Status in the Area of Potential Effect

Site ID Number / Name	Description	Documentation Status	Eligibility Status
5JF.1846: Verdos Ranchhouse and Garage-Lehow/Martin Stone Buildings – Lockheed Martin Discovery Pavilion at Chatfield State Park	Part of a 5,000-acre working ranch in the 1940s. Existing structures include a 1938 ranchhouse (remodeled in 1949) and 1949 garage. Other ranch buildings formerly on the property have been removed (milk house, shop, milk barn, chicken coop, and another ranchhouse).	Previously Recorded; Re-evaluated for this project	Rejected for listing to the State Register of Historic Properties (SRHP) by the CHS Board of Directors, March 2000
5JF.258.3: Segment of the Last Chance Ditch – Platte Canyon Ditch	Segment located in southwest portion of APE. Ditch has water rights dating to 1861 and is one of the earliest features in the area that supported the region's early farms. It was combined with Platte Canyon Ditch when a 1920s flood removed the Last Chance Ditch headgate. At one time, this ditch provided water necessary to operate the Kassler Water Treatment Plant sedimentation filter beds, which purified water for use by Denver citizens. Ditch has not been used for over 35 years.	Previously Recorded	Officially eligible for the NRHP under Criterion A, April 2003
5JF.258.9: Segment of the Last Chance Ditch – Platte Canyon Ditch	Segment extends from Kassler Treatment Plant to north border of the APE. Evidence of ditch has been destroyed in about half of this entire segment by construction of the Chatfield State Park water conduit, trail, and toilet facilities; construction of S. Wadsworth Blvd.; and burying of a fiber-optic cable.	Newly Recorded	Segment does not support the eligibility of the overall resource
5JF.373: Kassler Water Treatment Plant Historic District	Water treatment plant and associated Town of Kassler was built by Denver Union Water Co. between 1901 and 1906. The 22-acre property contains 22 contributing structures. It was the first English slow and filter plant built east of the Mississippi River. Designated as an American Water Landmark by the American Water Works Association. Kassler is the only historic company town associated with the history of Denver's water supply.	Previously Recorded	Officially eligible for the NRHP under Criterion A and C , August 1998

3.11.2 Historic Properties Impacts

No-Action Alternative

The No-Action Alternative would have no impacts to historic properties.

Preferred Alternative

Impacts to historic resources within the APE as a result of the Preferred Alternative are summarized below:

- **Verdos Ranchhouse and Garage – Lehow/Martin Stone Buildings – Lockheed Martin Discovery Pavilion at Chatfield State Park, 5JF.1846**: CDOT determined, and the SHPO concurred, that this site is ineligible for the NRHP (see letter dated August 18, 2009 in Appendix A). Therefore, there would be *No Historic Properties Affected* as a result of the Preferred Alternative.
- **Last Chance Ditch – Platte Canyon Ditch, 5JF.258.3**: The Preferred Alternative would have no direct impacts to this segment of the ditch alignment. Construction would result in temporary impacts from increased levels of noise and dust. There would be no temporary construction easements or changes in access that would affect this ditch segment. CDOT has determined that the Preferred Alternative would result in *no adverse effect* to this historic resource.
- **Last Chance Ditch – Platte Canyon Ditch, 5JF.258.9**: The widening of Waterton Road under the Preferred Alternative would impact approximately 300 feet of land that at one time included the ditch alignment. However, the portion of the ditch alignment located within the area impacted has been obliterated by earlier construction of a water conduit. Because the previously impacted segment does not support the eligibility of the entire ditch, CDOT has determined that the Preferred Alternative would result in *no adverse effect* to the ditch.
- **Kassler Water Treatment Plant Historic District - 5JF.373**: The road improvements to Waterton Road would remain within the existing right-of-way adjacent to the Kassler Property; therefore, the Preferred Alternative would result in no direct effects to this property. Construction would result in temporary impacts from increased levels of noise and dust. CDOT has determined that the Preferred Alternative would result in *no adverse effect* to this historic resource.

3.11.3 Historic Properties Mitigation

Because the Preferred Alternative would result in *no historic properties affected* for Site 5JF.1846, and *no adverse effect* to Site 5JF.258.3, Site 5JF.258.9, and Site 5JF.373, no mitigation measures are necessary.

3.12 Hazardous Materials

Hazardous waste may be encountered during the construction of a transportation project. Therefore, it is important to identify properties that may contain contamination prior to right-of-way acquisition and construction. Hazardous waste is defined as any waste product that is considered flammable, corrosive, reactive, or toxic. Hazardous waste can be found in various forms and can originate from a variety of sources.

This assessment was performed to screen the Study Area, and the surrounding area within ½ mile, for sites with known or suspected *recognized environmental conditions* (RECs) that would likely be impacted as a result of construction of the Preferred Alternative. RECs are the presence or likely presence of hazardous substances, hazardous waste, or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any such substances into structures on the property or into the ground, groundwater, or surface water of the property. Examples of potential sites with *recognized environmental conditions* include landfills, service stations, industrial areas, railroad corridors, and mine sites. When developing a transportation project, it is important to be aware of known hazardous waste sites so they can be avoided or their impacts minimized.

Previous assessments have not been conducted for this project. This section is based on information obtained from a review of environmental regulatory records, historic aerial photographs, topographic maps, and an on-site inspection.

3.12.1 Existing Conditions

Land use within the Study Area consists of vacant land, highway rights-of-way, recreation and nearby industrial use. There are no oil and gas wells within the Study Area. The closest well is located approximately three miles north of the Study Area. According to the Colorado Oil and Gas Conservation Commission (COGCC), that well has not been active since 1956.

Historic aerial photos and topographic maps were reviewed for the years 1944, 1948, 1964, 1965, 1975, 1980, 1983, 1999, and 2005. The Study Area historically has consisted of undeveloped land. The Lockheed Martin facility was constructed during the 1950s and continues to operate. The Chatfield Lake State Recreation Area was developed during the 1970s.

A search of federal, state, and local regulatory databases for registered sites was generated to locate potential *recognized environmental conditions* sites within the ASTM search radii (minimum of 1.25 miles and maximum of 2.25 miles depending on the database) from the target property. The report revealed one site within the area searched. Field visits of the Study Area were conducted on July 20, 2009 and June 2, 2010. Other than the site listed in the EDR report, there was one additional site observed within ½ mile of the Study Area with potential *recognized environmental conditions*.

3.12.2 Hazardous Materials Impacts

A file review of records maintained by the Colorado Department of Labor and Employment, Division of Oil and Public Safety (OPS), was performed for the listed potential *recognized environmental conditions* sites in the vicinity of the Study Area. Based on the information reviewed and a site inspection visit, this assessment has revealed evidence of known or suspect *recognized environmental conditions* in the Study Area. **Figure 3-10** depicts the location of the se sites, which are summarized below.

- **Lockheed Martin Waterton Plant (EDR Map ID #1)** – This facility is located at 12257 South Wadsworth Boulevard and includes a privately-owned filling station from 1986 to August 2007. This site is listed in the Resource Conservation Recovery Act (RCRA) – Treatment, Storage, or Disposal Facility (TSDF) and RCRA – Large Quantity Generator (LQG) database. This site is also listed in the Aboveground Storage Tank (AST) and Leaking Underground Storage Tank (LUST) databases as having three closed and two in-service ASTs and three closed USTs. The ASTs are used to store gasoline and diesel. On August 2, 2007, a release of diesel and waste oil was reported during the AST removal. The soil sampling indicated contamination on-site. No further action was granted by the Colorado Department of Labor and Employment, Division of Oil and Public Safety (OPS) in October 2007. In August 2007, a petroleum release was reported during removal and closure of the USTs. The OPS required investigation of the site to determine the extent of the contamination. Soil and groundwater samples were collected on site. The results concluded contamination levels were below state cleanup levels. Therefore, in December 2007, OPS granted no further action. An environmental records search was also conducted at the CDPHE. No records were found for this facility at the CDPHE.
- **Colorado Golf and Turf Inc – Observed:** This facility is located at 11757 Wadsworth Boulevard. Due to the sale of motorized vehicles on site, it is assumed this facility has ASTs or USTs. However, no records were found at the Division of OPS.

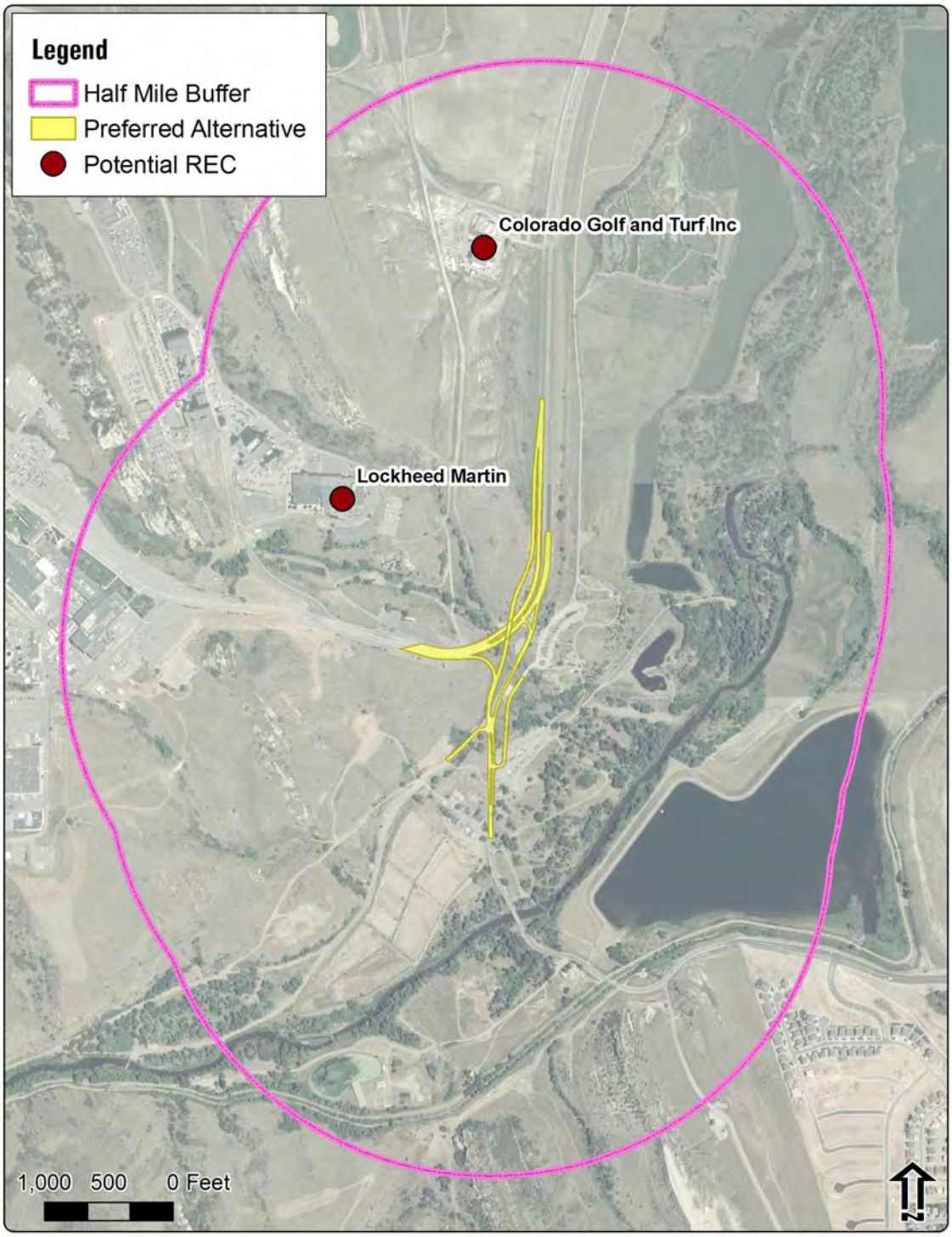
No-Action Alternative

The No-Action Alternative would not impact hazardous materials.

Preferred Alternative

Tthis assessment has revealed evidence of known or suspect RECs. However, since OPS has granted No Further Action for the Lockheed Martin site and no records were found for the Colorado Golf and Turf Inc. site indicating a violation has not occurred, no impacts to sites with RECs are anticipated as a result of the Preferred Alternative.

Figure 3-10: Potential Recognized Environmental Conditions Map



3.12.3 Hazardous Materials Mitigation

Jeffco andCDOT carefully considers the potential risks associated with hazardous waste on construction projects. F or example, Section 250 "Environmental Health and Safety Management" of the *Standard Specifications for Road and Bridge Construction* (CDOT, 2005) provides for the protection of the environment, persons, and property from contaminants, and includes special requirements for addressing hazardous waste, if encountered. Construction on the project is expected to include pavement removal, repaving, and minor utility relocation. As a result, encountering hazardous waste in soils and groundwater is anticipated. Construction personnel will be trained to recognize signs of possible contamination in soil, such as odors and staining.

Construction debris or asbestos utility lines will be inspected by appropriate professionals and handled in accordance with CDPHE regulations pertaining to asbestos waste management (6CCR 1007-2, Part 1, Section 5).

3.13 Section 4(f)

Section 4(f) refers to Section 4(f) of the USDOT Act of 1966. It is codified in Title 49 United States Code (U.S.C.) Section 303 and Title 23 U.S.C. Section 138. Section 138 states:

"The Secretary [of Transportation] shall not approve any program or project … which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic site of national, State, or local significance as so determined by such officials unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use."

Section 4(f) resources include publicly owned lands of a significant park, recreation area, or wildlife and waterfowl refuge, or land of a significant historic site. The Study Area contains numerous resources that meet the criteria for Section 4(f) that may be impacted through construction and operation of the Preferred Alternative. Following is a description of those resources.

Land is considered permanently incorporated into a transportation project or used when it has been purchased as right-of-way or sufficient property interests have been otherwise acquired for the purpose of project implementation.

In circumstances where the FHWA determines the impacts to the Section 4(f) resources are *de minimis*, an approval may be given without conducting a full evaluation under Section 4(f).

3.13.1 Identification of Section 4(f) Resources

Parks and Recreation Resources

Public parks and recreation areas within the Study Area are discussed in Section 3.10. Only parks and recreation resources potentially used by the Preferred Alternative are discussed in this section, and include the following:

- **Chatfield State Park**:
  - **Location**: Chatfield Reservoir in Jefferson County on the east side of South Wadsworth Boulevard within and north of the Study Area.
  - **Size/Amenities:** 5,378 acres of land and water. Includes paved and natural trails for hiking and biking, user facilities, boat launches, marina, campgrounds, horse stables/trails, model airplane field, picnic areas, swim-beach, and volleyball courts. ASGD portion includes classrooms and exhibit space; outdoor amphitheater; and trailhead and interpretive area serving Highline Canal Trail, Colorado Trail, and Platte River Trail. Future plans include construction of visitor center and classroom space.
  - **Officials with Jurisdiction**: Land is owned by USACE. However, Colorado Department of Natural Resources Division of State Parks and Outdoor Recreation (DPOR) holds a second party lease agreement for park management and operation. ASGD is a third party lessee of a portion of the Chatfield State Park property located in southwest corner of the park, east of the intersection of Waterton Road and South Wadsworth Boulevard.
  - **Resource Type/Significance**: Entire park is open to the public, with the main portion of the park charging daily usage fee; however, portions in the Study Area can be accessed for free from local parking lots. The ASGD, in partnership with a consortium of public and private organizations, plans to develop the Discovery Pavilion at Chatfield State Park to house the ASGD headquarters and serve as an interpretive site and trailhead for three major regional trails, with parking and public facilities.
- **Denver Water Property**:
  - **Location:** Surrounds southwest corner of Chatfield State Park and extends down to the South Platte River on both sides of Waterton Road in Jefferson County.
  - **Size/Amenities**: Approximately 156 acres. Includes hiking trails; picnic areas; fishing ponds; and Kassler Center, which houses interpretation and environmental education programs conducted by the Thorne Ecological Institute for school groups and through summer programs. Parking area on the property serves as secondary trailhead for Highline Canal Trail, Colorado Trail, and Platte River Trail.

- **Official with Jurisdiction**: Denver Water. Although a separate entity from the City and County of Denver (CCD), Denver Water is a public agency managed by a board appointed by the CCD mayor.

- **Resource Type/Significance**: Officials have indicated that the primary purpose of the property is to support their mission of water provision and that the recreation developments were enhancements to manage the recreation use that was already occurring on the property. However, the property is open to the public, and Denver voters approved a charter amendment that allows the agency to use funds for recreation infrastructure, indicating that Denver Water does have a recreation charge. The property serves as a public trailhead for the three major regional trails and the various nature trails located on the property, and receives heavy recreation use.

  In addition to the main body of their property, Denver Water also owns a parcel within the boundaries of Chatfield State Park purchased from the USACE for purposes of operating an underground water conveyance, referred to as Conduit No. 10. It includes a surface road that facilitates maintenance of the water conduit. The property is an approximately 100-foot-wide corridor that runs parallel to South Wadsworth Boulevard and crosses Waterton Road just south of the intersection. It then continues across Chatfield State Park until it enters Denver Water property. The land owned by Denver Water for Conduit No. 10 includes a deed restriction that the property remain open to the public for recreation purposes. The access road that follows the alignment is frequently used by bicyclists and hikers, and provides access to other areas of Chatfield State Park.

Historic Resources

Section 4(f) requirements are applicable only to significant historic resources [i.e., those sites listed on or eligible for listing on the NRHP, or sites otherwise determined significant by the FTA or FHWA Administrator (23 CFR Section 774.17) and FHWA Section 4(f) Policy Paper]. The historic resources considered here include all resources that were listed on the NRHP or determined officially eligible for listing on the NRHP. A complete discussion of the historic resources in the APE is provided in Section 3.11.

- **Kassler Water Treatment Plant Historic District - 5JF.373:** A 22-acre site owned by Denver Water, containing 22 contributing structures.
  - **Significance**: Determined officially eligible for inclusion on the NRHP on August 4, 1998 under Criterion A for its association with the development of early 20th century water resources for the growing city of Denver, and under Criterion C in the areas of Architecture and Engineering. It is designated as an American Water Landmark by the American Water Works Association.

- **Last Chance Ditch – Platte Canyon Ditch, 5JF. 258:** Two segments of this historic ditch are located within the APE, as described below:
  - **Segment 5JF.258.3**: Ditch segment located in the southwest portion of the APE previously recorded on January 6, 2003. Consists of a 3,750-foot portion of the ditch from the Kassler Treatment Plant southwest to a headgate in the South Platte River.
    - **Significance**: This segment was determined to support the eligibility of the linear resource of which it is a part, and officially determined eligible for listing on the NRHP on April 10, 2003 under Criterion A for its association with early irrigation and early water systems.
  - **Segment 5JF.258.9**: Ditch segment that extends from the Kassler Treatment Plant to the north end of the APE, and was first evaluated as part of this project.
    - **Significance**: - Several previous construction projects east of Waterton Road have impacted the segment's original alignment, including construction of a water conduit, trail, and toilet facilities at Chatfield State Park; the burying of a fiber optic cable; and construction of a parking lot for recreation users of Waterton Canyon. Because of the discontinuous nature of the remaining portions, 5JF258.9 has lost integrity and does not support the eligibility of the entire ditch.

3.13.2 Use of Section 4(f) Resources

No-Action Alternative

The No-Action Alternative would not use or temporarily affect Section 4(f) resources.

Preferred Alternative

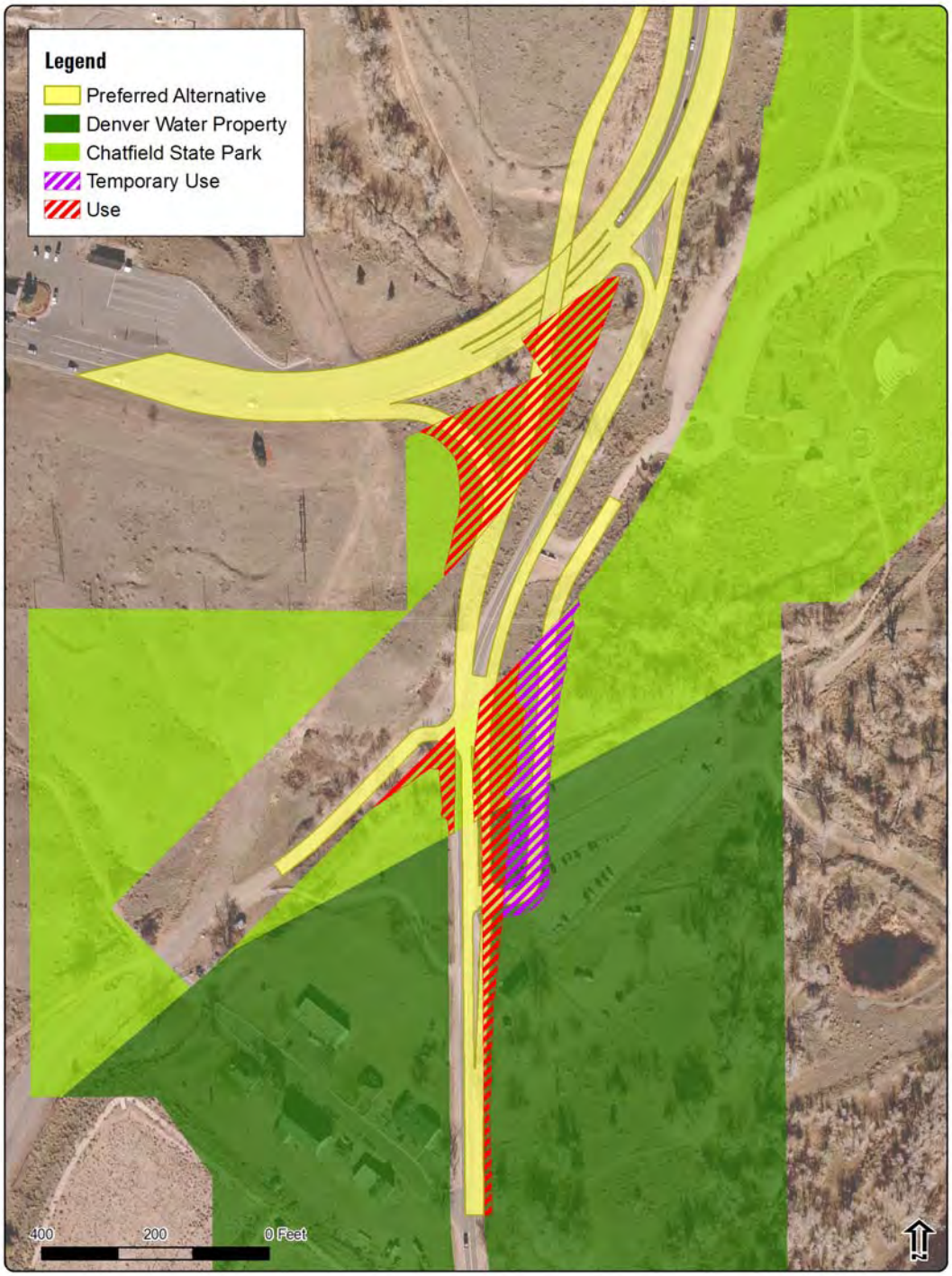
Parks and Recreation Resources

Impacts as a result of the Preferred Alternative are summarized below. It should be noted that property ownership is confusing in the area, and ownership boundaries are inconsistent in some locations. This project proposes to correct some of those issues. For the purposes of evaluating impacts to Section 4(f) properties, the best available property information was used.

- **Chatfield State Park:** Minor use of some Chatfield State Park land would occur as a result of implementation of the Preferred Alternative. **Figure 3-11** shows the state park area near the intersection. Existing Jefferson County and CDOT transportation rights-of-way are not considered Section 4(f) properties.

  Uses of Chatfield State Park can be categorized into three distinct areas. The first is an area of approximately 53,000 square feet located east of Waterton Road and south of South Wadsworth Boulevard as it approaches the Lockheed Martin entrance. This area has neither formal access nor any recreational developments.

Figure 3-11: Section 4(f) Use



The second area is approximately 22,700 square feet located on both sides of Waterton Road north of the Waterton parking lot. These areas are directly adjacent to Waterton Road and have no formal recreational amenities or access.

The third area is 20,230 square feet located directly adjacent to and west of the second area. This area would not be incorporated into the transportation facility however it would be temporarily closed and a new access to the Audubon Society facility and a pedestrian underpass would be constructed in this area. Following construction, this area would remain under the ownership of USACE and the lease to Colorado State Parks.

In all, approximately 75,700 square feet (1.74 acres) of State Park land would be permanently incorporated into the transportation facility. This land is currently not developed with recreation facilities and represents only approximately 0.03 percent of the entire Chatfield State Park. Also, the proposed underpass and improvements to the existing intersection will improve access and increase safety for users of the recreation resources in the area. Therefore, this Section 4(f) use may qualify for de minimis approval under Section 4(f) regulations.

- **Denver Water Property**: Approximately 17,080 square feet of land currently owned by Denver Water in the area of Waterton Road would be permanently incorporated into transportation right-of-way. The affected property consists of a small strip of land along the eastern edge of Waterton Road beginning at the northern end of the Waterton parking lot and extending south approximately 700 feet. Recreation development that exists in this area includes the Waterton parking lot and a picnic area. Up to approximately 20 parking spaces could be lost to the road widening proposed in this area. Also, there would be temporary impacts to approximately 14,770 square feet of land within this parking area, removing another approximately 40 parking spaces.

  The new entrance to a reconfigured Waterton parking lot and the access road to the Audubon Center would be constructed on property that would remain under the current ownership aside from the property acquired for the road widening. The Waterton parking lot would be reconfigured to accommodate the parking determined necessary by Denver Water (the Official with Jurisdiction), potentially by formalizing a less-used informal parking area located south of the existing lot.

  The remaining area that would be permanently incorporated into the transportation facility contains picnic sites and restroom facilities. Athough none of the picnic sites will be directly impacted by the improvements, the roadway will be moved closer to some sites potentially increasing noise levels.

  Implementation of the Preferred Alternative would permanently incorporate approximately 0.4 acres and temporarily occupy an additional 0.34 acres. Although minor alterations to the parking lot will be required, no net loss of parking is expected.

Also, the proposed underpass and improvements to the existing intersection will improve access and increase safety for users of the recreation resources in the area. Therefore, this Section 4(f) use may qualify for *de minimis* approval under Section 4(f) regulations.

Historic Resources

The Preferred Alternative would not result in a Section 4(f) use of any historic resources identified within the APE. No portions of land from the significant historic sites would be permanently incorporated into the proposed transportation facility, and no temporary occupancy or constructive use of identified historic resources would occur. CDOT has determined, and the SHPO has concurred with, the following effects to historic resources within the APE:

- Last Chance Ditch – Platte Canyon Ditch (5JF. 258.3): *No Adverse Effect*.
- Last Chance Ditch – Platte Canyon Ditch (5JF. 258.9): *No Adverse Effect*.
- Kassler Water Treatment Plant Historic District (5JF.373): *No Adverse Effect*.

3.14 Cumulative Effects

Cumulative effects are defined by the Council on Environmental Quality (CEQ) at 40 CFR 1508.7 as the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions". The Project Team will coordinate with CDOT and FHWA regarding the approach to any future cumulative effects assessment for the DCE. If required, this assessment would include an analysis of how past and present actions from transportation, water utility provision, and recreational use have affected environmental resources of concern, such as PMJM habitat. Further, it will catalogue foreseeable future actions to assess threats to the long-term viability of these resources. Foe example, potential highway widening through the study area due to the proposed Sterling Ranch development and future changes to the Chatfield Dam pool elevation would be viewed to determine their combined or cumulative effect on PMJM habitat. The analysis would also consider future actions such as expansion of the ASGD facility and employment increases at Lockheed Martin.

Chapter 4.0 Agency and Public Coordination

The Project Team developed and implemented a public involvement plan to encourage agency and public awareness, input, and comment. Outreach activities were designed to be open, inclusive, and ongoing throughout the feasibility study process. Coordination with stakeholders was an important part of the feasibility study process, and the Project Team established and maintained an open dialogue with interested parties to ensure that input was integrated into project decision making. This chapter summarizes these coordination efforts.

4.1 Agency and Small Group Meetings

The Project Team held the following Small Group coordination meetings with interested agencies to identify issues and solicit comment on the alternatives selection process:

U.S. Army Corps of Engineers (USACE) Small Group Meeting, December 10, 2008: This meeting included CDOT and FHWA. Meeting attendees decided that the feasibility study would be prepared under the assumption that FHWA/CDOT would serve as the future lead agency under NEPA, assuming federal funds are used for the project. If federal funds are not used, CDOT still would prepare a Categorical Exclusion - Form 128 for the intersection improvements using information from the feasibility study. The USACE also would use information from this study for its NEPA purposes. It was agreed that an abbreviated Planning and Environmental Linkages process would be used for this project. It was also discussed that any impacts to Brush Creek and any jurisdictional wetlands would require a Section 404 permit.

CDOT Small Group Meeting, May 1, 2009: This meeting included representatives from CDOT and the Project Team. The group discussed the design of the Preferred Alternative, including the construction of the two-lane ramp exiting South Wadsworth Boulevard southbound; the weave movement for the eastbound ramp from Lockheed Martin; and the consolidation of access points for the ASGD, Denver Water, and Waterton parking lots. They also discussed that including the pedestrian underpass would eliminate the at-grade pedestrian crossing of Waterton Road.

FHWA Small Group Meeting, July 13, 2009: This meeting included representatives from FHWA and the Project Team. The group discussed Section 4(f) issues and that the project will most likely fall under a programmatic or *de minimis* clearance because Section 4(f) impacts are minor. However, FHWA will make the final determination on Section 4(f) compliance based on input from the SHPO and other stakeholders. It was discussed that environmental clearance for the upper half of Form 128 will be necessary to obtain right-of-way. A Documented Categorical Exclusion was discussed as being the appropriate class of NEPA action for this project.

Denver Water Small Group Meeting, September 16, 2009: This meeting included representatives from Denver Water and the Project Team. The group discussed how different alternatives would impact Denver Water property and how access concerns could be handled

under each alternative. Additional detail was provided on constraints from the point of view of the project and Denver Water. Denver Water requested that additional details be provided to allow for a more complete understanding of how the alternatives could impact access to the different portions of the facility.

4.2 Stakeholder Team

At the onset of this study, the Project Team invited the following stakeholders to serve as members of a project Stakeholder Team that would provide input throughout all phases of the study, including issues identification, public involvement, review of existing and future conditions, and evaluation and selection of alternatives:

- CDOT
- USACE
- Colorado State Parks
- Denver Water
- ASGD
- FHWA

In addition to the above agencies, Colorado Trail Foundation representatives attended some of the meetings later in the process. The Project Team also invited Denver Botanic Gardens to serve on the Stakeholder Team, but they declined to participate. Stakeholder Team members were asked to regularly convey project progress and decisions to members of their organizations.

4.2.1 Stakeholder Team Meetings

Six Stakeholder Team meetings were held throughout the study process; these meetings are summarized below.

- **Stakeholder Team Meeting #1 (November 18, 2008)**: The Project Team introduced the project and explained that this study would examine ways to improve safety over existing conditions. The study would be conducted to consistent with NEPA requirements of NEPA, assuming future federal involvement. The team discussed planned agency and public involvement activities, which included a project website and two open house public meetings to provide information to the public and other stakeholders, and to receive input. Meeting attendees developed the following list of public contacts and interest groups:

  - Bike JeffCo
  - CDOW
  - Colorado Historical Society
  - FHWA
  - Ravenna Development
  - Sierra Club
  - Roxborough Area Historical Society
  - U.S. Forest Service - Pike National Forest
  - Colorado Trail Foundation
  - International Mountain Bicycling Association
  - Rocky Mountain Cycling Club
  - Roxborough State Park

- Roxborough Village
- Colorado Golf & Turf
- Chatfield Farms
- Sterling Ranch Development
- Thorne Ecological Institute

Copies of the Purpose and Need and the Evaluation Criteria were provided to the Stakeholder Team for review and comment. Stakeholders identified key concerns, which included the need for improved pedestrian and bicyclist safety in the area.

- **Stakeholder Team Meeting #2 (December 17, 2008)**: Discussion included the study's public involvement plan, including development of a contact database, a project website with links to JeffCo and Douglas County websites, and a survey form for web and hard-copy distribution. Details of the upcoming open house were discussed, including meeting location, notices, and ways to increase local participation.

- **Stakeholder Team Meeting #3 (January 22, 2009)**: Discussion included Level 1 screening of alternatives and scoring of each alternative based on Purpose and Need criteria. Pedestrian safety and crossings remained a primary concern of the Stakeholders. The team also discussed specific details of the February open house, including date and time and contact database updates. The team agreed that the meeting would be announced in the following ways: on the project website; placing flyers at the Waterton parking lot, State Parks, Audubon Nature Center, and libraries; and placing poster signs at the State Parks and Audubon Nature Center parking lots. In addition, a Variable Message Sign (VMS) board would be placed on local roadways, and advertisements would be placed in local newspapers.

- **Stakeholder Team Meeting #4 (March 26, 2009)**: Discussion focused on utilities, right-of-way, mapping, and traffic forecasts. A summary of open house attendance, key concerns, comments, and survey results was presented and discussed. The group also talked about bicycle lane issues, roadway design elements, pedestrian movements, and the growing number of Audubon facility visitors, which is increasing pedestrian activity and vehicle access demands on the facility's parking lot.

- **Stakeholder Team Meeting #5 (June 4, 2009)**: Meeting attendees discussed in more detail the advantages and disadvantages of the alternatives and noted concerns related to safety, traffic speed, crash potential, turning movements, and pedestrian crossings for each alternative. Level 2 screening was presented and discussed. Stakeholders identified the alternative they preferred and why. The discussion resulted in Alternative 6 being identified as the most likely to move forward as the Preferred Alternative.

- **Stakeholder Meeting #6 (July 16, 2009):** Stakeholders reviewed utility conflicts related to parking lot relocations and discussed JeffCo's presentation of Alternative 6 (Preferred Alternative) to the County Commission. It was discussed that project funding would not be

known for 18 months. The group also discussed the ultimate roadway section, the interim Waterton Road alignment, a 30 mph (design)/25 mph (posted) speed for Waterton Road, and keeping an at-grade equestrian crossing.

4.3 Public Involvement Activities

4.3.1 Public Involvement Plan

The Project Team developed a Public Involvement Plan (PIP) to inform the public about the planning and development phase of the project, and to provide the opportunity for public input. The main goals of the PIP were to:

1. Identify issues of concern for the community.
2. Provide a plan to address community concerns.
3. Provide a variety of outreach opportunities and methods for the public to voice their concerns and needs.

The PIP outlined the outreach tasks mentioned above, including the contact database, project website, open houses, media contacts, and documentation of the overall process.

4.3.2 Project Website

A project website was developed at project start up as a tool to communicate with the public. JeffCo hosted the website, which was linked to the Douglas County website, and provided information about the project purpose and progress, project documentation, and a public comment form (see Appendix B: Public Involvement).

4.3.3 Public Open Houses

Two Public Open Houses were planned for this project. The first public open house was held on February 25 from 5:00 pm to 7:30 pm at the Roxborough Elementary School. The second public open house has not occurred as of the release of this report however it is planned for late August, 2010.

For the first Open House the Project Team employed several methods to announce the open house, which included:

- VMS board posted along Waterton Canyon Road and at park facilities at Chatfield Reservoir.
- Email blast notification to Jefferson County and Douglas County homeowner associations and businesses - February 6, 2009.
- Email blast reminder notification - February 18, 2009.
- Postcards sent to contacts without email addresses, and Douglas County and JeffCo Commissioners - February 6, 2009.

- Advertisements placed in the Columbine Courier - February 11 and 18, 2009.
- Advertisements in five local newspapers: Highlands Ranch Herald, Castle Rock News Press, Douglas County News Press, Lone Tree Voice, and Parker Chronicle.
- Posters delivered to area State Parks and placed in parking lots - weekends of February 13 and 20, 2009.
- Flyers and postcards provided at Roxborough Library and ASGD - February 6, 2009.
- Additional poster placed in ASGD parking lot - weekend of February 20, 2009.
- Information placed on the One Roxborough website (www.oneroxborough.com), and e-mailed to 262 One Roxborough subscribers.
- Placed link to project website on Douglas County page (www.douglas.co.us). Information was e-mailed to 1,023 subscribers for Douglas County News and Events, Road Projects and Traffic.
- Douglas County emailed meeting information and the One Roxborough website link to the following contacts: three leaders of the One Roxborough group, Roxborough Park Foundation newsletter "Echoes Around the Rocks" (1,058 households), Roxborough Village newsletter "Roxborough eNews" (1,013 households), and Roxborough Voice newsletter (3,900 households).

Approximately 258 people attended the meeting. Project Team members and Jefferson and Douglas County staff were present to provide information and answer questions.

Information presented at the public meeting included:

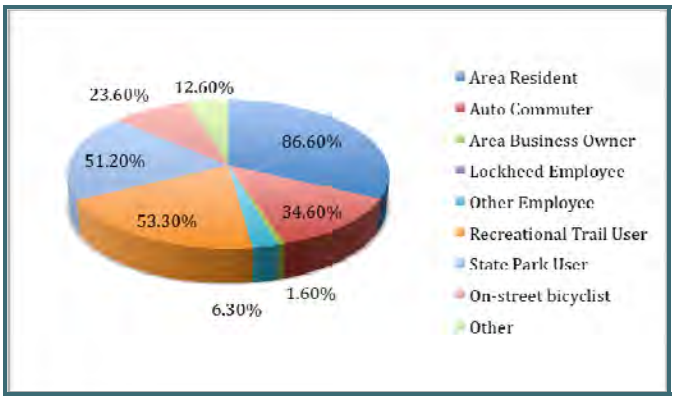
- Project Purpose and Overview
- Project Goals
- Project Schedule
- Study Area description/map
- 5 Alternatives
- Next Steps

Public Comment Form and Summary of Responses

A public comment form was developed early in the study process to identify the public's key issues. This form was available on the project website and at the February open house via hard copy and on-line computers. All comments were entered or collected instantly in an online database tied to the form. Results were made available following the open house and were posted on the project website. A summary of public comments received is provided below. A full report of comments is in **Appendix B**.

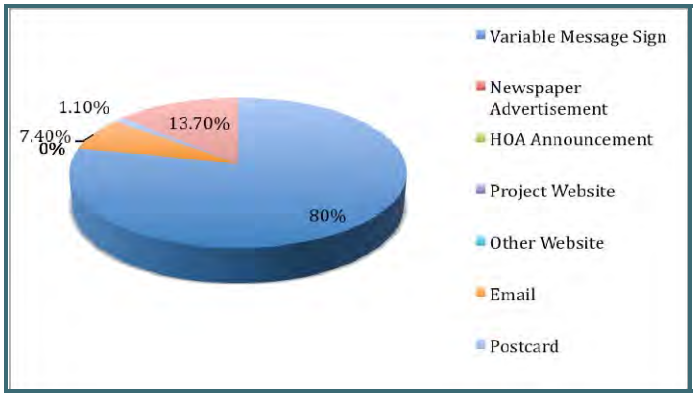
Question #1 - Check the category that best describes your interest in project:

Majority of attendees were Area Residents and Recreational Trail Users



Question #2 – How did you hear about the meeting?

Approximately 80 percent of attendees heard about the meeting through the variable message signboards

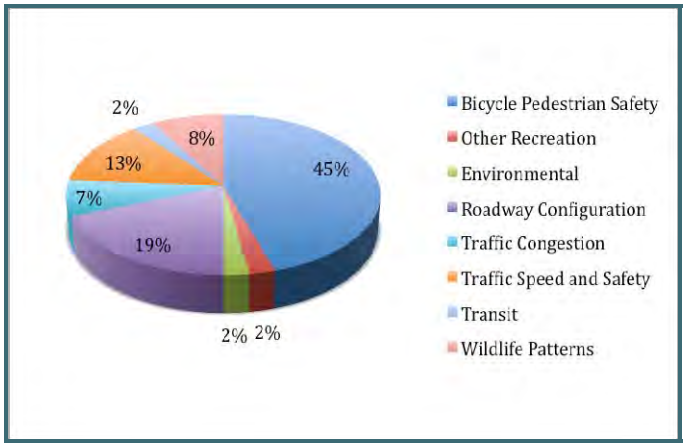


Question #3 – What do you see to be the greatest Transportation Needs?

The following were majority answers to each need:

- Traffic Congestion – 50 percent Extremely Important
- Correcting Roadway Deficiencies – 42 percent Important
- Improving Safety for All Modes – 76 percent Extremely Important
- Improving Access Control – 38 percent Extremely Important

Question #4 – What other transportation needs are in the Study Area?



- Bike and Pedestrian Safety – 45 percent of comments
  - 47 percent of Bike and Pedestrian comments were about improving safety for bicyclists along Waterton Road, either through the addition of bike lanes or bike paths.
  - 45 percent of Bike and Pedestrian comments concerned the safe crossing of Waterton Road, especially in light of traffic speed and growing development.
- Roadway Configuration - 19 percent of comments
- Traffic Speed and Safety – 13 percent of comments

Question #5 – Do you agree with the Project Goals?

The public was generally supportive of the project goals, with notes that wildlife and bicycle and pedestrian safety need to be high priorities.

Question #6 – What are your thoughts on the Alternatives presented?

Alternatives 1 and 6 received the highest levels of public support, with some consideration of Alternative 8.

- Alternative 1 was described as a simple and immediate solution offering increased safety with minimal cost.
- Alternative 6 was generally seen as a more long-term solution that would better address future traffic levels associated with growth, facilitate free flow of traffic into/out of Lockheed, limit impacts to the area, and avoid further congestion associated with a signal.
- Alternative 8 concerns regarded future traffic volumes and long-term answers. Supporters of Alternative 8 typically felt that a signal would increase congestion and intensify future congestion associated with growth.

Question #7 – What do you feel are the sensitive environmental resources in the area?

The majority of environmental concerns regarded safety of wildlife crossings, followed by pedestrian crossings to the trail. The best alternative would be underpasses for both wildlife and people.

Question #8 - What are your observations of traffic safety and bicycle and pedestrian safety?

Comments focused on the need for a "complete roadway" with shoulders, bike lanes, and safe crossings.

Appendix A.
Alternatives Technical Report

Appendix B.
Stakeholder Team Information

Appendix C.
Small Group Meetings

Appendix D.
Public Involvement Information

Appendix E.
Historic Resources Coordination