



# CHAPTER 5

## Final Section 4(f) Evaluation

### 5.1 INTRODUCTION

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2 This evaluation assesses impacts of the proposed  
3 US 6/Wadsworth project on parks and historic  
4 properties. It was prepared in compliance with  
5 Section 4(f) of the U.S. Department of Transportation  
6 Act and is supported by the following documents  
7 available in Appendix A: *Alternatives Development and*  
8 *Screening Technical Memorandum* (CH2M HILL,  
9 2008a), *Historic Resources Survey* (TEC, 2008), and  
10 *Determination of Effects to Historic Properties*  
11 (CH2M HILL et al., 2008b).

12 A draft Section 4(f) Evaluation prepared by CDOT and  
13 FHWA was published for public and agency review on  
14 July 13, 2009. FHWA also forwarded the evaluation to  
15 the Department of the Interior for review in  
16 accordance with Section 4(f) requirements. The  
17 Department of the Interior concurred with the findings  
18 of the draft Section 4(f) Evaluation in correspondence  
19 dated September 14, 2009 (see Appendix C to the  
20 FONSI). Lakewood Department of Parks and  
21 Recreation formally concurred that the project will not  
22 adversely affect the proposed Two Creeks Park in  
23 correspondence dated October 29, 2009. That  
24 correspondence also is included in Appendix C to the  
25 FONSI. No comments related to the Section 4(f)  
26 evaluation were received from the public during the  
27 45-day review period.

### 5.2 SECTION 4(f)

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29 Section 4(f) of the U.S. Department of Transportation  
30 Act of 1966, as amended, and codified in 49 United  
31 States Code (U.S.C.) § 303, declares that “[i]t is the  
32 policy of the United States Government that special  
33 effort should be made to preserve the natural beauty  
34 of the countryside and public park and recreation  
35 lands, wildlife and waterfowl refuges, and historic  
36 sites.” FHWA has adopted regulations to ensure its  
37 compliance with Section 4(f) (23 CFR 774).

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

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

51 The three types of Section 4(f) uses are: direct use,  
52 temporary use, and constructive use. Because this  
53 project would not result in any temporary or  
54 constructive uses, they are not discussed further.  
55 Direct uses are discussed below.

### 5.2.1 DIRECT USES

A direct use takes place when the Section 4(f) land is permanently incorporated into a transportation facility.

### 5.2.2 DE MINIMIS IMPACTS

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

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

For publicly owned parks, recreation areas, and wildlife and waterfowl refuges, *de minimis* impacts are defined as those that do not “adversely affect the activities, features and attributes” of the Section 4(f) resource. The public must be afforded an opportunity to review and comment on the findings.

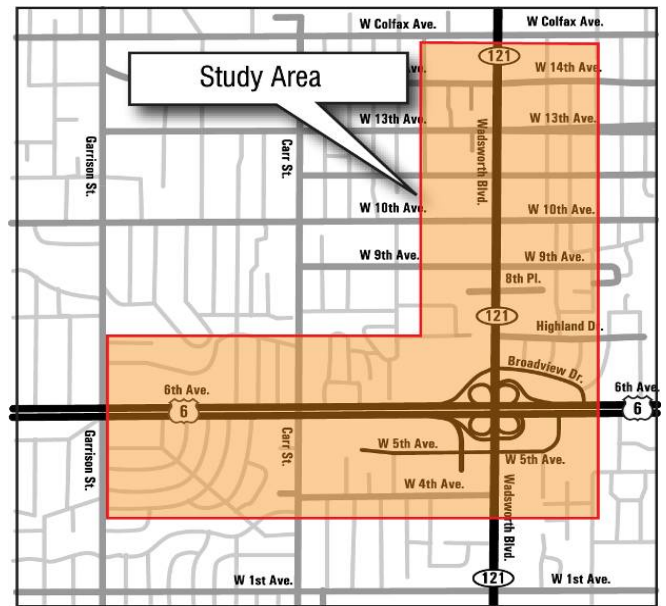
For historic sites, *de minimis* impacts are based on the determination that no historic property is affected by the project or that the project will have no adverse effect on the historic property in accordance with Section 106 of the National Historic Preservation Act. FHWA must notify the SHPO of its intent to make a *de minimis* finding.

FHWA has concluded that the Build Alternative would result in *de minimis* impacts to historic properties and to a planned park. This document serves as FHWA's final *de minimis* determination.

### 5.3 PURPOSE AND NEED

The purpose of the US 6/Wadsworth project is to improve traffic flow and safety, accommodate high traffic volumes, and increase multi-modal travel options and connections at the US 6 and Wadsworth interchange and along Wadsworth between 4th Avenue and 14th Avenue. The project is located entirely within central Lakewood in Jefferson County, Colorado (see Exhibit 5-1).

EXHIBIT 5-1: PROJECT LOCATION



Improvements are needed to:

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

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

## 5.4 FEASIBLE AND PRUDENT ALTERNATIVES

The first test under Section 4(f) is to determine which alternatives are feasible and prudent. An alternative is feasible if it is technically possible to design and build. According to FHWA regulations (23 CFR 774.17), an alternative may be rejected as not prudent for the following reasons:

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

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

The US 6/Wadsworth project initially considered nine interchange alternatives (including the No Build Alternative). Three additional alternatives were developed as Section 4(f) avoidance options. Exhibit 5-2 summarizes the Section 4(f) use and avoidance for all of twelve of these alternatives. Five were determined to be feasible and prudent, but none of these five feasible and prudent alternatives avoided Section 4(f) resources. Three alternatives (one of which is the No Build alternative) avoided or may have avoided Section 4(f) resources but were not feasible and prudent. The remaining four alternatives were neither feasible and prudent nor avoided Section 4(f) resources. Additional details on these alternatives are available in reference documents included in Appendix A (CH2M HILL, 2008a; CH2M HILL et al., 2008b; CH2M HILL, 2009a).

EXHIBIT 5-2: SUMMARY OF FEASIBLE AND PRUDENT INTERCHANGE ALTERNATIVES

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

<sup>1</sup> As noted in Section 5.4, alternatives are defined as not prudent based on standards contained in 23 CFR 774.17. Where an alternative is deemed not prudent in Exhibit 5-2, the standard is noted. For instance, if an alternative does not meet purpose and need, it is presented as "Not prudent (i)."



1 Because all feasible and prudent alternatives use land  
2 from Section 4(f) resources, the next step in the  
3 evaluation is to determine which one of the five  
4 feasible and prudent alternatives results in the least  
5 overall harm to the 4(f) resources. The discussion of  
6 least harm is presented in Section 5.6.3.

## 7 **5.5 PARKS AND RECREATION RESOURCES**

### 8 **5.5.1 DESCRIPTION OF 4(f) RESOURCES**

9 One Section 4(f) park resource is located within the  
10 construction limits of the Build Alternative. Two Creeks  
11 Park is a planned 3.35-acre recreational facility located  
12 east of Wadsworth between 10th and 12th Avenues,  
13 which is owned and planned to be operated by  
14 Lakewood. Only a small "finger" of the property  
15 associated with the confined Dry Gulch drainage  
16 channel is adjacent to Wadsworth. Dry Gulch runs  
17 through the southern portion of the property. The  
18 boundaries of the proposed park are outlined in black  
19 in Exhibit 5-3.

20 EXHIBIT 5-3: BOUNDARIES OF TWO CREEKS PARK



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

28 The property is not currently used for recreation or park  
29 purposes, and Lakewood has neither a specific plan  
30 nor funds to develop the property in the next 5 years.  
31 The park is not reflected either in Lakewood's  
32 Comprehensive Plan or the adopted Neighborhood

33 Plan, yet both plans identify the need for a park in the  
34 area. Although not formally designated in planning  
35 documents as a park, FHWA determined that the Two  
36 Creeks Park does qualify as a Section 4(f) recreation  
37 resource because the property acquisition is recent,  
38 the need for a park in the area is documented in land  
39 use plans, the acquisition is expressly for a park, and  
40 budgetary limitations, not intent, require development  
41 of the park to be phased.

### 42 **5.5.2 DE MINIMIS IMPACTS**

43 Impacts to the proposed park area are associated with  
44 replacing the Dry Gulch box culvert under Wadsworth.  
45 The existing culvert (Exhibit 5-4), which is an elliptical  
46 91" x 58" pipe, is undersized to carry a 100-year flood  
47 and would be enlarged to a 16' x 6' concrete box  
48 culvert; it must also be lengthened to accommodate  
49 the widened Wadsworth roadway section. (The  
50 dimensions of the improved culvert are subject to final  
51 engineering design.)

52 EXHIBIT 5-4: DRY GULCH CULVERT



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

60 This document serves as FHWA's final *de minimis*  
61 determination.

5.5.3 DE MINIMIS CONSULTATION AND COORDINATION

The project team coordinated with Lakewood and the Urban Drainage and Flood Control District. Each contributed to the design of the Build Alternative and recommended drainage improvements in the area of the planned Two Creeks Park.

Lakewood formally concurred that expansion of the culvert would not adversely affect the activities, features, and attributes that qualify Two Creeks Park for protection under Section 4(f) in correspondence dated October 29, 2009 (see Appendix C to the FONSI). Comments on the EA were solicited from the public during the 45-day formal review period (July 13, 2009, to August 26, 2009). No comments were received from the public on the impacts to Two Creeks Park or the intent to make a *de minimis* finding.

5.6 HISTORIC RESOURCES

The US 6/Wadsworth project would require use of property from eight Section 4(f) historic resources. Four additional historic properties are present within the area of potential effect but have no Section 4(f) use. Section 3.8 of the EA contains additional information on all historic resources.

5.6.1 DE MINIMIS IMPACTS

The Build Alternative would result in *de minimis* impacts to two individual historic properties and two historic districts. The properties are illustrated in Exhibit 5-5, and impacts are summarized in Exhibit 5-6. FHWA received concurrence from SHPO on December 19, 2008 regarding the determinations of No Adverse Effect for these four Section 4(f) resources. FHWA informed SHPO of its intent to make *de minimis* impact determinations. SHPO did not object to the *de minimis* determinations.

EXHIBIT 5-5: HISTORIC PROPERTIES WITH DE MINIMIS IMPACTS



5JF4511



5JF4513



Lakewood School Historic District (contributing building)



Green Acres Historic District (contributing building)

EXHIBIT 5-6: SUMMARY OF DE MINIMIS IMPACTS FOR SECTION 4(F) HISTORIC RESOURCES

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

5.6.2 DIRECT USES

Of the 12 interchange alternatives initially considered, only five of the alternatives were determined to be feasible and prudent. All five feasible and prudent alternatives would require total acquisition and demolition of four historic homes, resulting in direct use of the four historic homes. Photographs of these resources are presented in Exhibit 5-7. They are described briefly below, with additional details available in the *Historic Resources Survey* (TEC, 2008), included in Appendix A.

Property 5JF3548 (7395 W. 6th Ave. Frontage Road) is a one-story, single-family house built in 1946. It is eligible for listing in the National Register of Historic Places (NRHP) under Criterion C for its representative English Norman Cottage architecture.

Property 5JF3549 (7423 W. 6th Ave. Frontage Road) is a one-story, single-family residence built in 1939. It is eligible for listing in the NRHP under Criterion C because it is representative of the Mediterranean Revival architectural style.

Property 5JF4542 (7433 W. 6th Ave. Frontage Road) is a one-story, single-family house built in 1940. It is eligible for listing in the NRHP under Criterion C because it is representative of the Minimal Traditional architectural style.

Property 5JF4536 (700 Wadsworth Blvd.) is a one-story residence that has been converted to commercial use. It was constructed in 1947 and is eligible for listing in the NRHP under Criterion C

because it is a good example of a late 1940s residence that blends the Ranch and Usonian architectural styles.

EXHIBIT 5-7: SECTION 4(f) HISTORIC PROPERTIES WITH DIRECT USE



5JF3548



5JF3549



5JF4542



5JF4536

As summarized in Exhibit 5-8, all feasible and prudent interchange design concepts require use of these four historic properties, which are located in the northeast quadrant of the US 6/Wadsworth interchange. The use is the same for all four properties because they share two primary features: the need for a longer deceleration lane for the westbound off-ramp on US 6 and the need for an improved frontage road connection to Wadsworth in the northeast quadrant of the interchange.

EXHIBIT 5-8: SUMMARY OF DIRECT USES OF SECTION 4(f) HISTORIC RESOURCES

Historic Property	No Build <sup>1</sup>	Tight Diamond with Loop	Traditional Diamond	Tight Diamond	SPUI	Partial Cloverleaf	Relative Net Harm
5JF3548	No direct use	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Equal
5JF3549	No direct use	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Equal
5JF4542	No direct use	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Equal
5JF4536	No direct use	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Total acquisition and demolition of building	Equal

Notes: <sup>1</sup> No Build Alternative is not feasible and prudent but is analyzed for comparison with the build alternatives.



### 5.6.3 LEAST HARM ANALYSIS

The Section 4(f) regulation states that, if there is no feasible and prudent alternative that avoids use of Section 4(f) properties, FHWA “may approve only the alternative that causes the least overall harm in light of the statute’s preservation purpose.” In determining the alternative that causes the overall least harm, the following factors must be balanced (23 CFR 774.3):

- i) The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- ii) The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- iii) The relative significance of each Section 4(f) property;
- iv) The views of the official(s) with jurisdiction over each Section 4(f) property;
- v) The degree to which each alternative meets the purpose and need for the project;
- vi) After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- vii) Substantial differences in costs among the alternatives.

Exhibit 5-8 summarizes the uses associated with the feasible and prudent alternatives. Each requires total acquisition and demolition of the same four historic properties.

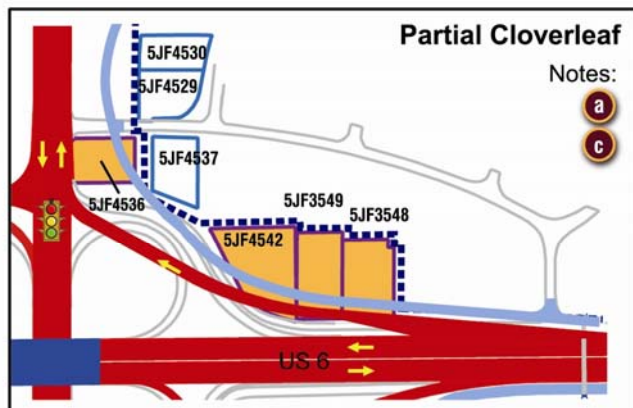
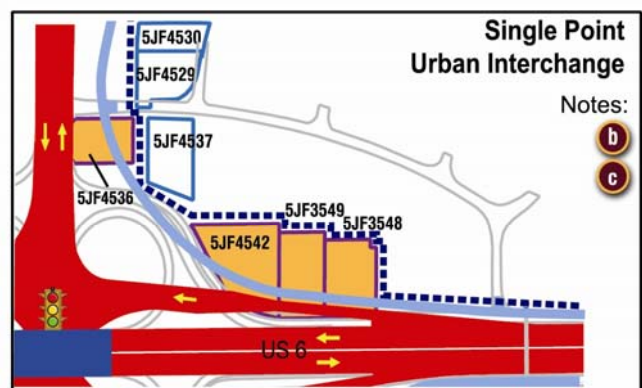
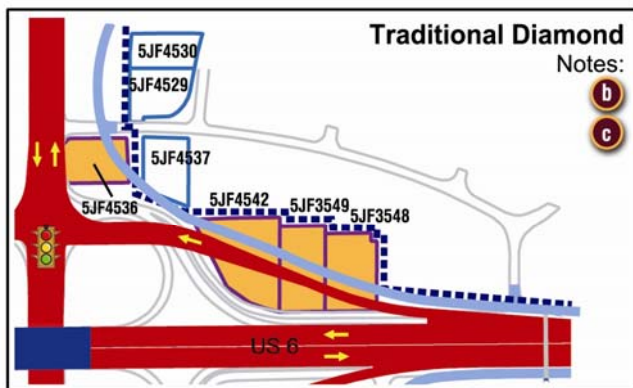
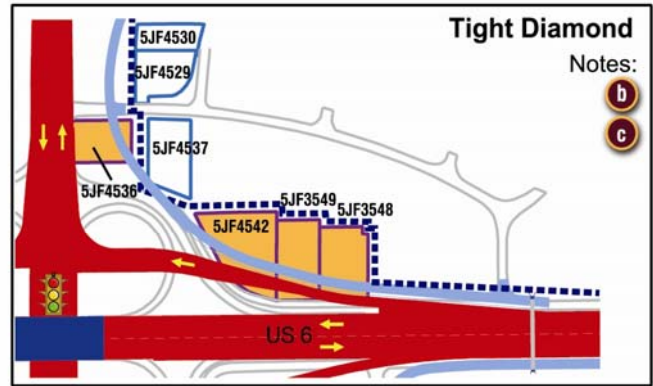
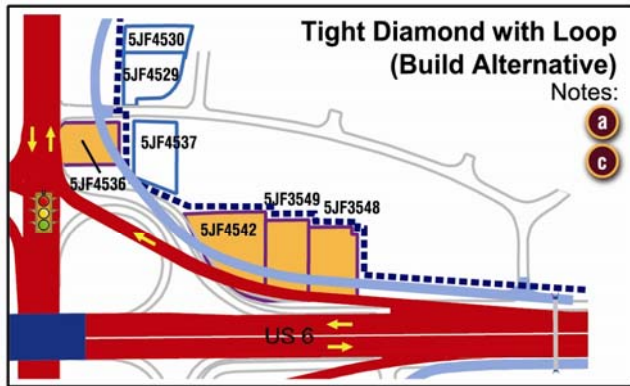
As illustrated in Exhibit 5-9, the off-ramp design requires acquisition of the three historic properties currently located on the frontage road (5JF3548, 5JF3549, and 5JF4542) under each of the five options considered. The traditional diamond has the greatest encroachment into the historic properties because it shifts the ramp intersection with Wadsworth farther north. Despite slight differences in the design footprints, all alternatives require relocation of the primary residence. The tight diamond and single-point urban interchange (SPUI) alternatives intersect Wadsworth closer to US 6 but require a signal at Wadsworth and, therefore, need a wider, multi-lane intersection for vehicle storage on the ramp. The partial cloverleaf and tight diamond with loop alternatives require only a single-lane intersection with Wadsworth but intersect Wadsworth farther north.

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

Because the direct use is similar, many of the factors for least harm do not apply to the project (that is, factors i through iv). The Tight Diamond with Loop is determined to be the least harm alternative based on factors v, vi, and vii. It best meets the project’s purpose and need, does not result in significant adverse impacts to other resources not protected by Section 4(f), and is not substantially more expensive than the other alternatives.



EXHIBIT 5-9: LEAST HARM ANALYSIS



LEGEND

New Structure	Contributing to Historic District
Existing Structure/Road	Individually Eligible for the NRHP
Interchange	Total Acquisition
New Frontage Road	Historic District Boundary
New Traffic Signal	

- a** Left turns for southbound traffic are handled through the loop ramp, and the auxiliary lane allows free-flow right turns for northbound traffic. The free-flow turn requires only a single lane to the intersection, resulting in a narrower footprint in the vicinity of historic properties.
- b** Multi-lane intersection required for vehicle queuing at Wadsworth traffic signal has larger footprint and encroaches farther into Section 4(f) properties. Need for wider intersection (more lanes) and proper intersection geometry (perpendicular rather than skewed) pushes frontage road through properties.
- c** Widening of Wadsworth to add northbound auxiliary merging lane for off-ramp requires acquisition of 5JF4536 regardless of frontage road configuration.

## 5.6.4 MEASURES TO MINIMIZE HARM

Before approving an action requiring use of any Section 4(f) property, FHWA is required to “include all possible planning to minimize harm” in that action. According to 23 CFR 774.17, “all possible planning means that all reasonable measures identified in the Section 4(f) evaluation to minimize harm or mitigate for adverse impacts and effects must be included in the project.” For historic sites, “all possible planning to minimize harm” is often accomplished through the mitigation measures identified through the Section 106 consultation process and Memorandum of Agreement (MOA) (36 CFR 800). This is the case here.

The project team carefully considered interchange design elements of the Build Alternative to determine if impacts could be avoided, minimized, or reduced while still maintaining a design that meets safety, capacity, and multi-modal needs. As illustrated in Exhibit 5-10, the following design elements (presented counter-clockwise from the top left) were evaluated:

- ◆ Inclusion of an auxiliary or add lane on Wadsworth associated with the northeast off-ramp.
- ◆ Radius of the loop ramp;
- ◆ Distance of separation between the off-ramp and frontage road and of the off-ramp and highway;
- ◆ Location of the gore area (the area needed for cars to recover if they miss the exit) for the westbound US 6 off-ramp; and
- ◆ Location of the taper area (speed-change transition area where pavement width increases or decreases as cars enter or exit a traffic stream) for the westbound US 6 off-ramp.

As described in Exhibit 5-10, none of these design elements could be modified enough to avoid impacts to historic properties without compromising the purpose and need for the project.

In addition to modifying design elements, the project team evaluated moving the houses at historic properties 5JF3548, 5JF3549, and 5JF4542 farther back on their existing lots and maintaining the properties as residential uses rather than demolishing the buildings. After evaluating this option, CDOT determined that moving the houses is not a practicable avoidance or minimization measure. Moving the properties would diminish the historic integrity of the resources to the point that they would no longer be eligible for listing in the NRHP (and thus, the properties would no longer qualify for Section 4(f) protection) and, therefore, would not minimize harm to these properties.

While measures to avoid, minimize, or reduce impacts to the four historic properties could not be incorporated into the project, compensatory mitigation measures for demolishing the properties have been included in an MOA among CDOT, FHWA, Colorado SHPO, and Lakewood. The MOA was prepared in accordance with the Section 106 consultation process. Mitigation measures include placement of a low-profile interpretive sign on the bike path within the project area and development of an educational website in coordination with Lakewood. The final MOA is included in Appendix C to the FONSI.

## 5.7 SECTION 4(F) FINDING

Based upon the above considerations, there is no feasible and prudent alternative to the use of four Section 4(f) historic properties (5JF3548, 5JF3549, 5JF4542, and 5JF3536), and the proposed action includes all possible planning to minimize harm to these properties resulting from such use.



EXHIBIT 5-10: DESIGN FEATURES OF THE TIGHT DIAMOND WITH LOOP INTERCHANGE AND CONSIDERATION OF IMPACTS TO SECTION 4(f) RESOURCES

