

I-70/E-470 INTERCHANGE COMPLEX

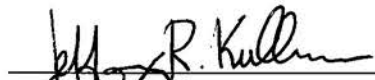
Environmental Assessment

**Submitted Pursuant to:
42 USC 4332(2)(c)**

**Submitted by:
Colorado Department of Transportation**

**Prepared for:
U.S. Department of Transportation
Federal Highway Administration**


Submitted by:



Jeffery R. Kullman, P.E.
Region 1 Transportation Director
Colorado Department of Transportation

November 1, 2006
Date


Concurred by:



Pamela A. Hutton, P.E.
Chief Engineer
Colorado Department of Transportation

November 6, 2006
Date

Approved by:



for David A. Nicol, PE
Division Administrator
Colorado Division
Federal Highway Administration

11/7/06
Date

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Environmental Assessment

I-70/E-470 Interchange Complex

Prepared for:

**U.S. Department of Transportation
Federal Highway Administration**



Information Availability

The following individuals may be contacted for further information regarding the proposed project and the Environmental Assessment:

- ▶ **Shaun Cutting, Program Delivery Engineer**
Colorado Division
Federal Highway Administration
12300 West Dakota Avenue, Suite 180
Lakewood, Colorado 80228
720-963-3014

- ▶ **Michelle Li, Planning and Environmental Manager**
Colorado Department of Transportation, Region 1
18500 East Colfax Avenue
Aurora, Colorado 80011
303-757-9112

- ▶ **Matt McDole, Chief Engineer**
E-470 Public Highway Authority
22470 East 6th Parkway
Aurora, Colorado 80018
303-537-3450

- ▶ **Mac Callison, Principal Planner**
City of Aurora
1470 South Havana Street
Suite 502
Aurora, Colorado 80012
303-739-7256

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Acronyms

2030 MVRTP	2030 Metro Vision Regional Transportation Plan	DRCOG	Denver Regional Council of Governments
AASHTO	American Association of State Highway and Transportation Officials	EA	Environmental Assessment
ADT	Average Daily Traffic	EAC	Early Action Compact
AMI	average median income	EPA	Environmental Protection Agency
APCD	Air Pollution Control Division	FEMA	Federal Emergency Management Agency
AST	Above Ground Storage Tank	FHWA	Federal Highway Administration
AVI	Automatic Vehicle Identification	FIRM	Flood Insurance Rate Map
BFE	Base Flood Elevation	FONSI	Finding of No Significant Impact
BMP	Best Management Practices	HAER	Historic American Engineering Record
BRT	Bus Rapid Transit	HOV	High Occupancy Vehicle
C/D	Collector/Distributor (Road)	HUD	U.S. Department of Housing and Urban Development
CDOT	Colorado Department of Transportation	ISA	Initial Site Assessment
CDOW	Colorado Division of Wildlife	ITS	Intelligent Transportation System
CDPHE	Colorado Department of Public Health and Environment	LOMR	Letter of Map Revision
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Information System	LOS	Level of Service
CEQ	Council on Environmental Quality	MBTA	Migratory Bird Treaty Act
CLOMR	Conditional Letter of Map Revision	MESA	Modified Phase I Environmental Site Assessment
CNHP	Colorado Natural Heritage Program	MIS	Major Investment Study
DIA	Denver International Airport	MS4	Municipal Separate Storm Sewer System
DOLA	Department of Local Affairs	MSA	Metropolitan Statistical Area
DOT	Department of Transportation	MSAT	Mobile Source Air Toxics



MUE	Multi-Use Easement	SIP	State Implementation Plan
NAAQS	National Ambient Air Quality Standards	SPL	State Priority List
NAC	Noise Abatement Criteria	SWLF	Solid Waste Landfill
NDIS	Natural Diversity Information Source	TAZ	Traffic Analysis Zone
NEATS	Northeast Aurora Transportation Study	TIP	Transportation Improvement Program
NEPA	National Environmental Policy Act	TNM	Traffic Noise Model
NFRTAFS	North Front Range Transportation Alternatives Feasibility Study	TSD	Treatment, Storage, or Disposal (Facility)
NPDES	National Pollutant Discharge Elimination System	UDFCD	Urban Drainage Flood Control District
NPL	National Priorities List	$\mu\text{g}/\text{m}^3$	Micrograms per Cubic Meter
NRCS	Natural Resources Conservation Service	UPRR	Union Pacific Railroad
OSP	Outfall Systems Planning	USACE	United States Army Corps of Engineers
PM10	Particulate Matter Less Than Ten Microns in Diameter	USDA	United States Department of Agriculture
PUD	Planned Unit Development	USFWS	United States Fish and Wildlife Service
RAC	Regional Activity Center	UST	Underground Storage Tank
RAQC	Regional Air Quality Council	vmt	Vehicles Miles of Travel
RCRA	Resource Conservation and Recovery Act	vpd	Vehicles Per Day
ROW	Right-of-Way	vph	Vehicles Per Hour
RSA	Regional Statistical Area		
RTD	Regional Transportation District		
RTP	Regional Transportation Plan		
SHPO	State Historic Preservation Officer		
SI	Sight Investigation		



EXECUTIVE SUMMARY

INTRODUCTION

Throughout this document, a series of questions addressing commonly expressed concerns are found in the boxes with blue background. They generally precede a focused technical summary of the Purpose and Need for the project, alternatives analysis, or affected environmental resources. This format is intended to quickly disclose public concerns while providing a more structured source of resource description, impacts, and design information.

The *I-70/E-470 Interchange Complex Environmental Assessment (EA)* evaluates the impact of the proposed interchange improvements to the Interstate 70 (I-70) and E-470 interchange and the addition of Harvest and Picadilly interchanges along I-70. This three-interchange configuration has been termed "The I-70/E-470 Interchange Complex." The purpose for this proposed action is the extensive residential, commercial, and industrial development that is occurring now, and is planned to continue in the interchange area. The lead agency for this study is the Federal Highway Administration (FHWA); the study is sponsored by the Colorado Department of Transportation (CDOT), the E-470 Public Highway Authority (E-470 Authority), and the City of Aurora.

The National Environmental Policy Act (NEPA) requires that a reasonable range of alternatives, including the No-Action Alternative, be presented and evaluated. This EA will evaluate environmental, social, and economic impacts of the proposed action.

This EA presents information about the projected impacts of a No-Action Alternative and a Preferred Alternative. The Preferred Alternative (Alternative 9) involves constructing new system-to-system (freeway-to-freeway) interchange ramps between E-470 and I-70. It also includes two system-to-service (freeway-to-arterial) interchanges along I-70. One replaces the existing partial interchange at I-70 and Colfax with a new full interchange at Picadilly Road, and the other is a new full interchange at I-70 and Harvest Road. Once complete, this would preclude the need for the current I-70 and Gun Club Road interchange, which would be closed.

37

Why can't the Gun Club interchange stay where it is?
Because of the need to preserve system-to-system movements, it is essential that the I-70/E-470 interchange be upgraded to allow for higher speed and higher capacity movements between the freeway and tollway systems. Alternatives were examined that would maintain the existing local I-70 access at Gun Club Road by integrating local access with the improved freeway-tollway directional ramps. Those alternatives were eliminated because local access would compromise safety and operations of the freeway-tollway interchange. Specifically, the integrated local and freeway-tollway interchange would lead to large concentrations of traffic at I-70 exit and entrance points, non-standard spacing between driver decision points, and unacceptable signing. AASHTO's Policy on Geometric Design of Highways and Streets provides a rule of thumb of one mile for minimum spacing between interchanges. Gun Club and the E-470 interchanges would be spaced less than a quarter mile apart.

A decision document will incorporate public and agency comments, responses to comments, document the decision on a preferred alternative, and commit to mitigation.

Project History. The concept of a circumferential beltway around the Denver metropolitan area was originally conceived in the 1950s. The original Interstate Highway System for Colorado included such a route. The route was subsequently removed from the Interstate System by the State of Colorado. In the 1980s, the concept of an eastern bypass in the form of the E-470 Toll Highway was revived. The Colorado General Assembly enacted the "Public Highway Authority Law" in 1987, and the E-470 Authority was established in 1988. The first segment of E-470 between I-25 and Parker Road was opened in 1991. The final segment of the 47-mile toll highway was completed in 2003.

As a cost saving measure, E-470 has used an existing interchange with I-70 at Gun Club Road for an interim period. This has always been thought of as a temporary situation. The primary concern is safety because drivers on E-470 are not expecting signals. As traffic increased, the eventual construction of a



1 system-to-system interchange was planned for the
2 future.

3 A flyby has recently been opened to carry the main
4 lanes of E-470 over I-70 to bypass the current signal-
5 ized intersections. Also, Ramp H, a ramp to connect
6 northbound E-470 to westbound I-70, is included in
7 the current construction. Recognizing the need for a
8 full interchange at E-470 and I-70, the E-470 Author-
9 ity, in cooperation with the City of Aurora and
10 CDOT, commenced 1601 system-level and project-
11 level feasibility studies in 2003 as required by
12 CDOT for any new interchanges on the interstate
13 system. The study examined a number of potential
14 interchange concepts preserving local access to I-70
15 at Gun Club Road and providing new ramps for the
16 connecting movements between I-70 and E-470.

17 Under the latest 1601 procedures, CDOT has elimi-
18 nated the need for duplication of reports. CDOT has
19 agreed that the Interstate Access Request and the EA
20 will satisfy most of the 1601 requirements. A sepa-
21 rate draft financial plan has been prepared, and
22 CDOT, the E-470 Authority, and the City of Aurora
23 have executed an Intergovernmental Agreement
24 (IGA) to carry out the initial steps of project imple-
25 mentation which included a phased approach,
26 equally sharing of the cost of the environmental
27 study, and a capital construction funding strategy.
28 Because of the complexity of the combined inter-
29 change, the parties agreed in 2004 to expand the
30 study area to consider the possibility of alternative
31 interchanges to provide access to I-70 separated
32 from the E-470 interchange. According to the agree-
33 ment, the expanded study area is part of the analysis
34 completed for this EA.

35 FHWA approved the Interstate Access Request on
36 February 9, 2006. The CDOT Transportation Com-
37 mission approved the 1601 System Level Study on
38 March 16, 2006.

39 This Executive Summary highlights the major find-
40 ings of this EA related to:

- 41 ▶ Purpose and Need
- 42 ▶ Alternatives Considered

43 ▶ Affected Environment

44 ▶ Public and Agency Coordination

45 **PURPOSE AND NEED**

46 The primary purpose of the I-70/E-470 project is to
47 efficiently and safely connect the freeway and toll-
48 way systems, I-70 and E-470, while maintaining and
49 improving local access for existing and planned
50 roadways and future travel demand.

51 Basic goals are to:

- 52 ▶ Improve regional mobility and safety, and to
53 serve forecasted future travel demands.
- 54 ▶ Correct roadway deficiencies associated with
55 substandard ramps and insufficient inter-
56 changes.
- 57 ▶ Increase access for adjacent land uses (both
58 existing and planned).

59 Improve Regional Mobility

60 Traffic counts based on 2004 and 2005 data show I-
61 70 traffic volumes at roughly 29,000 vehicles per
62 day (vpd) east of the E-470 interchange and 39,000
63 vpd west of the E-470 interchange. However, the I-
64 70/E-470 study area is located within a rapidly
65 developing part of the Denver-Aurora metropolitan
66 area. According to the Denver Regional Council of
67 Governments (DRCOG), the population in the area
68 is forecasted to almost quadruple by the year 2030.
69 Such a drastic increase in population would trans-
70 late into an equally drastic rise in travel demand. As
71 the area is rapidly developing, traffic volumes are
72 forecasted to increase east of E-470 from 29,000
73 vpd to 77,000 vpd with the No-Action Alternative
74 and to 94,000 vpd with the Preferred Alternative;
75 while west of E-470, traffic volumes are predicted to
76 increase from 39,000 vpd to 102,000 vpd with the
77 No-Action Alternative and to 109,000 vpd with the
78 Preferred Alternative. The reason that there will be
79 more vehicles per day with the Preferred Alternative
80 is because it provides additional access points on I-
81 70, so there is additional traffic on I-70 segments
82 that are adjacent to E-470.

1 Correct Roadway Deficiencies

2 Currently, E-470 in the study area has ramp move-
3 ments passing through the closely spaced signalized
4 intersections. These signalized intersections do not
5 meet American Association of State Highway and
6 Transportation Officials (AASHTO) standards for
7 freeway-to-freeway connections. The flyby, cur-
8 rently under construction, will grade separate the
9 through E-470 roadway from Gun Club Road. Ramp
10 H will also provide a direct connection from north-
11 bound E-470 to westbound I-70. However, other
12 substandard ramp connections are not yet being
13 updated because the remaining ramp connections
14 are the subject of the alternatives analyzed in this
15 EA. I-70 in the study area has interchange deficien-
16 cies, including substandard weaving distances, a
17 non-standard two-lane left exit ramp from I-70 west-
18 bound to Colfax, and substandard ramp accelera-
19 tion and deceleration lanes at the Gun Club/E-470
20 interchange. Presently, I-70/Colfax (US 40) has a
21 partial interchange, which is missing the westbound
22 entrance ramp to I-70. These interchange deficien-
23 cies on both E-470 and I-70 will contribute to
24 increased safety risks as traffic volumes increase.

25 Increase Access

26 DRCOG's *2030 Metro Vision Regional Transporta-*
27 *tion Plan* forecasts a substantial amount of new
28 development in the study area and surrounding
29 areas. It is anticipated that the demand on the exist-
30 ing arterial network will be a lot greater than the
31 existing arterial network capacity.

32 Planned transportation projects within the study
33 area include a widening of E-470 to six lanes, new
34 interchanges, and improvements to local roads. In
35 addition, the Regional Transportation District (RTD),
36 as part of the FasTracks program, plans to expand its
37 bus network, FastConnects, through the study area.
38 Also planned is a design to accommodate a future
39 transit line (for light rail, express bus, or bus rapid
40 transit type of service) in the E-470 median and two
41 new freight tracks to the Union Pacific Railroad line.

42 **ALTERNATIVES CONSIDERED**

43 Nine main alternatives were developed and evalu-
44 ated during the EA process. The general public and
45 local, state, and federal agencies were involved dur-
46 ing alternatives development and screening. Alter-
47 natives evaluated included a wide range of
48 improvements to the roadway system, construction
49 of directional ramps, and new full-movement inter-
50 changes.

51 The two alternatives fully evaluated in this EA are
52 the No-Action Alternative and the Preferred Alterna-
53 tive. The No-Action Alternative is the base line to
54 which all alternatives are measured. It would not
55 meet the demands of the 2030 traffic projections
56 nor would it improve the substandard and incom-
57 plete ramps at I-70/Colfax. There would be seven
58 missing system-to-system interchange ramps
59 between I-70 and E-470, and future interchanges
60 identified in local and regional plans would not be
61 constructed. The No-Action Alternative would not
62 meet the project's Purpose and Need.

63 The Preferred Alternative for the I-70/E-470 com-
64 plex consists of a package of three separate inter-
65 changes. This includes additional ramps for
66 freeway-to-freeway access between I-70 and E-470,
67 a full interchange at Picadilly Road that replaces the
68 partial interchange at Colfax, and a new, full inter-
69 change at Harvest Road. New interchanges for I-70
70 at Picadilly Road and at Harvest Road are included
71 in both the *DRCOG 2030 Metro Vision Regional*
72 *Transportation Plan* and the *City of Aurora Compre-*
73 *hensive Plan, 2003*. There are several major ele-
74 ments included with this package that would
75 accommodate the anticipated increase in traffic vol-
76 ume in the area and access to adjacent land uses.
77 The build alternatives, including the No-Action
78 Alternative, are discussed in detail in Chapter 2.

79 **ENVIRONMENTAL CONSEQUENCES**

80 The major environmental impacts of the Preferred
81 Alternative are:



- 1 ▶ The Preferred Alternative would influence the 45
2 location of the ongoing development in this 46
3 largely undeveloped rural area. However, such 47
4 development is already occurring consistent 48
5 with local and regional land use plans and is 49
6 supported by local planning and zoning agencies, such as DRCOG and the City of Aurora. 50
7
- 8 ▶ From a social and economic perspective, construction of the Preferred Alternative would 51
9 result in improved local and regional accessibility. Reduced travel times and improved mobility 52
10 for local residents to regional destinations is expected to occur. 53
11
- 12 ▶ As mentioned, extensive growth and development in the area is expected to occur whether 54
13 or not the Preferred Alternative is constructed. The City of Aurora has zoned the area around 55
14 the I-70/E-470 interchange for land uses that include retail/commercial uses (hotels, restaurants, shops), as well as light industrial and 56
15 open space/park uses. However, construction of the Preferred Alternative could cause an 57
16 increase in economic enterprise within the area. 58
- 17 ▶ The Preferred Alternative would not require the displacement or relocation of any residence or 59
18 business in the study area. However, temporary impacts to residents of the Foxridge Farm 60
19 Mobile Home Park and the residence near the intersection of I-70 and Colfax would include 61
20 an increase in dust, dirt, noise, and traffic during the construction period. Both minority and non- 62
21 minority populations will equally experience these impacts. Therefore, these impacts would 63
22 not be disproportionately high and adverse because they would not be predominately borne by minority populations, nor would they 64
23 be appreciably more severe or greater in magnitude than the impacts borne by non-minority 65
24 populations. New right-of-way to be required consists of approximately 235 acres from 13 66
25 parcels mostly located at the proposed Picadilly Road and Harvest Road interchanges. 67
26
- 27 ▶ Increases in traffic-related noise, pollution, traffic, and a decrease in visual quality would occur 68
28 at the Candle Lite Motel and the adjacent single-family residence. 69
29
- 30 ▶ The Preferred Alternative would impact First Creek. Permanent modification to the stream 70
31 would be necessary. Additionally, while the Preferred Alternative would not directly impact 71
32 wetlands, it would impact the jurisdictional portion of the First Creek swale adjacent to I-70. A 72
33 Nationwide Section 404 Permit would be required for this impact. Finally, the floodplain 73
34 of First Creek would be impacted by the Preferred Alternative. 74
35
- 36 ▶ The Preferred Alternative would result in the loss of tree groves in the northeast quadrant of 75
37 the I-70/E-470 interchange that provide nesting and roosting sites for birds. Undeveloped lands 76
38 that provide wildlife habitat would be impacted. 77
39
- 40 ▶ A required bridge replacement for E-470 would span the Kansas Pacific/Union Pacific Railroad 78
41 grade, a historic railroad. However, because the pier replacement would essentially replicate the 79
42 piers that are currently in place, there would be no adverse impact to the historic character of 80
43 the railroad. The State Historic Preservation Officer (SHPO) concurred in a letter dated July 81
44 12, 2006. 82
- 45 ▶ Cumulative impacts to noise and wildlife have been identified. Although there would be no 83
46 direct impacts to wetlands under the Preferred Alternative, extensive growth and development 84
47 in the area has generated concern for wetland resources. Therefore, cumulative impacts to 85
48 wetlands were analyzed and identified under the Preferred Alternative. The proposed action 86
49 would contribute to the ongoing development of the area. The incremental impact of the Preferred 87
50 Alternative would not cause major impacts to any of the environmental areas of concern or result in effects that cause an unacceptable 88
51 deterioration in the human quality of life. 89
52 Specific mitigation measures for the above-mentioned impacts are included in Chapter 3 of this EA.

1 Along with required mitigation, through CDOT's
2 environmental stewardship, Best Management Prac-
3 tices (BMPs) will be employed. These include:

- 4 ▶ Good communication during design and con-
5 struction will be implemented with emergency
6 services, local businesses, government agen-
7 cies, and residents regarding traffic delays and
8 access changes.
- 9 ▶ Measures will be taken to protect against ero-
10 sion of soil, extensive water runoff, the quality
11 of water runoff, and disturbance to vegetation.
- 12 ▶ In compliance with the Federal Emergency
13 Management Agency (FEMA) regulations and
14 criteria, the design of all roadway, drainage, and
15 structural features will protect against distur-
16 bance of the drainage system.
- 17 ▶ Retention of large trees where possible, and use
18 of temporary and permanent erosion controls
19 are measures that will be employed to safeguard
20 wildlife and offset impacts due to increased sur-
21 face runoff.

22 PUBLIC AND AGENCY COORDINATION

23 This project has been carried out with extensive
24 involvement from the public and from agencies.
25 Public coordination has involved meetings with citi-
26 zens, property owners, businesses, developers, and
27 elected officials. This coordination involves written
28 communication, meetings with small groups and
29 homeowners associations, and public meetings.

30 Agency coordination has occurred on a regular
31 basis through scoping meetings and quarterly coor-
32 dination meetings. Agencies that have provided
33 input are Arapahoe County, Adams County, Denver
34 International Airport (DIA), the U.S. Environmental
35 Protection Agency, utility companies, water and
36 sanitation districts, and the Union Pacific Railroad.
37 Additionally, meetings with DRCOG have occurred
38 throughout the planning and preliminary design
39 process, and monthly team coordination meetings,
40 occurred between CDOT, FHWA, E-470, Aurora,
41 and the consultant team.

42 PUBLIC INVOLVEMENT FOLLOWING 43 COMPLETION OF EA

44 Once this EA has been completed and signed, a 30-
45 day public and agency document review and com-
46 ment period will begin. This comment period will
47 be officially announced through a notice published
48 in local newspapers, and sent to all on the project
49 mailing list. Flyers will be hand delivered to the res-
50 idents located in the Environmental Justice areas.
51 During this period, a public hearing will be held to
52 explain the Preferred Alternative to agencies and the
53 public and to obtain their input. Any comments
54 received during the comment period will be
55 addressed in the decision document. The decision
56 document will also include a project description, a
57 summary of mitigation measures, the project coordi-
58 nation process, any clarification to the EA, and
59 either selection of the Preferred Alternative, or a
60 Notice of Intent to prepare an Environmental Impact
61 Statement.



CHAPTER 1.0: PURPOSE AND NEED FOR PROPOSED ACTION

1.1 INTRODUCTION

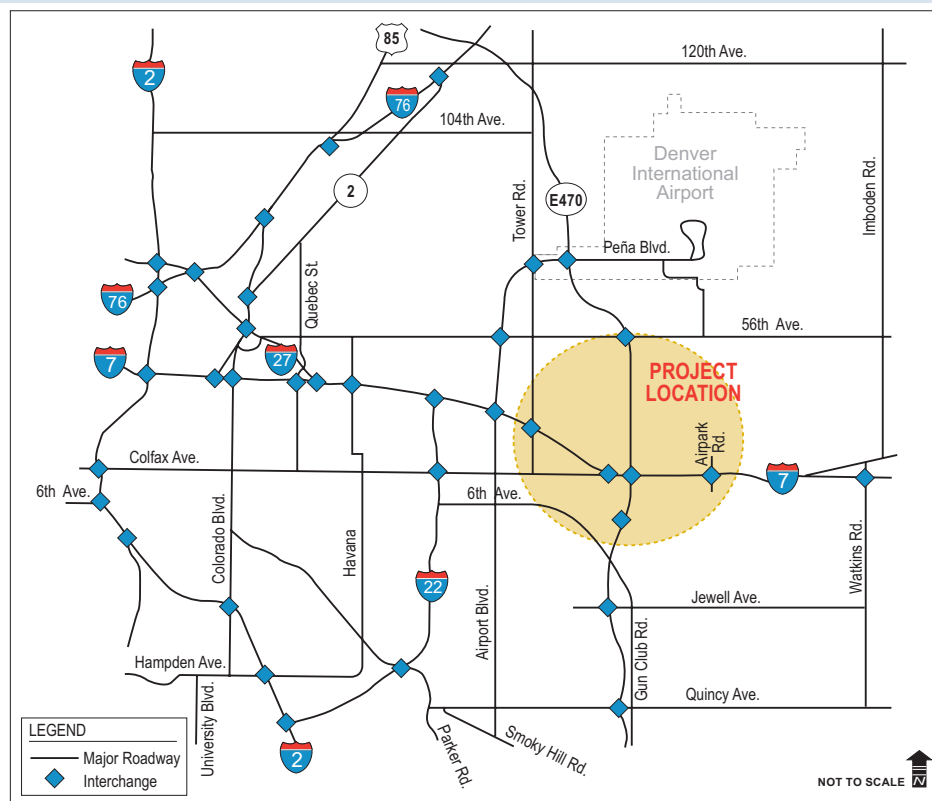
The Federal Highway Administration (FHWA), the project's lead federal agency, in cooperation with the project's lead agencies that include the Colorado Department of Transportation (CDOT), the E-470 Public Highway Authority (E-470 Authority), and the City of Aurora, as sponsors of this study, have identified a system of access improvements to the Interstate 70 (I-70) and E-470 highways. Additional technical oversight was provided by Arapahoe County, Adams County, Denver International Airport (DIA) and the Denver Regional Council of Governments (DRCOG). The study includes preliminary engineering to develop alternative improvements and conduct environmental studies to assess potential impacts to the study area. This report describes the study process and addresses specific

19 questions that have been raised during the public
20 involvement process.

1.2 PROJECT LOCATION

The project study area is located on the eastern fringe of the Denver-Aurora metropolitan area in northeast Aurora, south of DIA (see **Figure 1-1**). I-70 is the major east-west interstate route serving Colorado and passes through the study area between Airport Road on the east and Tower Road on the west. E-470 is the toll road serving as a circumferential belt highway around the eastern portions of the metropolitan area. The E-470 roadway in the study area extends from the 6th Parkway interchange on the south to north of 26th Avenue.

Figure 1-1
Regional Project Vicinity





1.3 PROJECT BACKGROUND

The E-470 tollway was conceived in the late 1980s as a belt highway around the eastern perimeter of the Denver-Aurora metropolitan area that could meet growing travel demands. The highway could not be financed for many decades by then-current transportation funding sources. The E-470 Authority was established in 1988 by Adams, Arapahoe, and Douglas Counties under the Public Highway Authority Act as the entity that would design, build, and finance the tollway. The E-470 Authority was subsequently expanded to include the Cities of Aurora, Commerce City, Brighton, Thornton, and the Town of Parker.

The I-70/E-470 interchange complex is located partly in the City of Aurora, with portions in unincorporated Adams and Arapahoe Counties. The proposed project centers around the junction of I-70, the one east-west interstate highway which traverses the entire state of Colorado, and the E-470 tollway. The 47-mile-long toll road circles the eastern half of the Denver-Aurora metropolitan area, connecting with I-25 to the south in Douglas County and I-25 to the north in Thornton.

The *E-470 Environmental Study*, dated July 1993, and updated March 1994, described a three-phased development of the I-70/E-470 interchange. The first phase, with only minor turn lanes added to the Gun Club Road interchange, was anticipated to have acceptable traffic operations until 2005. The second phase to handle traffic through 2010 included a new roadway for E-470 through traffic, and possibly a cloverleaf interchange eliminating access between Gun Club Road and I-70. Phase 3, for some time after 2010, included directional or semi-directional ramps between E-470 and I-70.

37

Why did E-470 move from the more easterly alignment?

Initial planning for E-470 identified an alignment more to the east of the location ultimately developed. Analysis of that initial alignment indicated that traffic volumes would be insufficient to produce sufficient revenue to finance construction of the toll road. Studies of alternative alignments were conducted in 1992 and 1993, including extensive environmental studies and a public involvement program. These studies identified the current alignment closer to the Gun Club Road section line as serving a lot more traffic and generating the toll revenue to support the payback to the bond holders.

The proposed action at the I-70/E-470 interchange complex is composed of three separate interchanges. The complex would replace the present I-70 diamond interchange at Gun Club Road that has been used as a temporary interchange to connect I-70 and E-470. The Preferred Alternative would also replace the partial interchange between I-70 and Colfax Avenue. A new freeway-to-freeway interchange is proposed to provide full directional movements between I-70 and E-470. Two new interchanges are proposed at I-70 and Picadilly Road and at I-70 and Harvest Road to provide local access off of the interstate.

38

Why were traffic lights allowed on a high-speed toll road?

E-470 initially was faced with budget limitations, and traffic projections showed that the existing I-70 diamond interchange at Gun Club Road could be used on an interim basis. While this required E-470 traffic to pass through four traffic signals, it deferred the \$50 million cost of a new directional interchange. This arrangement received favorable approval from both CDOT and FHWA.

39

Nearby residents have said that they were promised continued free access to I-70 when E-470 was built. Why is this changing?

During the interim use of the I-70/Gun Club Road interchange for E-470 traffic, local free access has been preserved from Gun Club Road, Smith Road, and Colfax Avenue. In evaluating numerous alternatives for a full, separate interchange between I-70 and E-470, design guidelines for safe operations did not permit retaining Gun Club which would have resulted in decision points too closely spaced, as well as confusing signing. This led to the need to add two new local service interchanges at Picadilly Road and Harvest Road to maintain free access to I-70. The full safety analysis can be found in the document titled *Technical Memorandum-Safety Analysis for Ramp H*, November 2005.

1.4 PROPOSED ACTION

The proposed action is to ultimately construct new system-to-system (freeway-to-freeway) interchange ramps between the E-470 and I-70, while maintaining service-to-system (arterial-to-freeway) access with I-70. See **Figure 1-2** for a map of the study area. The study area includes the I-70 interchange at E-470 and extends from the I-70/Tower Road interchange on the west to the I-70/Air Park Road on the east, and along E-470 from the 6th Parkway interchange on the south to north of 26th Avenue on the north. FHWA is the lead federal agency for the National Environmental Policy Act (NEPA) process. CDOT is the applicant.

As a result of the extensive preliminary traffic and environmental studies prior to this EA, a complex of

three separate interchanges is the proposed action—the I-70/E-470 interchange complex. This would include a system-to-system interchange between I-70 and E-470 and two system-to-service interchanges, one replacing the existing partial interchange between I-70 and Colfax Avenue with a new full interchange at Picadilly Road, and a new interchange between I-70 and Harvest Road.

What is the difference between a system-to-system interchange and a system-to-service interchange? A system-to-system interchange is one that connects two major interstates or key metropolitan freeways or toll roads and serves interregional trips. A system-to-system interchange provides continuous flow ramps without traffic signals. A system-to-service interchange, in contrast, provides access to the freeway from subregional developments, in effect providing service or access to adjacent communities.

**Figure 1-2
Study Area**





1.5 PURPOSE AND NEED

The purpose of the project is to link the freeway and tollway systems, I-70 and E-470, in an efficient and safe manner while maintaining and enhancing local access for the existing and planned roadway system and future travel demand. This will be accomplished while maintaining the integrity of the mainline I-70 roadway, particularly with regard to traffic safety and operations.

The need for the project is three-fold:

1. Improve regional mobility

The E-470 Authority in January 2003 completed the last link in the toll facility from I-25 and C-470 at the southern terminus to I-25 south of 160th Avenue at the northern terminus. E-470 provides access to DIA. It serves the fast-growing Douglas, Arapahoe, and Adams Counties area, as well as major portions of the City of Aurora. I-70 is the major east-west interstate freeway in Colorado and is a strategic link in the nationwide highway network. The I-70 freeway and E-470 are major components of the transportation network serving the Denver metropolitan area. Substandard connections to these highways are affecting regional mobility. Modifications to the freeway-to-freeway interchange ramp connections are needed to improve regional mobility and safety, and to serve forecasted traffic volumes.

Currently, the I-70/E-470 ramp movements must pass through one or more of four closely spaced signalized intersections. It is highly desirable to design an interchange complex that will satisfy both the freeway-to-freeway linkages and local access needs, while accommodating future travel demands.

2. Roadway deficiencies

Currently, E-470 in the study area has ramp movements passing through the closely spaced signalized intersections that do not meet American Association of State Highway and Transportation Officials (AASHTO) standards for freeway-to-freeway connections. The flyby, which has been recently opened, grade separates the through E-470 roadway

from Gun Club Road. Ramp H will also provide a direct connection from northbound E-470 to westbound I-70. However, other substandard ramp connections are not yet being updated because the remaining ramp connections are the subject of the alternatives analyzed in this EA. I-70 in the study area has interchange deficiencies, including substandard weaving distances, a non-standard two-lane left exit ramp from I-70 westbound to Colfax, and substandard ramp acceleration and deceleration lanes at the Gun Club/E-470 interchange. Presently, I-70/Colfax (US 40) has a partial interchange, which is missing the westbound entrance ramp to I-70. These interchange deficiencies on both E-470 and I-70 will contribute to increased safety risks as traffic volumes increase.

3. Enhance access for the adjacent land uses

DRCOG's 2030 Metro Vision Regional Transportation Plan forecasts a substantial amount of new development in the study area and surrounding areas. It is anticipated that the demand on the existing arterial network will be a lot greater than the existing arterial network capacity.

Maintaining arterial access and access for the adjacent land uses to the freeway network is critical since the portion of the City of Aurora surrounding the existing I-70 interchange with E-470 and Gun Club Road includes substantial land areas under development. Immediately north of I-70, light industrial uses and distribution centers are developing. The zoning in the *City of Aurora Comprehensive Plan*, 2003 depicts major regional retail, commercial, and residential development on adjacent properties south of I-70. The plan includes major arterial roadways west and east of E-470 at Picadilly Road and Harvest Road, as well as arterials that parallel I-70 on the north and south sides, including Colfax Avenue and Smith Road.

The linkages between I-70 and E-470 with the existing and planned arterial network in the study area are vital to service the existing and proposed commercial and residential developments of northeast Aurora. To avoid confusion to drivers and complex

1 traffic operations, separation of service access from
2 the freeway-to-freeway interchange is desirable.

3
Why can't the I-70 interchange at Gun Club Road be left in place for local access? Portions of the Gun Club Road access will remain in place until added ramps are constructed between I-70 and E-470. Ultimately, however, I-70/E-470 ramps need to be upgraded to create higher speed and higher capacity connections for regional traffic movements between I-70 and E-470. These types of high-speed ramps serving regional traffic (similar to the I-25/I-70 interchange in Denver or the I-25/E-470/C-470 interchange in Douglas County) are not compatible with local access ramps like the existing I-70/Gun Club Road ramps. The combination of regional traffic flow and local access movements would create safety conflicts and negatively affect traffic flow on the regional freeway and tollway system. Thus, the local access to I-70 that is currently provided by the Gun Club ramps will be replaced with full movement I-70 interchanges at Picadilly Road and Harvest Road.

4
Why can't I turn left at I-70 heading westbound without the green arrow? With the current volume and speed of traffic passing through the Gun Club interchange, and the high number of crashes experienced at the left turn intersections compared with other similar intersections, CDOT has provided "protected" left turn signal arrows, permitting left turns only when the opposing traffic has a red light. With the completion of the flyby and Ramp H, the volume of traffic passing through the signalized intersections will be reduced and CDOT will review the signal operations. It may be possible to keep the green arrows for left turns on for longer periods.

5
Isn't the flyby and the new flyover ramp (Ramp H) enough? Why do more? The flyby and Ramp H may permit safe operation of the I-70/Gun Club Road interchange for many years. That time period will depend on the pace of residential, industrial and commercial development in the area and the resulting traffic increases. Current traffic forecasts based on the DRCOG regional forecasts of population and employment show that a complex of three interchanges will be needed by 2030 to serve future regional and local trips.

6
Why isn't I-70 being widened? The EA and the Preferred Alternative must be consistent with the *DRCOG 2030 MVRTP*. Widening of I-70 is not included in that plan. However, all of the concept plans have been developed to not preclude the future widening of both I-70 and E-470 that may be necessary in the future.

7 I.6 PREVIOUS STUDIES

8 A number of studies of the I-70/E-470 interchange
9 have been conducted over the past several years
10 supporting the need for additional arterial and free-
11 way/tollway capacity to serve the ever-growing
12 Denver-Aurora metropolitan area. The list includes:

- 13 ▶ *I-70/Gun Club Road Interchange Improvement Plan and Capacity Analysis for Future I-70/E-470 Interchange*, July 5, 1993
- 14
- 15
- 16 ▶ *E-470 Environmental Study of Alternative Alignments*, March 1994
- 17
- 18 ▶ *Aurora Northeast Area Transportation Study*, December 1999
- 19
- 20 ▶ *Draft I-70/E-470 System Level Study Appendix*, March 5, 2001
- 21
- 22 ▶ *Arapahoe County Comprehensive Plan*, June 2001
- 23
- 24 ▶ *Final E-470/I-70 System Feasibility Study*, April 11, 2002
- 25
- 26 ▶ *Draft I-70/E-470 System Level/Project Level Feasibility Study*, October 2003
- 27
- 28 ▶ *City of Aurora Comprehensive Plan*, October 2003
- 29
- 30 ▶ *Adams County Comprehensive Plan*, January 2004
- 31
- 32 ▶ *DRCOG Metro Vision 2030 Plan*, January 2005 (fiscally non-constrained)
- 33
- 34 ▶ *DRCOG 2030 Metro Vision Regional Transportation Plan*, January 2005 (fiscally constrained)
- 35
- 36 ▶ *CDOT's I-70 Corridor Assessment Study*



1

These previous studies only looked at I-70/E-470 and Gun Club Road. Why are you now looking at Picadilly Road and Harvest Road? Development of detailed concept plans and traffic operations analyses showed that combining local access at I-70 and Gun Club Road with the freeway-to-tollway ramps between I-70 and E-470. This would result in an unacceptable interchange design with too many decision points this would resulting in confusing and potentially dangerous situation for drivers where effective signage would be difficult. As a result, CDOT, E-470 and Aurora, with concurrence from FHWA, agreed to expand the study area to include consideration of alternatives which would include I-70 interchanges at Picadilly Road and Harvest Road.

2

1.7 PLANNING CONTEXT

3 The I-70/E-470 Interchange Complex Environmental
4 Assessment (EA) is being conducted in conformance
5 with the DRCOG 2030 Metro Vision Regional
6 Transportation Plan (2030 MVRTP) for the Denver-
7 Aurora metropolitan region. The DRCOG plan was
8 developed through a cooperative planning process
9 that involved all the counties and municipalities in
10 the region. The plan is fiscally constrained to reflect
11 federal and state funds anticipated in the planning
12 period. The plan is multimodal and includes
13 detailed population and employment forecasts for
14 small areas that are then utilized to forecast future
15 travel in the region.

16 In addition to the regional plan, the City of Aurora
17 conducted the *Northeast Aurora Transportation*
18 *Study* (NEATS), which examined future travel pat-
19 terns and roadway needs in the section of Aurora
20 that included the EA study area. As part of NEATS,
21 both Picadilly Road and Harvest Road were identi-
22 fied as needed future road improvements and inter-
23 changes with I-70, and both arterials were part of
24 the recommended plan. The NEATS recommenda-
25 tions were adopted by the City of Aurora in 2002.
26 The City of Aurora also adopted a Comprehensive
27 Plan in 2003, which included major improvements
28 for Picadilly Road and Harvest Road along with
29 interchanges for both routes at I-70.

30 1.8 EXISTING ROADWAY PROJECTS

31 The E-470 Authority has just opened a new main-
32 line roadway for the toll road to allow through
33 north-south traffic to bypass the four signalized
34 intersections. This improvement, called the flyby,
35 was funded primarily by the E-470 Authority
36 through bond financing with some contribution by
37 CDOT. The flyby will remove the high-speed
38 through traffic from the I-70/Gun Club Road dia-
39 mond interchange (see **Figure 1-3**). In addition, the
40 E-470 Authority is constructing Ramp H, a new
41 direct connection between northbound E-470 and
42 westbound I-70, as a further safety improvement.
43 This is being paid 100 percent by the E-470 Author-
44 ity with no federal or state funds.

45 1.9 PLANNED TRANSPORTATION 46 PROJECTS

47 As part of the DRCOG 2030 MVRTP, widening of E-
48 470 to six lanes is anticipated by 2030. A new inter-
49 change on E-470 is also planned at 48th Avenue.
50 These improvements would be funded by the E-470
51 Authority with no federal or state funds. The City of
52 Aurora, in addition to improvements to Picadilly
53 Road and Harvest Road, is planning to improve 6th
54 Avenue/Parkway as a major east-west arterial
55 between SH 30 and Monaghan Road. Aurora also
56 plans to extend Tower Road between Colfax Ave-
57 nue and SH 30. These local arterial improvements
58 are included in the *City of Aurora Comprehensive*
59 *Plan, 2003* and the DRCOG 2030 MVRTP. They are
60 anticipated to be funded as part of future land devel-
61 opments. **Figure 1-3** shows the location of these
62 improvements. The DRCOG 2030 MVRTP includes
63 new interchanges for I-70 at both Picadilly Road
64 and Harvest Road.

65 While it is outside the EA study area, the Regional
66 Transportation District (RTD), as part of the Fas-
67 Tracks plan approved by the voters in 2004, plans
68 to construct a new rail transit line, the East Corridor,
69 between Denver Union Station and DIA. FasTracks
70 also includes an expanded bus network, called Fast

**Figure 1-3
Planned Transportation Projects**



1 Connects, which would provide new bus routes to
 2 serve the new developments in the study area and
 3 provide connections with the new East Corridor.

4 While not part of the current FasTracks program, the
 5 E-470 Authority has made provision in the design of
 6 the toll road to accommodate a future transit line in
 7 the median of E-470 if warranted. The type of transit
 8 would be determined at a future date after its need
 9 has been identified in a future constrained plan.

10 The study area is also served by the Union Pacific
 11 Railroad (UPRR). Spur tracks off the main rail line
 12 provide freight service to many area industries,
 13 including the new General Motors distribution center.
 14 Union Pacific is also planning to relocate much
 15 of its intermodal transfer operations to the Front
 16 Range Airport area just to the east of the study area.

17 As part of the planning for the I-70/E-470 inter-
 18 change, provision is being made to accommodate
 19 the addition of two new tracks to the UPRR line to
 20 serve growing freight business.

21

Who is responsible for building these new roads? Construction of arterial and local streets to provide access is a condition of approval for development within the City of Aurora. Aurora, like other cities in Colorado, has the responsibility to maintain efficient and safe access and mobility as the city develops. Developers are required to prepare traffic studies that project the travel demands that will be created by proposed developments, and to provide local streets and their fair share of regional roads to accommodate those travel demands.



¹ **Why is Aurora proposing to add all these new streets?** More than 8,000 new residents and jobs are projected by the Denver Regional Council of Governments (DRCOG) for the immediate area around I-70/E-470 by 2030. For the larger area of eastern Aurora, DRCOG projects a more than four-fold increase in population to 192,000 residents in 2030. The City of Aurora continually prepares plans for the development of the city and for services to adequately serve the planned development. Specifically, the City of Aurora, with extensive involvement of the public, prepared the *Aurora Northeast Area Transportation Study* in 1999 and the *City of Aurora Comprehensive Plan* in 2003. Both of these plans evaluated travel demands associated with forecasted development and include a planned roadway system to serve those demands. The plans also include a system of arterial streets throughout the city's growth areas. There are plans to construct, extend, and upgrade roads through and around the I-70/E-470 study area, including Picadilly Road, Harvest Road, Powhaton Road, Monaghan Road, 6th Parkway/Avenue, Colfax Avenue, and 26th Avenue.



CHAPTER 2.0: ALTERNATIVES CONSIDERED

2.1 INTRODUCTION

The I-70/E-470 Interchange Complex in Aurora has been the subject of extensive studies starting in 2000 to develop plans to upgrade the interim interchange which utilized the existing I-70 diamond interchange with Gun Club Road. The studies were initially part of a combined System Level and Project Level Feasibility Study issued in draft form in September 2003. Because of operational and safety issues with combined system-to-system and system-to-service ramps, the E-470 Authority, CDOT and the City of Aurora agreed to jointly sponsor an expanded study as an EA and to include the potential for separation of the system-to-service interchange connections from the freeway-to-tollway interchange.

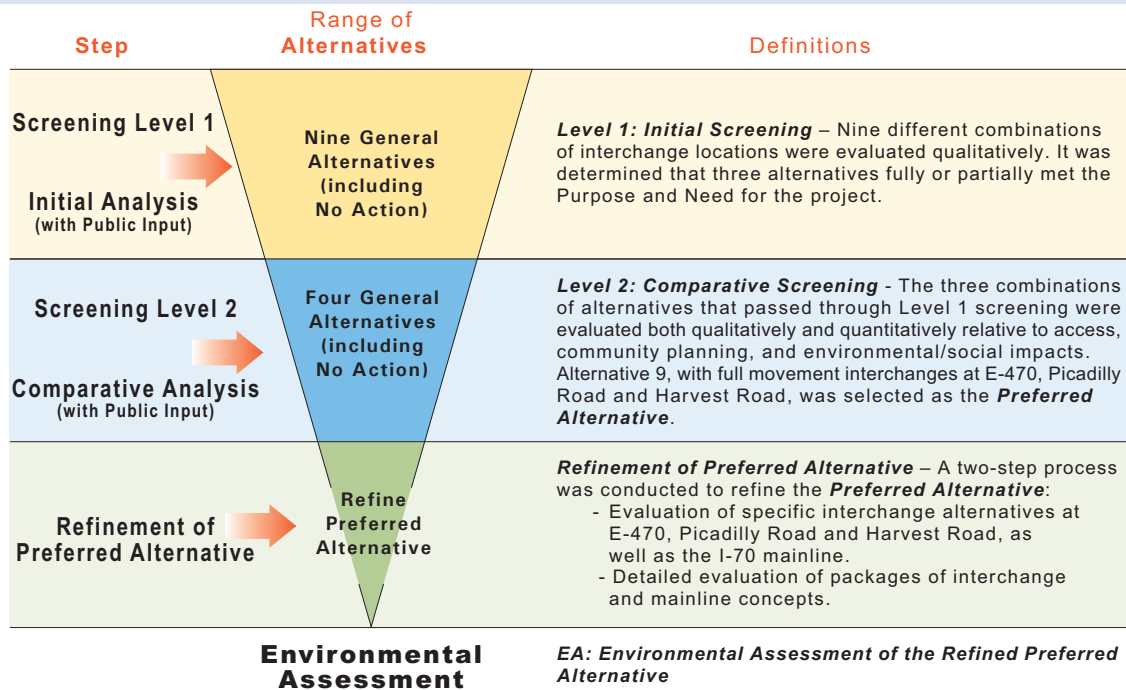
Nine alternative interchange combinations have been developed and evaluated in a two-step screen-

ing process. As the first step in the EA process, the Purpose and Need of the project was developed by the three sponsors in close cooperation with the FHWA. The Purpose and Need then formed the basis for the criteria used in the screening process.

2.2 OVERVIEW OF SCREENING PROCESS

Figure 2-1 provides an illustration of the Alternatives Screening Process. Nine alternatives were developed and evaluated in a two-level screening process, described in this chapter. The two screening levels used similar criteria described in the next section. Level 1 was geared to screening alternatives with serious flaws relative to one or more of the evaluation criteria. This screening resulted in three alternatives, in addition to the No-Action alternative, being carried forward into Level 2 screening.

Figure 2-1
Alternatives Screening Process





1 Level 2 screening involved more detailed evaluations of the three build alternatives, particularly in
2 the areas of traffic analysis, access provision, preliminary environmental impacts and community planning. Level 2 screening resulted in selection of
3 Alternative 9 as the Preferred Alternative. Alternative 9 includes a freeway-to-freeway I-70/E-470
4 interchange with local Gun Club access to I-70 eliminated and the existing partial I-70/Colfax
5 access also eliminated. Replacement I-70 access is provided by the addition of full movement local
6 access interchanges at I-70/Picadilly Road and at I-70/Harvest Road.

14 The final step in the alternative development process was to refine Alternative 9, specifying geometric characteristics including specific interchange types, lane configurations and traffic control to accommodate 2030 traffic forecasts. The refinement process is documented in **Appendix C**.

20 2.3 ALTERNATIVES CONSIDERED

21 Nine alternatives were identified and evaluated in a multilevel screening process:

23 **Alternative 1:** No-Action, retaining the existing I-70/Gun Club diamond and the I-70/Colfax ramps and adding committed E-470 flyby over I-70 and a fly-over ramp from northbound E-470 to westbound I-70.

28 **Alternative 2:** Congestion Management, adding transportation system management elements to enhance efficiency of the No-Action alternative.

31 **Alternative 3:** I-70/E-470 directional interchange, retaining I 70/Gun Club diamond and I-70/Colfax ramps.

34 **Alternative 4:** I-70/E-470 directional interchange retaining I 70/Gun Club diamond and the I-70/Colfax ramp and adding I-70/Picadilly Road interchange.

38 **Alternative 5:** I-70/E-470 directional interchange, retaining I 70/Gun Club diamond and I-70/Colfax ramps and adding I-70/Harvest Road interchange.

41 **Alternative 6:** I-70/E-470 directional interchange, retaining I 70/Gun Club diamond and the I-70/Colfax ramp and adding I-70/Picadilly Road and I-70/Harvest Road interchanges.

45 **Alternative 7:** I-70/E-470 directional interchange, closing I-70/Gun Club diamond and the I-70/Colfax ramp and adding I-70/Picadilly Road interchange.

48 **Alternative 8:** I-70/E-470 directional interchange, closing I-70/Gun Club diamond, retaining Colfax ramps and adding I-70/Harvest Road interchange.

51 **Alternative 9:** I-70/E-470 directional interchange, closing I-70/Gun Club diamond and the I-70/Colfax ramp and adding I-70/Harvest Road and I-70/Picadilly Road interchanges.

55 Following are descriptions and depictions of each of the nine alternatives.

57

What is a directional interchange? A directional interchange is an interchange with free-flowing ramp movements. Directional ramps provide more efficient and safer ways to handle movements between high-speed freeways and tollways, i.e. system-to-system interchange movements. In contrast, diamond interchanges typically have signalized intersections at their connections with the cross-street, so that drivers who are interchanging between the two roads often need to stop at the signalized intersections.

58 2.3.1 *Alternative 1: No-Action, Retaining the Existing I-70/Gun Club Diamond and the I-70/Colfax Ramps and Adding Committed E-470 Flyby Over I-70 and a Fly-over Ramp From Northbound E-470 to Westbound I-70*

64 The No-Action Alternative, which is the base line against which other alternatives are measured, would include the E-470 flyby over I-70 as well as the Ramp H flyover ramp from northbound E-470 to westbound I-70, which are both currently under construction. The I-70/Colfax interchange would remain as it is currently configured. **Figure 2-2** depicts this alternative.

1 The No-Action Alternative, along with each of the
2 other alternatives, also has new and improved road-
3 ways that are included in the adopted, fiscally con-
4 strained DRCOG 2030 MVRTP. These are roadways
5 and roadway improvements that are planned to be
6 implemented independent of the proposed action
7 relative to the E-470/I-70 interchange complex.

8 No-Action roadway improvements in the study
9 area, as shown on **Figure 2-2**, include extension and
10 paving to complete arterial roadway corridors on
11 Picadilly Road and Harvest Road, as well as exten-
12 sions and realignments of 19th Avenue, Colfax Ave-
13 nue, and Gun Club Road.

14 **2.3.2 Alternative 2: Congestion Management,
15 Adding Transportation System Manage-
16 ment Elements to Enhance Efficiency of
17 the No-Action Alternative**

18 The Congestion Management Alternative would
19 contain the same physical configuration as Alterna-
20 tive 1; however, elements such as ramp metering,
21 intelligent transportation system (ITS) technology,
22 and rideshare program enhancements would be uti-

23 lized to optimize traffic flow and encourage higher
24 auto occupancy. This alternative was eliminated in
25 Level 1 screening since it does not meet the Purpose
26 and Need as a stand-alone alternative. Elements of
27 the alternative would be part of any selected alter-
28 native.

29 **2.3.3 Alternative 3: I-70/E-470 Directional
30 Interchange, Retaining I-70/Gun Club
31 Diamond and I-70/Colfax Ramps**

32 Alternative 3 would include the existing Gun Club
33 ramps with I-70 as configured and with the E-470
34 flyby. In addition to this, directional ramps would
35 be constructed for the I-70/E-470 system-to-system
36 interchange. The I-70/Colfax interchange would
37 remain as it exists today. **Figure 2-3** depicts this
38 alternative.

**Figure 2-2
Alternative 1: No-Action Alternative**

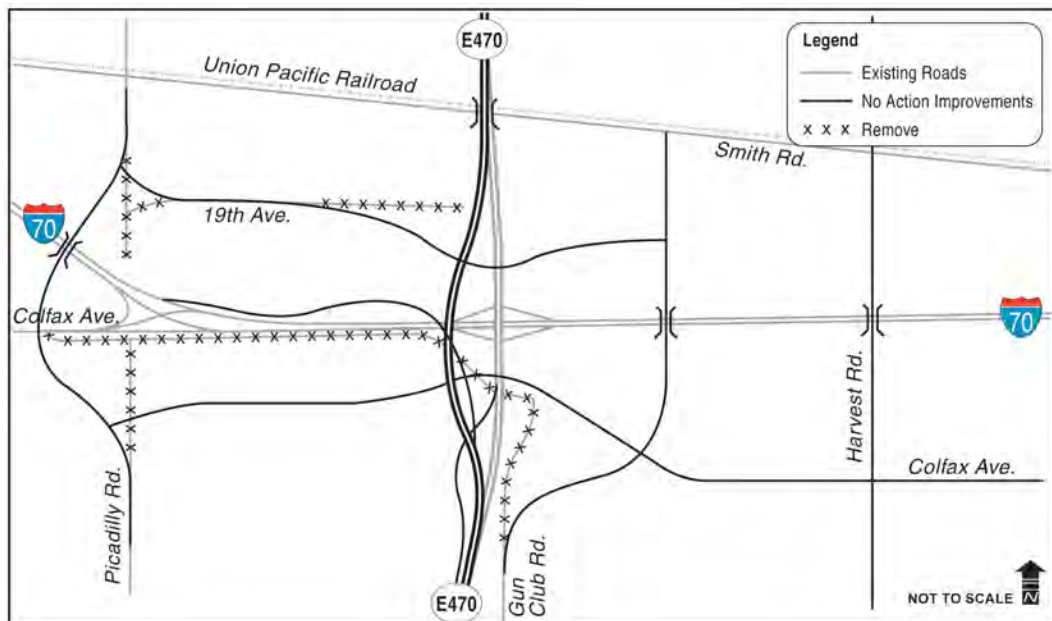
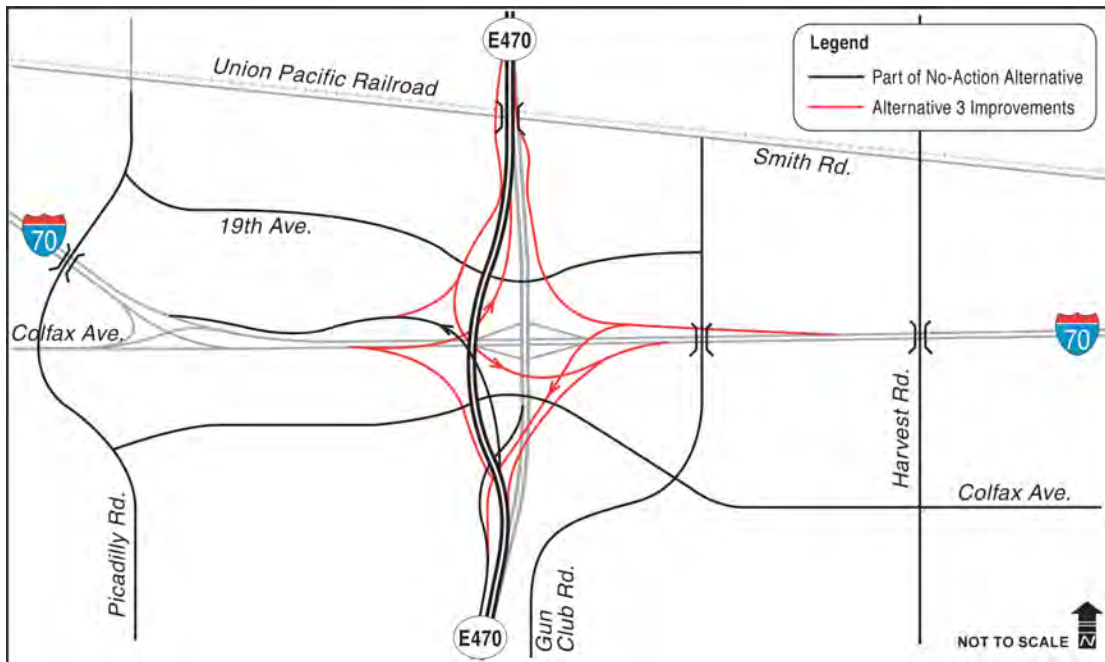




Figure 2-3
Alternative 3: I-70/E-470 Directional Interchange, Retaining Gun Club
Diamond and Colfax Ramps



2.3.4 Alternative 4: I-70/E-470 Directional Interchange, Retaining I-70/Gun Club Diamond and Adding I-70/Picadilly Interchange

Alternative 4 would include the existing Gun Club ramps with I-70 as configured with the flyby. Similar to Alternative 3, directional ramps would be constructed for the I-70/E-470 system-to-system interchange. A new full-movement interchange would be constructed at I-70/Picadilly Road to replace the existing partial I-70/Colfax Avenue interchange. **Figure 2-4** depicts this alternative.

2.3.5 Alternative 5: I-70/E-470 Directional Interchange, Retaining I-70/Gun Club Diamond and I-70/Colfax Ramps and Adding I-70/Harvest Interchange

Alternative 5 would include the existing Gun Club ramps with I-70 as configured with the flyby. The I-70/Colfax interchange would remain as it exists

today. Similar to Alternatives 3 and 4, directional ramps would be constructed for the I-70/E-470 system-to-system interchange. A Harvest Road interchange with I-70 would be constructed. **Figure 2-5** depicts this alternative.

2.3.6 Alternative 6: I-70/E-470 Directional Interchange, Retaining I-70/Gun Club Diamond and Adding I-70/Picadilly and I-70/Harvest Interchanges

Alternative 6 would include the existing Gun Club ramps with I-70 as configured with the flyby. Similar to Alternatives 3, 4, and 5, directional ramps would be constructed for the I-70/E-470 system-to-system interchange. A new full-movement interchange would be constructed at I-70 and Picadilly Road to replace the partial Colfax interchange. A Harvest Road interchange with I-70 would be constructed. **Figure 2-6** depicts this alternative.

Figure 2-4
Alternative 4: I-70/E-470 Directional Interchange, Retaining Gun Club Diamond and Adding Picadilly Interchange

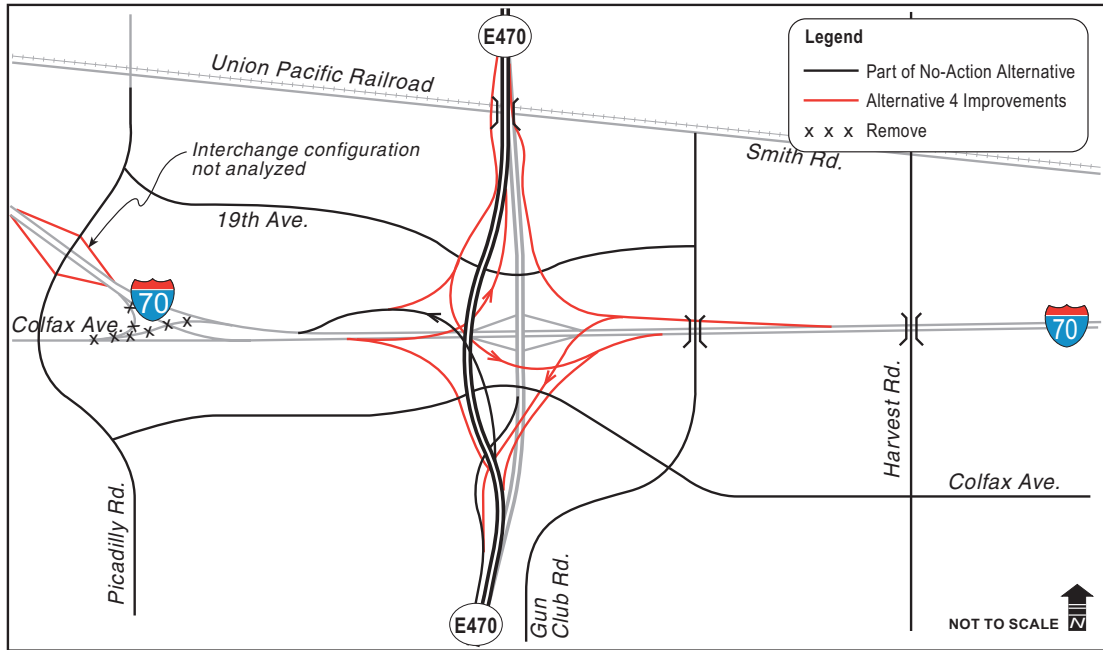


Figure 2-5
Alternative 5: I-70/E-470 Directional Interchange, Retaining Gun Club Diamond and Colfax Ramps and Adding Harvest Road Interchange

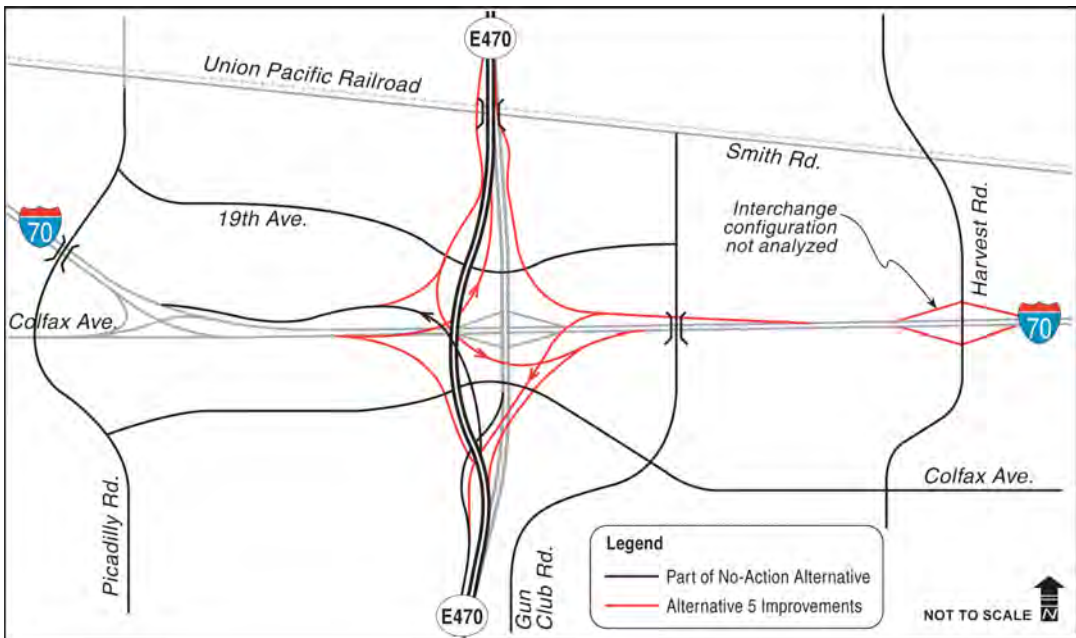
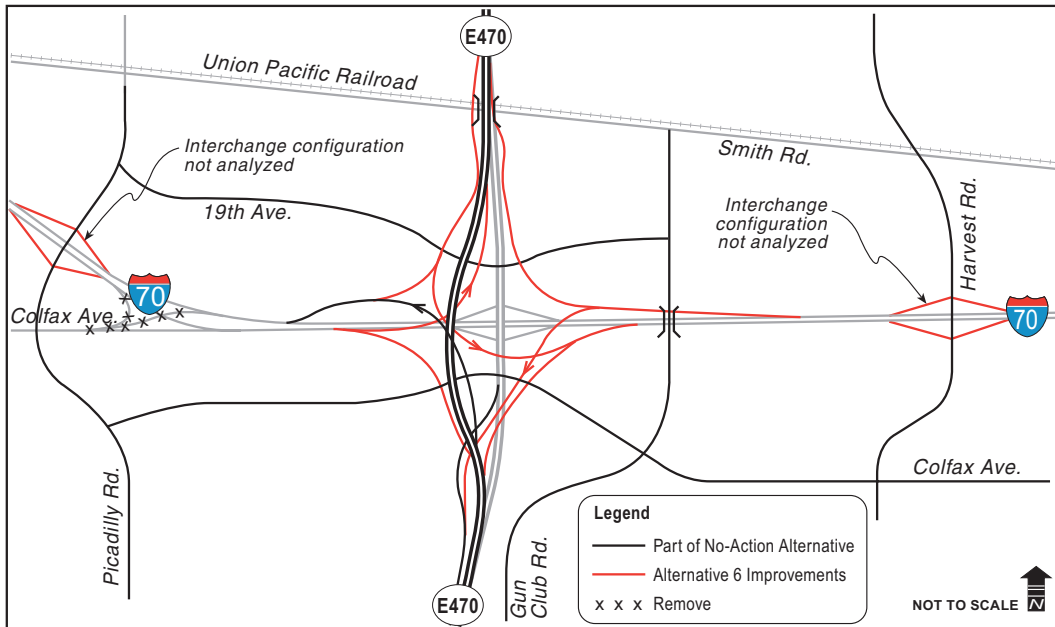




Figure 2-6
Alternative 6: I-70/E-470 Directional Interchange, Retaining I-70/Gun Club
Diamond and Adding I-70/Picadilly and I-70/Harvest Interchanges



2.3.7 **Alternative 7: I-70/E-470 Directional Interchange, Closing I-70/Gun Club Diamond and Adding I-70/Picadilly Interchange**

For Alternative 7, directional ramps would be constructed for the I-70/E-470 system-to-system interchange. The existing Gun Club diamond interchange ramps with I-70 would be eliminated; however, access from Gun Club Road and E-470 would remain in place. A new full-movement interchange would be constructed at I-70 and Picadilly Road to replace the partial Colfax interchange. **Figure 2-7** depicts this alternative.

2.3.8 **Alternative 8: I-70/E-470 Directional Interchange, Closing I-70/Gun Club Diamond, Retaining Colfax Ramps and Adding I-70/Harvest Interchange**

For Alternative 8, directional ramps would be constructed for the I-70/E-470 system-to-system interchange. The existing Gun Club diamond

interchange ramps with I-70 would be eliminated; however, access from Gun Club Road and E-470 would remain in place. The existing Colfax ramps would remain in place. A new I-70 and Harvest Road interchange would be constructed. **Figure 2-8** depicts this alternative.

2.3.9 **Alternative 9: I-70/E-470 Directional Interchange, Closing I-70/Gun Club Diamond and Adding I-70/Harvest and I-70/Picadilly Interchanges**

For Alternative 9, ramps would be constructed for the I-70/E-470 system-to-system interchange. All these ramps would be directional flyovers except the eastbound I-70 to north bound E-470, which would be a loop. The existing Gun Club diamond interchange ramps with I-70 would be eliminated; however, access from Gun Club Road and E-470 would remain in place. A new full-movement interchange would be constructed at I-70 and Picadilly Road to replace the partial Colfax interchange. A new I-70 and Harvest Road interchange would also be constructed. **Figure 2-9** depicts this alternative.

Figure 2-7
Alternative 7: I-70/E-470 Directional Interchange, Closing I-70/Gun Club Diamond and Adding I-70/Picadilly Interchange

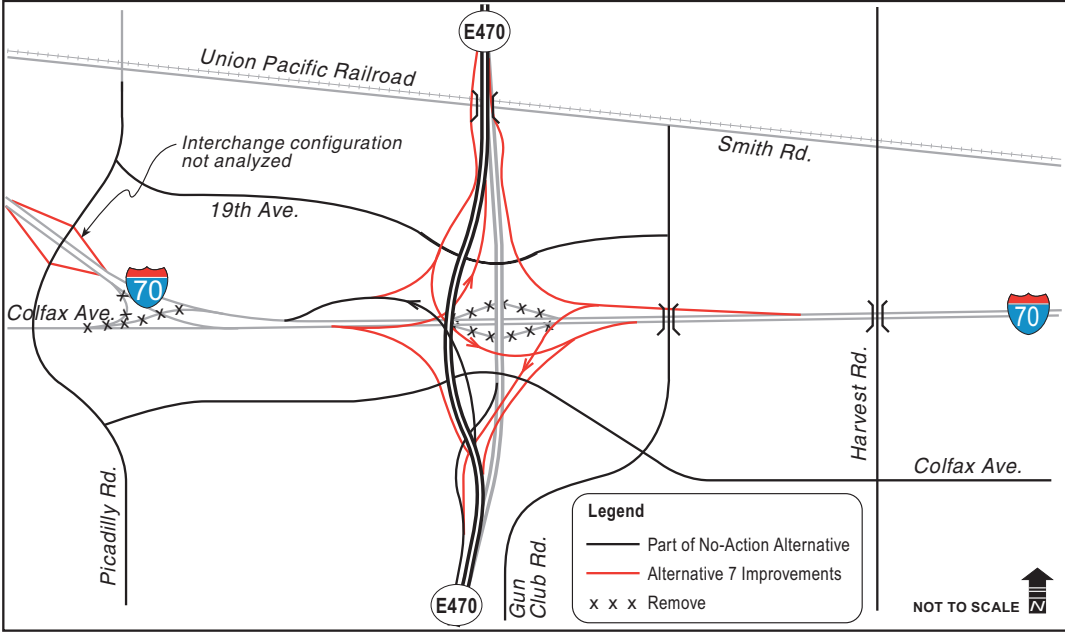


Figure 2-8
Alternative 8: I-70/E-470 Directional Interchange, Closing I-70/Gun Club Diamond, Retaining Colfax Ramps and Adding I-70/Harvest Interchange

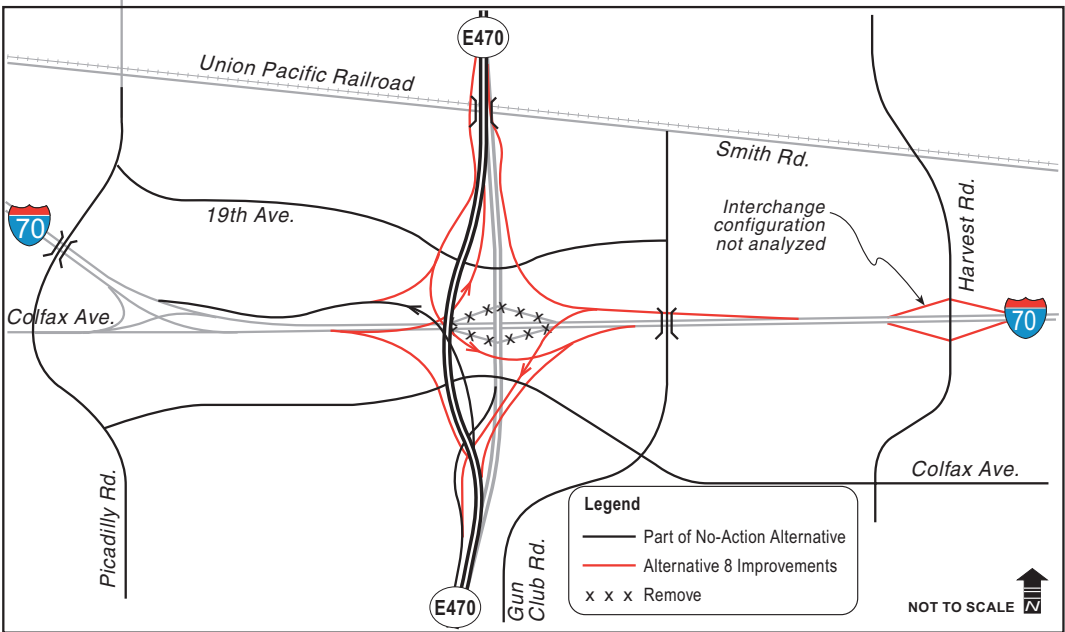
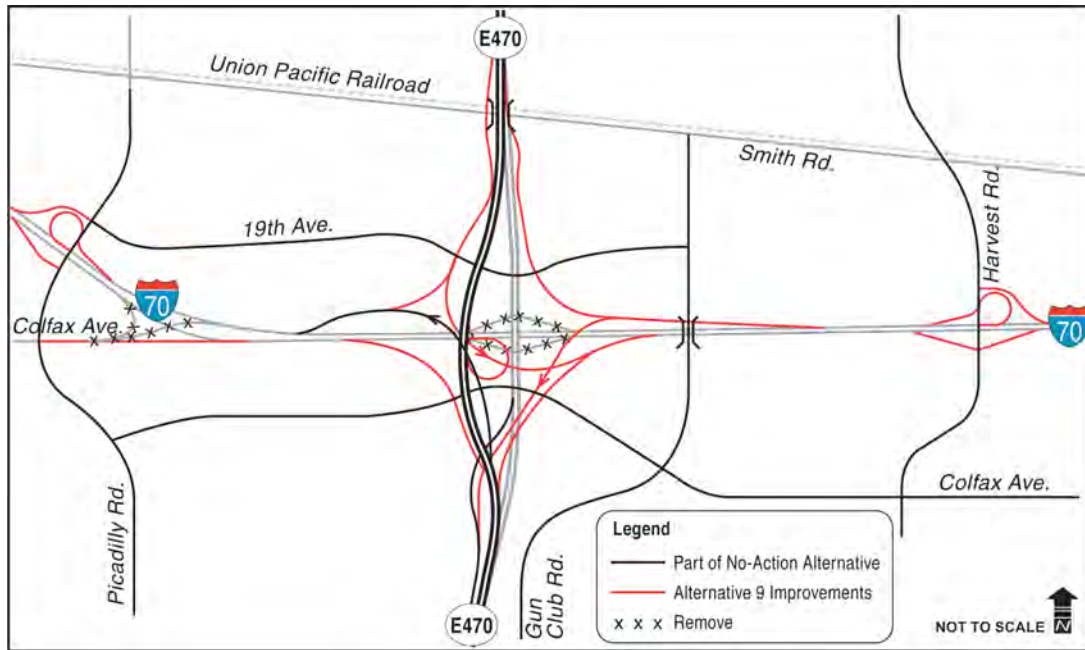




Figure 2-9
Alternative 9: I-70/E-470 Directional Interchange, Closing I-70/Gun Club
Diamond and Adding I-70/Harvest and I-70/Picadilly Interchanges



1 **Why can't the Gun Club interchange stay where it is?**
 Because of the need to preserve system-to-system movements, it is essential that the I-70/E-470 interchange be upgraded to allow for higher speed and higher capacity movements between the freeway and tollway systems. Alternatives were examined that would maintain the existing local I-70 access at Gun Club Road by integrating local access with the improved freeway-tollway directional ramps. Those alternatives were eliminated because local access would compromise safety and operations of the freeway-tollway interchange. Specifically, the integrated local and freeway-tollway interchange would lead to large concentrations of traffic at I-70 exit and entrance points, non-standard spacing between driver decision points, and unacceptable signing. AASHTO's Policy on Geometric Design of Highways and Streets provides a rule of thumb of one mile for minimum spacing between interchanges. Gun Club and the E-470 interchanges would be spaced less than a quarter mile apart.

2 **What's the problem with the Colfax exit?** The existing I-70/Colfax Avenue interchange has a number of deficiencies that would not continue to provide safe and efficient traffic flow if it remained in place. The westbound exit to Colfax Avenue comes from the left lane of I-70. Left-hand exit ramps are becoming less common and so less expected by drivers, and as traffic volumes and the number of lanes on I-70 increases, the presence of left-hand exit ramps becomes less safe for drivers. Left-hand exits create difficulty for drivers in right-hand lanes to access, particularly heavy trucks. Additionally, some of the features of the existing Colfax interchange, such as short acceleration lanes and tight turning radii, are becoming increasingly problematic as traffic levels rise.

3 **2.4 LEVEL I SCREENING**

4 **2.4.1 LEVEL I EVALUATION CRITERIA**

5 Level 1 screening criteria were developed based
 6 upon the Purpose and Need Statement. The purpose
 7 of the project is to link the freeway and tollway sys-
 8 tems, I-70 and E-470, in an efficient and safe man-

ner while enhancing local access for the existing and planned roadway system and future travel demand. The need for the project lies in three primary areas: regional mobility, safety and geometric feasibility, and effectiveness and directness of access. Community planning considerations are the fourth area of Level 1 screening criteria. Following is a description of each of the criteria and how each was evaluated in the Level 1 Screening process.

2.4.1.1 Regional Mobility

1. *Will the I-70/E-470 interchange satisfy regional mobility needs?* This focuses on operational capabilities of the I-70 main lanes, the E-470 main lanes and the I-70/E-470 interchange. Low scores were given if regional traffic capacity is constrained through design deficiencies or compromises (e.g. signals on the ramps, or closely spaced interchange ramps with excessive weave movements causing friction/congestion on I-70).

2. *Will Local Access to I-70 conflict with regional mobility needs?* Impacts to regional traffic through the provision of multiple local ramps were given low scores. Impacts to regional traffic through signing and complex exiting and entering maneuvers were given moderate scores.

2.4.1.2 Safety / Geometric Feasibility

1. *Does alternative meet AASHTO and other applicable design criteria?* Low scores were given if adequate distance between interchanges cannot be provided. Operational characteristics which deviate from normal driver expectancies, such as left hand exit ramps, were also scored poorly. Very low scores were given for alternatives which do not meet desirable safety standards.

2. *Are standards met for ramp gore spacing and successive decision points?* Low scores were given for closely spaced interchanges and secondary ramp splits resulting in short distances between gores and decision points.

3. *Can effective signing be provided to allow for the safe and efficient operation of the facilities?* Low scores were given for the following:

- ▶ Traffic to multiple destinations must exit at a single ramp.
- ▶ Complex/multiple signing is required to direct motorists.
- ▶ Geometric/operational characteristics require signing that deviates from driver expectancy.

2.4.1.3 Effectiveness and Directness of Access

1. *Is effective access to I-70 and E-470 provided for existing and planned development?* Low Scores were given for eliminating or limiting access to major regional activity centers and commercial/industrial complexes.

2. *Is access direct and efficient?* Low scores were given to concepts that require out-of-direction travel or more travel on local streets to access E-470 or I-70. Measures include changes in travel time and travel distance.

3. *Are full movement interchanges provided at freeway/tollway access locations?* Low scores were given if full direction movements are not provided (i.e. partial movement at I-70/Colfax without westbound on ramp).

2.4.1.4 Community Planning

1. *Does the alternative present unacceptable community traffic impacts or cause localized congestion?* Low scores were given to alternatives that increased traffic volumes on local streets. Low scores were given to alternatives that were incompatible with local or regional plans.

2.4.2 LEVEL 1 SCREENING RESULTS

Level 1 Screening results are summarized in the evaluation matrix provided on **Figure 2-10**.

On the basis of Level 1 screening, Alternatives 7, 8, and 9 were carried forward to Level 2 screening, along with the No-Action Alternative (Alternative 1).



1 Alternative 2, the Congestion Management Alterna- 46
2 tive was eliminated as a stand-alone alternative 47
3 because it does not meet the project's Purpose and 48
4 Need. Alternatives 3, 4, 5, and 6 were eliminated 49
5 primarily because of the combination of the Gun 50
6 Club/I-70 service interchange within the I-70/E 470 51
7 freeway-freeway interchanges does not meet safety 52
8 and geometric feasibility criteria. Following are 53
9 summaries of the Level 1 evaluations for each alter- 54
10 native and the Level 1 screening decisions. 55

11 ▶ **Alternative 1:** The No-Action Alternative would 56
12 not meet the demands of 2030 traffic projec- 57
13 tions nor would it improve the substandard and 58
14 incomplete ramps at I-70/Colfax. It would not 59
15 provide system-to-system interchange ramps 60
16 from I-70 to E-470 and thus, except for Ramp H, 61
17 all ramp traffic would have to pass through traf- 62
18 fic signals. This alternative also does not address 63
19 the need for enhanced local access identified in 64
20 the Purpose and Need. For these reasons the 65
21 No-Action Alternative does not meet the 66
22 project's Purpose and Need. However, because 67
23 it is required by the Council on Environmental 68
24 Quality (CEQ), the No-Action Alternative was 69
25 considered throughout the EA process as a via- 70
26 ble alternative. 71

27 ▶ **Alternative 2:** While this concept could 72
28 improve traffic flow, this concept alone would 73
29 not address the Purpose and Need for the 74
30 project. Elements of this alternative such as 75
31 ramp meters, HOV ramp bypass lanes, other ITS 76
32 techniques, and added transportation demand 77
33 management could be utilized and combined 78
34 with the final proposed action. This concept 79
35 was eliminated in screening Level 1 screening 80
36 as a stand-alone alternative. 81

37 ▶ **Alternative 3:** This alternative would compli- 82
38 cate traffic operations along I-70 between Col- 83
39 fax and the eastern E-470 ramps due to the 84
40 proximity of I-70/Gun Club ramps to the I-70/E- 85
41 470 ramps. This less than standard spacing of 86
42 ramps would create mobility and safety prob- 87
43 lems, compromising the ability of the I-70/E-470 88
44 interchange to meet the project's regional 89
45 mobility purpose and need. Complex and con-

fusing signing would add to the number of deci-
sion points required by motorists. The
maintenance of good interchange spacing for
potential future I-70 interchanges with Picadilly
Road and Harvest Road would be very difficult
if these existing ramps were retained. In addi-
tion, Colfax is currently not a complete inter-
change. It lacks a westbound on-ramp and the
east bound off-ramp has a substantial (15 mph)
design speed. The implementation of this con-
cept would force much of the Picadilly and Har-
vest Road traffic demand to the Gun Club
interchange, which would further compound
safety issues at this interchange. A safety study
titled *Technical Memorandum-Safety Analysis
for Ramp H*, Nov. 2005 explains the safety
issues in detail. This concept was eliminated in
Level 1 screening.

▶ **Alternative 4:** This alternative would also com-
plicate traffic operations along I-70 between
Colfax and the eastern E-470 ramps due to the
proximity of I-70/Gun Club ramps to the I-70/E-
470 ramps. This less than standard spacing of
ramps would create mobility and safety prob-
lems, compromising the ability of the I-70/E-470
interchange to meet the project's regional
mobility purpose and need. Complex and con-
fusing signing would increase the quick succes-
sion of decisions required by motorists. The
maintenance of good interchange spacing for I-
70 interchanges with Picadilly Road would be
very difficult. While the construction of an I-70/
Picadilly Road/Colfax interchange provides
some relief to the Gun Club interchange, the
implementation of this concept would force
much of the Harvest Road traffic demand to the
Gun Club interchange in close proximity to the
freeway-tollway interchange. A safety study
titled *Technical Memorandum-Safety Analysis
for Ramp H*, Nov. 2005 explains the safety
issues in detail. This concept was eliminated in
Level 1 screening.

▶ **Alternative 5:** This alternative would also com-
plicate traffic operations along I-70 between
Colfax and the eastern E-470 ramps due to
incorporating the I-70/Gun Club ramps within

Figure 2-10
Alternative Evaluation Process - Level 1 Screening Results

Alternatives	REGIONAL MOBILITY		SAFETY / GEOMETRIC FEASIBILITY			EFFECTIVENESS AND DIRECTNESS OF ACCESS			COMMUNITY PLANNING ISSUES	AGGREGATE RATING	Comments
	Will the I-70 / E-470 interchange satisfy regional mobility needs?	Will local access to I-70 conflict with regional mobility needs?	Does alternative meet AASHTO and other applicable design criteria?	Are standards met for ramp gore spacing and successive decision points?	Can effective signing be provided to allow for the safe and efficient operation of the facilities?	Is effective access to I-70 and E-470 provided for existing and planned development?	Is access direct and efficient?	Are full movement interchanges provided at freeway/tollway access locations?	Does the alternative present unacceptable community traffic impacts or cause localized congestion?		
1 No Action (Includes Flyby)	○(-1)	○(-1)	○(-1)	◐(0)	○(-1)	○(-1)	◐(0)	○(-1)	○(-1)	○(-7)	Retain as baseline for comparison of build alternatives.
2 Congestion Management Techniques	○(-1)	○(-1)	○(-1)	◐(0)	○(-1)	○(-1)	◐(0)	○(-1)	○(-1)	○(-7)	As a stand alone alternative, #2 does not meet project purpose and need. All build alternatives will include components of congestion management. <i>Eliminate.</i>
3 I-70 / E-470 Directional Interchange retaining Gun Club diamond & Colfax Ramps	◐(0)	○(-1)	⊘(-2)	⊘(-2)	⊘(-2)	○(-1)	◐(0)	○(-1)	◐(0)	○(-9)	Excessive local traffic at Gun Club diamond-complex; non-standard combined interchange ramps. Fails to meet desirable safety criteria. <i>Eliminate.</i>
4 I-70 / E-470 Directional Interchange retaining Gun Club diamond and adding Picadilly / Colfax Interchange	◐(0)	○(-1)	⊘(-2)	⊘(-2)	⊘(-2)	◐(0)	◐(0)	●(+1)	◐(0)	○(-6)	Better local traffic distribution but poor access to the east; non-standard combined ramps. Fails to meet desirable safety criteria. <i>Eliminate.</i>
5 I-70 / E-470 Directional Interchange retaining Gun Club diamond & Colfax Ramps and adding Harvest Interchange	◐(0)	○(-1)	⊘(-2)	⊘(-2)	⊘(-2)	◐(0)	◐(0)	◐(0)	◐(0)	○(-7)	Lacks westbound access at Colfax; excess traffic at Gun Club; non-standard combined ramps. Fails to meet desirable safety criteria. <i>Eliminate.</i>
6 I-70 / E-470 Directional Interchange Retaining Gun Club diamond and adding Harvest and Picadilly/Colfax Interchanges	◐(0)	○(-1)	⊘(-2)	⊘(-2)	⊘(-2)	●(+1)	◐(0)	●(+1)	◐(0)	○(-5)	Complex non-standard combined interchange ramps; excessive local traffic at Gun Club diamond. Fails to meet desirable safety criteria. <i>Eliminate.</i>
7 I-70 / E-470 Directional Interchange closing Gun Club ramps and adding Picadilly / Colfax Interchange	●(+1)	●(+1)	●(+1)	●(+1)	●(+1)	◐(0)	◐(0)	●(+1)	○(-1)	◐(+6)	Concentration of local access at Picadilly results in arterial congestion and added travel. Retain for further evaluation.
8 I-70 / E-470 Directional Interchange closing Gun Club ramps retaining Colfax Ramps and adding Harvest Interchange	●(+1)	●(+1)	◐(0)	●(+1)	●(+1)	◐(0)	○(-1)	○(-1)	◐(0)	◐(+2)	Lacks full interchange at Picadilly / Colfax. Retain for further evaluation.
9 I-70 / E-470 Directional Interchange closing Gun Club ramps and adding Harvest and Picadilly/Colfax Interchanges	●(+1)	●(+1)	●(+1)	●(+1)	●(+1)	●(+1)	●(+1)	●(+1)	●(+1)	●(+9)	Provides the best performance for Regional Mobility, Access and Community Planning. Retain for further analysis of traffic operations including need for collector/distributor roads and/or braided ramps.

LEGEND	SYMBOL
Satisfies criteria	●
Partially satisfies criteria	◐
Fails to satisfy criteria	○
Fails to meet safety criteria	⊘

Alternatives Carried Forward into Level 2 Screening

Level 1 Screening is intended to remove unresolvable and infeasible alternatives from further consideration. Alternatives that survive Level 1 Screening will undergo further environmental and social analysis (e.g. noise assessment, wetlands delineation, air quality analysis, etc.) in Level 2 and Level 3 Screening for public review and comment in the environmental assessment.

August 9, 2005



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the I-70/ E-470 ramps, compromising the ability of the I-70/E-470 interchange to meet the project's regional mobility purpose and need. Complex and confusing signing would increase the number of successive decisions required by motorists. Preferred interchange spacing for I-70 interchanges would be sacrificed with Colfax, Gun Club, E-470, and Harvest Road interchanges in the space of three miles. The construction of a Harvest Road interchange provides some relief to the Gun Club interchange; however, the deficiencies of the existing Colfax interchange would remain and the unacceptable geometric and safety objective of maintaining a Gun Club interchange along with the I-70/E-470 directional interchange does not offset these benefits. This concept was eliminated in Level 1 screening.

► **Alternative 6:** This alternative would also complicate traffic operations along I-70 between Colfax and the eastern E-470 ramps due to the incorporation of I-70/Gun Club ramps within the I-70/E-470 ramps, compromising the ability of the I-70/E-470 interchange to meet the project's regional mobility purpose and need. Complex and confusing signing would increase the amount of successive decisions required by motorists. The maintenance of good interchange spacing for I-70 interchanges with Picadilly Road and Harvest Road would be very difficult. The construction of a Picadilly Road/ Colfax and a Harvest Road interchange with I-70 provides the most relief to the Gun Club interchange. However, the unacceptable geometric and safety challenges of maintaining a Gun Club interchange within the I-70/E-470 directional interchange does not meet the Purpose and Need of providing a safe and efficient linkage. This concept was eliminated in Level 1 screening.

► **Alternative 7:** This alternative provides better interchange spacing along I-70 and less confusing signing. Driver expectancy and the amount of quick decisions are improved over Alternatives 3 through 6. Removing the existing I-70 and Colfax interchange would eliminate inter-

change deficiencies. This concept does not provide an I-70 interchange with Harvest Road and, thus, forces traffic to other adjacent interchanges. This concept also forces traffic onto local streets and provides only one I-70 point of access in four miles. By eliminating the Gun Club ramps, this alternative would meet desirable safety and operational criteria at the I-70/E-470 interchange; therefore, this concept was carried forward to Level 2 screening.

► **Alternative 8:** This alternative eliminates the Gun Club interchange and provides better interchange spacing along I-70 and less confusing signing. Driver expectancy and the amount of quick decisions are improved over Alternatives 3 through 6. This alternative does not address the deficiencies at the existing Colfax and I-70 interchange or the hazard of including a local interchange with a system-to-system interchange. It would be difficult to provide for the northbound E-470 to Colfax movement. Although the Harvest Road and I-70 interchange would provide local access to I-70 east of E-470, the lack of existing ramps at Colfax and I-70 forces some traffic to other interchanges. By eliminating the Gun Club ramps, this alternative would meet desirable safety and operational criteria at the I-70/E-470 interchange; therefore, this concept was carried forward to Level 2 screening.

► **Alternative 9:** This alternative provides better interchange spacing along I-70 and less confusing signing because it eliminates the local ramps at Gun Club and the left-hand exit at Colfax Avenue, resulting in one-mile spacing between the three interchanges. Driver expectancy and the amount of quick decisions are improved over Alternatives 3 through 6 because of the elimination of the Gun Club Road diamond interchange. This alternative also provides the best local access to I-70 by including interchanges at both Picadilly Road/Colfax and at Harvest Road. By eliminating the Gun Club ramps, this alternative would meet desirable safety and operational criteria at the I-70/E-470



interchange; therefore, this concept was carried forward to Level 2 screening.

2.5 LEVEL 2 SCREENING

2.5.1 LEVEL 2 EVALUATION CRITERIA

While the Level 1 criteria were used qualitatively to screen alternatives out that had the most flaws, it became apparent that more quantitative and detailed analysis would be needed to complete the screening of the remaining alternatives. Three alternatives, Alternative 7, Alternative 8 and Alternative 9, in addition to the No-Action alternative, were carried forward to a Level 2 screening process. Level 2 screening provided additional analysis and quantification in areas such as travel demand, trip diversion onto local streets, and the provision of local access to I-70. In addition, effects on key environmental resources were assessed qualitatively.

The Level 2 screening process documented in this section resulted in the selection of Alternative 9 as the proposed build alternative to be refined and evaluated in detail in the EA.

In addition to the Level 1 evaluations, Level 2 adds the following quantitative measures associated with the previously described evaluation criteria:

2.5.1.1 Effectiveness and Directness of Access

1. *Is effective access to I-70 and E-470 provided for existing and planned development?* Travel demand at potential I-70 interchanges at Picadilly/Colfax and at Harvest Road was forecast. These forecasted daily volumes were used to determine the magnitude of traffic demand at these potential interchange locations, and also to determine the extent of additional traffic demands that would be placed on existing interchanges if full access were not provided at Picadilly/Colfax or at Harvest Road.

2. *Is access direct and efficient?* Daily traffic increases were quantified at adjacent interchanges to determine the amount of travel to other interchanges, additional distance traveled

to the next interchange access, and as a measure of general inconvenience to the traveling public.

2.5.1.2 Community Planning

1. *Does the alternative present unacceptable community traffic impacts or cause localized congestion?* Through modeling results, daily travel on local streets was quantified and compared between alternatives.

2.5.1.3 Environmental

Environmental effects were evaluated qualitatively to assess whether any potential environmental impacts would distinguish between alternatives. Following is a summary of the environmental resources that were qualitatively assessed and the assumptions used:

- ▶ There would be no impacts to Section 4(f) resources, historic resources, wetlands, or endangered species in the area with any of the alternatives.
- ▶ Noise is more of an issue the closer the alternative is to existing sensitive receptors, which is the case with Alternatives 7 and 9, which both include interchanges at Picadilly.
- ▶ Air quality will likely be impacted with all alternatives.
- ▶ Visual impacts are likely with all of the build alternatives.
- ▶ Environmental justice impacts are more likely with Alternatives 7 and 9 because the primary known likely environmental justice area is the triangular area north of Colfax. However, this area is planned for private redevelopment by the owners and may no longer be an environmental justice issue.
- ▶ Maintaining rural quality of life would be negatively affected with any of the build alternatives.
- ▶ The floodplain at First Creek could be impacted with Alternatives 8 and 9 in the Harvest Road interchange area.

1 Conclusions of the Level 2 environmental screening
2 are:

- 3 ▶ For the Level 2 screening analysis, socioeco-
4 nomic and environmental impacts are not of the
5 nature that would indicate any of the build alter-
6 natives have fatal flaws.
- 7 ▶ Neither Picadilly Road nor Harvest Road inter-
8 changes have Section 4(f) impacts, wetland
9 impacts, endangered species impacts, or his-
10 toric property impacts. The primary difference
11 between the two is the effect to existing residen-
12 tial areas, which is a greater impact with the Pic-
13 adilly Road interchange, and the effect to future
14 development patterns.

15 2.5.2 LEVEL 2 SCREENING RESULTS

- 16 ▶ Level 2 Screening results are summarized in the
17 evaluation matrix provided on **Figure 2-11**.

18 On the basis of Level 2 screening, Alternative 9 was
19 selected as the Preferred Alternative to be refined in
20 Level 3 screening and carried into the EA along with
21 the No-Action Alternative. Following are summaries
22 of the Level 2 evaluations and the Level 2 screening
23 decisions.

- 24 ▶ **Alternative 1:** Per the requirements of the CEQ,
25 this concept was carried forward as a compar-
26 ison to action alternatives.
- 27 ▶ **Alternative 7:** The lack of I-70 access at Harvest
28 Road would create out-of-direction travel,
29 impacts on adjacent interchanges, and traffic
30 increases on other parts of the surface street sys-
31 tem. The lack of an I-70/Harvest Road inter-
32 change fails to enhance access for the adjacent
33 land uses, which is one of the identified project
34 needs. This alternative was eliminated in Level
35 2 screening.
- 36 ▶ **Alternative 8:** The lack of full-movement I-70
37 access at Picadilly Road/Colfax Avenue would
38 create out-of-direction travel, impacts on adja-
39 cent interchanges, and traffic increases on other
40 parts of the surface street system. The lack of a
41 full-movement I-70/Picadilly Road interchange

42 fails to enhance access for the adjacent land
43 uses, which is one of the identified project
44 needs. Retention of the existing partial I-70/Col-
45 fax interchange would perpetuate existing geo-
46 metric deficiencies associated with that
47 interchange. This alternative was eliminated in
48 Level 2 screening.

- 49 ▶ **Alternative 9:** With the inclusion of full-move-
50 ment I-70 interchanges at both Picadilly Road
51 and Harvest Road, this alternative provides the
52 most effective and direct access. The Picadilly
53 interchange replaces the partial-movement Col-
54 fax interchange. The full-movement inter-
55 changes also minimize traffic loading at
56 adjacent interchanges and on the surface street
57 system. It is compatible with both regional and
58 local plans. No environmental impacts were
59 identified that cannot be avoided, minimized or
60 mitigated. This alternative was selected as the
61 framework for the Preferred Alternative to be
62 carried forward for refinement in the Level 3
63 screening process.

64 2.6 DESCRIPTION OF THE PREFERRED 65 ALTERNATIVE

66 The Preferred Alternative is depicted in **Figure 2-12**.
67 The Preferred Alternative was developed by refining
68 Alternative 9 at each of the I-70 mainline and inter-
69 change areas. Matrices summarizing this refinement
70 process are provided in **Appendix C**.

71 The Preferred Alternative is composed of three sepa-
72 rate interchanges. This interchange complex would
73 replace the present diamond interchange at Gun
74 Club Road that has been used as a temporary inter-
75 change to connect I-70 and E-470. The Preferred
76 Alternative would also replace the partial inter-
77 change between I-70 and Colfax Avenue. A new
78 freeway-to-freeway interchange is proposed to pro-
79 vide full directional movements between I-70 and E-
80 470. Two system-to-service interchanges are pro-
81 posed at I-70/Picadilly Road and at I-70/Harvest
82 Road.



1 Through the study area, I-70 would remain a four-
2 lane freeway with two lanes in each direction. Aux-
3 iliary lanes would be added between the Picadilly
4 Road interchange and the E-470 interchange,
5 between Tower Road and Picadilly Road, and
6 between E-470 and the Harvest Road interchange.
7 E-470 would be a six-lane freeway as included in
8 the DRCOG 2030 MVRTP, with auxiliary lanes
9 between the 6th Parkway interchange and the I-70
10 interchange.

11 **What are braided ramps?** When the on-ramp from one loca-
tion is close to an off-ramp at the next freeway interchange,
the on-ramp and off-ramp traffic can create conflicts. These
conflicts are referred to as weaving movements, when drivers
entering the freeway are trying to move to the left into through
lanes, while drivers on the freeway are trying to move to right,
or weave, to reach the off-ramp. Weaving movements can
cause safety problems under certain conditions, especially
when traffic volumes are high and when consecutive on-
ramps and off-ramps are close to one another. One solution to
these weaving problems is to “braid” the ramps, meaning to
construct a bridge so that on-ramp traffic passes under or over
the off-ramp traffic, eliminating the weaving conflicts. In the
Preferred Alternative, the Picadilly Road on-ramp to east-
bound I-70 and the eastbound I-70 off-ramp to E-470 have
been braided to avoid weaving conflicts and create the safest
and most convenient freeway possible for eastbound I-70. It
should be noted that more length is available for the west-
bound I-70 area between the E-470 on-ramp and the Picadilly
Road off-ramp; therefore, braiding of these ramps is not
needed to provide safe and efficient operation.

12 **Why is Colfax Avenue proposed to be offset at Picadilly
Road?** When Picadilly Road is completed as a principal north-
south arterial street, the I-70/Picadilly Road interchange will
provide I-70 access for two principal arterials: Picadilly Road
and Colfax Avenue. This will create large volumes of traffic
where Colfax Avenue from the west, Picadilly Road, and the
eastbound I-70 on-ramp all intersect. Several different inter-
section and interchange configurations were evaluated to see
which one would operate in the most efficient and safe man-
ner, without impacting surrounding land uses and local cir-
culation. It was determined that moving the portion of Colfax
Avenue east of Picadilly Road to the south, or offsetting Col-
fax Avenue at Picadilly Road, would be the best way to
accomplish these objectives. This will allow the City of
Aurora to work with the Horizon City Center developer to
design Colfax Avenue to the east in a way that will provide
good access and circulation for that development without
conflicting with the regional movements of Colfax Avenue
and Picadilly Road and their interchanges with I-70.

13 The I-70/Picadilly Road interchange would be a par-
14 tial cloverleaf interchange with a loop exit ramp
15 from westbound I-70 to southbound Picadilly Road.
16 Picadilly Road would be relocated west of the cur-
17 rent location and would pass under new bridges
18 that would carry I-70 over Picadilly Road. Picadilly
19 Road would be realigned between Smith Road and
20 11th Avenue. Part of the No-Action Alternative that
21 could occur concurrently with the Preferred Alterna-
22 tive is that the current Colfax Avenue along I-70 east
23 of Picadilly be relocated south of its current location
24 as part of the planned Horizon City Center develop-
25 ment.

26 From a new “T” intersection with relocated Picadilly
27 Road, the new Colfax Avenue would continue east
28 under the E-470 flyby roadway now under construc-
29 tion. To provide access to the existing development
30 in the triangle between Colfax and I-70, a portion of
31 the existing Picadilly Road right-of-way would be
32 used for a connecting roadway that would include a
33 bridge over the eastbound on-ramp to I-70/E-470.

34 The current eastbound on-ramp from Colfax to I-70
35 would be retained in approximately the same loca-
36 tion and would have a braided arrangement with
37 the eastbound exit ramp from I-70 to E-470. The exit
38 ramp would be on structure passing over the on-
39 ramp to I-70. A connecting roadway to East 19th
40 Avenue in the Prologis industrial park would have a
41 signalized intersection with Picadilly Road opposite
42 the westbound on-ramp to I-70.

43 The I-70/Harvest Road interchange would also be a
44 partial cloverleaf interchange with a loop ramp in
45 the northeast quadrant to serve traffic from north-
46 bound Harvest Road to westbound I-70. Harvest
47 Road would have a new bridge over I-70. Harvest
48 Road would be located east of the section line to
49 provide better spacing between this interchange
50 and I 70/E-470. The Harvest Road profile would be
51 designed to permit a future grade separation struc-
52 ture for the UPRR and Smith Road. Connecting
53 roadways would be provided between Harvest
54 Road and Smith Road.

55 Congestion management elements, such as ramp
56 metering, ITS technology, and rideshare program

**Figure 2-11
Alternative Evaluation Process - Level 2 Screening Results**

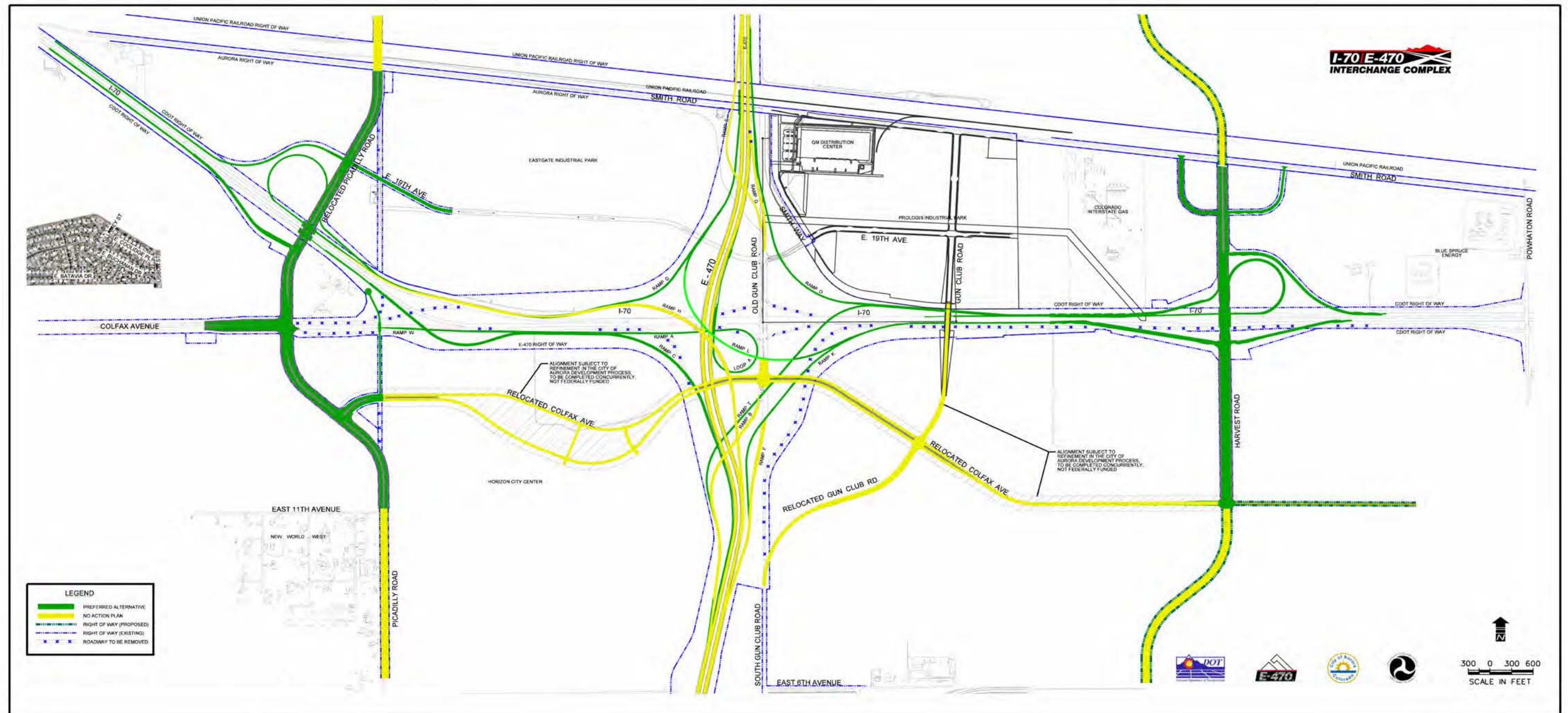
ALTERNATIVE	LEVEL 1 SCREENING		EFFECTIVENESS AND DIRECTNESS OF ACCESS		COMMUNITY PLANNING ISSUES	ENVIRONMENTAL / SOCIAL IMPACTS										LEVEL 2 SCREENING AGGREGATE RATING	CONCLUSIONS
	AGGREGATE RATING	MEETS PURPOSE AND NEED CRITERIA	How well is the need for access to I-70 accommodated? (Measure based on forecasted 2030 daily demand)	Are there high I-70 access demands at adjacent interchanges (Measure based on forecasted 2030 daily demand)	Are there additional traffic volumes on surface streets compared with other alternatives? (Measure based on forecasted 2030 daily demand)	Section 4(f)	Historic	Wetlands	Noise	Air Quality	Visual	Endangered Species	Environmental Justice	Rural Character	Floodplain		
1 No Action (Includes Flyby and northbound E-470-to-westbound I-70 direct ramp)	○ (-7)	FAILS TO SATISFY CRITERIA	Local access and freeway-rampway movements are all concentrated at a single location ○ (-1)	No new I-70 access concentrates high future travel demands at I-70/Tower, I-70/Airpark, E-470/6th Pkwy., E-470/48th Ave., and E-470/56th Ave. interchanges. ○ (-1)	No relief provided to surface street system. ○ (-1)	No Impact	No Impact	No Impact	No Impact	Possible Negative Impact with Potential Mitigation	No Impact	No Impact	No Impact	No Impact	No Impact	○ (-3)	CARRY FORWARD AS BASELINE FOR COMPARISON OF BUILD ALTERNATIVES.
7 I-70/E-470 Directional Interchange closing I-70/Gun Club ramps and adding I-70/Picadilly/Collfax Interchange	● (+6)	PARTIALLY SATISFIES CRITERIA	Picadilly Interchange accommodates 34,000 additional vehicles (compared with partial Collfax interchange), reducing out-of-direction travel and relieving the surface street system. ● (0)	Compared with No Action, reduces demand at adjacent interchanges: I-70/Tower: -4,000 E-470/48th Ave.: -5,000 ● (0)	Compared with No Action, full movement Picadilly access provides relief to surface streets including: Smith Road: Up to 4,000 reduction Tower Road: Up to 5,000 reduction ● (0)	No Impact	No Impact	No Impact	Possible Negative Impact with Potential Mitigation	Possible Negative Impact with Potential Mitigation	Possible Negative Impact with Potential Mitigation	No Impact	Possible Negative Impact with Potential Mitigation	Possible Negative Impact	No Impact	● (0)	Full movement Picadilly interchange improves access in western part of study area. Lack of Harvest access to I-70 creates out-of-direction travel, impacts on adjacent interchanges, and traffic increases on surface street system. Lack of Harvest access is not compatible with regional or local planning. No environmental impacts identified that cannot be avoided, minimized or mitigated. DO NOT CARRY FORWARD.
8 I-70/E-470 Directional Interchange closing I-70/Gun Club ramps retaining I-70/Collfax Ramps and adding I-70/Harvest Interchange	● (+2)	PARTIALLY SATISFIES CRITERIA	Harvest Interchange accommodates 54,000 vehicles, reducing out-of-direction travel and relieving the surface street system. ● (0)	Compared with No Action, reduces demand at adjacent interchanges: I-70/E-470/Gun Club: -9,000 E-470/6th Pkwy.: -5,000 E-470/48th Ave.: -4,000 ● (0)	Compared with No Action, Harvest access provides relief to surface streets including: Airpark/Monaghan: Up to 7,000 reduction 6th Parkway: Up to 6,000 reduction ● (0)	No Impact	No Impact	No Impact	No Impact	Possible Negative Impact with Potential Mitigation	Possible Negative Impact with Potential Mitigation	No Impact	No Impact	Possible Negative Impact	Possible Negative Impact	● (0)	Harvest interchange improves access in eastern part of study area. Lack of full movement Picadilly/Collfax access creates out-of-direction travel, impacts on adjacent interchanges, and traffic increases on surface street system. Lack of full movement Picadilly/Collfax access is not compatible with regional or local planning. No environmental impacts identified that cannot be avoided, minimized or mitigated. DO NOT CARRY FORWARD.
9 I-70/E-470 Directional Interchange closing I-70/Gun Club ramps and adding I-70/Harvest and I-70/Picadilly/Collfax Interchanges	● (+9)	SATISFIES CRITERIA	Provides the best I-70 access for adjacent land use and the arterial street system, accommodating 59,000 vehicles at Picadilly/Collfax and 54,000 vehicles at Harvest. ● (+1)	Compared with No Action, reduces demand at adjacent interchanges: I-70/Tower: -4,000 I-70/E-470/Gun Club: -9,000 I-70/Airpark: 12,000 E-470/6th Pkwy.: -5,000 E-470/48th: -4,000 ● (+1)	Compared with No Action, Picadilly and Harvest access provides relief to surface streets including: Smith Road: Up to 5,000 reduction Tower Road: Up to 4,000 reduction 6th Parkway: Up to 6,000 reduction Airpark/Monaghan: Up to 9,000 reduction ● (+1)	No Impact	No Impact	No Impact	Possible Negative Impact with Potential Mitigation	Possible Negative Impact with Potential Mitigation	Possible Negative Impact with Potential Mitigation	No Impact	Possible Negative Impact with Potential Mitigation	Possible Negative Impact	Possible Negative Impact with Potential Mitigation	● (+3)	Provides the most effective and direct access. Minimizes traffic loading at adjacent interchanges and on surface street system. No environmental impacts identified that cannot be avoided, minimized or mitigated. CARRY FORWARD FOR LEVEL 3 REFINEMENT AND ENVIRONMENTAL ASSESSMENT.

LEGEND	SYMBOL
Beneficial Improvement	●
Marginal Improvement	◐
No Improvement	○

Alternatives Carried Forward into Interchange Refinement Process and Environmental Assessment



Figure 2-12
Preferred Alternative



enhancements, would be incorporated with the design and implementation of the Preferred Alternative in concert with state, regional, and local agency programs.

Why is I-70 access needed at Picadilly and Harvest Roads?

The existing local access to I-70 at Gun Club Road cannot be safely and efficiently maintained while accomplishing the needed upgrade of the I-70/E-470 interchange to full system-system interchange standards. The adjacent full-movement service interchanges on I-70 are currently three miles to the west at Tower Road and three miles to the east at Airpark Road. This six-mile spacing would not provide adequate access for existing and planned development in the area. Extensive residential, commercial, and industrial development is occurring in the area and is planned to continue into the future, including a Regional Activity Center immediately southwest of the I-70/E-470 interchange. Principal arterial roadways with extensive continuity and high travel demands are planned by the City of Aurora on Picadilly Road, one mile west of E-470, and on Harvest Road, one mile east of E-470. Portions of both arterials are currently under construction as part of adjacent land developments. Thus, providing full-movement I-70 interchanges at Picadilly Road and at Harvest Road would replace existing local access provided at Gun Club Road, provide convenient access to existing and planned development, and tie the City of Aurora's planned arterial street network together with the regional highway system.

Why isn't Picadilly Road planned to bridge over the Union Pacific Railroad?

Picadilly Road, north of I-70, currently crosses the Union Pacific Railroad (UPRR) at grade. Upgrades to railroad crossings, including bridging over or under railroads, will require ongoing cooperation and financing by several entities, including the railroad, local jurisdictions, Colorado Public Utilities Commission, Federal Railroad Administration, and private developers. Future upgrades to the Picadilly Road crossing of the UPRR will be pursued by these different entities, but this crossing is not part of the Purpose and Need of the I-70/E-470 Interchange Complex project. The current action will not preclude a future Picadilly Road bridge over Smith Road and the UPRR.

Why do freeway-to-freeway movements need to be separated from arterial access?

Freeway-to-freeway interchanges and ramps are designed to accommodate movements at relatively high speeds since they are serving high volumes of traffic moving at close to freeway speeds. In contrast, ramps connecting with arterial streets are designed to transition the speed of drivers leaving the freeway and entering slower speed arterial streets, frequently at signalized intersections. The high speed of freeway-to-freeway ramps requires longer distances between directional signs to provide adequate driver perception. Separating the two functions provides drivers with more time between decision points and improves safety.

2.6.0.I Costs Associated with the Preferred Alternative

Preliminary cost estimates were prepared for the interchange complex that include construction and engineering.

▶ I-70/E-470 Interchange	\$83M
▶ I-70/ Picadilly/Colfax Interchange (including auxiliary lanes)	\$14M
▶ Relocation of Picadilly Road (including I-70 bridges)	\$20M
▶ I-70/Harvest Road Interchange	\$7M
▶ Relocation of Harvest Road (including I-70 bridge)	\$26M

The estimated total is \$150 million, excluding right-of-way costs. The Preferred Alternative is included in the fiscally constrained DRCOG 2030 MVRTP.



CHAPTER 3.0: IMPACTS AND MITIGATION

3.1 LAND USE AND ZONING

3.1.1 Existing Land Use

As shown in **Figure 3-1**, the predominant land use in the study area is agricultural. Additional land uses include industrial, residential, public, and commercial developments.

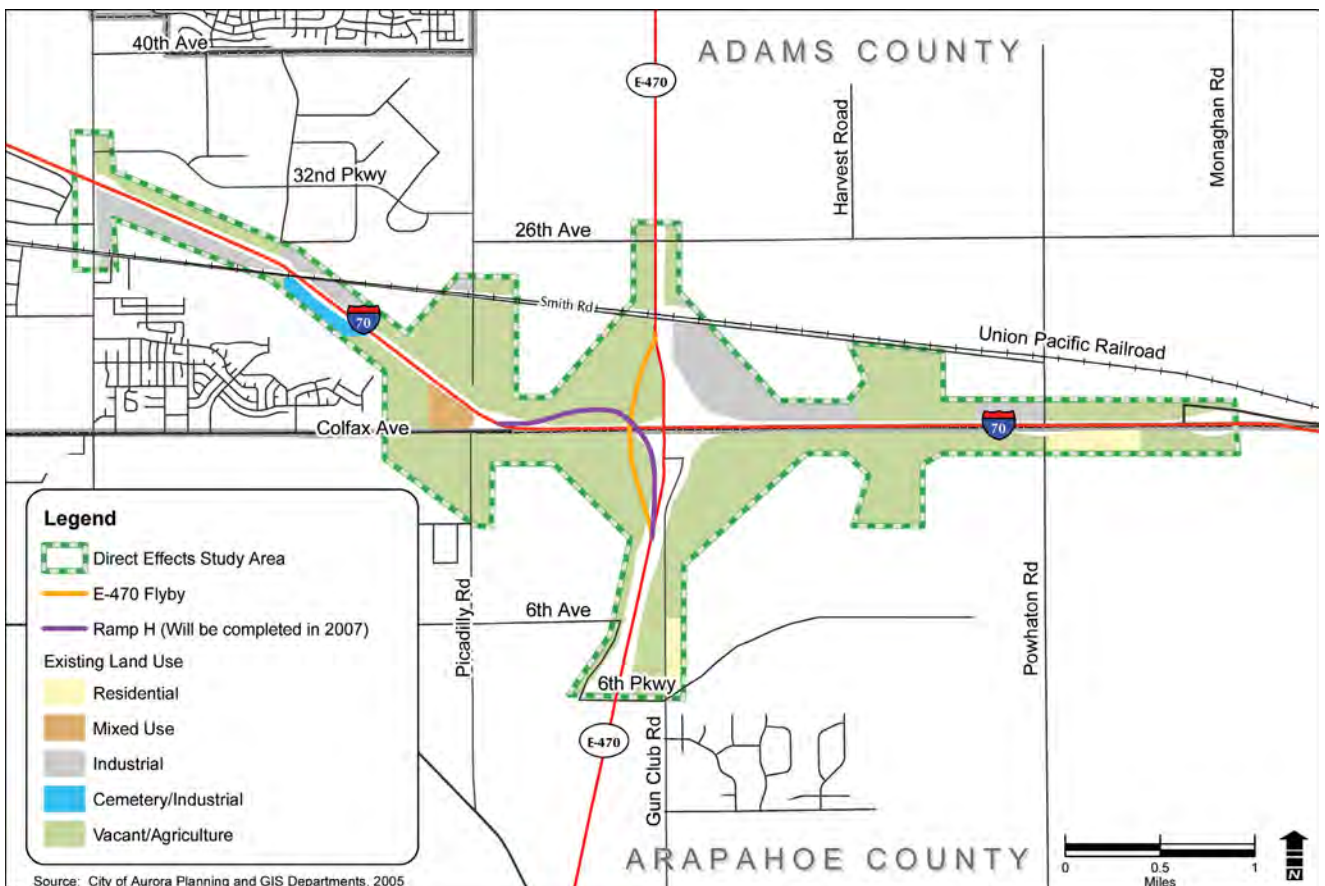
In the northern portion of the study area, several parcels of land support light industry. A number of warehouses and buildings associated with the UPRR are located partially inside the study area, just west of Picadilly Road. The British Petroleum Gas

Plant and Blue Spruce Energy Center are located along Powhatan Road, just outside the study area.

Commercial development is scattered throughout the study area and caters mostly to agricultural uses. The most substantial business near the study area is Prologis business park, which is located northeast of the existing I-70/E-470 interchange.

Several residential developments are located in or near the study area. Foxridge Farm Mobile Home Park is south of I-70 on Powhatan Road. Approximately half of this subdivision lies inside of the study area. Cross Creek, a medium-density residential subdivision, lies east of Gun Club Road and

Figure 3-1
Existing Land Uses Within the Study Area





1 south of East 6th Avenue. A small section of the
 2 western part of the subdivision lies within the study
 3 area. There is a small residential/mixed-use area
 4 located just to the west of where Colfax and I-70
 5 merge. This parcel consists of one single-family
 6 home, one multiunit residence, and a small busi-
 7 ness.

8 Public land uses within the study area include a
 9 cemetery, and E-470-owned and state-owned right-
 10 of-way for transportation uses related to I-70 and
 11 E-470.

12 3.1.2 Existing Zoning

13 Existing zoning within and adjacent to the study
 14 area is shown in **Figure 3-2**. Land within the study
 15 area is zoned by the City of Aurora, Adams County,

16 or Arapahoe County. The majority of the land is
 17 zoned by the City of Aurora.

18 The E-470 zoning district was created by the City of
 19 Aurora and includes the land making up the four
 20 quadrants surrounding the existing I-70/E-470 inter-
 21 change (from Picadilly Road to Harvest Road and
 22 6th Parkway to 26th Avenue). E-470 zoning districts
 23 within the study area include:

24 **Regional Activity Center Sub-Area:** a sub-area
 25 intended to generate economic activity. These large-
 26 scale, attractive, urban regional activity centers are
 27 to be visually pleasing and would serve as Aurora's
 28 "image makers" along the E-470 corridor. The pri-
 29 mary interest is to create major economic genera-
 30 tors using a mix of concentrated land uses in an
 31 organized fashion. Examples of development ideas

Figure 3-2
Existing Zoning Within and Adjacent to the Study Area



1 include restaurants, theatres, and shopping malls.
2 Additionally, the areas are serviced by mass transit
3 facilities (FastConnects) and are pedestrian-friendly,
4 in order to reduce demand for auto-travel and
5 enhance visual appeal.

6 **Light Industrial/Flex Office Sub-Area:** a sub-area to
7 be used for high-quality distribution, industrial,
8 technology, and assembly land uses. Both vehicular
9 and rail transportation systems are used to support
10 the industry and flex office/warehouse development
11 within these areas. Residential uses are not permit-
12 ted within this sub-area.

13 **Regional Retail/Commercial Sub-Area:** a sub-area
14 intended to facilitate the development of high-quality
15 retail and employment centers. Land use in this
16 area takes full advantage of major transportation
17 corridors. Examples of development ideas include
18 shopping centers, hotels, and motels. Office and
19 residential uses are allowed, but are not intended to
20 be the primary use of this sub-area. The intensity of
21 development in this sub-area is intended to be less
22 than that of the Regional Activity Center sub-area.

23 **Open Space/Parks Sub-Area:** a sub-area designated
24 as unoccupied space open to the sky. It is used as a
25 recreational area exclusively for pedestrian and
26 non-motorized traffic.

27 Additional zoning within the study area includes
28 residential, agriculture, and mixed use.

29 **3.1.3 Future Land Use**

30 The following plans and reports are used to guide
31 land use in the study area:

- 32 ▶ *City of Aurora Comprehensive Plan, 2003*
- 33 ▶ *DRCOG Metro Vision 2030 Plan, 2005*
- 34 ▶ *Adams County Comprehensive Plan, 2004*
- 35 ▶ *Arapahoe County Comprehensive Plan, 2001*

36 The *City of Aurora Comprehensive Plan, 2003*, is
37 the only plan that specifically addresses land use in
38 the study area. The Comprehensive Plan is a strate-
39 gic document that is used to guide the City's policy
40 making. It is designed to help the City make
41 informed choices about future growth and redevelop-
42 opment. The plan addresses a range of issues from
43 land use and development to urban design and
44 maintenance, and enhancement of a sound finan-
45 cial process.

46 The City of Aurora has extensive plans for renewal
47 and redevelopment in the study area. According to
48 the Comprehensive Plan, the E-470 corridor pro-
49 vides a critical opportunity for high-quality eco-
50 nomic and residential development.

51 Low-density residential neighborhoods located out-
52 side the study area are expected to grow, and the
53 medium-density residential area of Cross Creek (East
54 6th Parkway and Gun Club Road), located partially
55 inside the study area, is in the process of expanding.
56 Light industrial parcels found north of I-70 are also
57 in the process of expansion.

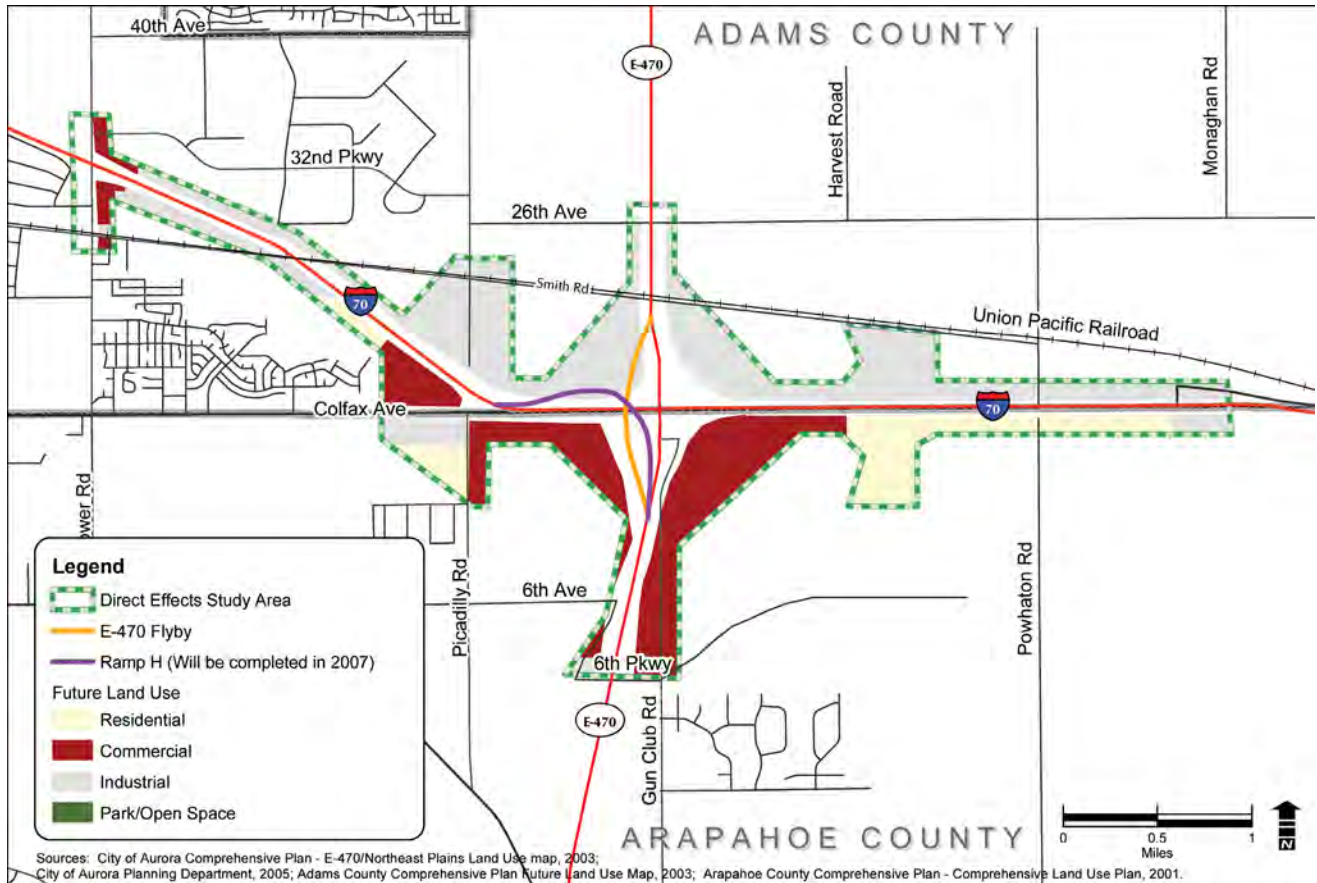
58 The *Metro Vision 2030 Plan* is the Denver region's
59 plan for future growth. It integrates previously sepa-
60 rate plans for growth, development, transportation,
61 and water quality management.

62 The Arapahoe and Adams County comprehensive
63 plans recognize the adopted land use plans for the
64 City of Aurora as being consistent with county plan-
65 ning efforts.

66 **Figure 3-3** shows future land use in the study area.



**Figure 3-3
Future Land Use in the Study Area**



3.1.4 Land Use Impacts

This section addresses impacts to land use.

How much growth is anticipated? Population is expected to grow in the City of Aurora, as well as in Adams and Arapahoe Counties by a range of 30 to 60 percent between now and 2030. The housing trend is also growing; there are 9 percent more housing units in the City of Aurora in 2000 than there were in 1990, and is anticipated to continue.

Would this project encourage more growth? This project would support the growth that has already been planned in the area. Without the proposed interchange and roadway improvements, the planned development could be constrained by traffic congestion causing secondary problems to overall mobility and business access.

No-Action Alternative. Substantial growth and development is expected to continue regardless of whether or not the proposed action is constructed. Increased residential and commercial development would lead to increased congestion and travel time delays along I-70, E-470, and local roads adjacent to the study area. The No-Action Alternative would restrict accessibility and overall mobility in and beyond the study area. Therefore, the No-Action Alternative by itself is not compatible with future local and area development plans.

Preferred Alternative. Construction of the Preferred Alternative would result in a direct conversion of land to a transportation use. Thirteen properties in the study area would be impacted for right-of-way purposes (see Section 3.4, Right-of-Way). The Preferred Alternative is consistent with planned devel-

1 opment in the general area and it would more
2 adequately support through traffic with a strong arte-
3 rial network.

4 The Preferred Alternative would encourage devel-
5 opment in currently undeveloped rural areas. How-
6 ever, such development is consistent with local and
7 regional land use plans and is supported by local
8 planning and zoning agencies (see Section 3.1.6 for
9 more detail).

10

How is the rural landscape going to change? The rural and suburban patterns of development that are common along the I-70/E-470 corridors between Smith Road and 6th Parkway, and Picadilly and Airpark Roads have become affected by the rapid and substantial regional growth.

The land surrounding I-70/E-470 interchange is in a special zoning district created by the City of Aurora in 2003 to encourage reasonable development and employment growth. The interchange improvement would support the planned growth.

The City of Aurora has adopted a regional Smart Growth development and zoning plan for the E-470 corridor to better manage anticipated growth. This plan is based on the objective of developing town and community activity centers. Zoning districts require centers that would be primarily situated at E-470 interchanges. These centers would be characterized by higher development density than surrounding areas, mixed land uses, compact development form with defined edges, more traditionally urban pattern of buildings set close to streets and sidewalks. Plans include high-quality connections to the existing road and transit networks, and an extensive pedestrian network and bicycle connections. These connections are discussed further in Section 3.6.4.2 of this EA.

11 3.1.5 Land Use Mitigation

12 No mitigation is necessary for land use impacts. See
13 Section 3.4.3, Right-of-Way, for mitigation mea-
14 sures associated with the acquisition of property.

15 3.1.6 Indirect Effects and Induced Growth

16 The Delphi Plus methodology was used to assess
17 the indirect induced growth effects of the design
18 alternatives being considered for the improvement
19 of the I-70/E-470 interchange complex. The results
20 of this analysis for the No-Action and Preferred
21 Alternatives are summarized below. They are docu-
22 mented fully in the *Indirect Effects Technical Mem-*

What is causing all the growth? This area was targeted for growth by the *City of Aurora Comprehensive Plan 2003*, and supported by the *Metro Vision 2030 Plan*, *Adams County Comprehensive Plan*, 2004, and *Arapahoe County Comprehensive Plan*, 2001. Market forces that contribute to attractiveness of development include proximity to employment, land values, supportive public policies, availability of water, and proximity to Denver International Airport. The *City of Aurora Comprehensive Plan* (adopted October 27, 2003) contains a variety of key provisions that assist in the successful implementation of Smart Growth development. The following is a description of City policies directed at accomplishing Smart Growth:

E-470 Corridor: The zoning that has been adopted for the E-470 corridor is based on the objective of developing activity centers. Zone districts require centers at the neighborhood, community, and regional levels (situated primarily at the existing and planned E-470 interchanges). The centers would have the following consistent set of characteristics:

- ▶ Higher development density than surrounding areas
- ▶ Mixed land uses
- ▶ Compact development form and defined edges
- ▶ High-quality connections to the existing road and transit network
- ▶ An extensive pedestrian network and bike connections, and buildings set close to streets and walkways in a traditional urban pattern

Water and Other Natural Resources: Creeks, wetlands, and other water features shall be preserved, to the greatest extent possible, in their natural state. These features would be used for water quality enhancement, storm water management, open space, and recreational purposes when appropriate. Use of vegetative buffers to protect wetlands and other water features from development encroachment is required. Open space corridors shall be preserved and interconnected as much as possible in order to preserve existing wildlife corridors and extend the urban trail system.

Smart Growth in General: New town centers would exist at a variety of the zoned Regional Activity Centers within the E-470 corridor. These centers would be developed in a synergistic manner, affording work/shop/live/play opportunities for area residents, as well as acting as regional draws for employment, recreation, hospitality, and shopping activities. These centers would be intensive, mixed-use developments at the E-470 interchanges. The centers would feature walkable main streets and focal points (prominent buildings with distinctive architecture). The E-470 corridor plan also includes mixed-use employment areas and areas for new, high-quality neighborhoods. Design standards for the corridor require quality materials and integration throughout each center.



1 orandum prepared for this EA (Carter & Burgess,
 2 2004).

3 Indirect effects, as defined by the Council on Envi-
 4 ronmental Quality (CEQ), are those effects that are
 5 caused by a proposed action and are later in time or
 6 farther removed in distance, but are still reasonably
 7 foreseeable. Indirect effects may include growth
 8 inducing effects and other effects related to induced
 9 changes in the pattern of land use, population den-
 10 sity or growth rate, and related effects on air and
 11 water and other natural systems, including ecosys-
 12 tems (40 CFR § 1508.8).

13 The Delphi Plus methodology relies on established
 14 models of transportation analysis and geographical
 15 research to predict how land use would change
 16 with a new transportation project. The technique
 17 applies the results of research on the land use

18 impacts of transportation projects to local data, such
 19 as infrastructure plans, growth policies, and existing
 20 and future zoning and land uses. Once assembled,
 21 this information is utilized to identify potential land
 22 use impacts. A team of land use, socioeconomic,
 23 and economic experts review the data and finalize
 24 the prediction of potential indirect effects. Related
 25 impacts to environmental resources are then
 26 assessed.

27 The study area for the analysis of indirect induced
 28 growth effects was chosen to represent the area that
 29 would most likely be influenced by the construction
 30 of an improved/new interchange at I-70/E-470.
 31 Study area boundaries included Tower Road on the
 32 west, Monaghan Road on the east, 6th Avenue, 6th
 33 Parkway on the south, and 26th Avenue/32nd Park-
 34 way on the north. The study area for the indirect
 35 effects analysis is shown in **Figure 3-4**.

Figure 3-4
Indirect Effects Study Area



1 Overall, the analysis determined that the No-Action
 2 Alternative would have more indirect impacts to
 3 certain natural resources as a result of possible land
 4 use changes, when compared to the Preferred Alter-
 5 native. This is because indirect impacts resulting
 6 from the No-Action Alternative would include a
 7 shift in land development patterns to the south part
 8 of the study area. Here, there would be greater
 9 impacts to prairie dog and white-tailed deer habitat,
 10 riparian areas, wetlands, and the 100-year flood-
 11 plains associated with the study area. This shift is
 12 largely because Adams County, Arapahoe County,
 13 and the City of Aurora have identified the E-470
 14 area along I-70 as a strong employment growth area
 15 and have zoned the study area and planned future
 16 land uses accordingly. Therefore, the growth would
 17 occur whether or not improvements are completed
 18 along I-70. If they are not completed, growth would
 19 simply occur farther south where there are larger
 20 areas of floodplain, wildlife habitat, and wetland/
 21 riparian areas. **Table 3-1** shows a comparison of the
 22 potential indirect effects to environmental resources
 23 in the study area.

Table 3-1
Potential Indirect Effects to Environmental
Resources in the Study Area

Resource	No-Action Alternative ⁽¹⁾	Preferred Alternative ⁽¹⁾
Wildlife Habitat	1,678 acres	1,225 acres
Wetlands/ Riparian Areas	36 acres	12 acres
Floodplains	Intense develop- ment in and adjacent to floodplain.	Open space in, and less intense development adja- cent to, floodplain.

(1) Values reported in this table are approximate and are based on predicted land use changes derived from input received from the indirect effects panel (2004), as well as Aurora, Adams County, and Arapahoe County zoning data. Impacts would be minimized with the Preferred Alternative.

24 The analysis also showed that indirect impacts of
 25 land use changes could result in increases in noise,
 26 traffic, and other effects to rural quality of life. These

27 impacts would be more noticeable to areas along
 28 Picadilly and Harvest Road as development occurs
 29 at those new interchanges.

30 Typical mitigation for the indirect growth-related
 31 impacts of a project includes the adoption of Smart
 32 Growth policies, open space acquisition, and/or the
 33 implementation of transportation demand manage-
 34 ment policies and design standards.

35 Mitigation that could be considered for local juris-
 36 dictions includes:

- 37 ▶ Commitments to enforcing Smart Growth poli-
 38 cies as evidenced in the differential figures of
 39 the impacts shown in **Table 3-1** (see letter from
 40 the City of Aurora in **Appendix A** committing to
 41 Smart Growth principles).
- 42 ▶ Commitments for open space set asides or
 43 acquisitions, particularly along the floodplains
 44 of Sand Creek and First Creek.
- 45 ▶ Adequate and timely investments in supportive
 46 infrastructure, such as the local street system
 47 underway as demonstrated in the No-Action
 48 Alternative.
- 49 ▶ Commitments to appropriate design standards
 50 to minimize air pollution and traffic impacts
 51 (development in the vicinity of the new inter-
 52 changes would replace rural, undeveloped land
 53 potentially impacting visual quality and quality
 54 of life for residents currently living in this mostly
 55 rural area).

56 3.2 FARMLAND

57 3.2.1 Existing Conditions

58 The Farmland Protection Policy Act of 1981 pro-
 59 tects prime and unique farmland as identified by the
 60 U.S. Department of Agriculture (USDA) Natural
 61 Resources Conservation Service (NRCS). The pur-
 62 pose of the act is to minimize the extent to which
 63 federal programs contribute to the unnecessary and
 64 irreversible conversion of farmland to nonagricul-
 65 tural uses. It also assures that federal programs are



1 administered in a manner that, to the extent practicable, would be compatible with government and private programs and policies to protect farmland.

4 Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and can economically produce sustained high yields of these crops when treated and managed according to acceptable farming practices. Unique farmland is land other than prime farmland that is used to produce specific high-value food and fiber crops. It can economically produce sustained high yields of these specialized crops when treated and managed according to acceptable farming practices. Farmland of statewide importance is land that has been identified by criteria determined by the Colorado State Experiment Station, the Colorado State Department of Agriculture and the Colorado State Soil Conservation Board. Farmland of local importance is land that has not been identified as having national or statewide importance, yet may have local significance based on the goals of the community and of the various agricultural enterprises that maintain a viable agricultural community.

25 Information defining prime and unique farmlands and farmlands of statewide or local importance in the study area was obtained from the NRCS Brighton Service Center. Soils surveys of Adams County (1974) and Arapahoe County (1971) were also referenced.

31 The NRCS identified several soil types in the vicinity of the study area as prime farmland if irrigated; however, the majority of the study area is planned for development and has been zoned for industrial, commercial, or residential development. Under the Farmland Protection Policy Act, lands that are in urban use or that would be developed in the near future are not considered farmland. Additionally, existing transportation right-of-way is not considered farmland. One parcel within the study area, located between I-70 and Smith Road just east of Harvest Road, has been zoned for agricultural use. Because the land upon this parcel is not irrigated, it is not considered prime farmland. Therefore, there are no prime or unique farmlands or farmlands of

46 statewide or local importance within the study area. Correspondence with the NRCS Brighton Service Center and form AD-1006 is located in **Appendix A**.

49 Research of organic and truck farms in Colorado (Organic Commodities Statistics, Colorado Department of Agriculture—Division of Plant Industry, 1998) did not identify any such farms within or adjacent to the proposed interchange location.

54 3.2.2 Farmland Impacts

55 There are no prime or unique farmlands or farmlands of statewide or local importance within the study area. Therefore, no impacts to farmlands would occur under either the No-Action or the Preferred Alternative.

60 3.2.3 Farmland Mitigation

61 Because there are no impacts to prime or unique farmlands or farmlands of statewide importance, no mitigation is required.

64 3.3 SOCIAL

65 3.3.1 Existing and Forecasted Conditions

66 The study area is located partly in Adams County and partly in Arapahoe County, and mainly lies within the City of Aurora. The areas surrounding the study area have experienced considerable population growth over the past decade. Substantial growth is expected to continue in the region and study area. **Table 3-2** shows current and projected population statistics for the state of Colorado, Adams County, Arapahoe County, and the City of Aurora.

Table 3-2
Current and Projected Population Statistics

Location	1990 ⁽¹⁾	2000 ⁽¹⁾	Percent Change 1990-2000	2025	2030
Colorado	3,294,394	4,301,261	31%	6,652,082 ⁽²⁾	7,156,422 ⁽²⁾
Adams County	265,038	363,857	37%	635,685 ⁽²⁾	699,541 ⁽²⁾
Arapahoe County	391,591	487,967	25%	648,279 ⁽²⁾	668,776 ⁽²⁾
City of Aurora	222,103	276,393	24%	423,577 ⁽³⁾	460,456 ⁽³⁾

(1) US Census Bureau, 1990 and 2000.

(2) Colorado Demography Section, Department of Local Affairs (DOLA), November 2004.

(3) City of Aurora, Colorado, 2004 Population Projections (based on DRCOG Exponential Projection).

3.3.2 Community Facilities

Many of the community facilities that serve the residents of this region lie outside the study area. However, area residents generally use the E-470 and I-70 highways to access these facilities. There are 77 public schools (only one of which is located east of E-470 as of March 2006), a community college, a public library, and three hospitals within the Aurora city limits. None of these facilities are located within the study area. East of E-470, just outside the study area, the Front Range Airport provides services for non-commercial, corporate, and private aircraft, and as an air freight hub with a roadway connection to DIA.

There is a small, active cemetery located south of I-70 and west of E-470 within the study area. It is not considered to be historic; however, it is an important community feature. It would not be affected.

3.3.3 Emergency Services

A number of emergency service entities provide response services to residents in the study area. The City of Aurora Fire Department and the Sable Altura Fire Department provide fire and other emergency response services. All fire and emergency service dispatching is controlled by the City of Aurora. The Arapahoe County and Adams County Sheriff Departments provide law enforcement services to the unincorporated areas in and around the study area. Along the I-70 and E-470 corridors the Colo-

rado State Patrol holds jurisdiction over all traffic violations. The City of Aurora Police Department provides law enforcement services to the areas that have been annexed into the City of Aurora.

3.3.4 Housing Availability in the Study Area

After experiencing only a minimal increase in population during the economic slump between 1980 and 1990, the City of Aurora experienced much greater population growth from 1990 to 2000. According to the *City of Aurora Comprehensive Plan*, 2003, this growth was due primarily to a decrease in the number of vacant residences and to an increase in household size. This occurred because of a resurgence of economic development and job creation. **Table 3-3** shows a comparison of housing statistics for Aurora in 1990 and 2000.

Table 3-3
Comparison for 1990 and 2000 Census Housing Statistics for the City of Aurora

	1990	2000
Total Housing Units	99,890	109,260
- Occupied	89,132	105,625
- Owner	52,313	67,489
- Renter	36,819	38,136
- Vacant	10,758	3,635
Household Size	2.47	2.6

Source: US Census Bureau, 2000.



1 The study area includes partial sections of two resi-
2 dential areas in Aurora. Foxridge Farm Mobile
3 Home Park is located south of I-70 on Powhatan
4 Road. Approximately half of this neighborhood lies
5 within the study area. Cross Creek, a subdivision
6 located at Gun Club Road and East 6th Avenue, also
7 lies partially within the study area. Finally, the
8 former Candle Lite Motel, which is used as a multi-
9 unit residence, and a single-family residence are
10 located within the study area at the interchange of
11 Colfax and I-70.

12 3.3.5 Social Impacts

13 This section describes impacts to the social environ-
14 ment.

15

Would this project encroach into my neighborhood? The immediate construction of the I-70/E-470, Picadilly Road, and Harvest Road Interchanges would not directly encroach on any existing neighborhood, except for the Feed Store complex centered within the existing Colfax /I-70 interchange. However, the proposed City of Aurora roadway improvements to Picadilly and Harvest Roads and the future relocation of Colfax Avenue are designed to carry more traffic into and around the adjacent residential areas. These road improvements are planned to respond to the increased population and residential and commercial development projected for this portion of Aurora and Arapahoe/Adams Counties. The planned development at Horizon City Center would provide new right-of-way required for roadway improvements to Picadilly Road. It is anticipated that no new right-of-way would be required from existing residential property owners except at the Feed Store complex.

16

What changes would this project cause to my neighborhood? Although the interchange project limits do not intrude upon any neighborhood within the study area, some impacts would result from locally planned roadway upgrades and improvements. These impacts include temporary disturbances associated with construction, such as equipment noise, traffic diversions or access changes, would be disclosed and coordinated with neighborhoods in advance of construction activity.

17 **No-Action Alternative.** The No-Action Alternative
18 would not change population growth trends or
19 development patterns within the study area.
20 Because substantial growth is planned for the area
21 surrounding the interchange (as evidenced by popu-
22 lation statistics and the approved land use plans of
23 the administering jurisdictions), increased conges-

24 tion along I-70, E-470, and local connectors is
25 expected. This would result in time delays, safety
26 concerns, and out-of-direction travel for residential
27 areas near the study area. Response times for emer-
28 gency service vehicles would also increase. Planned
29 arterial roadways, such as a six-lane Picadilly Road,
30 along residential developments would add to the
31 changing rural character of these existing neighbor-
32 hoods.

33 **Preferred Alternative.** Construction of the Preferred
34 Alternative would result in improved local and
35 regional accessibility. Reduced travel times and
36 improved mobility for local residents to regional
37 destinations is expected to occur. The Preferred
38 Alternative is consistent with local and area devel-
39 opment plans and would alleviate traffic congestion
40 as the area progresses from primarily agricultural to
41 mixed, commercial, and residential uses.

42 Under the Preferred Alternative, planned develop-
43 ment would happen smoother and faster in the loca-
44 tion of the study area. However, development
45 would still occur under the No-Action Alternative,
46 but in different locations (see Section 3.1.6, Indirect
47 Effects and Induced Growth)

48 Response times for emergency vehicles would
49 improve with increased mobility and reduced con-
50 gestion. Community facilities and services would
51 not be disrupted, nor would neighborhoods be
52 divided.

53 Impacts to the former Candle Lite Motel and the
54 nearby residence would include an increase in traf-
55 fic-related noise, air pollution, traffic, and a
56 decrease in visual quality.

57 3.3.6 Social Mitigation

58 No social mitigation is needed.

59 3.3.7 Environmental Justice

60 3.3.7.1 Environmental Justice Existing Conditions

61 In February 1994, President Clinton issued Execu-
62 tive Order 12898 requiring federal agencies to
63 incorporate consideration of environmental justice
64 into the NEPA evaluation process. The purpose of

1 this order is to ensure that minority and low-income
2 populations and minority-owned businesses do not
3 receive disproportionately high and adverse human
4 health or environmental impacts as a result of fed-
5 eral actions. This analysis is done in compliance
6 with CDOT's *Title VI and Environmental Justice*
7 *Guidelines for NEPA Projects* released in Decem-
8 ber, 2004.

9 3.3.7.2 Minority Populations and Minority-Owned 10 Businesses

11 The discussion of minority populations is based
12 upon information from *Census 2000* data at the
13 block level because that is all that is available.
14 Minority populations are comprised of ethnic and/
15 or racial minorities. According to census data, race
16 information is broken down into seven mutually
17 exclusive categories: White, Black or African Ameri-
18 can, American Indian and Alaska Native, Asian,
19 Native Hawaiian and Other Pacific Islander, some
20 other race, and two or more races. It is important to
21 note that Hispanic is not listed as a race category;
22 data pertaining to the people of Hispanic origin is
23 accounted for under euthanasic.

24 The percentages of minority populations within
25 each census block are compared to county aver-
26 ages. Adams County and Arapahoe County as a
27 whole contain minority populations of 36.7 percent
28 and 26.1 percent, respectively. Of the blocks
29 located within the study area in Adams County,
30 three blocks (Tract 83.53, Block Group 1, blocks
31 1069, 1095, and 1073) have a minority population
32 greater than the county average (see **Table 3-4** and
33 **Figure 3-5**). However, these blocks contain only
34 one or two households each, since the populations
35 of these blocks are three, six, and nine persons. In
36 addition, in these three blocks, there are no residen-
37 tial units in the portion of the block that falls within
38 the study area. The households are outside of the
39 study area boundary. Of the blocks located in Arap-
40 ahoe County, two blocks within the study area
41 (Tract 71.02, Block Group 2, Block 1014, and Tract
42 71.02, Block Group 3, and Block 2045) have a
43 minority population greater than the county average
44 (see **Table 3-4** and **Figure 3-5**). One of these blocks
45 (Block 1014) is likely to have only a few households
46 since the block has a population of 22. However,

47 again there are no residential units in this block
48 found in the study area. The other block (Block
49 2045), which is 33 percent minority, represents part
50 of the Foxridge Farm Mobile Home Park located
51 south of I-70 on Powhaton. According to CDOT
52 guidance, based on the minority percentage, this
53 block should be evaluated for disproportionately
54 high and adverse effects.

55 3.3.7.3 Low-Income Populations

56 For purposes of privacy, available income informa-
57 tion as reported from the government is limited to
58 the census block group. CDOT's recommended
59 approach in determining low-income populations in
60 the study area is to utilize the income thresholds set
61 annually by the U.S. Department of Housing and
62 Urban Development (HUD).

63 There are five block groups in the study area, which
64 include over 2,000 households, most of which are
65 not within the study area. The geographic bound-
66 aries of the block groups extend well outside of the
67 study area. However, household and income data
68 from these block groups were used to representa-
69 tively describe the study area.

70 The median family income in the Denver Metropol-
71 itan Statistical Area (MSA) is \$71,300 (2006 HUD
72 Income Limits). The study area is located in two
73 counties, Arapahoe and Adams. The average house-
74 hold size is used to determine the average median
75 income (AMI) for each county. The average house-
76 hold size for Adams County is 2.81 persons, while
77 the average household size for Arapahoe County is
78 2.53 persons. The income limits for 30 percent of
79 the AMI, for Arapahoe and Adams Counties are
80 \$18,339 and \$18,941, respectively. Income limits
81 for 30 percent of the AMI are used as a threshold for
82 determining low income, consistent with the meth-
83 odology identified in the CDOT's *Title VI and Envi-*
84 *ronmental Justice Guidelines for NEPA Projects*.
85 Because census income statistics are divided into
86 increments of \$5,000, the income threshold of
87 \$19,999 is used in this analysis. Any households in
88 the study area with average household incomes
89 below \$19,999 are considered to be low-income
90 and are to be evaluated as a low-income commu-
91 nity.



**Table 3-4
Potential Minority Populations in the Study Area***

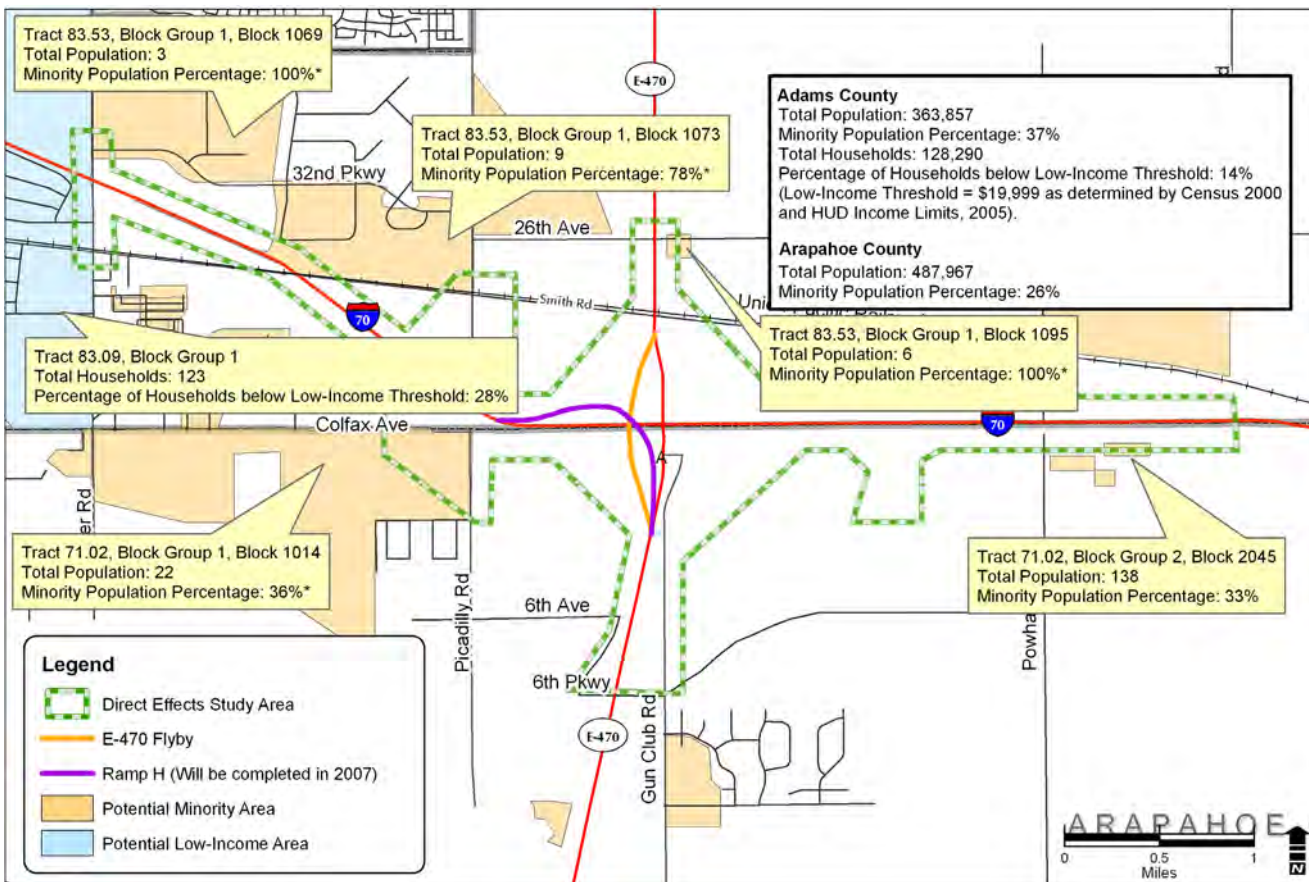
Total Population	Total Population	Minority Population	Percent Minority
Tract 71.02, Block Group 1, Block 1014	22	8	36%
Tract 71.02, Block Group 2, Block 2045	138	45	33%
Tract 83.53, Block Group 1, Block 1073	9	7	78% **
Tract 83.53, Block Group 1, Block 1095	6	6	100% **
Tract 83.53, Block Group 1, Block 1069	3	3	100% **
Adams County	363,857	133,357	37%
Arapahoe County	487,967	127,223	26%

Source: Census 2000.

* Although the study area stretches east to Monaghan Road and west to Tower Road, the populations in the census block located near these areas would not be directly impacted by the proposed action.

** The minority populations that live in these census blocks are physically located outside of the study area.

**Figure 3-5
Potential Low-Income and Minority Populations**



* The minority population that live in these census blocks are physically located outside of the study area.

1 According to *Census 2000* data at the block group
 2 level, 14.4 percent of the households in Adams
 3 County and 11.8 percent of the households in Arapahoe
 4 County fall below the \$19,999 low-income
 5 level. Census block groups with a higher percentage
 6 of low-income populations than their respective
 7 counties would be evaluated for disproportionately
 8 high and adverse effects. Only one block group in
 9 the study area has a higher percentage of low-
 10 income population than its respective county (Tract
 11 83.09, Block Group 1). However, this block group,
 12 which has 28 percent of households below the
 13 threshold, extends well beyond the study area (see
 14 **Figure 3-5**). In addition, an examination of aerial
 15 photography revealed that there are no homes
 16 within the portion of the block group found within
 17 the study area. Therefore, according to census data,
 18 there does not appear to be a low-income popula-
 19 tion within the study area that would experience
 20 disproportionately high and adverse impacts.

21 **3.3.7.4 Other Data Sources**

22 Because the data collected by the U.S. Census
 23 Bureau is geographically broad and does not
 24 present the level of detail needed to identify individ-
 25 ual environmental justice impacts, additional
 26 sources of data were utilized. Field visits were con-
 27 ducted in July 2004 and August 2005. The former
 28 Candle Lite Motel (located at 21561 East Colfax)
 29 and a nearby residence were determined to be of
 30 concern. According to a property manager, the
 31 former motel contains 12 units, but only six people
 32 were living there at the time of the first visit. The
 33 property manager noted that the rents in the build-
 34 ing were low, the building is rarely fully occupied,
 35 and it has a high turnover rate. Based on the prox-
 36 imity to the former Candle Lite Motel and transpor-
 37 tation infrastructure, the residence may also be
 38 considered low-income. Although census data does
 39 not identify this location (of the former motel and
 40 residence) as an area of low-income concern, it has
 41 been evaluated for disproportionately high and
 42 adverse effects.

43 **3.3.7.5 Outreach to Low-Income and Minority Popula-** 44 **tions**

45 Specialized outreach to low-income and minority
 46 populations was conducted as part of the public
 47 involvement process to gather comments and con-
 48 cerns regarding the project. Outreach included
 49 project mailings, which announced upcoming
 50 meetings and described the project process, and fli-
 51 ers distributed to businesses and residences in the
 52 study area prior to every open house. In addition, a
 53 Spanish translator attended the public open houses
 54 to answer questions and facilitate comments, and
 55 project material was translated and available. In
 56 depth description of outreach and public involve-
 57 ment is contained in Section 4.1 of this document.

58 A brief conversation was held with the business
 59 owner of the feed store and the manager of the
 60 former motel located on the parcel that is of low-
 61 income concern at Colfax and I-70. The owner and
 62 manager both indicated support for the project and
 63 no concerns. No individuals located in the low-
 64 income areas of concern attended the public meet-
 65 ings or requested correspondence with the consult-
 66 ant team despite the specialized outreach.

67 **3.3.8 Environmental Justice Impacts**

68 This section describes impacts to low-income and
 69 minority populations.

70

Why are low-income and minority populations given special consideration? Because some federal actions in the past have had disproportionate impacts to low-income and minority populations, President Clinton signed an Executive Order in 1994 that requires us to look at these particular impacts more closely.

71 **No-Action Alternative.** The No-Action Alternative
 72 would not result in any disproportionate adverse
 73 impacts to minority or low-income populations.
 74 Increased congestion, particularly at the I-70/Gun
 75 Club Road interchange, associated with the No-
 76 Action Alternative would hinder access to employ-
 77 ment and housing in the study area. Because of the
 78 new and expanded roadways at Picadilly Road and
 79 Harvest Road, the No-Action Alternative may



1 require property acquisitions; however, these are
 2 not known at this time.

3 **Preferred Alternative.** The Preferred Alternative
 4 would not require the relocation of any businesses
 5 or residences in the study area.

6 Residents of the Foxridge Farm Mobile Home Park
 7 would benefit from improved mobility and access
 8 to housing, businesses, and community facilities
 9 throughout the region. Temporary impacts to the
 10 community would include increased noise, and traf-
 11 fic during construction. In addition, temporary air
 12 quality impacts may include increases in dust and
 13 dirt. However, only a portion of the park lies inside
 14 the study area. This portion is only 24 percent of the
 15 population of the census block. Further, the block
 16 itself is only partially within the study area. Both
 17 minority and non-minority populations will equally
 18 experience these impacts. Therefore, these impacts
 19 would not be disproportionately high and adverse
 20 because they would not be predominately borne by
 21 minority populations, nor would they be apprecia-
 22 bly more severe or greater in magnitude than the
 23 impacts borne by non-minority populations.

24 Although there would be impacts to the low-income
 25 population identified by the property manager of
 26 the former Candle Lite Motel (the former motel and
 27 adjacent residence), these impacts would not be
 28 large; existing conditions for the former motel and
 29 residence would not drastically change. Temporary
 30 impacts would include increased noise during con-
 31 struction, as well as an increase in dust and dirt
 32 which affects air quality. This would subside once
 33 construction is complete. Measures implemented to
 34 avoid impact to the area include revising the design
 35 plan for Picadilly so as to reduce noise and visual
 36 impairment to the parcel, adding a connector road-
 37 way over the eastbound on ramp to relocate Colfax,
 38 and to maintain access to the parcel. Residents in
 39 the parcel would cumulatively benefit from the pro-
 40 posed action due to an increase in development and
 41 an increase in economic activity compared to the
 42 No-Action Alternative. In addition, because the
 43 former motel has only a transient population, there
 44 does not seem to be a cohesive community in the
 45 area. For these reasons, low-income populations

46 would not experience a disproportionately high and
 47 adverse impact.

48 **3.3.9 Environmental Justice Mitigation**

49 Because there would be no disproportionate
 50 adverse impacts to low-income or minority popula-
 51 tions in the study area, no mitigation measures are
 52 required. Mitigation for noise, visual, and construc-
 53 tion-related impacts are addressed in Section 3.9.4,
 54 Section 3.19.3, and Section 3.21.2, respectively.

55 **3.4 RIGHT-OF-WAY AND RELOCATION**

56 **3.4.1 Existing Conditions**

57 The information necessary for the analysis of exist-
 58 ing right-of-way for the study area was provided
 59 from measurements of preliminary concept plans.
 60 The existing right-of-way varies depending on the
 61 specific road. The approximate widths of existing
 62 right-of-way for roads within the study area are
 63 found in **Table 3-5**.

Table 3-5
Approximate Right-of-Way Widths for Existing
Roads

Road	Approximate Width
I-70 Mainline	Varies from 250 feet to 325 feet
Colfax Avenue	200 feet
E-470 Mainline	Varies from 315 feet to 325 feet
Picadilly Road	25 feet
Gun Club Road	30 feet

64 **3.4.2 Right-of-Way Impacts**

65 **No-Action Alternative.** The No-Action Alternative
 66 would not require any relocations.

67 **Preferred Alternative.** The Preferred Alternative
 68 would require the acquisition of approximately 235
 69 acres of new right-of-way. At the I-70/Picadilly Road
 70 and I-70/Harvest Road interchanges, approximately
 71 75 and 160 acres of new right-of-way would be
 72 acquired, respectively. Based on current design,
 73 construction of the Preferred Alternative would

1 require partial acquisition of 13 parcels. No reloca-
2 tions would be required.

3 The relocation of Picadilly Road and the new inter-
4 change at I-70 would primarily affect vacant proper-
5 ties north and south of I-70. The only effect to these
6 properties would be the conversion of the land that
7 is adjacent to I-70 to highway right-of-way. There
8 would not be property segmentation or access
9 changes. In addition to the vacant properties that
10 will be impacted, the land that contains the former
11 motel parcel on Colfax Avenue would be connected
12 to the relocation of Colfax Avenue by a new bridge
13 over the eastbound on-ramp to I-70. The location of
14 Harvest Road and the new I-70 interchange would
15 be located entirely on vacant property or farm prop-
16 erty. Description of the right-of-way road widths for
17 the Preferred Alternative are found in **Table 3-6**. **Fig-**
18 **ure 3-6** is a map showing the new right-of-way that

19 will be required. **Table 3-7** shows the impact to
20 individual parcels.

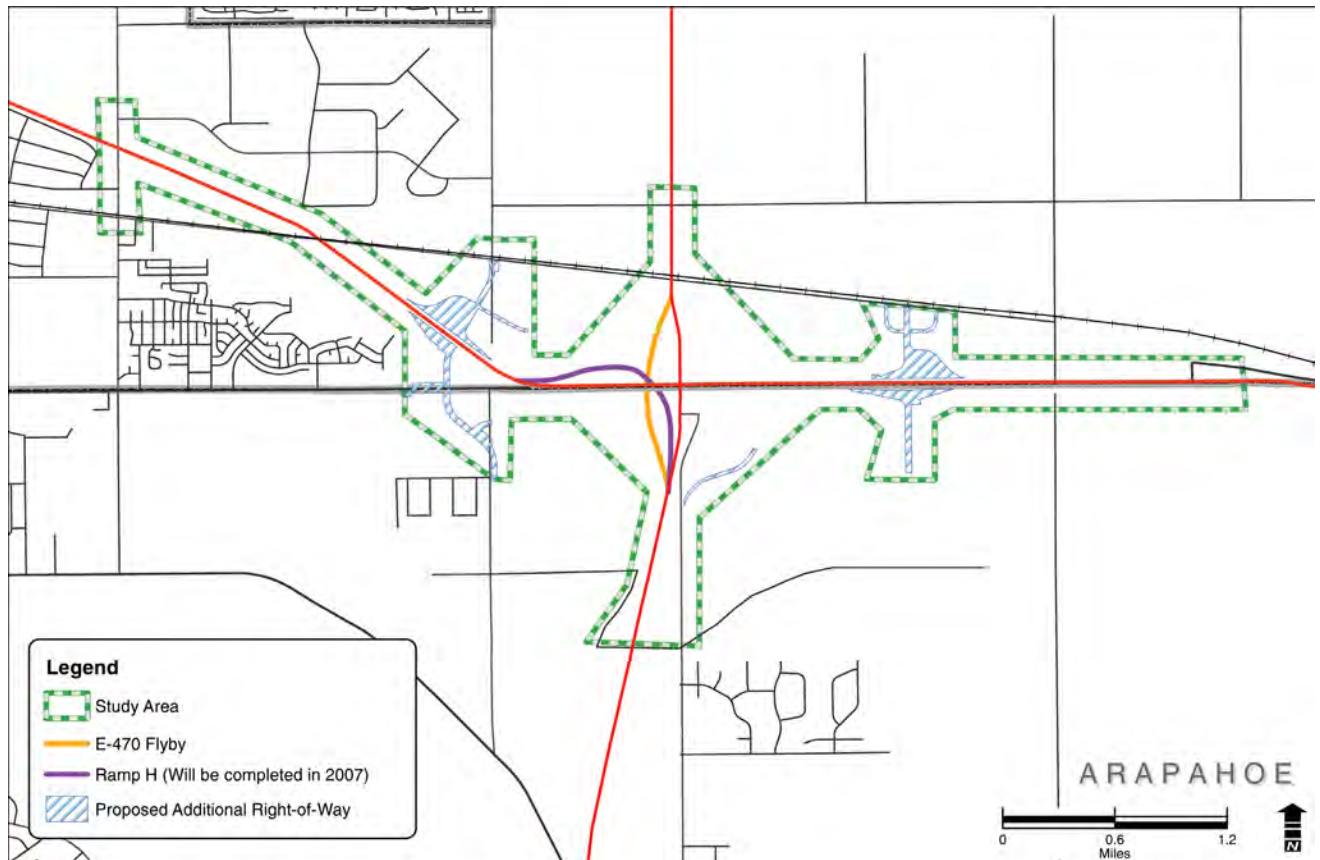
Table 3-6
Approximate Right-of-Way Widths for Proposed Roads

Road	Approximate Width
I-70 Mainline	Varies from 250 feet to 325 feet
Relocated Colfax Avenue	Undetermined*
E-470 Mainline	No proposed right-of-way**
Harvest Road	Varies from 250 feet to 300 feet
Picadilly Road	150 feet

* The proposed six-lane Colfax alignment has several proposed alignments varying in width.

** Right-of-way for E-470 mainline has already been acquired by the E-470 Authority; therefore, there would be no change.

Figure 3-6
Existing and Proposed Right-of-Way





**Table 3-7
Right-of-Way Impact to Parcels in the Study Area**

Parcel Owner	Total Area of Parcel in Acres	Area of Impact to Parcel in Acres
Cordillera	140.19	31.89
Catellus	294.43	3.24
Gennesse	136.92	9.22
Denver Group	20.61	3.11
Sells	77.64	0.34
Bounds	74.12	1.13
Coakes	74.63	12.14
Horizon	492.35	1.75
Gun Club	226.45	5.16
Grim	318.56	35.16
Property Reserve	999.63	21.23
TOTAL	2,855.53	124.36

3.4.3 Right-of-Way Mitigation

Acquisition of land for right-of-way would begin when the proposed action is fully designed, funded, and moves toward construction. Right-of-way acquisition for the I-70/E-470 interchange complex would comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended, which contains specific requirements that govern the manner in which a government entity acquires property for public use. The purpose of the Uniform Act is to provide a uniform policy for fair and equitable treatment of persons displaced from their homes, businesses, or farms as a result of federal and federally assisted programs. The law is designed to ensure just compensation for all acquired properties and minimal impact to the current owners.

The Uniform Act requires that a property owner be notified of the interest to acquire their property before a real property appraisal is completed. Each property owner is given the opportunity to accompany the appraiser during the inspection of the

property. Just compensation is established based on a current appraisal. The owner of real property acquired for right-of-way would be compensated at fair market value, in accordance with the Uniform Act, state statutes, and CDOT policies and procedures. No owner would be required to surrender possession of the real property until paid the agreed purchase price or the amount deemed to be just compensation has been deposited with the court for the benefit of the owner. Other entities, such as the City of Aurora, may acquire the property on behalf of CDOT but would be bound by the requirements of the Uniform Act.

3.5 ECONOMIC

3.5.1 Existing Economic Conditions

Site surveys, aerial photographs, and the *City of Aurora Comprehensive Plan, 2003* indicate that most land within the study area is used for either agricultural or light industrial purposes and does not contain many other economic enterprises. According to the Comprehensive Plan and information gained from the City of Aurora and E-470 Authority, substantial economic development is planned for the area. The proximity of the area to retailers and services in Aurora is a sound incentive to alleviate future arterial traffic congestion. The City of Aurora, along with Adams and Arapahoe Counties, expects that these land use changes would lead to an increase in property tax revenues and personal incomes for area residents.

A strong service sector exists in Aurora. Most industry lies in education, health, and social services (16.6 percent), retail (14.6 percent), and professional, scientific, management, administrative, and waste management services (13.8 percent). An increase in population, as discussed in Section 3.3, Social Conditions, has contributed to development and growth in the area. However, according to the Colorado Department of Labor and Employment, unemployment has increased by 4.7 percentage points (2.2 percent in 2000 to 6.9 percent in 2004). The statistics shown in **Table 3-8** indicate labor trends in the City of Aurora.

Table 3-8
Year 2003 Labor Force Statistics for the City of Aurora

	Aurora
In Labor Force*	163,877
Employed	147,608
Unemployed	15,187
Median Household Income	\$44,401
Per Capita Income	\$22,107

*Population aged 16 or over.

Source: US Census Bureau, 2003 American Community Survey Summary Tables

1 According to the 2003-2004 Aurora Economic Profile, the City of Aurora has over 12,300 businesses
 2 employing more than 118,700 people. Strong
 3 industries in the Aurora economy include retail
 4 trade, government, health care, accommodation
 5 and food service, and construction. In addition,
 6 high-technology firms such as Raytheon, The Boe-
 7 ing Company, Lockheed Martin, and Northrop
 8 Grumman are located in the area.

10 DRCOG and Adams and Arapahoe Counties have
 11 identified the E-470 corridor at I-70 as a strong
 12 employment growth area. Because of this planned
 13 growth along the I-70/E-470 corridor, especially in
 14 the interchange area, land use is expected to change
 15 from agricultural to a higher intensity of land use,
 16 including light industrial regional retail and
 17 Regional Activity Centers. The *City of Aurora Comprehensive Plan, 2003* defines Regional Activity
 18 Centers as intensive, mixed-use developments featuring walkable main streets and prominent build-
 19 ings.
 20
 21

22 3.5.2 Economic Impacts

23 This section describes impacts to the economic
 24 environment.

25

Is it true that this project would actually improve the economy in the area? Yes. As with most transportation improvement projects, the local economy not only gets a boost due to the construction project itself, but improved facilities tend to allow for increased business activity and improved mobility. New businesses generate tax revenue, and new residents generate property tax revenue.

26 **No-Action Alternative.** Economic conditions would
 27 improve under the No-Action Alternative, but not to
 28 the extent of the Preferred Alternative because of
 29 traffic congestion and limited business access. Sub-
 30 stantial growth and development is expected to con-
 31 tinue regardless of whether or not this project is
 32 constructed. The lack of the system to service inter-
 33 changes could slow development and limit the
 34 overall marketability of properties in the area.
 35 Under the No-Action Alternative, the flyover being
 36 built by the E-470 Authority is to be completed in
 37 2006. This would allow northbound and south-
 38 bound E-470 commuters to bypass traffic signals
 39 when crossing I-70. Also Ramp H that is currently
 40 being constructed would allow northbound E-470
 41 traffic to bypass signals when changing to west-
 42 bound I-70. However, these improvements alone
 43 would not accommodate the traffic that is antici-
 44 pated to occur with planned development of the
 45 area.

46 **Preferred Alternative.** The Preferred Alternative
 47 would result in improved mobility and increased
 48 accessibility to business establishments within and
 49 adjacent to the study area. Under this alternative,
 50 the development of economic enterprises would be
 51 supported resulting in a growth in employment.
 52 This would be consistent with future land use plans
 53 for the study area.

54 Businesses near the proposed interchanges would
 55 experience increased noise levels and traffic with
 56 ultimately improved visibility and access. In addi-
 57 tion, access to businesses in the study area may be
 58 temporarily impaired during construction.

59 The Preferred Alternative would not require the dis-
 60 placement of any businesses.



3.5.3 Economic Impact Mitigation

During the construction phase, good communication with emergency service providers, local businesses, government agencies, and residents is recommended with regard to traffic delays and access changes. Such notifications could be accomplished through radio and public announcements, newspaper notices, and on-site signage. If access to a business is compromised, alternate access routes would be provided during construction.

3.6 TRANSPORTATION (INCLUDING PEDESTRIANS AND BICYCLISTS)

3.6.1 Existing Traffic Conditions

Figure 3-7 shows existing daily traffic volumes on major study area roadways based on traffic counts obtained in 2004 and 2005. Traffic data show I-70 traffic volumes of 39,000 vehicles per day (vpd) west of E-470 and 29,000 vpd east of E-470. E-470 traffic counts show 19,000 vpd north of I-70 and 28,000 vpd south of I-70. Traffic volumes on other roads in the study area are 10,000 vpd or less.

Figure 3-8 shows current peak hour levels of service on study area roads and intersections. Level of service (LOS) is a standardized measure of congestion for highway segments, ramp merge and diverge areas, and intersections. LOS is measured on a scale from A to F, where LOS A refers to essentially uninterrupted traffic flow with minimal delays; LOS F refers to very high levels of congestion, with traffic volumes exceeding the levels for which a road or intersection was designed. Intermediate grades of B, C, D, and E reflect incremental increases in congestion. LOS D or better is CDOT's desired level to achieve for peak period operations.

Figure 3-8 shows that current peak hour operations are LOS C or better at all locations throughout the study area. Forecasted LOS is discussed in Section 3.6.2.4 of this EA.

3.6.1.1 Safety Analysis

Until 2006, the principal traffic safety concern in the study area has been the presence of four at-

grade, signalized intersections (at Colfax Avenue/Gun Club Road, the I-70 Gun Club ramp terminal intersections, and 19th Avenue/Gun Club Road) on the otherwise free-flowing E-470 tollway. The flyby, opened in 2006, has eliminated these conflicts for E-470 through traffic. The programmed Ramp H construction that is part of the NO-Action alternative will eliminate these intersection conflicts for northbound E-470 to westbound I-70 traffic. These recent and programmed improvements can be expected to substantially improve traffic safety in the study area.

3.6.2 2030 Traffic Projections

Traffic forecasts were developed using the Denver Regional Council of Governments (DRCOG) 2030 regional travel demand model as a basis. The principal features of the regional model were retained for the EA forecasting process, including population and employment forecasts and all DRCOG model procedures and parameters.

3.6.2.1 Development Forecasts

The study area and surrounding parts of eastern Aurora are rapidly developing. The study area is within the Denver-Aurora Urban Growth Boundary determined by DRCOG. DRCOG 2030 population forecast for the larger study area shown is 192,000; nearly four times the existing population for the same area. Employment forecasts for 2030 show 76,044 people employed, more than 15 times the 2005 level.

The forecasts for the TAZs in the immediate study area surrounding the E-470/I-70 interchange show more than 8,500 population and 8,600 people employed in 2030. Specifically, development plans include the major industrial development to the north, some of which has recently occurred and a mixed-use Regional Activity Center to the south.

Figure 3-9 shows the transportation analysis zone (TAZ) system in the area, and **Table 3-9** shows the existing and forecasted population and number of people employed.

Figure 3-7 Existing and Forecasted Daily Traffic Volume Comparisons

Figure 2-10 Existing and Forecasted Daily Traffic Volume Comparisons

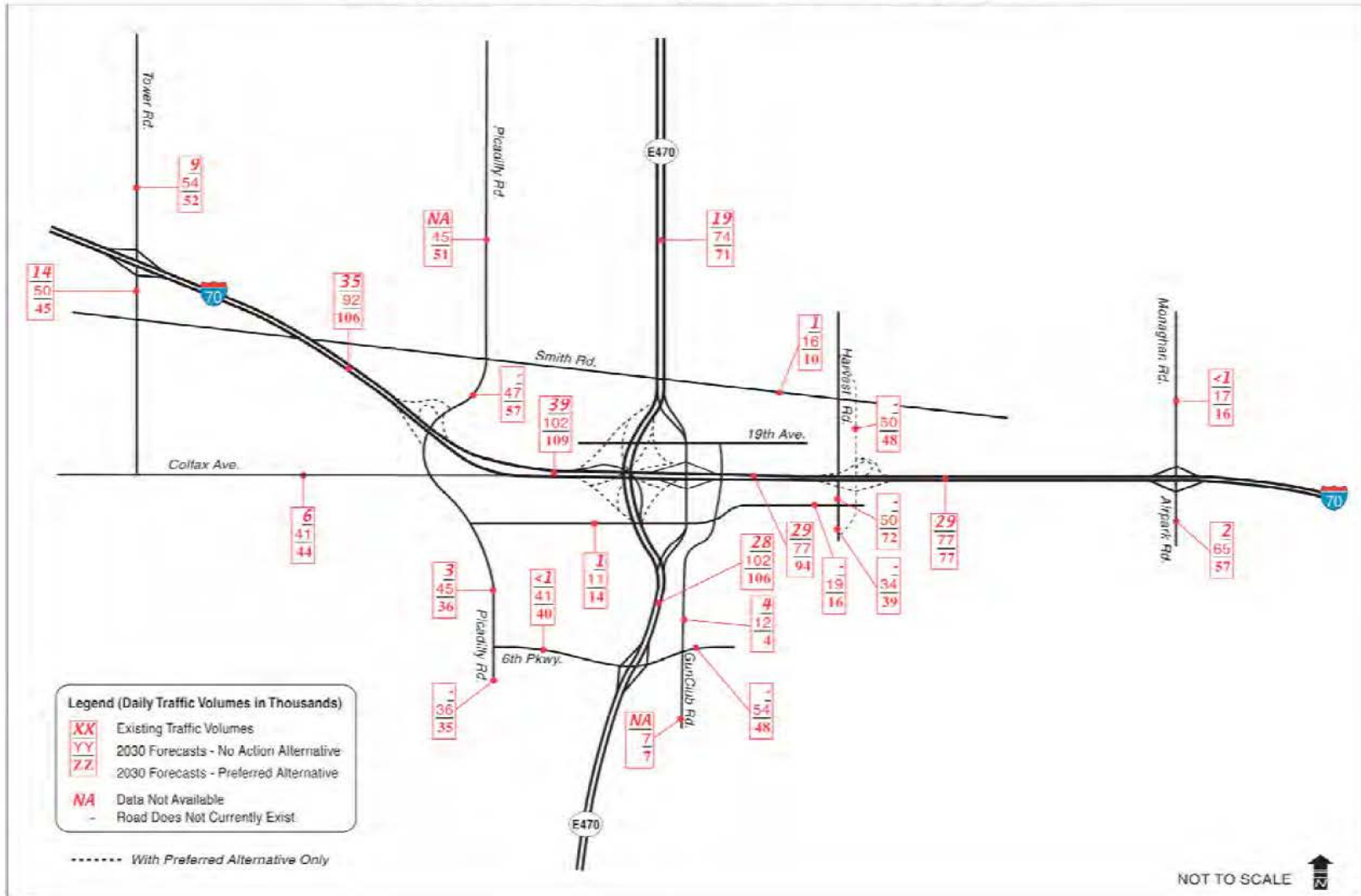


Figure 3-8
Existing Traffic Operations

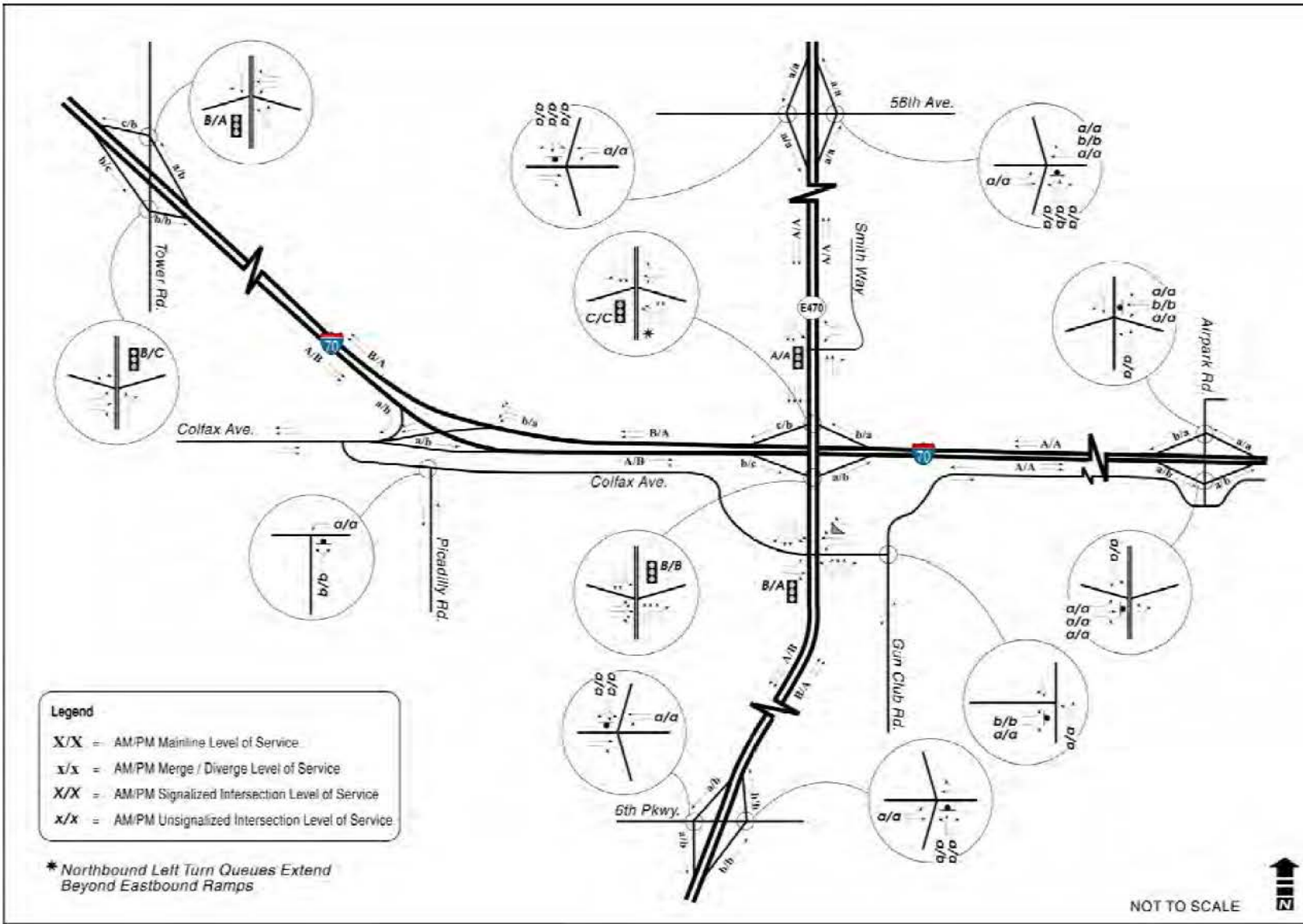
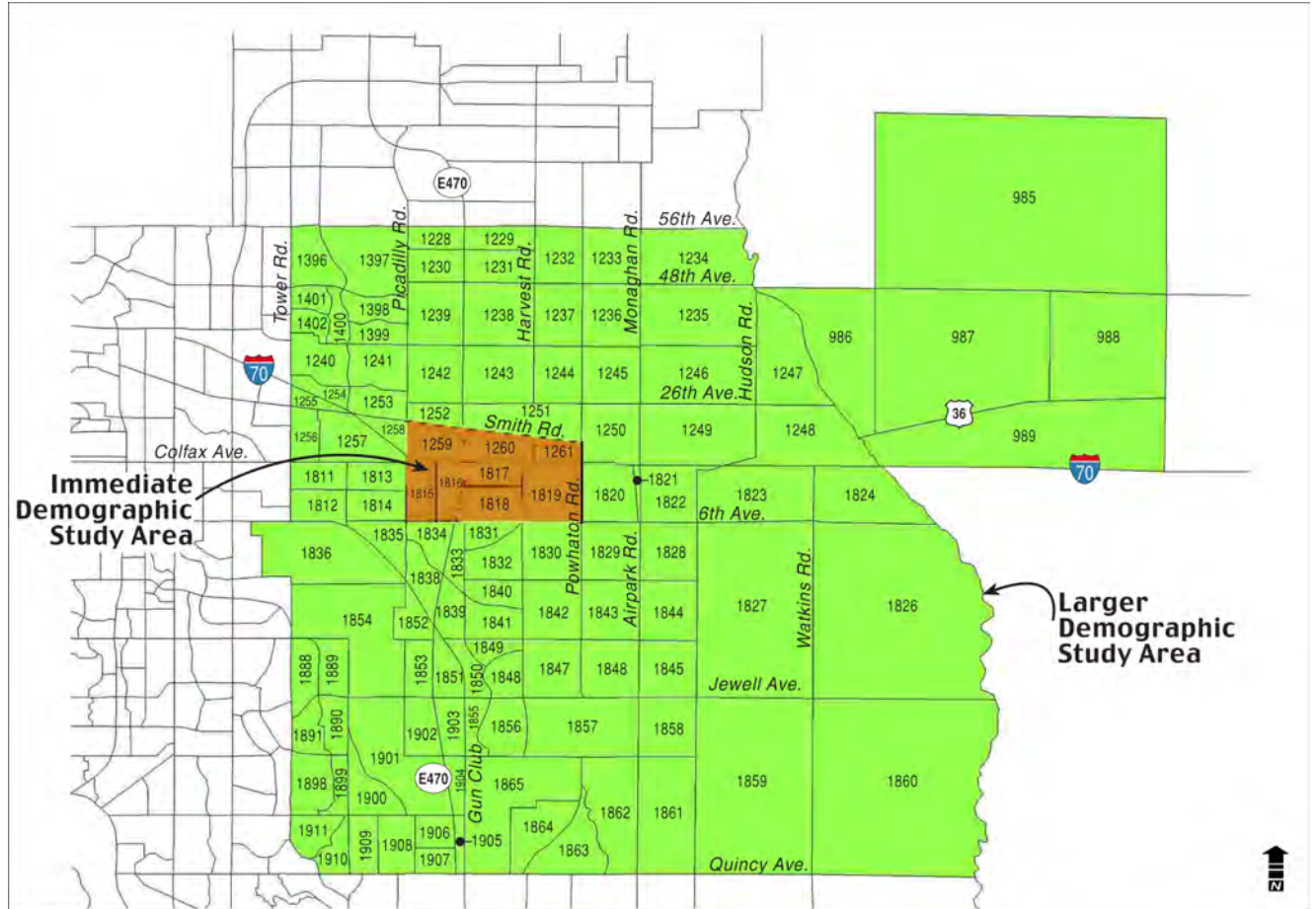


Figure 3-9
Transportation Analysis Zones



1 **3.6.2.2 Roadway Networks**

2 For the traffic model, roadway networks were devel-
 3 oped to represent the No-Action Alternative (Alter-
 4 native 1) and Alternative 9 (the Preferred
 5 Alternative), which includes two separate full-movement
 6 I-70 interchanges at Picadilly Road and Har-
 7 vest Road and is, therefore, consistent with
 8 DRCOG's fiscally constrained 2030 MVRTP base
 9 network. Both networks include the RTP lane
 10 assumptions of the existing four lanes on I-70
 11 through the study area and widening of E-470 from
 12 four to six lanes.

13 Several refinements were made to the roadway net-
 14 work in and around the study area, in coordination
 15 with DRCOG. Refinements included changes to

16 numbers of through lanes or functional classifica-
 17 tion on surface streets to better reflect evolving City
 18 of Aurora planning and refinements to TAZ connec-
 19 tions to the roadway network. Specific network
 20 refinements include:

- 21 ▶ Widening 6th Parkway west between E-470 and
 22 SH 30 to four lanes.
- 23 ▶ Adding the segment of Monaghan Road
 24 between 6th Parkway and 26th Avenue (con-
 25 necting with the Airpark Interchange).
- 26 ▶ Widening Monaghan Road between 26th Ave-
 27 nue and 56th Avenue to four lanes.
- 28 ▶ Widening Harvest Road between Jewell Ave-
 29 nue and 56th Avenue to six lanes.



Table 3-9
2005 and 2030 Population and Employment in the Immediate and Larger Study Area

TAZ	2005		2030	
	Population	Number of People Employed	Population	Number of People Employed
1259	0	0	0	831
1260	0	43	225	1,380
1261	1	0	3	189
1815	0	0	1,296	915
1816	0	0	812	1,813
1817	0	0	482	1,150
1818	0	68	1,388	2,244
1819	7	0	4,324	116
Immediate Demographic Study Area Total	8	111	8,530	8,638
Larger Demographic Study Area	49,078	4,804	192,082	76,044

Source: U.S. Census Bureau and DRCOG

3.6.2.3 Traffic Forecasts

Figure 3-7 shows daily traffic forecasts for 2030 with the No-Action Alternative and Alternative 9, or the Preferred Alternative, and provides a comparison of those traffic forecasts with existing traffic volumes. The map shows that traffic forecasts are expected to increase sharply throughout the study area between now and 2030.

I-70 traffic volumes are forecasted to increase west of E-470 from 39,000 vehicles per day (vpd) to 102,000 vpd with the No-Action Alternative and 109,000 vpd with the Preferred Alternative. East of E-470, I-70 volumes are forecasted to increase from 29,000 vpd currently to 77,000 vpd in 2030 with the No-Action Alternative and 94,000 vpd with the Preferred Alternative. I-70 traffic forecasts with the Preferred Alternative are higher than with the No-Action on study area segments because of the more direct access to I-70 afforded by the Preferred Alternative. Specifically, some of the traffic that would use surface streets, such as 6th Parkway, Colfax Avenue and Smith Road to travel across the study area under the No-Action, would use the Harvest or Picadilly interchanges to access I-70 and use the higher speed interstate to travel through the study area.

Figure 3-7 also shows forecasts on E-470 that are more than three times existing traffic volumes. The rapid development in and around the study area is forecasted to generate traffic of 40,000 and 70,000 vpd on segments of north-south arterial roadways, including Tower Road, Picadilly Road, Harvest Road, and Airpark Road.

Figure 3-10 and Figure 3-11 show forecasted peak-hour traffic volumes on freeway segments and at major intersections with the No-Action and Preferred Alternatives.

What will happen to local Gun Club Road traffic? There are several features of the proposed action that will enable existing traffic on Gun Club Road to continue to conveniently travel to and from regional roads and destinations. First, access to and from the new E-470 tollway will continue to be provided via ramps to and from the existing E-470 roadway south of Colfax Avenue and north of 19th Avenue. Second, a new relocation of Gun Club Road is planned to be built swinging east from its current location to intersect with Colfax Avenue, pass over I-70, and intersect with 19th Avenue. Finally, access for existing and future development to the regional highway system will be available using the local street system at four locations, each approximately one mile from the new I-70/E-470 interchange: I-70/Picadilly Road, I-70/Harvest Road, E-470/6th Parkway, and E-470/56th Avenue.

Figure 3-10
No-Action Year 2030 Peak Hour Traffic Forecasts

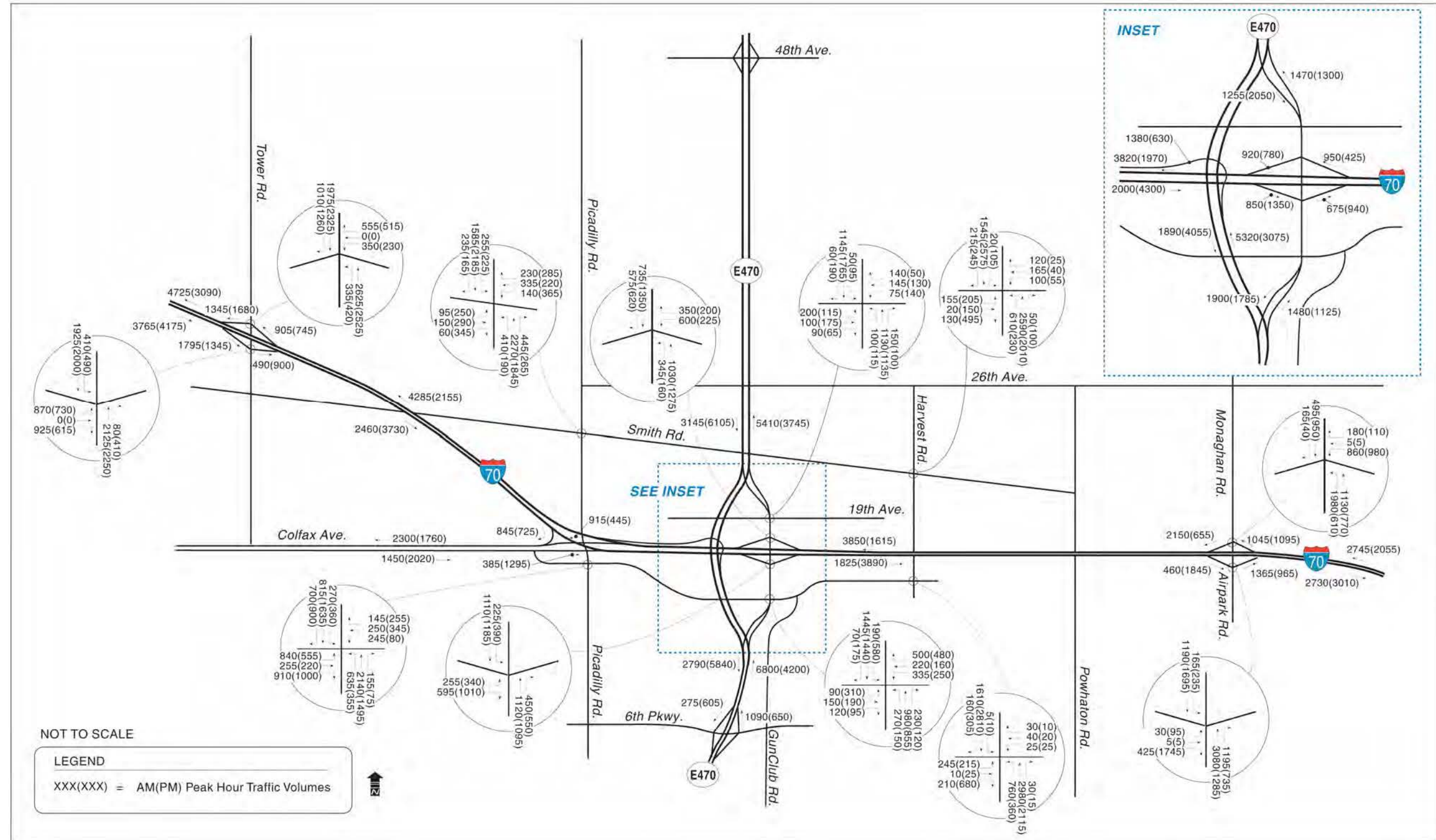
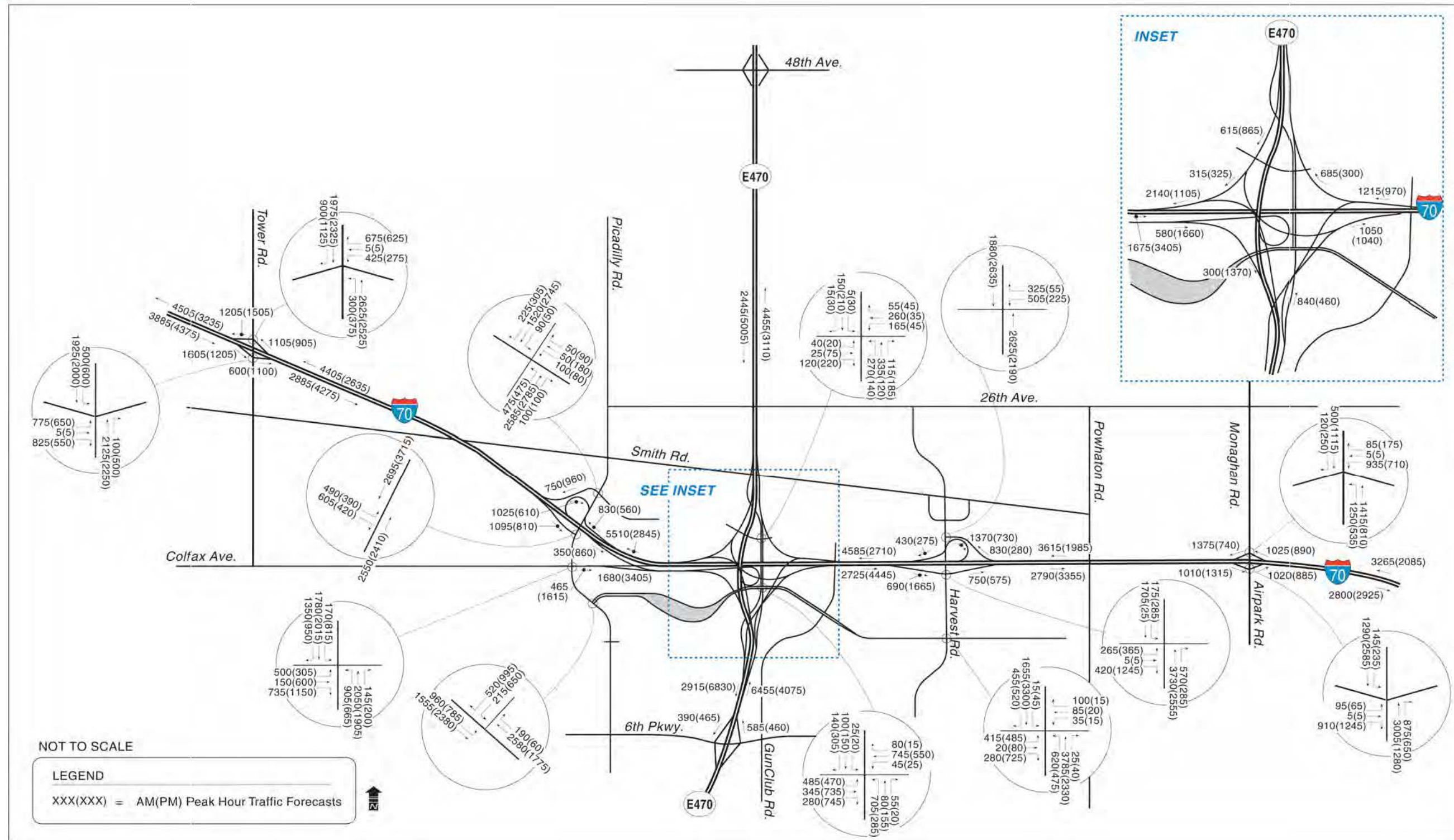




Figure 3-11
Proposed Action - Year 2030 Peak Hour Traffic Forecasts



3.6.2.4 Traffic Operations

2030 peak-hour traffic operations were evaluated based on the forecasts displayed on **Figure 3-10** and **Figure 3-11**. **Figure 3-12** shows LOS findings for the No-Action Alternative. LOS F conditions, with volumes in excess of roadway capacity and resulting severe congestion, were calculated on freeway segments of both I-70 and E-470.

Figure 3-13 shows LOS with Alternative 9, or the Preferred Alternative. LOS reflects the additional I-70 access and additional auxiliary lanes on I-70 and on E-470 that are associated with the Preferred Alternative. These additional features would eliminate all of the LOS F conditions and would result in LOS D or better on I-70, and LOS E or better on E-470.

3.6.3 Local Access and Planned Improvements

3.6.3.1 Existing Conditions

The properties to the south of I-70, including residential developments outside the study area, currently have local access via collector roadways that connect with Colfax Avenue, Gun Club Road, or Picadilly Road. To the north of I-70, 26th Avenue and Picadilly Road serve as access for residential developments to the northwest of the study area. East Smith Road serves as access to the industrial development to the northeast of the I-70 interchange at Gun Club Road. Local access to I-70 is provided at Gun Club Road. Partial access to I-70 is also available at Colfax Avenue just east of Picadilly Road.

Local access to E-470 is provided by full interchanges at 6th Parkway and at 56th Avenue. The current access to E-470 at Gun Club Road is being modified by the current flyby construction, but access both north and south on E-470 is being maintained.

3.6.3.2 Forecasted Conditions

With the construction of the new I-70/E-470 interchange, local access to E-470 is planned to be maintained. New local access interchanges with I-70 are

included at Picadilly Road and at Harvest Road in the Preferred Alternative. Both would be full interchanges with ramps serving eastbound and westbound traffic. Picadilly Road would be relocated to a more westerly location between East 11th Avenue and Smith Road and would pass under two new (or widened) bridges carrying I-70. Harvest Road would also be relocated slightly east of its section line location and would have a new bridge to carry it over I-70.

3.6.4 Transit

3.6.4.1 Existing Conditions

Public transportation service within the Denver metropolitan area is provided by RTD. Because of the rural character of this portion of the City of Aurora, Adams County, and Arapahoe County, there is presently limited bus service near the study area. Although no bus routes pass directly through the study area, a limited route (Route 15 Ltd) running east-west along Colfax Avenue serves a residential area approximately two miles west of the I-70/E-470 interchange. An express route (Route 47X) serves the Green Valley Ranch residential area approximately three miles northwest of the proposed interchange. Another express route (Route 185X) runs north-south along Tower Road and Airport Road, approximately three miles west of the I-70/E-470 interchange, from DIA to southern Aurora.

3.6.4.2 Forecasted Conditions

Currently, there are plans to improve transit options near the study area beyond what currently exists. As part of its FasTracks program, RTD is planning a new East Corridor rail line linking downtown Denver and DIA. A station is planned just north of I-70 west of Tower Road at Airport Boulevard with a major park-n-Ride facility. This project is the subject of the *I-70 East Corridor EIS* currently being conducted by RTD. Also as part of FasTracks, RTD is planning a series of expanded bus routes called FastConnects. This would include feeder bus routes to the new East Corridor, as well as circumferential routes serving outlying areas, including the study area. The City of Aurora is planning a Regional Activity Center south of I-70 at Picadilly Road (see



1 Section 3.1.2 for a definition of a Regional Activity
2 Center). This activity center would include mass
3 transit facilities. Additionally, there is a park-n-Ride
4 facility planned at the Horizon City Center develop-
5 ment.

6 3.6.5 Pedestrians and Bicyclists

7 3.6.5.1 Existing Conditions

8 There are no established pedestrian/bicycle trails in
9 the study area, and none of the existing roadways
10 have attached or detached sidewalk facilities. As a
11 result of the lack of facilities and the existing rural
12 character of the area, there is very little bicycle and
13 pedestrian use.

14 3.6.5.2 Forecasted Conditions

15 There would be a multiuse pedestrian/bike paved
16 trail built along E-470 in the future. Preliminary
17 design and provisions for its future construction are
18 included in the current preliminary design plans.
19 Provisions for sidewalks have been included in the
20 current flyby construction at the bridges over relo-
21 cated Colfax Avenue. Plans for the E-470/I-70 inter-
22 change area were coordinated with the City of
23 Aurora Department of Parks and Open Space to pro-
24 vide routes for both the E-470 trail and the proposed
25 First Creek Trail.

26 3.6.6 Transportation Impacts

27 This section describes impacts to transportation in
28 the area.

29

Would I have to pay a toll to get to I-70? Local Gun Club Road traffic is forecasted to be primarily local traffic serving adjacent neighborhoods. The planned development of Harvest Road as a new major parallel north-south arterial to the east would serve much of the traffic accessing I-70. Gun Club Road north of 6th Parkway would be relocated to a more easterly alignment with a new bridge over I-70 providing a connection to the commercial area east of Smith Road. Some traffic currently using Gun Club Road may also choose to use Picadilly Road to the west, which is planned to be widened and extended from Colfax Avenue north under I-70, with the new interchange at I-70. These alternate routes would not require a toll payment. See **Figure 3-14** for a graphic representation of these changes.

30

What is going to happen to Colfax? Colfax Avenue is planned to remain as a major state highway, west of Picadilly Road. Colfax Avenue would join I-70 at the new Picadilly Road interchange. East of Picadilly Road, as part of the No-Action Alternative, Colfax Avenue would be relocated to the south to a location parallel to I-70 as part of planned developments.

31

Would conditions along Picadilly Road be addressed? The EA includes Picadilly Road north of East 11th Avenue. In this area, Picadilly Road would be relocated to the west of its current location to a new intersection with Colfax Avenue. Safety concerns have been expressed about the limited sight distance on Picadilly Road south of East 11th Avenue. This area is adjacent to the planned Horizon City Center development. In this area, the City of Aurora and the developer are examining alternate concepts to improve Picadilly Road to meet Aurora's arterial design standards while maintaining its local access function.

32

Would out-of-direction travel be required? No, there would not be a need for out-of-direction travel with the closure of the Gun Club Road local ramps at I-70. The new interchange one mile to the west at Picadilly Road would provide convenient access for traffic wishing to go to and from the west on I-70, and the new interchange at Harvest Road, one mile to the east, would serve traffic to and from the east on I-70. Planned improvements included in the No-Action Alternative plan for 6th Parkway, Smith Road, and relocated Colfax Avenue would provide convenient east-west connections to both Picadilly Road and Harvest Road. Little or no added travel distance would be required with the new accesses to I-70 (see **Figure 3-14**). Those who use E-470 would still be able to do

33

34 **No-Action Alternative.** The No-Action Alternative
35 would result in future peak-hour delays at the I-70
36 interchanges on the arterials approaching the free-
37 way at both Gun Club Road and at Colfax Avenue.
38 In addition, queues of vehicles on the interchange
39 off ramps would continue to increase in length and
40 duration, which would impact freeway traffic opera-
41 tions. The short weaving distance between the west-
42 bound entrance ramp to I-70 from Gun Club Road
43 and the left-hand exit ramp from westbound I-70 to
44 Colfax would result in LOS F operations in the
45 future. The flyby, currently under construction, is
46 part of the No-Action Alternative and is designed to
47 remove the signals from the E-470 mainline. This

Figure 3-12
No-Action Year 2030 Traffic Operations

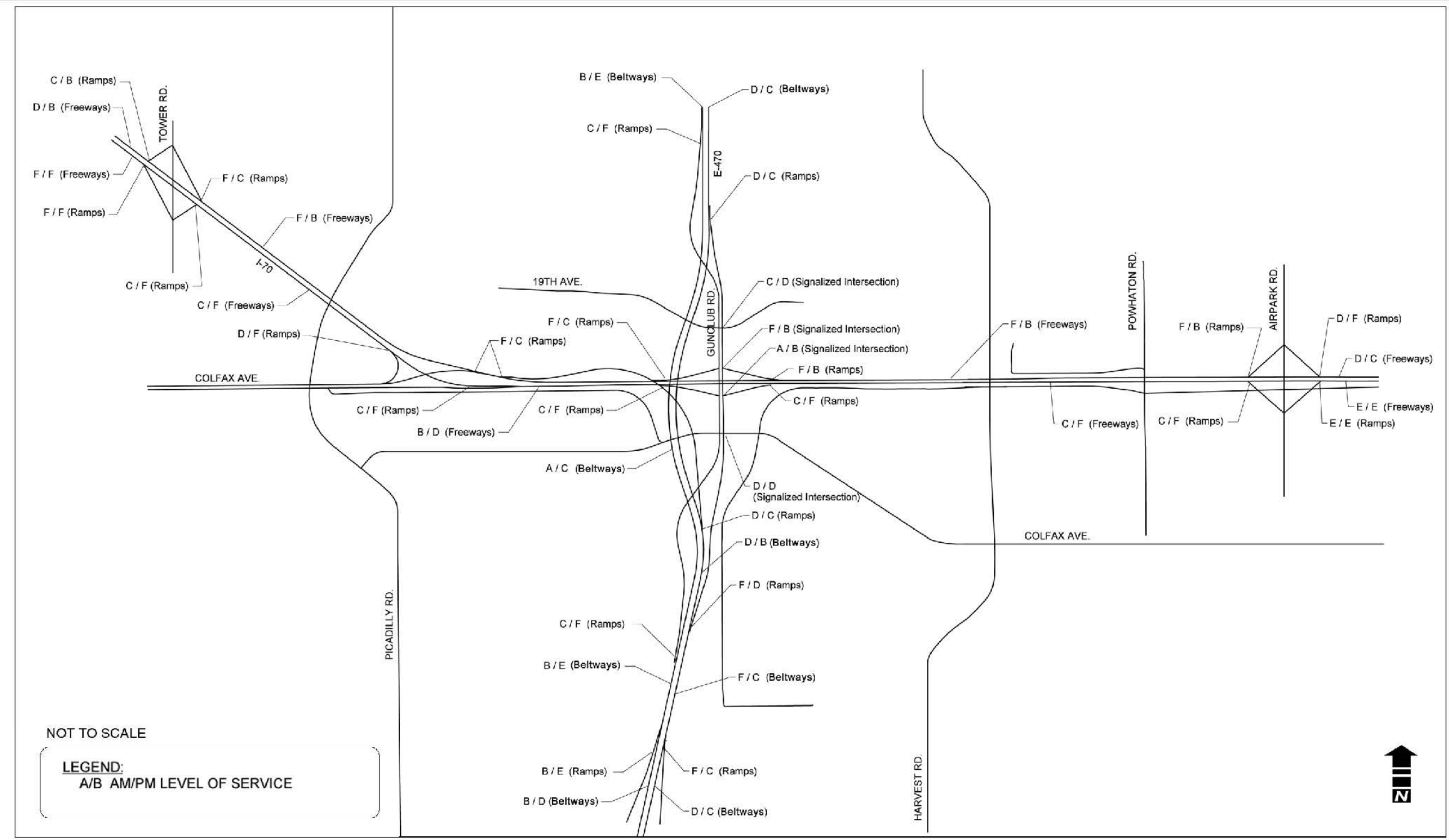




Figure 3-13
Proposed Action - Year 2030 Traffic Operations

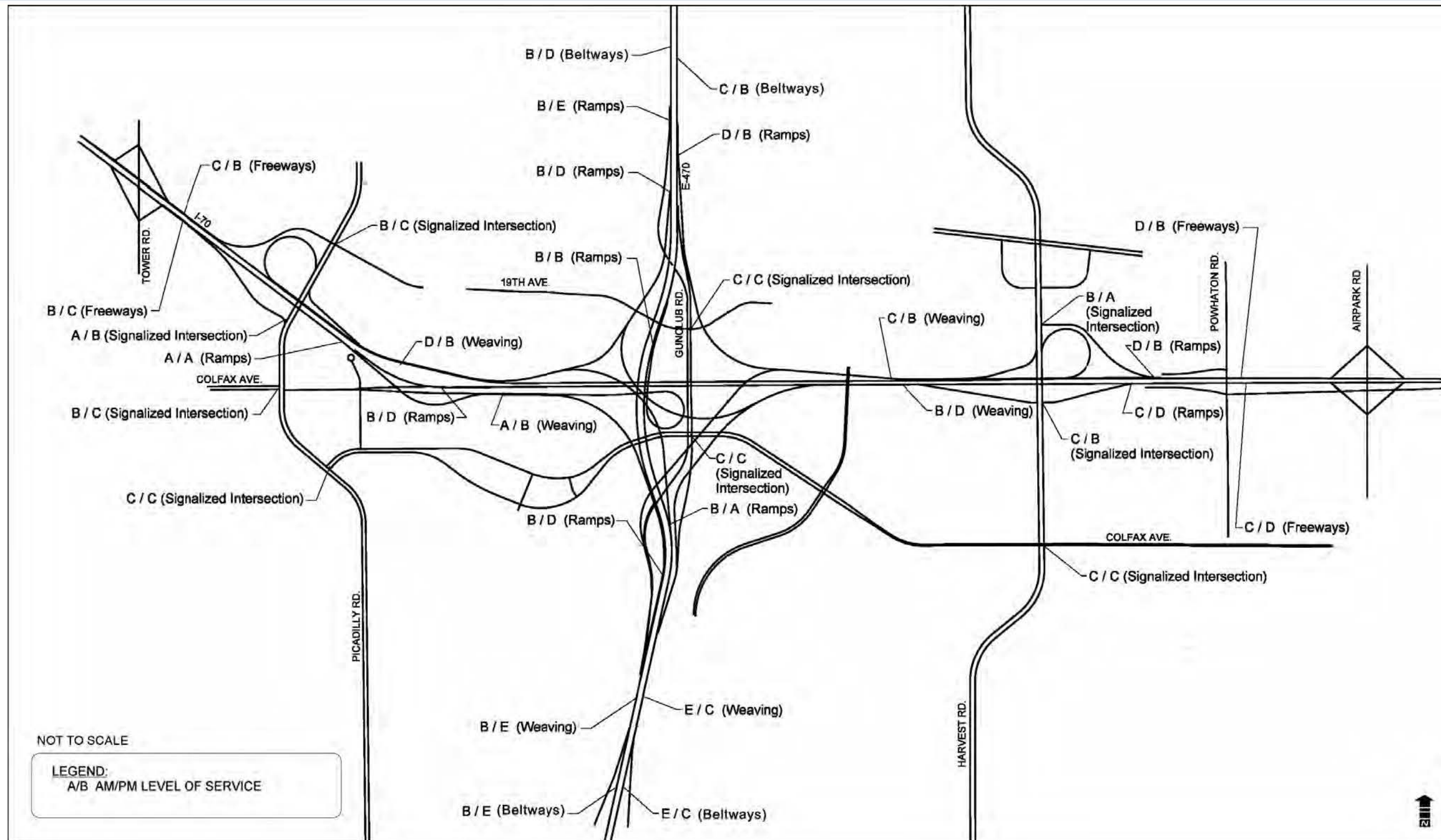
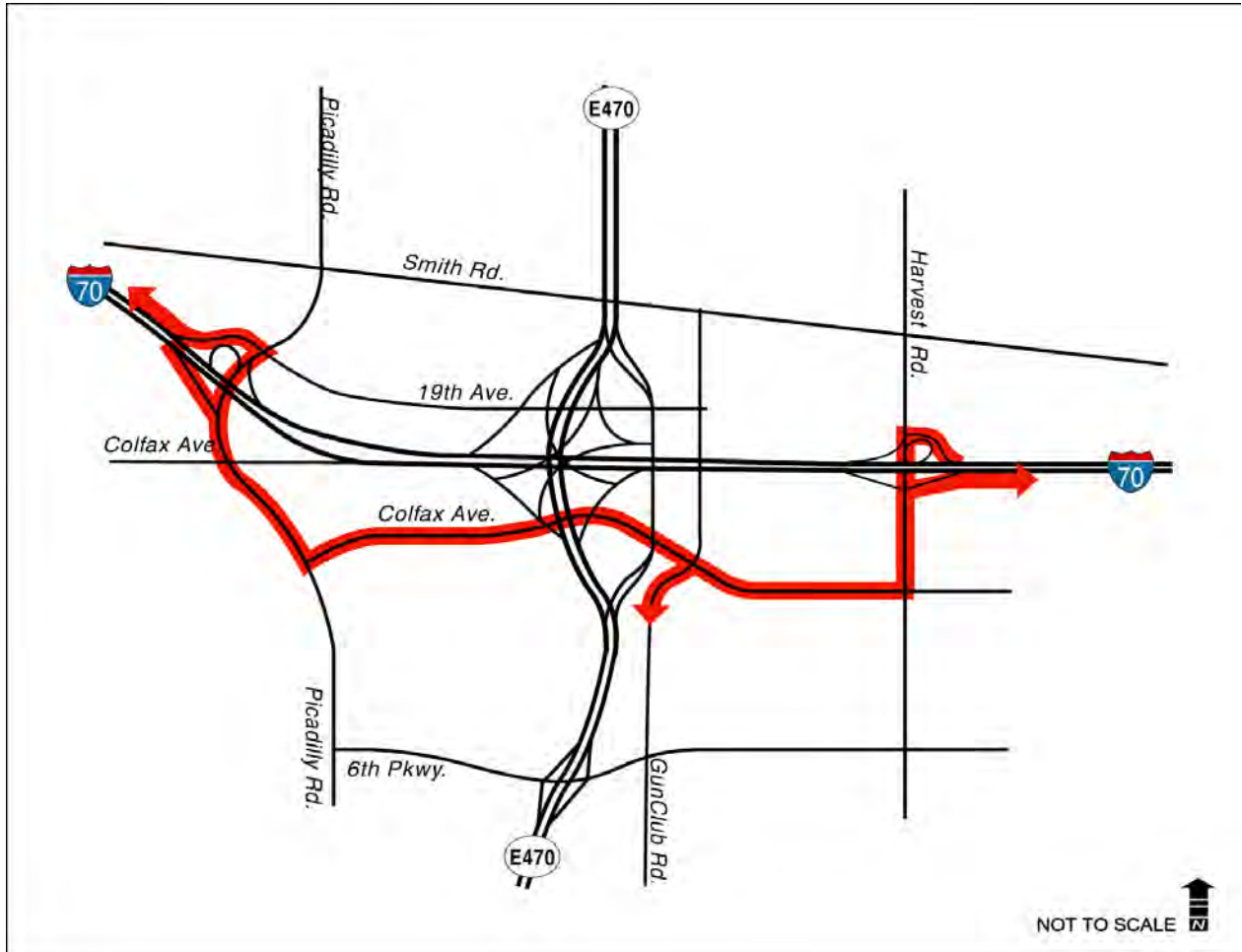


Figure 3-14
Gun Club Road Access Change (Preferred Alternative)



1 will create a free-flow mainline roadway for E-470
 2 through-traffic. Also under construction is Ramp H,
 3 which will allow northbound E-470 traffic to access
 4 westbound I-70 in a free-flow movement.

5 **Preferred Alternative.** The Preferred Alternative is
 6 designed to create a full-movement interchange
 7 between I-70 and E-470. The Preferred Alternative
 8 would also improve access to the surrounding land
 9 uses and planned developments by constructing
 10 two new full interchanges on I-70 at Picadilly Road
 11 and at Harvest Road. The area's LOS would be
 12 improved as well.

13 The 2030 daily forecast volumes do not show a dis-
 14 cernible difference in LOS between the No-Action
 15 and Preferred Alternative on roadways and intersec-
 16 tions outside of the interchange. The LOS within the
 17 interchange area would be maintained with the Pre-
 18 ferred Alternative. The LOS on I-70 is greatly
 19 improved over the No-Action Alternative. In part,
 20 this is because of the addition of the Harvest Road
 21 interchange, which would reduce the heavy vol-
 22 umes forecasted for the I-70/Airpark Road inter-
 23 change. Addition of auxiliary lanes in the Preferred
 24 Alternative would also result in improved LOS for
 25 sections of I-70.



3.6.7 Transportation Mitigation

The Preferred Alternative does not require mitigation.

3.7 PARKS AND RECREATIONAL RESOURCES

There are no existing parks, recreational facilities, or designated open space in the study area. Therefore, there would be no impacts to parks or recreational facilities, and no mitigation is required. The areas that are zoned for parks/open space and plans for recreational facilities have already taken this proposed action into consideration.

3.8 AIR QUALITY

3.8.1 Existing Conditions

The geographical and meteorological characteristics of the Denver metropolitan area are a major cause of the air quality conditions that exist within the study area. The study area is located within the valley of the South Platte River, making it susceptible to temperature inversions during the winter months. However, local winds on the eastern plains often gust quite strongly as they move off the mountains to the east and tend to blow the pollution away.

The E-470/I-70 interchange complex is located on the eastern edge of the Denver metropolitan area, in the City of Aurora, on the border of Arapahoe and Adams Counties. It is within the Denver metropolitan attainment/maintenance area. Effective October 16, 2002, the U.S. Environmental Protection Agency (EPA) designated the Denver metropolitan area as an attainment/maintenance area for fine particulate matter less than ten microns in diameter (PM₁₀). The Denver metropolitan area had previously received designation as an attainment/maintenance area for carbon monoxide (CO) and the 1-hour ozone (O₃) standard. The data from the last 5-year period show that the decline in both 1-hour and 8-hour carbon monoxide levels are still declining from 1970s levels, and the statewide 8-hour

average has remained less than one half of the level of the standard. However, ozone levels show a decade-long trend in increases of 1-hour and 8-hour concentrations. EPA-mandated Maintenance Plans have been prepared and approved by the EPA for the Denver metropolitan area CO, O₃, and PM₁₀ maintenance areas. In July 2004, an Early Action Compact (EAC) for ozone was submitted to the EPA to establish a plan of action and implementation milestones to lower 8-hour ozone levels in the metropolitan area before December 31, 2007. This effort was in response to violations in the 8-hour ozone standards between 2002 and 2003. EPA has deferred nonattainment designation for 8-hour ozone as long as the area meets the milestones in the EAC.

The Colorado Department of Public Health and Environment (CDPHE), Air Pollution Control Division, oversees the process to determine air quality impacts. The process includes both regional and project-level air quality analysis. The EPA evaluates projects on a regional level to assure they do not have a negative impact on air quality, and the air quality impacts fit into the regional budget emissions established by the EPA. Projects that meet these criteria (and are financially constrained) are included in a current Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP). Projects are also evaluated on a project level to determine impacts related to carbon monoxide concentrations.

The pollutants of primary concern in the Denver metropolitan area are CO, PM₁₀ and ozone. Generally speaking, CO concentrations increase as vehicular congestion rises, and PM₁₀ emissions increase with growth in vehicle-miles-of-travel (vmt). Ozone is not directly emitted by motor vehicles; it is an indirect by-product of motor vehicle emissions. Based on input from the Interagency Consultation Team, which is described in Section 3.8.3, it was decided that the approach for the air quality analysis for the EA would include the following areas of analysis:

- 1 ▶ Intersection “Hot-spot” analysis for CO
- 2 ▶ Qualitative analysis for PM₁₀

38

What would happen to the quality of the air because of this project? It is not anticipated that any violation of air quality conformity or exceedance of ambient air quality standards will result from this project.

3.8.2 Transportation Conformity

4 The transportation air quality conformity regulations
5 of July 2004 require that regionally important and/
6 or federally funded transportation projects demon-
7 strate conformity to state implementation and main-
8 tenance plans. The I-70/E-470 interchange complex
9 is not federally funded, but is considered a region-
10 ally important project and would undergo conform-
11 ity determination.

12 The transportation conformity regulations require
13 that:

- 14 ▶ The project be included in a fiscally constrained
15 RTP.
- 16 ▶ The project be included in a fiscally constrained
17 TIP.
- 18 ▶ The project does not cause or contribute to any
19 new or existing violations of National Ambient
20 Air Quality Standards (NAAQS).

21 The I-70/E-470, I-70/Harvest Road and I-70/Picadilly
22 Road interchanges are in DRCOG’s *2030 Metro*
23 *Vision Regional Transportation Plan*. The proposed
24 I-70 auxiliary lanes between Tower Road and Pica-
25 dilly Road interchanges are currently being evalu-
26 ated in DRCOG’s 2007-2012 TIP. The I-70/E-470
27 interchange complex is not included in the most
28 recent TIP because it is locally funded.

3.8.3 Interagency Consultation Team

30 An Interagency Consultation team met on July 18,
31 2003, to provide direction regarding the scope of
32 the air quality analysis for the EA and to review the
33 results. The team consisted of representatives from
34 the CDPHE, Air Pollution Control Division; CDOT;
35 and the consultant team.

3.8.4 Air Quality Impacts

37 This section describes impacts to air quality.

39 **No-Action Alternative.** The signalized intersections
40 at old E 470 and 19th Avenue would operate at
41 morning and evening peak Levels of Service (LOS)
42 C/D. The westbound I-70 ramps would operate at
43 morning and evening peak LOS F/B. The signalized
44 intersection of future Colfax Frontage Road and Gun
45 Club Road would operate at morning and peak hour
46 LOS D/D. CO “hot-spot” analysis was done for the
47 three intersections showing that no violations of 1-
48 hour or 8-hour standards for CO concentrations
49 would occur in 2030. The results for 8-hour average
50 concentrations of CO for morning and evening
51 peak-hour traffic volumes at the existing E-470/19th
52 Avenue intersection, existing E-470/westbound I-70
53 ramps, and existing E-470/Colfax Avenue signalized
54 intersections are 1.2/1.3 ppm, 1.5/1.4 ppm and 3.5/
55 2.1 ppm, respectively. The 8-hour standard is 9.0
56 ppm.

57 **Preferred Alternative.** There are no signalized inter-
58 sections identified in the Preferred Alternative that
59 would operate less than LOS C at either morning
60 peak or evening peak hours; therefore, no project-
61 level CO analysis was performed for the Preferred
62 Alternative.

63 A qualitative analysis of PM₁₀ emissions was con-
64 ducted for the study area. Most PM₁₀ is fugitive dust
65 generated by vehicle re-entrainment of excess road-
66 way sand from winter sanding operations or from
67 windblown dirt and sand from fields and construc-
68 tion sites. Vehicle emissions contribute compara-
69 tively little to PM₁₀. According to the *Colorado Air*
70 *Quality Control Commission Report to the Public,*
71 2001-2002, there are no monitors in the study area
72 to provide PM₁₀ air quality data; therefore, actual
73 levels of this pollutant in the study area are not
74 available.

75 The *Federal Clean Air Act Amendments* of 1990
76 requires a TIP or RTP to conform to the State Imple-
77 mentation Plan. As part of the State Implementation



1 Plan development process, an emissions budget for
2 PM_{10} is established for attainment and maintenance
3 areas to meet the NAAQS. Because the Denver met-
4ropolitan area is classified as attainment/mainte-
5 nance for PM_{10} , projected emissions of the
6 pollutant resulting from the TIP or RTP must not
7 exceed the emissions budget set forth in the plan.

8 The PM_{10} Maintenance Plan for the Denver Metro-
9 politan Area, recently approved by the EPA, esti-
10 mates through dispersion modeling the effect of
11 emissions in 5-year increments through 2030 to
12 demonstrate continued maintenance of the standard
13 during this time period. The modeling domain for
14 regional PM_{10} concentrations described in the tech-
15 nical support document to the Maintenance Plan
16 shows that the highest modeled concentration near-
17 est to the interchange is $101 \mu\text{g}/\text{m}^3$, below the 150
18 $\mu\text{g}/\text{m}^3$ standard. Because the proposed action is
19 included within the current conformity model,
20 exceedances of the PM_{10} standard are unlikely.

21 3.8.5 Air Quality Mitigation

22 No mitigation for air quality is necessary.

23 3.8.6 Mobile Source Air Toxics

24 On February 3, 2006, the FHWA released its
25 interim guidance on when and how to analyze
26 MSATs in the NEPA process for highways. The fol-
27 lowing discussion and discussion in the Air Quality
28 Technical Memorandum (Appendix G) are in accord-
29 dance with the interim guidance.

30 In addition to the criteria air pollutants for which
31 there are NAAQS, the EPA also regulates air toxics.
32 Most air toxics originate from human-made sources,
33 including on-road mobile sources, non-road mobile
34 sources (e.g., airplanes), area sources (e.g., dry
35 cleaners) and stationary sources (e.g., factories or
36 refineries). The FHWA has prepared guidance
37 (dated February 3, 2006) on the analysis of mobile
38 source air toxics for highway projects.

39 Mobile Source Air Toxics (MSATs) are a subset of
40 the 188 air toxics defined by the Clean Air Act.
41 MSATs are compounds emitted from highway vehi-
42 cles and non-road equipment. Some toxic com-

43 pounds are present in fuel and are emitted to the air
44 when the fuel evaporates or passes through the
45 engine unburned. Other toxics are emitted from the
46 incomplete combustion of fuels or as secondary
47 combustion products. Metal air toxics also result
48 from engine wear or from impurities in oil or gaso-
49 line. See document No. EPA420-R-00-023 (Decem-
50 ber 2000).

51 The EPA is the lead Federal Agency for administer-
52 ing the Clean Air Act and has certain responsibilities
53 regarding the health effects of MSATs. The EPA
54 issued a Final Rule on Controlling Emissions of Haz-
55 ardous Air Pollutants from Mobile Sources. 66 FR
56 17229 (March 29, 2001). This rule was issued under
57 the authority in Section 202 of the Clean Air Act. In
58 its rule, EPA examined the impacts of existing and
59 newly promulgated mobile source control pro-
60 grams, including its reformulated gasoline (RFG)
61 program, its national low emission vehicle (NLEV)
62 standards, its Tier 2 motor vehicle emissions stan-
63 dards and gasoline sulfur control requirements, and
64 its proposed heavy duty engine and vehicle stan-
65 dards and on-highway diesel fuel sulfur control
66 requirements. Between 2000 and 2020, FHWA
67 projects that even with a 64 percent increase in
68 VMT, these programs will reduce on-highway emis-
69 sions of benzene, formaldehyde, 1,3-butadiene, and
70 acetaldehyde by 57 percent to 65 percent, and will
71 reduce on-highway diesel PM emissions by 87 per-
72 cent, as shown in **Figure 3-15**.

73 As a result, EPA concluded that no further motor
74 vehicle emissions standards or fuel standards were
75 necessary to further control MSATs. The agency is
76 preparing another rule under authority of CAA Sec-
77 tion 202(l) that will address these issues and could
78 make adjustments to the full 21 and the primary six
79 MSATs.

80 3.8.6.1 Unavailable Information for Project Specific 81 MSAT Impact Analysis

82 This EA includes a basic analysis of the likely MSAT
83 emission impacts of this project. However, available
84 technical tools do not enable us to predict the
85 project-specific health impacts of the emission
86 changes associated with the alternatives in this EA.

1 Due to these limitations, the following discussion is
 2 included in accordance with CEQ regulations (40
 3 CFR 1502.22(b)) regarding incomplete or unavail-
 4 able information:

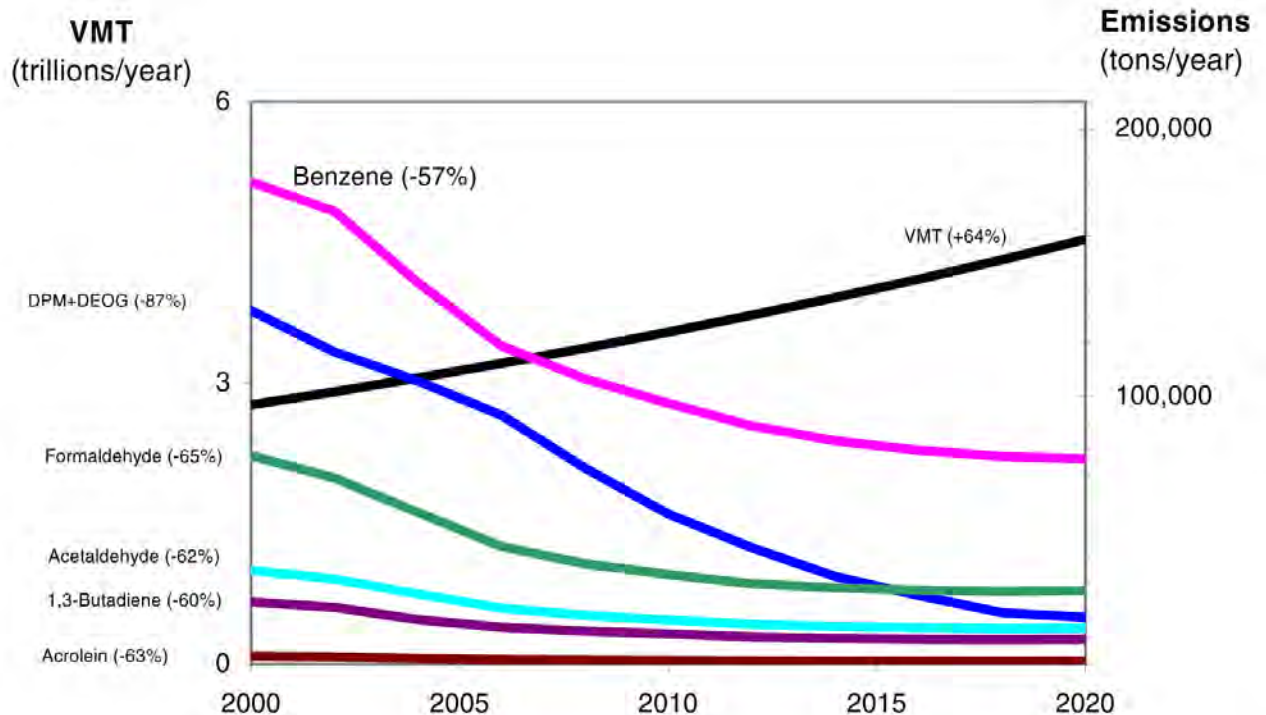
5 **Information that is Unavailable or Incomplete.**

6 Evaluating the environmental and health impacts
 7 from MSATs on a proposed highway project would
 8 involve several key elements, including emissions
 9 modeling, dispersion modeling in order to estimate
 10 ambient concentrations resulting from the estimated
 11 emissions, exposure modeling in order to estimate
 12 human exposure to the estimated concentrations,
 13 and then final determination of health impacts
 14 based on the estimated exposure. Each of these
 15 steps is encumbered by technical shortcomings or

16 uncertain science that prevents a more complete
 17 determination of the MSAT health impacts of this
 18 project.

19 1. Emissions: The EPA tools to estimate MSAT
 20 emissions from motor vehicles are not sensitive
 21 to key variables determining emissions of
 22 MSATs in the context of highway projects.
 23 While MOBILE 6.2 is used to predict emissions
 24 at a regional level, it has limited applicability at
 25 the project level. MOBILE 6.2 is a trip-based
 26 model—emission factors are projected based on
 27 a typical trip of 7.5 miles, and on average
 28 speeds for this typical trip. This means that
 29 MOBILE 6.2 does not have the ability to predict
 30 emission factors for a specific vehicle operating

Figure 3-15
U.S. Annual Vehicle Miles Traveled (VMT) vs. Mobile Source Air Toxics Emissions, 2000-2020



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.



1 condition at a specific location at a specific
2 time. Because of this limitation, MOBILE 6.2
3 can only approximate the operating speeds and
4 levels of congestion likely to be present on the
5 largest-scale projects, and cannot adequately
6 capture emissions effects of smaller projects. For
7 particulate matter, the model results are not sen-
8 sitive to average trip speed, although the other
9 MSAT emission rates do change with changes in
10 trip speed. Lastly, in its discussions of PM under
11 the conformity rule, EPA has identified prob-
12 lems with MOBILE6.2 as an obstacle to quanti-
13 tative analysis.

14 These deficiencies compromise the capability of
15 MOBILE 6.2 to estimate MSAT emissions.
16 MOBILE6.2 is an adequate tool for projecting
17 emissions trends, and performing relative analy-
18 ses between alternatives for very large projects,
19 but it is not sensitive enough to capture the
20 effects of travel changes tied to smaller projects
21 or to predict emissions near specific roadside
22 locations.

- 23 2. Dispersion. The tools to predict how MSATs dis-
24 perse are also limited. The EPA's current regula-
25 tory models, CALINE3 and CAL3QHC, were
26 developed and validated more than a decade
27 ago for the purpose of predicting episodic con-
28 centrations of carbon monoxide to determine
29 compliance with the NAAQS. The performance
30 of dispersion models is more accurate for pre-
31 dicting maximum concentrations that can occur
32 at some time at some location within a geo-
33 graphic area. This limitation makes it difficult to
34 predict accurate exposure patterns at specific
35 times at specific highway project locations
36 across an urban area to assess potential health
37 risk. The NCHRP is conducting research on best
38 practices in applying models and other techni-
39 cal methods in the analysis of MSATs. This work
40 also will focus on identifying appropriate meth-
41 ods of documenting and communicating MSAT
42 impacts in the NEPA process and to the general
43 public. Along with these general limitations of
44 dispersion models, FHWA is also faced with a
45 lack of monitoring data in most areas for use in

46 establishing project-specific MSAT background
47 concentrations.

- 48 3. Exposure Levels and Health Effects. Finally,
49 even if emission levels and concentrations of
50 MSATs could be accurately predicted, short-
51 comings in current techniques for exposure
52 assessment and risk analysis preclude us from
53 reaching meaningful conclusions about project-
54 specific health impacts. Exposure assessments
55 are difficult because it is difficult to accurately
56 calculate annual concentrations of MSATs near
57 roadways, and to determine the portion of a
58 year that people are actually exposed to those
59 concentrations at a specific location. These diffi-
60 culties are magnified for 70-year cancer assess-
61 ments, particularly because unsupportable
62 assumptions would have to be made regarding
63 changes in travel patterns and vehicle technol-
64 ogy (which affects emissions rates) over a 70-
65 year period. There are also considerable uncer-
66 tainties associated with the existing estimates of
67 toxicity of the various MSATs, because of factors
68 such as low-dose extrapolation and translation
69 of occupational exposure data to the general
70 population. Because of these shortcomings, any
71 calculated difference in health impacts between
72 alternatives is likely to be much smaller than the
73 uncertainties associated with calculating the
74 impacts. Consequently, the results of such
75 assessments would not be useful to decision
76 makers, who would need to weigh this informa-
77 tion against other project impacts that are better
78 suited for quantitative analysis.

79 ***Summary of Existing Credible Scientific Evidence***
80 ***Relevant to Evaluating the Impacts of MSATs.***

81 Research into the health impacts of MSATs is ongo-
82 ing. For different emission types, there are a variety
83 of studies that show that some either are statistically
84 associated with adverse health outcomes through
85 epidemiological studies (frequently based on emis-
86 sions levels found in occupational settings) or that
87 animals demonstrate adverse health outcomes
88 when exposed to large doses.

89 Exposure to toxics has been a focus of a number of
90 EPA efforts. Most notably, the agency conducted the

1 National Air Toxics Assessment (NATA) in 1996 to
 2 evaluate modeled estimates of human exposure
 3 applicable to the county level. While not intended
 4 for use as a measure of or benchmark for local expo-
 5 sure, the modeled estimates in the NATA database
 6 best illustrate the levels of various toxics when
 7 aggregated to a national or State level.

8 The EPA is in the process of assessing the risks of
 9 various kinds of exposures to these pollutants. The
 10 EPA Integrated Risk Information System (IRIS) is a
 11 database of human health effects that may result
 12 from exposure to various substances found in the
 13 environment. The IRIS database is located at [http://](http://www.epa.gov/iris)
 14 www.epa.gov/iris. The following toxicity informa-
 15 tion for the six prioritized MSATs was taken from
 16 the IRIS database Weight of Evidence Characteriza-
 17 tion summaries. This information is taken verbatim
 18 from EPA's IRIS database and represents the
 19 Agency's most current evaluations of the potential
 20 hazards and toxicology of these chemicals or mix-
 21 tures.

- 22 ▶ **Benzene** is characterized as a known human
 23 carcinogen.
- 24 ▶ The potential carcinogenicity of **acrolein** cannot
 25 be determined because the existing data are
 26 inadequate for an assessment of human carcino-
 27 genic potential for either the oral or inhalation
 28 route of exposure.
- 29 ▶ **Formaldehyde** is a probable human carcinogen,
 30 based on limited evidence in humans, and suffi-
 31 cient evidence in animals.
- 32 ▶ **1,3-butadiene** is characterized as carcinogenic
 33 to humans by inhalation.
- 34 ▶ **Acetaldehyde** is a probable human carcinogen
 35 based on increased incidence of nasal tumors in
 36 male and female rats and laryngeal tumors in

37 male and female hamsters after inhalation expo-
 38 sure.

- 39 ▶ **Diesel exhaust** is likely to be carcinogenic to
 40 humans by inhalation from environmental
 41 exposures. Diesel exhaust as reviewed in this
 42 document is the combination of diesel particu-
 43 late matter and diesel exhaust organic gases.
- 44 ▶ **Diesel exhaust** also represents chronic respira-
 45 tory effects, possibly the primary noncancer
 46 hazard from MSATs. Prolonged exposures may
 47 impair pulmonary function and could produce
 48 symptoms, such as cough, phlegm, and chronic
 49 bronchitis. Exposure relationships have not
 50 been developed from these studies.

51 There have been other studies that address MSAT
 52 health impacts in proximity to roadways. The
 53 Health Effects Institute, a non-profit organization
 54 funded by EPA, FHWA, and industry, has under-
 55 taken a major series of studies to research near-road-
 56 way MSAT hot spots, the health implications of the
 57 entire mix of mobile source pollutants, and other
 58 topics. The final summary of the series is not
 59 expected for several years.

60 Some recent studies have reported that proximity to
 61 roadways is related to adverse health outcomes-par-
 62 ticularly respiratory problems¹. Much of this
 63 research is not specific to MSATs, instead surveying
 64 the full spectrum of both criteria and other pollut-
 65 ants. The FHWA cannot evaluate the validity of
 66 these studies, but more importantly, they do not
 67 provide information that would be useful to allevi-
 68 ate the uncertainties listed above and enable us to
 69 perform a more comprehensive evaluation of the
 70 health impacts specific to this project.

71 ***Relevance of Unavailable or Incomplete Informa-***
 72 ***tion to Evaluating Reasonably Foreseeable Signifi-***
 73 ***cant Adverse Impacts on the Environment, and***
 74 ***Evaluation of impacts based upon theoretical***

1.South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.



1 **approaches or research methods generally**
2 **accepted in the scientific community.** Because of
3 the uncertainties outlined above, FHWA believes a
4 quantitative assessment of the effects of air toxic
5 emissions impacts on human health cannot be
6 made at the transportation project level. While
7 available tools do allow us to reasonably predict relative
8 emissions changes between alternatives for
9 larger projects, the amount of MSAT emissions from
10 each of the project alternatives and MSAT concentrations
11 or exposures created by each of the project
12 alternatives cannot be predicted with enough accuracy
13 to be useful in estimating health impacts. (As
14 noted above, the current emissions model is not
15 capable of serving as a meaningful emissions analysis
16 tool for smaller projects.) Therefore, the relevance
17 of the unavailable or incomplete information is that
18 it is not possible to make a determination of whether
19 any of the alternatives would have “significant
20 adverse impacts on the human environment.”

21 In this document, FHWA has provided a qualitative
22 analysis of MSAT emissions relative to the various
23 alternatives and has acknowledged that the two
24 project alternatives (Preferred and Optional) may
25 result in increased exposure to MSAT emissions in
26 certain locations, although the concentrations and
27 duration of exposures are uncertain, and because of
28 this uncertainty, the health effects from these
29 emissions cannot be estimated.

30 **3.8.6.2 Project-Level Analysis**

31 As discussed above, FHWA believes technical
32 shortcomings of emissions and dispersion models
33 and uncertain science with respect to health effects
34 prevent meaningful or reliable estimates of MSAT
35 emissions and effects of this transportation project.
36 However, even though reliable methods do not
37 exist to accurately estimate the health impacts of
38 MSATs at the transportation project level, it is possible
39 to qualitatively assess the levels of future MSAT
40 emissions under the project. Although a qualitative
41 analysis cannot identify and measure health impacts
42 from MSATs, it can give a basis for identifying and
43 comparing the potential differences among MSAT
44 emissions-if any-from the various alternatives. The
45 qualitative assessment presented below is derived in

46 part from a study conducted by the FHWA entitled
47 A Methodology for Evaluating Mobile Source Air
48 Toxic Emissions Among Transportation Project
49 Alternatives, found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

51 For each EA alternative, the amount of MSATs emitted
52 would be proportional to the vmt assuming that
53 other variables such as fleet mix are the same for
54 each alternative. The vmt estimated for the Preferred
55 Alternative is slightly higher than that for the No-
56 Action Alternative because the additional capacity
57 would increase the efficiency of the roadway and
58 attracts rerouted trips from elsewhere in the transportation
59 network. The Preferred Alternative
60 includes all three interchange ramp configurations.
61 The No-Action Alternative includes upgrading and
62 improving local arterial roadways to six-lanes (Picadilly,
63 Harvest and Colfax extensions). The .001 percent
64 increase in vmt would lead to slightly higher
65 MSAT emissions for the Preferred Alternative. The
66 emissions increase is offset somewhat by lower
67 MSAT emission rates due to increased speeds;
68 according to EPA's MOBILE6 emissions model,
69 emissions of all of the priority MSATs except for diesel
70 particulate matter decrease as speed increases.
71 The extent to which the decreases in these speed-
72 related emissions would offset the increases of vmt-
73 related emissions cannot be reliably projected
74 because of the inherent deficiencies of technical
75 models.

76 It is anticipated that the Preferred Alternative would
77 move traffic closer to future sensitive receivers, thus
78 increasing exposure to MSATs. However, the Preferred
79 Alternative would result in a free-flowing LOS
80 lowering overall MSAT concentrations; congestion
81 resulting from the No-Action Alternative would contribute
82 to higher MSAT levels. Also, regardless of
83 the alternative chosen, emissions (with either the
84 No-Action or Preferred Alternatives) would likely be
85 lower than present levels in 2030 as a result of
86 EPA's national control programs that are projected
87 to reduce MSAT emissions by 57 to 87 percent
88 between 2000 and 2020. The magnitude of the
89 EPA-projected reductions is so great (even after
90 accounting for vmt growth) that MSAT emissions in

1 the study area are likely to be lower in the future in
 2 nearly all cases.

3 3.9 NOISE

4 Noise levels are measured in decibels, abbreviated
 5 dB, and are adjusted to better match the response of
 6 the human ear by a method called A-weighting
 7 (dBA). Noise level measurements are also averaged
 8 to replicate an hour-long period to better represent
 9 the multiple noise events occurring in an area rather
 10 than measuring a single noise event. This measure-
 11 ment is referred to as the Leq(h). The measured
 12 noise levels are used to validate a Traffic Noise
 13 Model (TNM) v2.5 of the site. Noise levels from
 14 computer modeling incorporate free-flowing peak-
 15 hour traffic volumes, traffic speeds, local topogra-
 16 phy, roadway configurations, and the location of
 17 receivers relative to the roadway.

18 CDOT has adopted criteria by which to determine
 19 noise impacts from traffic sources on certain land
 20 uses. These noise abatement criteria (NAC) are
 21 shown in **Table 3-10**.

22 The criteria are typically applied to outdoor areas of
 23 use, which for residences is usually described as a

24 first-floor outdoor patio/deck area. If a project
 25 would result in noise levels above these thresholds,
 26 noise mitigation would need to be considered as a
 27 part of the project. Additionally, a noise impact is
 28 considered to be substantial if the project would
 29 result in a noise increase of 10 dBA or greater over
 30 existing noise levels. Mitigation would then need to
 31 be considered. Generally, an increase of 3 to 5 dBA
 32 is noticeable to the human ear, and an increase of
 33 10 dBA is perceived by the human ear as a doubling
 34 of noise levels.

35 3.9.1 Existing Conditions

36 Land uses in the study area are primarily transporta-
 37 tion and agricultural, with some commercial and
 38 residential uses. Noise-sensitive land uses include
 39 the former Candle Lite Motel, a single-family resi-
 40 dence, and residential subdivisions between I-70
 41 and East Colfax Avenue, and 11th Avenue and Pica-
 42 dilly. Much of the currently undeveloped agricul-
 43 tural land is platted for commercial and light
 44 industrial development. Commercial, light indus-
 45 trial facilities are located northeast of the current I-
 46 70/E-470 interchange, and a natural gas compres-
 47 sion station is north of I-70 near Harvest Road.

Table 3-10
CDOT Noise Abatement Criteria (NAC)

Category	Leq(h)* Decibels of A wave	Description of Activity Category
A	56 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 Exterior	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	71 Exterior	Developed lands, properties or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	51 Interior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: CDOT

*Leq(h) describes the hourly value of Leq. Leq is the mean noise level during the peak traffic period.



1 Noise analyses were conducted for the study area.
 2 Current CDOT noise policy requires a noise analy-
 3 sis to include all receivers within a study area that is
 4 defined as receivers within a 500-foot distance in all
 5 directions from any of the proposed action's road-
 6 ways (see **Figure 2-12**). Field noise measurements
 7 were taken at three locations around the study area
 8 where outdoor activity is likely to occur. Results of
 9 existing noise levels for the monitored sites are
 10 shown in **Table 3-11** and locations shown on **Figure**
 11 **3-16**. For more detailed information, please refer to
 12 the *I-70/E-470 Noise Analysis Technical Memorandum*
 13 (Carter & Burgess, 2006).

14 The existing noise levels approach or exceed the
 15 NAC at two of the monitoring locations. These sites
 16 fall under Activity Category B of the NAC. These
 17 field measurements were also used to verify the
 18 model of existing noise levels for all receivers in the
 19 study area, using the STAMINA 2.0 software accord-
 20 ing to CDOT noise modeling guidelines.

21 CDOT noise policy states that noise impacts must
 22 be determined for future developments that have
 23 been platted and have issued building permits at the
 24 time of the analysis. At the time of this study, most
 25 of the study area between Picadilly Road and Har-
 26 vest Road, and Smith Road and Colfax Avenue, has
 27 been planned or platted for development. The

28 northeast quadrant of the existing I-70/E-470 inter-
 29 change is platted and permitted for a business park.
 30 The northwest quadrant of the existing I-70/E-470
 31 interchange is platted for warehouse and light
 32 industrial development. The City of Aurora has
 33 recently disclosed planning for Horizon City Center,
 34 a 2,800-unit residential development with associ-
 35 ated retail and commercial development centered
 36 on the relocated Colfax Avenue.

37 Receivers have been placed to represent noise sen-
 38 sitive sites in accordance with the CDOT Noise Pol-
 39 icy and Guidelines (2002). There are currently no
 40 plats or building permits for this development.

41 3.9.2 Future Noise Levels

42 Future traffic volumes and future interchange road-
 43 way alignments were modeled to determine future
 44 noise levels with the Preferred Alternative. Receiv-
 45 ers were placed at the monitored sites and seven
 46 other sites within the study area to determine future
 47 noise levels and impacts under both the No-Action
 48 and the Preferred Alternative (see **Figure 3-16** for
 49 the locations of the noise model receivers). The sites
 50 modeled represent current and future noise-sensi-
 51 tive uses within the study area. Predicted noise lev-
 52 els in 2030 at the impacted locations are listed in
 53 **Table 3-12**.

Table 3-11
Field Noise Monitoring Results

Site ID	Activity Category	Location	Monitored Noise Level (dBA) During a.m. Peak Hours	Monitored Noise Level (dBA) During p.m. Peak Hours	Modeled Existing Noise Level (dBA) During p.m. Peak Hours
R4	B	East end of residential motel	59.5	67.6	68.6
R5	B	West end of residential motel	57.6	71.5	67.6
R6	B	Picadilly and East 11th Street	53.6	54.7	60.3

Figure 3-16
Noise Monitoring and Model Receiver Locations

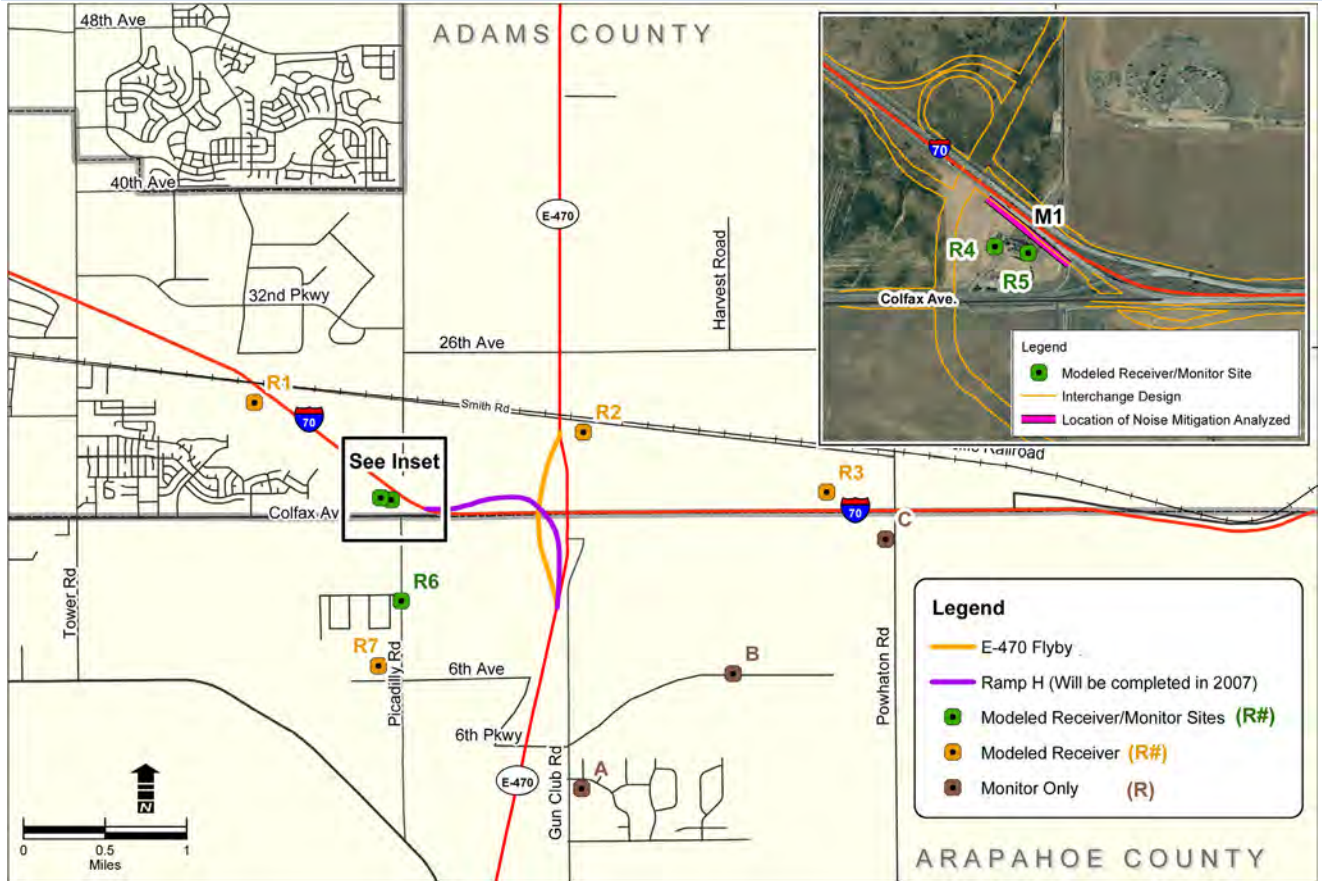


Table 3-12
Predicted Noise Levels at Modeled Locations

Site ID	NAC Category	Description of Receiver	Existing 2005 Traffic (dBA)	No-Action Including Flyby Alternative 2030 AM/PM Peak Traffic (dBA)	Preferred Alternative 2030 AM/PM Peak Traffic (dBA)
R1	B	Cemetery 300 feet from I-70	65.2	67.3/67.3	67.9/68.0
R2	C	Commercial site at East 19th Avenue	57.8	57.8/57.4	61.5/61.2
R3	B	Grimm Farm, 2580 I-70 Frontage Road	--	59.3/59.6	61.3/61.4
R4	B	Single residence at I-70 Colfax ramps	69.7	62.9/63.4	63.8/64.1
R5	B	Former motel at I-70 Colfax ramps	68.2	65.5/66.4	65.5/66.0
R6	B	Representative residence at East 11th Street & Picadilly	56.0	62.3/63.2	63.6/65.1
R7	B	Representative residence along Picadilly Road	--	64.4/65.6	65.9/67.7



3.9.3 Noise Impacts

This section describes noise impacts.

Would this project increase noise levels? The noise levels predicted for the new interchanges along I-70 at E-470 and Harvest Road would not greatly increase the noise levels at any existing neighborhood. The resident-motel at I-70 and Picadilly would remain impacted above federally established thresholds. It is currently impacted by the existing I-70 mainline traffic. The neighborhood at Picadilly Road and 11th Avenue would experience an increase of 7 to 9 decibels over the existing noise levels because of the modification planned on Picadilly Road.

No-Action Alternative. Noise levels near the interchange are expected to increase as traffic increases. The No-Action Alternative includes the widened six-lane Picadilly Road, extended, six-lane Harvest Road, relocated and extended Colfax Avenue, the E-470 Flyby, the modified old E-470 alignment, I-70 access ramps, and a northbound E-470 to westbound I-70 ramp. 2030 traffic projections developed using the DRCOG regional model show that the Gun Club Road daily traffic south of Colfax Avenue would average 12,000 vehicles per day (vpd). Traffic counts on Gun Club Road in 2004 totaled 3,600 vehicles on the average day. The No-Action Alternative continues to focus interstate-destined traffic onto E-470 and Gun Club Road, increasing the effect of noise along those routes.

Predicted noise levels are listed in **Table 3-12**. All modeled noise receiver locations are highlighted in **Figure 3-16**. The former motel at the I-70 Colfax ramps (R4) and the cemetery south of I-70 (R1) would experience noise at or above the 66 dBA Colorado NAC, while the Picadilly residential subdivision (R6, R7) and Grimm Farm (R3) located near I-70 at Harvest Road would not exceed the NAC. The existing Category C commercial receiver located at East 19th Avenue east of E-470 (R2) would not experience noise at or above 71 dBA commercial abatement criterion.

Preferred Alternative. The Preferred Alternative has three separate interchanges. A series of complex braided and flyover ramps would provide freeway-to-freeway access between I-70 and E-470. The existing E-470 alignment would be reconfigured

and existing signalized intersections would be preserved to provide local access at 19th Avenue and relocated Colfax Avenue. This alternative would allow the through traffic on north- and southbound E-470 to flow freely while allowing local access through the existing intersections.

Under the Preferred Alternative, the present diaphragm interchange at Gun Club Road would be replaced by a new full interchange with an overpass at a continuous, widened Harvest Road. The Preferred Alternative would also replace the partial interchange at Colfax Avenue with a full interchange including a continuous, widened Picadilly Road. The main roadway of Picadilly Road would be depressed and pass under I-70. Colfax Avenue would be relocated to an offset location south along Picadilly Road and continue east to connect with Harvest Road.

The receivers in the Preferred Alternative would generally experience the same or slightly increased noise as the No-Action Alternative, as shown in **Table 3-12**. The former motel at the I-70 Colfax ramps (R4), the cemetery south of I-70 (R1), and residences along Picadilly Road (R7) would experience noise at or above the 66 dBA Colorado NAC. Residential noise receivers exceeding the abatement criterion require consideration of mitigation measures. The existing Category C commercial receiver located at East 19th Avenue east of E-470 (R2) would not experience noise at or above 71 dBA commercial abatement criterion. Additional discussion of noise issues can be found in **Section 3.22**.

3.9.4 Noise Mitigation

According to FHWA and CDOT, the “feasibility and reasonableness” of mitigation needs to be considered for all locations that are projected to experience noise impacts. The feasibility analysis of mitigation considers such factors as the effectiveness of a barrier to achieve a 5-dBA reduction in predicted future noise levels, construction, engineering, maintenance, or other design issues. Mitigation measures are considered feasible if they can achieve a minimum of a 5-dBA noise reduction for at least one receiver. They should not create any

1 safety or unacceptable maintenance problems.
 2 Noise mitigation is considered reasonable if it meets
 3 certain criteria, such as the cost per receiver per
 4 decibel of noise reduction and type of land use pro-
 5 tected. For example, business districts typically do
 6 not receive noise mitigation, as noise barriers would
 7 block the view of businesses from motorists.

8 Mitigation should consider all possible noise abate-
 9 ment measures for reasonableness and feasibility.
 10 These include noise barriers or walls, earthen
 11 berms, creating buffer zones of undeveloped land,
 12 planting vegetation, traffic management, installing
 13 noise insulation on buildings, and relocating the
 14 highway.
 15

What would happen to local Gun Club Road traffic? Would the noise levels increase in the Gun Club Road neighborhoods south of the interchanges?

More than 8,000 new residents and jobs are projected for the immediate area around I-70/E-470 by 2030. Access with I-70 and E-470 would be provided by ramps to and from the existing system at three locations, each approximately one mile from the new I-70/E-470 interchange: I-70/Picadilly Road, I-70/Harvest Road, and E-470/6th Parkway. Access would also be provided at E-470 and 6th and E-470 and 56th. A new alignment of Gun Club Road in the vicinity of I-70 is planned, removing direct accessibility from the interstate and E-470. Most local, interstate and tollway traffic would be distributed to the improved Picadilly and Harvest Roads by the new interchanges and ramp configurations. This would eliminate much of the through traffic that currently utilizes Gun Club Road and is responsible for much of the noise in the neighborhoods today. Morning and afternoon rush hour measurements of 58.0 and 58.3 decibels were taken at the vicinity of Gun Club and 6th Parkway. Today's traffic on Gun Club Road averages 3,600 vehicles per day (vpd). If no interchanges are built, the 2030 traffic would be over 8,000 vpd with a corresponding increase in noise levels of about 2 to 3 decibels, still under the threshold for noise impacts. With the installation of the three interchanges, that number drops to 4,000 vpd. These new and improved Picadilly and Harvest Roads are expected to carry more than 21,000 vpd resulting from growth and the new facilities in 2030. The composition of traffic on Gun Club (high heavy truck volumes) would likely change because of the lack of direct interstate access. The net result to outlying subdivisions, particularly in the vicinity of E-470 and 6th Parkway, would be increased traffic, and therefore increased noise levels on the improved Picadilly and Harvest Roads. Noise levels on Gun Club Road would remain at levels similar to the existing conditions.

16 Creating buffer zones, constructing earth berms,
 17 and planting vegetation may be feasible south of the
 18 I-70 corridor. Although these abatement measures
 19 require large amounts of land to achieve the neces-
 20 sary noise reductions, the early planning stages of
 21 development and surrounding land use in the south-
 22 ern half of the study area could allow the City of
 23 Aurora to require abatement measures, such as ded-
 24 icated landscaped buffers and set-backs for areas of
 25 development with concentrated sensitive receivers.

26 Traffic management, such as limiting truck traffic on
 27 the highway, is not feasible because the interstate is
 28 the designated national transport route. Tolling on
 29 E-470 already is effective in controlling traffic vol-
 30 umes and composition. However, restriction of
 31 truck traffic on arterial streets would create difficul-
 32 ties because of the limited local roadway network
 33 connectivity and the high demand for truck access
 34 at both the Quincy Road landfill and warehouse-
 35 light industry businesses of the northern quadrants
 36 of the study area.

37 Because of the high cost, installing noise insulation
 38 on buildings is usually reserved for public buildings
 39 such as schools or hospitals. For this reason, noise
 40 barriers are the most appropriate noise abatement
 41 measure for the Preferred Alternative.

42 Site R1 is a cemetery, which in the future with the
 43 No-Action and Preferred Alternatives, would
 44 exceed the FHWA and CDOT Noise Abatement Cri-
 45 teria. Because the cemetery has only sporadic use, a
 46 barrier at this location would constitute little recog-
 47 nizable benefit, thus a barrier is not feasible and rea-
 48 sonable and not recommended.

49 **Barrier M1.** Noise walls of various lengths and
 50 heights were modeled for the impacted receiver at
 51 the former motel location to determine if mitigation
 52 would be reasonable and feasible. The mitigation
 53 analysis addressed walls located adjacent to the I-70
 54 eastbound clear zone running at varying lengths
 55 between the Picadilly Road bridge to near the pro-
 56 posed E-470 southbound ramp. As shown in the
 57 summary of mitigation analysis in **Table 3-13**, to
 58 achieve the minimum 5-decibel reduction required
 59 by CDOT, portions of the wall would need to be at



**Table 3-13
Results of Mitigation Analysis for the Preferred Alternative**

Barrier	Barrier Height (ft)	Barrier Length (ft)	Barrier Cost	Benefited Receivers	Average Noise Reduction (dBA)	Cost per Benefited Received per dBA	Reasonable or Feasible
M1a	14	1,300	\$546,000	6	1.9	\$47,890	No
M1b	18	1,300	\$702,000	6	3.3	\$35,450	No
M1c	20	1,300	\$780,000	6	5.4	\$21,660	No
M1d	20	900	\$540,000	6	4.6	\$19,565	No

1 least 20 feet tall. A 20-foot-tall noise barrier would
 2 exceed \$19,500 per decibel reduction for all recep-
 3 tors that experienced a reduction in noise. **For this**
 4 **reason, noise mitigation for the Preferred Alterna-**
 5 **tive was found to be not reasonable or feasible.**

6 **Picadilly Road.** Noise impacts to the Picadilly Road
 7 residential subdivision represented by receivers R6
 8 and R7 require consideration of noise abatement
 9 mitigation. Each residence would require driveway
 10 access to the existing Picadilly alignment. A mitiga-
 11 tion barrier would not be reasonable or feasible for
 12 multiple reasons. The continuity of the noise barrier
 13 would be broken by gaps created at each driveway.
 14 Line-of-sight restrictions from these driveways
 15 accessing the existing Picadilly alignment would
 16 require large gaps in the noise barrier, which dra-
 17 matically reduce the barrier’s overall effectiveness.
 18 Additionally, the relatively wide spacing of homes
 19 along Picadilly would require a 4,000- to 5,000-
 20 foot-long wall to achieve an effective noise reduc-
 21 tion for the first row of receivers. The cost-benefit
 22 for such a barrier with this low-density housing is
 23 typically not reasonable.

24 If the alignment of Picadilly Road were shifted east
 25 of the current alignment, noise reduction would
 26 result. A major change of alignment would allow for
 27 other noise abatement measures to be employed to
 28 further reduce noise at this subdivision, such as use
 29 of the existing Picadilly Road as a frontage road to
 30 maintain access to existing driveways while provid-

31 ing limited access to a new mainline Picadilly arte-
 32 rial road located farther east. This scenario would
 33 address feasibility flaws created by safety issues and
 34 allow future consideration of noise abatement bar-
 35 rier. This mitigation measure would be the responsi-
 36 bility of the City of Aurora or developers.

37 3.10 WATER RESOURCES AND 38 WATER QUALITY

39 3.10.1 Existing Conditions

40 The study area falls within the South Platte River
 41 Basin, which covers approximately 24,300 square
 42 miles. The South Platte River originates in the
 43 mountains of central Colorado at altitudes higher
 44 than 14,000 feet above sea level. The river flows
 45 northeastward for approximately 270 miles through
 46 the Front Range urban corridor and across the east-
 47 ern plains. Elevations in the vicinity of the project
 48 average 5,117 feet above sea level.

49 The City of Aurora's water supply comes primarily
 50 from snowmelt runoff in Colorado. Water is trans-
 51 ported from as far as 180 miles away to meet daily
 52 needs. The City of Aurora has a comprehensive plan
 53 to provide for the current and future water needs of
 54 Aurora residents. Aurora's goal is to double storage
 55 capacity by the year 2030 to 300,000 acre-feet,
 56 which would meet projected water demand. The
 57 plan includes developments for improving water

1 storage capabilities and maintaining and upgrading
2 pipes, pumps, and treatment plants. In addition, it
3 actively encourages conservation.

4 The only surface water within the study area
5 includes one intermittent stream, First Creek. Sand
6 Creek is next closest drainageway just to the south
7 of the study area. Because of the intermittent nature
8 of these creeks, there is no water quality or flow
9 information available for either creek.

10 The proposed action's location falls under the
11 CDPHE Phase I and Phase II Storm Water Regula-
12 tions, "Urbanized Areas," and would follow the
13 requirements of CDOT's Municipal Separate Storm
14 Sewer System (MS4) permit.

15 3.10.2 Water Resources and Water Quality 16 Impacts

17 **No-Action Alternative.** The No-Action Alternative
18 would likely have no impact on First Creek in the
19 near term; however, based on the expected loca-
20 tions and amount of impervious roadway surface of
21 the No-Action Alternative roadway network,
22 impacts to the creek would occur in the future.

23 **Preferred Alternative.** The Preferred Alternative
24 would impact First Creek. Construction of the new
25 interchanges, in addition to placement of new road-
26 ways, would increase the amount of impervious sur-
27 faces, thereby increasing storm runoff. Another
28 impact associated with construction is soil erosion,
29 which could result in increased contamination of
30 waterways. In addition, due to construction activi-
31 ties, permanent modification to First Creek, an inter-
32 mittent stream channel, would be necessary. These
33 water quality impacts are expected to be minimal
34 because of the intermittent nature of First Creek and
35 the implementation of temporary and permanent
36 Best Management Practices (BMPs) (see Section
37 3.10.3). By implementing the BMPs, there would
38 not be a major long-term impact to the water quality
39 of First Creek or downstream waterways in the
40 South Platte River Basin.

41 No impacts to ground water quality are expected
42 because of the Preferred Alternative.

43 3.10.3 Water Resources and Water Quality 44 Mitigation

45 The use of standard erosion and sediment control
46 BMPs in accordance with Erosion Control and
47 Storm Water Quality Guide, CDOT, 2002, would
48 be included in the final design plans. A drainage
49 master plan would be prepared in cooperation with
50 the Urban Drainage and Flood Control District,
51 E-470, CDOT, the City of Aurora, and the Counties
52 of Adams and Arapahoe, ensuring that new inter-
53 change drainage facilities are compatible with adja-
54 cent facilities.

55 All work on the proposed action shall be in confor-
56 mity with Subsection 107.25 and Section 208 of the
57 *CDOT Standard Specifications for Road and Bridge*
58 *Construction*. As previously mentioned, the pro-
59 posed action's location falls under the CDPHE
60 Phase I and Phase II Storm Water Regulations and
61 would follow the requirements of CDOT's MS4 per-
62 mit. Specifically, the two CDOT Storm Water Man-
63 agement Programs that would apply are the
64 Construction Sites Storm Water Management Pro-
65 gram and the New Development and Redevelop-
66 ment Planning Procedures for Storm Water
67 Management.

68 After a highway project is identified, the permanent
69 BMP planning process under MS4 is to determine if
70 there would be water quality impacts. If there are,
71 permanent BMPs are required. The permanent
72 BMPs should be included in the proposed action's
73 preliminary design, including cost consideration.
74 Once this design, is underway, an environmental
75 review can be performed that includes the concep-
76 tual BMPs. As the environmental document is being
77 prepared, final determination on the BMPs is made.
78 Once this is completed, field review and prelimi-
79 nary design modifications are conducted, which is
80 then followed by final BMP design and CDOT
81 review.

82 Through continuous collaboration with the flyby
83 design team, the E-470 Authority, and CDOT, the
84 interim and ultimate condition analyses for the full
85 I-70/E-470 interchange were coordinated so that
86 permanent BMPs designed for the flyby phase



1 would also be used in the full I-70/E-470 inter-
2 change. This is documented in the *Final Storm*
3 *Drainage Design Report: I-70/E-470 Interchange*
4 *Complex Project, Flyby Phase 1*, February 2005 and
5 revised in April 2005. The flyby did not impact the
6 Harvest Road interchange area or the Picadilly Road
7 interchange area; therefore, new water quality facili-
8 ties have been proposed for those areas and are
9 described in the *I-70/E-470 Interchange Complex*
10 *Preliminary Storm Drainage Design Report*, (Par-
11 sons Brinckerhoff, 2006). This report will be submit-
12 ted to CDOT before the completion of the EA
13 process. Proposed permanent BMP water quality
14 facilities were preliminarily sized using the Water
15 Quality Control Volume (WQCV) equation pre-
16 sented in the *Urban Drainage and Flood Control*
17 *District (UDFCD) Urban Storm Drainage Criteria*
18 *Manual (USDCM) Volume 3, Best Management*
19 *Practices*. This equation bases the size of the basin
20 on the amount of impervious area contributing to
21 the basin. All permanent BMPs were designed to
22 capture 100 percent of the runoff from the impervi-
23 ous surface.

24 The following specific BMPs from the *Erosion Con-*
25 *trol and Storm Water Quality Guide*, CDOT, 2002,
26 would be required during construction to reduce
27 construction-related and/or long-term impacts to
28 water resources:

- 29 ▶ Adjacent disturbed fill slopes would be revege-
30 tated with native plant species to protect
31 exposed soils from erosion.
- 32 ▶ Disturbance to vegetated areas would be mini-
33 mized, and revegetation of disturbed vegetated
34 surfaces would occur within seven days of
35 earthwork as required by the Colorado Dis-
36 charge Permit System regulations. Where tem-
37 porary or permanent seeding operations are not
38 feasible because of seasonal constraints (e.g.,
39 summer and winter months), mulch and mulch
40 tackifier or soil binder would be applied to pro-
41 tect soils from erosion.
- 42 ▶ Erosion control blankets would be used on, a
43 minimum, steep (2:1 or greater, or 3:1 or
44 greater on slopes facing south or west), newly

45 seeded slopes to control erosion and to promote
46 the establishment of vegetation. Slopes should
47 be roughened at all times.

- 48 ▶ Concrete washout must be contained and prop-
49 erly disposed.
- 50 ▶ Erosion bales and straw logs would be used as
51 sediment barriers and filters along the toes-of-fill
52 adjacent to surface waterways and at inlets
53 where appropriate.
- 54 ▶ Silt fences, erosion logs, or temporary berms
55 would be used to intercept sediment-laden run-
56 off before it enters a wetland or surface water
57 feature.
- 58 ▶ Sediment catch basins would be built during
59 construction and permanently maintained to
60 capture the sand from the road surface during
61 winter sanding operations.
- 62 ▶ Where appropriate, slope drains would be used
63 to convey concentrated runoff from the top to
64 bottom of disturbed slopes. Slope and cross-
65 drain outlets would be constructed to trap sedi-
66 ment.
- 67 ▶ Storm drain inlet barriers would be used where
68 appropriate to trap sediment before it enters the
69 cross-drain.
- 70 ▶ Check dams would be used where appropriate
71 to slow the velocity of water through roadside
72 ditches and in swales.
- 73 ▶ Temporary retention ponds would be used to
74 allow sediment to settle out of runoff before it
75 leaves the construction area. These ponds may
76 be combined with permanent detention ponds.
- 77 ▶ Structural BMPs can include the following:
78 extended detention basins with sediment fore-
79 bays, wetland grass swales, wetland grass buff-
80 ers, and constructed wetland basins. Non-
81 structural BMPs can include litter and debris
82 control, and landscaping and vegetative prac-
83 tices.
- 84 ▶ Settling ponds for effluent from dewatering
85 operations would be used, if needed.

1 During the design, the CDOT Hydraulic Engineer
2 and Landscape Architect would review the project
3 plans and provide comments as necessary.

16 Although wetland area has decreased recently
17 because of severe drought, it is anticipated that wet-
18 lands would recover as hydrology is restored.

4 **3.II WETLANDS AND OTHER WATERS**
5 **OF THE U.S.**

19 **3.II.I Existing Conditions**

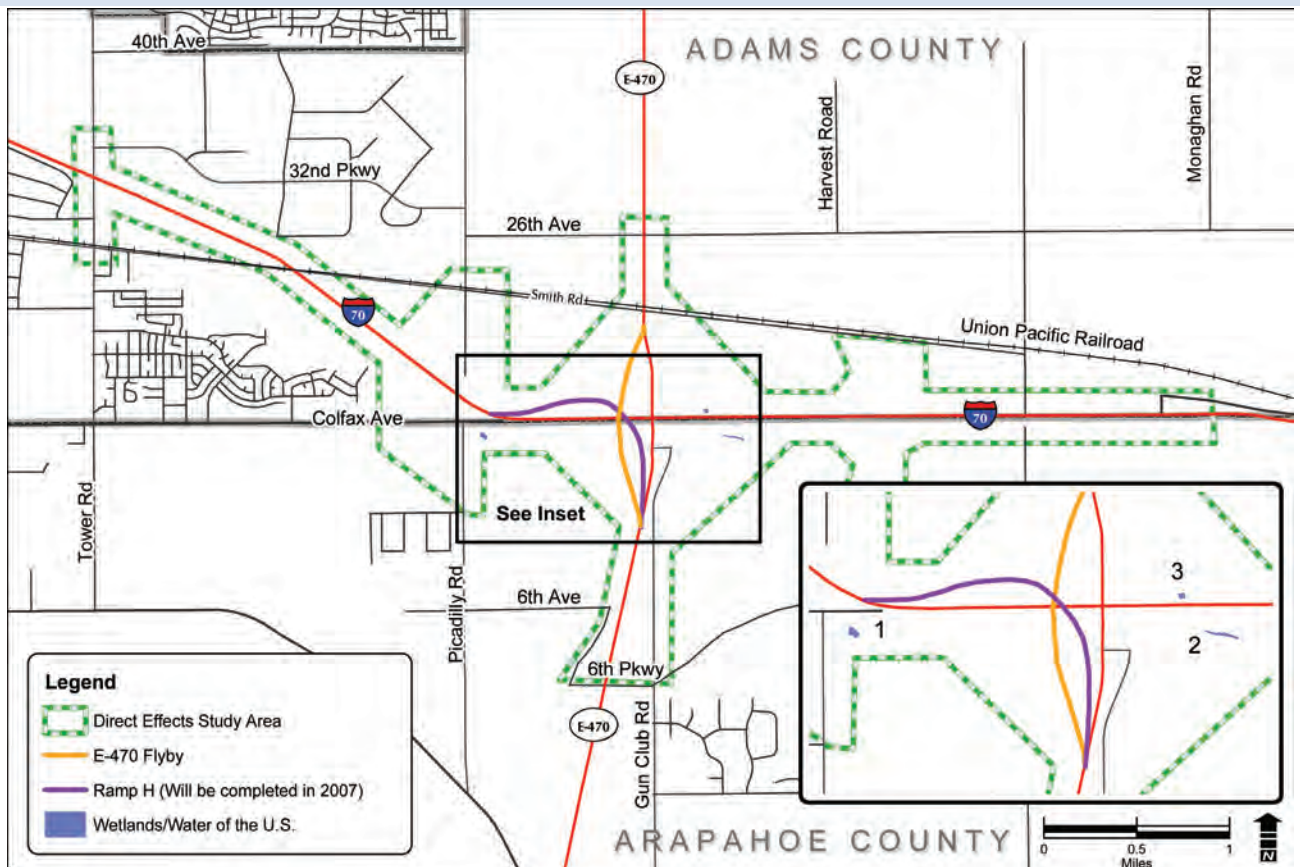
6 Wetlands of the study area were delineated by ERO
7 Resources in September and November 2000, and
8 were reviewed and rechecked in April 2003 by
9 Carter & Burgess. Wetland areas were determined
10 based on the presence of hydrophytic vegetation,
11 hydric soils, and wetland hydrology as specified in
12 the 1987 U.S. Army Corps of Engineers Wetlands
13 Delineation Manual. Wetlands were present in the
14 southwest quadrant of the interchange and in the
15 First Creek swale (see **Figure 3-17**).

20 As shown in **Figure 3-17** and **Table 3-14**, two wet-
21 land sites and one other Waters of the U.S. site are
22 present within the study area. As determined by the
23 U.S. Army Corps of Engineers (USACE), jurisdic-
24 tional wetlands and Waters of the U.S. are present
25 in the First Creek swale (correspondence from the
26 USACE is included in **Appendix A**).

27 **3.II.2 Wetlands and other Waters of the U.S.**
28 **Within the Study Area**

29 Wetland delineations were conducted in spring
30 2003 to verify previously identified wetlands.

**Figure 3-17
Existing Wetlands**





**Table 3-14
Wetlands and other Waters of the U.S. in the Study Area**

Site ID	Existing Acres within the Study Area	USACE Jurisdictional?	Cowardin Wetland Type	Comment
1	2*	No	Palustrine emergent	Isolated marsh
2	1*	Yes	Palustrine emergent	First Creek swale
3	<.01	Yes	Waters of the U.S.	First Creek
Total	3 acres			

*Maximum area based on 2000 surveys.

1 **Site 1** is a wetland that appeared to be in transition
 2 to a drier vegetation community, probably due to
 3 the severe drought condition of the two previous
 4 summers. The area was mapped as possibly wetland
 5 based on saturated soils, borderline soil colors, and
 6 presence of senescent bulrush (*Schoenoplectus*
 7 *lacustris*, obligate wetland). Much of the former
 8 wetland area has been invaded by noxious weed
 9 Canada thistle (*Breea arvensis*, facultative upland)
 10 and by alien kochia (*Bassia sieversiana*, facultative
 11 upland).

12 **Site 2** is a cattail (*Typha angustifolia*, obligate) wet-
 13 land with a mature peach-leaved willow (*Salix*
 14 *amygdaloides*, facultative wetland) in the First Creek
 15 swale. Soils were saturated and had low-chroma
 16 colors. A Canada thistle infestation was present
 17 adjacent to the wetland.

18 The USACE has determined that wetlands in the
 19 First Creek swale may be jurisdictional wetlands.
 20 First Creek is an intermittent stream that flows only
 21 after storm events. Much of the swale is vegetated
 22 by upland species and is under cultivation.

23 In general, wetland functions include channel stab-
 24 lization, food chain support, wildlife habitat, flood
 25 control, and groundwater recharge/discharge.

26 **Site 3** is the First Creek swale just north of I-70. The
 27 50-foot section at the I-70 concrete box culvert out-
 28 let meets streambed qualifications and is considered
 29 a Waters of the U.S. under USACE jurisdiction.

30 **3.11.3 Wetlands and Other Waters of the U.S.** 31 **Impacts**

32 **No-Action Alternative.** No wetlands or other
 33 Waters of the U.S. would be impacted under the
 34 No-Action Alternative.

35 **Preferred Alternative.** The Preferred Alternative
 36 would not impact wetlands but would impact the
 37 jurisdictional portion of the First Creek swale adja-
 38 cent to I-70. The culvert would be extended about
 39 50 feet to the north because of widening of the I-70
 40 mainline. USACE anticipates use of Nationwide Per-
 41 mit 18 for fill in the First Creek Waters of the U.S.;
 42 no mitigation is required with this permit.

43 **3.11.4 Practicable Alternatives**

44 Because the Preferred Alternative would involve
 45 construction of an auxiliary lane on I-70 westbound,
 46 no practicable alternatives were present to avoid
 47 impacts to the jurisdictional portion of the First
 48 Creek swale.

49 **3.11.5 Wetland Mitigation**

50 Because no wetlands would be impacted, wetland
 51 mitigation would not be required.

3.12 VEGETATION AND NOXIOUS WEEDS

3.12.1 Vegetation Existing Conditions

Highly altered since European settlement, the study area is dominated by noxious weeds and other non-native plants. Probably less than one percent of the existing vegetation cover is comprised of plants native to the eastern plains of Colorado. Soils of the project area appear to be very dry and most trees appear drought-stressed. Currently most of the study area is fields or cropland which is either fallow or too dry to support crop species. Vegetation of the highway rights-of-way is mainly smooth brome, kochia, State of Colorado Noxious Weed field bindweed, and Canada thistle with minor cover by native western wheatgrass. Dominant vegetation of the fields adjacent to the roads includes State of Colorado Noxious Weeds field bindweed, Canada thistle, common mullein, musk thistle, diffuse knapweed, leafy spurge, and weedy species such as plumeless thistle, kochia, and prickly lettuce. Minor areas of planted trees including pinyon pine, juniper, Chinese elm, and locust are present at the eastern end of the project area. A grove of native plains cottonwood with Chinese elm is present west of E-470 and north of I-25. In the old farm area in the northeast quadrant of the intersection are very scattered Chinese elm, juniper, pine, plains cottonwood, tree-of-heaven, and Russian olive, a State of Colorado Noxious Weed. A small grove of plains cottonwood and native peach-leaved willow is present at the First Creek culvert outlet north of I-70. A band of scattered Russian olive is present south of the frontage road adjacent to eastbound I-25.

3.12.2 Noxious Weeds Existing Conditions

Noxious weeds are invasive, non-native plants introduced to Colorado by accident or which spread after being planted for another purpose and which 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 value of the lands of the state and if present in any area of the state must be managed." The legisla-

tion 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, diseases, or parasites
- ▶ Has direct or indirect effects that are detrimental to the environmentally sound management of natural or agricultural ecosystems.

Under the Noxious Weed Act, the State of Colorado Noxious Weed lists are categorized by control priority:

- ▶ List A: Rare noxious weeds and all county noxious weeds in dispersal conduits. High priority species are designated for eradication.
- ▶ List B: Well established noxious weeds with discrete statewide distributions which must be managed to stop continued spread.
- ▶ List C: Extensive, wide-spread, well-established infestations for which control is recommended.

It is the duty of all persons to use integrated methods to manage noxious weeds if the weeds are likely to be materially damaging to the land of neighboring land owners.

Additionally, both Adams and Arapahoe Counties have published county lists of Noxious Weed Species.

A weed survey of the study area was conducted in August 2006. Nearly 100 percent of vegetation cover in the study area is by non-native species although not all these species are currently listed as State of Colorado Noxious Weeds.

No weed species from the State of Colorado High Priority List (List A) were noted in the study area during weed surveys. Weed species from the State Medium Priority List (List B), Low Priority List (List C) and CDOT's Top 25 List were observed in the study area during the surveys. These weed species are listed in **Table 3-15**. Other State listed species



1 not blooming during the weed survey or lacking
 2 persistent stalks may be present in the project area.
 3 Weeds not currently listed by the State of Colorado
 4 or by CDOT noted in the study area were kochia,
 5 curly dock, and prickly lettuce.

6 **3.12.3 Vegetation Impacts**

7 No-Action Alternative. As planned development
 8 continues in the study area, impacts would continue
 9 to occur to vegetation.

10 Preferred Alternative. Direct impacts to vegetation
 11 would occur from clearing, excavation, and grading
 12 for the proposed improvements. There are no con-
 13 servation sites or sensitive plant communities within
 14 the study area. Impacts to native vegetation are
 15 anticipated to be minimal since the entire undevel-

16 oped portion of the study area is dominated by
 17 weedy species.

18 **3.12.4 Noxious Weeds Impacts**

19 No-Action Alternative. Construction of projects
 20 under the No-Action Alternative would disturb
 21 areas that are already inhabited by weeds, resulting
 22 in the potential for the introduction of new weed
 23 species into those areas.

24 Preferred Alternative. Construction of the Preferred
 25 Alternative would disturb areas that are already
 26 inhabited by weeds and would disturb areas that
 27 currently have a relative minor weed cover, result-
 28 ing in the potential for the introduction of weeds
 29 into those areas. Temporary work areas would also
 30 be susceptible to weed invasion.

**Table 3-15
 State of Colorado, Adams County and Arapahoe County Listed Weed Species and Common Vegetation
 Species Observed in the I-70/E-470 Study Area**

Common Name	Scientific Name	Adams County Weed List*	Arapahoe County Weed List*	CDOT Weed List**	State Noxious Weed List***
Canada thistle	<i>Cirsium arvense</i>	X	X	X	B
Common mullein	<i>Verbascum thapsus</i>				C
Diffuse knapweed	<i>Centaurea diffusa</i>	X	X	X	B
Downy brome	<i>Bromus tectorum</i>				C
Field bindweed	<i>Convolvulus arvensis</i>	X	X	X	C
Leafy spurge	<i>Ephorbia esula</i>	X	X		B
Musk thistle	<i>Carduus nutans</i>	X	X	X	B
Plumeless thistle	<i>Carduus acanthoides</i>			X	B
Russian-olive	<i>Elaeagnus angustifolia</i>			X	B
Chinese elm	<i>Ulmus pumila</i>				-
Juniper	<i>Sabina osteosperma</i>				-
Kochia	<i>Bassia sieversiana</i>				-
Locust	<i>Robinia spp.</i>				
Peach-leaved willow	<i>Salix amygdaloides</i>				-
Pinyon pine	<i>Pinus edulis</i>				-
Plains cottonwood	<i>Populus deltoides</i> subsp. <i>monilifera</i>				-
Plumeless thistle	<i>Carduus acanthoides</i>				-
Smooth brome	<i>Bromopsis inermis</i>				-
Tree-of-heaven	<i>Ailanthus altissima</i>				-
Western wheatgrass	<i>Pascopyrum smithii</i>				-

* From Colorado State University Cooperative Extension website
 ** From CDOT Noxious Weed Management Plan top 25 weed species to be mapped.
 ***Colorado Department of Agriculture Noxious Weed Management Program Website,
 Colorado Noxious Weed list of 5/30/06.

1 Soil disturbance associated with construction of the
 2 Preferred Alternative is anticipated to provide fur-
 3 ther conditions for invasion of new noxious weed
 4 species. Nearly all of the study area is vegetated by
 5 non-native, highly invasive species; however, the
 6 listed noxious weed species known in the study
 7 area which are most likely to spread to construction
 8 sites include Canada thistle, diffuse knapweed,
 9 musk thistle, common mullein, field bindweed,
 10 downy brome, and plumeless thistle.

11 3.12.5 Vegetation and Noxious Weeds Impact 12 Mitigation

13 All CDOT revegetation BMPs and guidelines will be
 14 followed to ensure adequate revegetation of the
 15 study area. All disturbed areas will be seeded in
 16 phases throughout construction. Although specific
 17 BMPs to be used in the study area will not be deter-
 18 mined until final design, mitigation measures are
 19 anticipated to include:

- 20 ▶ Minimize the amount of disturbance and limit
 21 the amount of time that disturbed areas are
 22 allowed to be non-vegetated.
- 23 ▶ Implement the project Integrated Weed Man-
 24 agement Plan.
- 25 ▶ Avoid existing trees not included in the Colo-
 26 rado Noxious Weed list, and areas with a minor
 27 weed cover to the maximum extent possible.
- 28 ▶ Implement temporary and permanent erosion
 29 control measures to limit erosion and soil loss.
 30 Erosion control blankets will be used on steep,
 31 newly seeded slopes to control erosion and to
 32 promote the establishment of vegetation. Slopes
 33 should be roughened at all times and concrete
 34 washout contained.
- 35 ▶ Time tree removal for outside of nesting season
 36 per the Migratory Bird Treaty Act.
- 37 ▶ All disturbed areas will be revegetated with
 38 native grass and forb species. Seed, mulch and
 39 mulch tackifier will be applied in phases
 40 throughout construction.

- 41 ▶ Removed native trees and shrubs will be
 42 replaced on a 1:1 basis, if practicable, as
 43 required by CDOT Region 1.

44 Since soil disturbance with accompanying invasion
 45 by noxious weed species can be associated with
 46 highway construction, an Integrated Weed Manage-
 47 ment Plan will be written during design per CDOT
 48 guidelines, reviewed by CDOT, incorporated into
 49 the project design and implemented during con-
 50 struction. Specific BMPs will be required during
 51 construction to reduce the potential for introduction
 52 and spread of noxious weed species and include:

- 53 ▶ Mapping will be included in the construction
 54 documents along with appropriate control
 55 methods for noxious weeds.
- 56 ▶ Highway right-of-way areas will periodically be
 57 inspected by a noxious weed specialist from the
 58 city or its consultants during construction and
 59 during post-construction weed monitoring for
 60 invasion of noxious weeds.
- 61 ▶ Weed management measures will include
 62 removal of heavily infested topsoil (> 61%
 63 cover by noxious weeds), chemical treatment of
 64 more lightly infested topsoil (< 60% cover by
 65 noxious weeds), limiting disturbance areas,
 66 phased seeding with native species throughout
 67 the project, monitoring during and after con-
 68 struction, other chemical and/or mechanical
 69 treatments.
- 71 ▶ Use of herbicides will include selection of
 72 appropriate herbicides and timing of herbicide
 73 spraying.
- 74 ▶ Certified weed-free hay and/or mulch will be
 75 used in all revegetated areas.
- 76 ▶ No fertilizers will be allowed on the project site.
- 74 ▶ Supplemental weed control measures may be
 75 added during design and construction planning.
- 76 Preventative Control Measures for project design
 77 and construction may include:
 - 78 ▶ Native Plants: Use of native species in revegeta-
 79 tion sites.



- 1 ▶ Weed Free Forage Act: Materials used for the
2 project will be inspected and regulated under
3 the Weed Free Forage Act, Title 35, Article
4 27.5, CRS.
- 5 ▶ Topsoil Management: When salvaging topsoil
6 from on-site construction locations, the poten-
7 tial for spread of noxious weeds will be consid-
8 ered. Importing topsoil onto the project site will
9 not be allowed.
- 10 ▶ Equipment Management: Equipment will
11 remain on designated roadways and stay out of
12 weed- infested areas until the areas are treated.
13 All equipment will be cleaned of all soil and
14 vegetative plant parts prior to arriving on the
15 project site.

16 3.13 FLOODPLAINS

17 3.13.1 Existing Conditions

18 For the purpose of this existing condition assess-
19 ment, only the effective floodplain information
20 would be presented. The Federal Emergency Man-
21 agement Agency (FEMA) regulates the effective
22 floodplain in conjunction with any proposed devel-
23 opment activity, such as the I-70/E-470 interchange
24 complex.

25 First Creek is the only drainageway within the study
26 area. A 100-year floodplain has been delineated for
27 First Creek. Floodplain boundaries are shown on
28 the effective Flood Insurance Rate Map (FIRM)
29 Panel Number 08002 0205E, dated August 16,
30 1995. Following the construction of E-470 in this
31 vicinity in 1998, a floodplain boundary revision was
32 issued by FEMA to document impacts of E-470 to
33 the First Creek floodplain. This revision became
34 effective on January 23, 2002. **Figure 3-18** shows
35 the revised floodplain boundary. **Table 3-16** lists the
36 peak flood discharges used to determine the flood-
37 plain boundaries.

38 First Creek is an east bank tributary to the South
39 Platte River. First Creek originates in central Arapa-
40 hoe County and has a total basin area of approxi-
41 mately 47 square miles. E-470 crosses First Creek

42 about 21 miles upstream from its confluence with
43 the South Platte River. The tributary area upstream
44 of the study area is approximately 13 square miles.
45 There are no flow-regulating structures of any kind
46 on the main stem of First Creek upstream of the
47 interchange.

48 Currently through the study area, First Creek crosses
49 I-70, Smith Way, and the E-470 mainline. Each of
50 the crossings is a multicelled concrete box culvert
51 structure. None of these roadways are inundated by
52 the 100-year floodplain.

53 Through the study area, the existing natural channel
54 is poorly defined and flows are intermittent. The
55 creek does not support any fish habitat. The regu-
56 lated floodplain in the vicinity of the study area
57 ranges from 500 to 1,180 feet in width. The creek is
58 vegetated with native grasses and stands of cotton-
59 wood and willow trees, with cultivated cropland in
60 the overbank areas. The streambed crosses through
61 the study area flowing generally from southeast to
62 northwest. The channel bottom is sandy, and the
63 average stream gradient is about 0.3 percent.

64 3.13.2 Floodplain Impacts

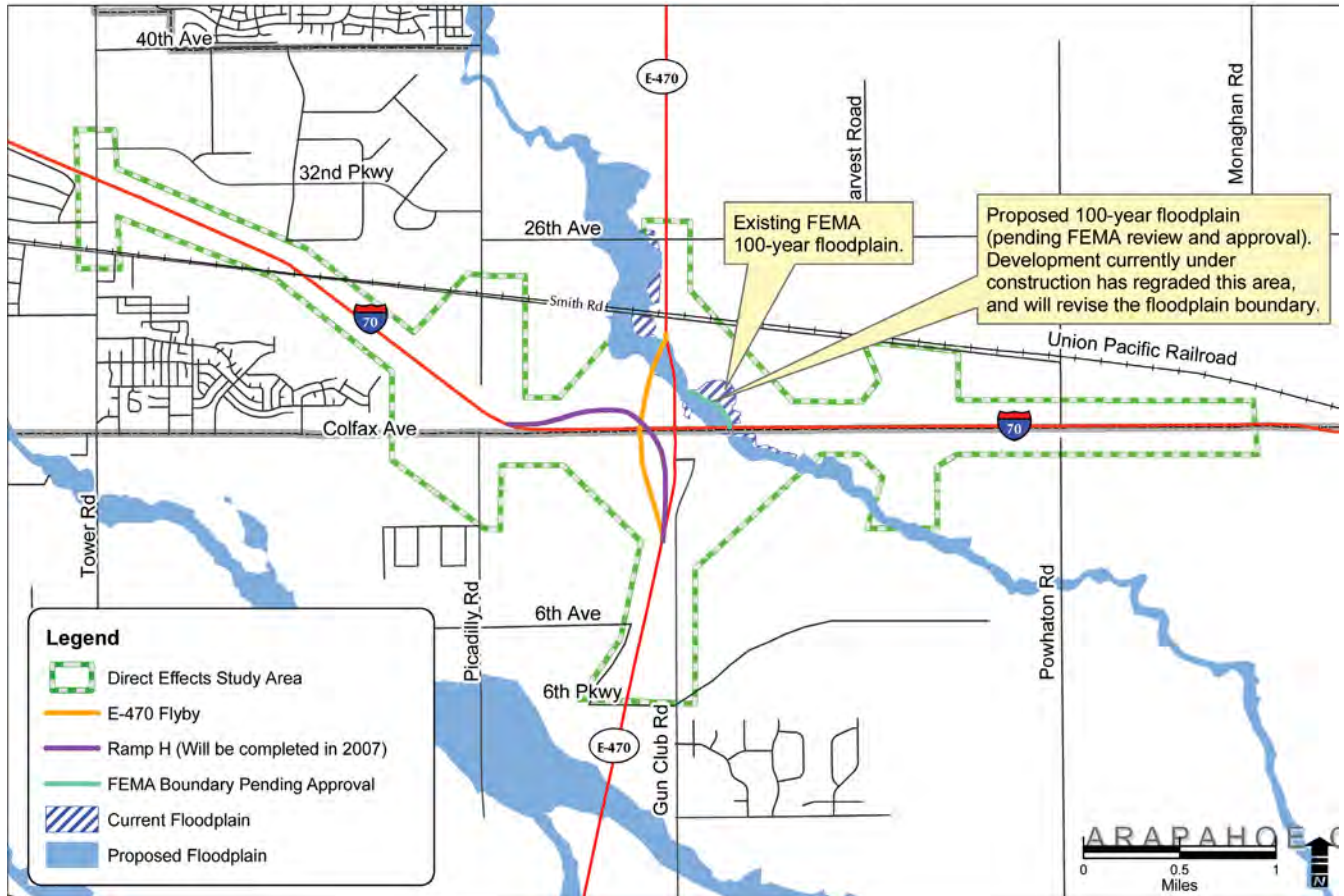
65 This section describes impacts to floodplains in the
66 study area.

67

Would the flooding along Picadilly Road be addressed in this project? No. The flooding on Picadilly Road occurs south of East 11th Avenue, which is the southerly limit of the proposed improvements to Picadilly Road included in the Preferred Alternative. However, improvements to the portion of Picadilly Road south of East 11th Avenue are included in the *City of Aurora Comprehensive Plan* and are planned in conjunction with the proposed Horizon City Center project. As part of that project, new drainage facilities are planned to provide for carrying storm water south to Coal Creek, alleviating the current flooding west of Picadilly. The City of Aurora would review these plans as part of the development process.

68 **No-Action Alternative.** Under the No-Action Alter-
69 native, Gun Club Road is proposed to be relocated
70 approximately 0.5 mile east of its current location,
71 while Colfax Avenue would be relocated approxi-
72 mately 0.5 mile south of I-70. Both of these road-
73 way relocations would cross the First Creek

**Figure 3-18
Existing Floodplains**



**Table 3-16
First Creek Effective FEMA Flood Discharges (cfs)**

Location	10-year	50-year	100-year	500-year
Downstream of I-70	1,022	1,594	3,035	4,128
Downstream of Smith Way	1,046	1,628	3,085	4,198

1 floodplain. Harvest Road would also cross the First
 2 Creek floodplain just south of the intersection with
 3 relocated Colfax Avenue. Each of these crossings
 4 would require bridges or box culverts that meet
 5 FEMA regulations for impacts to the water surface.
 6 These three crossings of First Creek impact approxi-
 7 mately 11.4 acres of the floodplain.

8 In addition, there is currently a development under-
 9 way within the northeast quadrant for Prologis Park.
 10 This development placed fill along the northeastern
 11 edge of the floodplain, to one foot above the effec-
 12 tive water surface elevation, to remove the site from
 13 the floodplain. It also required a realignment of
 14 Smith Way, and an extension of the existing box
 15 culvert for about 35 feet upstream.



1 **Preferred Alternative.** The Preferred Alternative
 2 impacts the effective First Creek floodplain at sev-
 3 eral locations.

4 Beginning in the southeast quadrant, Ramp K would
 5 carry traffic from northbound E-470 to eastbound
 6 I-70. The slope limits from this ramp would fill in
 7 approximately 2.9 acres of the floodplain. An exten-
 8 sion of the existing six-celled 10- by 9-foot concrete
 9 box culvert would be required for about 150 feet
 10 upstream. This culvert extension would need to be
 11 designed such that any floodplain modifications
 12 would not cause a large increase to the water sur-
 13 face elevation within the southeast quadrant (less
 14 than one foot, in accordance with FEMA regula-
 15 tions). The area that would be affected by any flood-
 16 plain backwater increase consists mainly of
 17 cultivated cropland, thus minimizing any risk asso-
 18 ciated with the proposed action.

19 The E-470 construction in 1998 mainly impacted
 20 the northeast quadrant of the interchange. Construc-
 21 tion of E-470 caused a water surface elevation
 22 increase from the new concrete box culverts under
 23 Smith Way and the E-470 mainline (six-celled 10-
 24 by 6-foot concrete box culverts). This backwater
 25 resulted in a very wide, shallow floodplain in this
 26 quadrant, as shown by the revised effective flood-
 27 plain delineation. The proposed ramp from west-
 28 bound I-70 to northbound E-470 (Ramp O) parallels
 29 First Creek for much of its alignment. This ramp can
 30 be seen on **Figure 2-12** in Chapter 2. Because of the
 31 ramp geometry relative to the floodplain boundary,
 32 and since there has already been a large impact to
 33 the floodplain in this quadrant, Ramp O would be
 34 placed mainly on structure rather than fill. Conse-
 35 quently, the impacts to the First Creek floodplain in
 36 the northeast quadrant would be relatively minor
 37 from a floodplain management standpoint (approxi-
 38 mately 0.5 acre). This design would minimize
 39 potential floodplain impacts resulting from a longi-
 40 tudinal encroachment.

41 The main impact area is at the downstream side of
 42 the existing box culvert crossing under I-70. This
 43 culvert would need to be extended about 50 feet to
 44 the north because of widening of the I-70 mainline.
 45 There would also be impacts where bridge piers

46 would be required within the floodplain. Pier scour
 47 analysis would be required under these conditions.

48 Another impact to the First Creek floodplain would
 49 occur in the northwest quadrant of the interchange.
 50 The existing E-470 mainline utilizes the old Gun
 51 Club Road bridge over I-70. Under the Preferred
 52 Alternative, the E-470 crossing of I-70 would be
 53 shifted approximately 800 feet to the west. The E-
 54 470 mainline and various ramps and collector/dis-
 55 tributor roads would be placed on fill and would
 56 cross the floodplain boundary in this quadrant,
 57 impacting a total of about 80 acres. These fill slopes
 58 would require major extensions of the existing box
 59 culvert crossings under E-470 and Smith Way (about
 60 1,000 feet total). However, since these extensions
 61 would occurring on the downstream side of the cul-
 62 verts, once the full flood flow has already entered
 63 the barrel, the fill being placed within the floodplain
 64 should have little impact on the upstream water sur-
 65 face elevations.

66 The impacts to the First Creek floodplain from the
 67 Preferred Alternative are summarized in **Table 3-17**.
 68 As stated in the No-Action Alternative section, other
 69 potential developments within the study area could
 70 have an impact on the First Creek floodplain. A
 71 Conditional Letter of Map Revision (CLOMR)
 72 request was submitted to FEMA for the Prologis
 73 development in February 2003. This CLOMR pro-
 74 poses the establishment of a floodway throughout
 75 the study area. Once established, recognition of this
 76 floodway would be required for the interchange
 77 improvements.

Table 3-17
First Creek Floodplain Impacts

Location	Acreage
Southeast Quadrant	2.9
Northeast Quadrant	0.5
Northwest Quadrant	8.0
TOTAL	11.4

78 The City of Aurora, in cooperation with the Urban
 79 Drainage and Flood Control District (UDFCD), has
 80 an *Outfall Systems Planning Study* (OSP) for First

1 Creek. This report is used as a Master Plan for drain-
2 age improvements as areas develop. Because of the
3 improvements in the Preferred Alternative, the City
4 and UDFCD may require implementation of various
5 Master Plan improvements throughout the study
6 area, which could include improvements to the
7 channel. The design of these types of improvements
8 would be coordinated with adjacent developments,
9 such as the proposed Eastgate development in the
10 northwest quadrant.

11 3.13.3 Floodplain Mitigation

12 Mitigation measures would be required to minimize
13 impacts to the First Creek floodplain. New construc-
14 tion within regulated floodplains requires compli-
15 ance with FEMA regulations and criteria. The design
16 of all roadway, drainage, and structural features
17 would be in accordance with these criteria, as well
18 as local jurisdictional requirements. This would
19 require close coordination during the design pro-
20 cess with several parties, including FEMA, CDOT,
21 UDFCD, the City of Aurora, and any affected prop-
22 erty owners.

23 As noted previously, there is a Master Plan for drain-
24 age improvements on First Creek. This report was
25 prepared in anticipation of future developments,
26 such as including the I-70/E-470 interchange com-
27 plex. One of the purposes of such a report is to
28 determine potential drainage problems and impacts
29 of future development on the drainage system, and
30 to develop proposed improvements to reduce these
31 impacts. Implementation of various proposed
32 improvements may be required as a mitigation mea-
33 sure, which would minimize risk associated with the
34 action. These measures would also restore and pre-
35 serve the natural and beneficial floodplain values.

36 In addition to permanent measures to help control
37 future flooding, other temporary measures would be
38 required along First Creek during construction of
39 the interchange. This includes use of standard
40 CDOT and UDFCD erosion control techniques to
41 minimize impacts to the drainageway. Implementa-
42 tion of BMPs would be required to help control ero-
43 sion and sedimentation within the drainage basin.

44 This would also improve water quality for the runoff
45 being delivered further downstream.

46 3.14 WILD AND SCENIC RIVERS

47 First Creek, the only water resource in the study
48 area, is not considered a wild and scenic river. No
49 impacts to a wild and scenic river would occur as a
50 result of either the No-Action Alternative or the Pre-
51 ferred Alternative; therefore, no mitigation is neces-
52 sary.

53 3.15 WILDLIFE AND FISHERIES

54 3.15.1 Wildlife Existing Conditions

55 Wildlife habitat of the study area is associated with
56 wetlands, mature tree groves, and uncultivated
57 grasslands. Toads are reported in wetter areas. Areas
58 disturbed by agricultural activity are considered
59 poor wildlife habitat by the Colorado Division of
60 Wildlife (CDOW).

61 The 2003 natural resources site review conducted
62 by ERO Resources reported nests for great horned
63 owl, Swainson's hawk, barn swallow, and possibly
64 for raptors. These birds are protected under the
65 Migratory Bird Treaty Act.

66 3.15.1.1 Burrowing Owl (*Athene cunicularia*)

67 Burrowing owls, a State of Colorado threatened spe-
68 cies, occur in prairie dog colonies and use aban-
69 doned prairie dog burrows for roosting and nesting.
70 Federal and state laws, including the Migratory Bird
71 Treaty Act, prohibit killing or harassing burrowing
72 owls. Burrowing owl surveys are not required since
73 no prairie dog colonies are present in the study
74 area.

75 3.15.1.2 Mountain Plover (*Charadrius montanus*)

76 Mountain plovers are ground nesting birds of prairie
77 grasslands and fields. Once common, the mountain
78 plover is a Species of Special Concern in Colorado.
79 Very little potential habitat for mountain plover is
80 present in the study area, and no mountain plover
81 were observed during the 2003 survey.



3.15.1.3 Ferruginous Hawk (*Buteo regalis*)

Ferruginous hawks are primarily winter residents on the Colorado eastern plains. Sensitive to human disturbance, the ferruginous hawk is a Species of Special Concern in Colorado. Ferruginous hawks prefer wintering habitat with prairie dog colonies. Since no prairie dog colonies are present in the study area, ferruginous hawks are unlikely to winter in the study area.

3.15.1.4 Raptors and Migratory Birds

No raptor nests were observed in the study area. Groves of mature trees providing important raptor and migratory bird habitat are present in the northwest and northeast quadrants of the interchange and in the First Creek swale south of I-70. Bank swallow nests were present in the First Creek concrete box culvert under I-70.

3.15.1.5 Black-tailed Prairie Dogs (*Cynomys ludovicianus*)

Black-tailed prairie dogs, a keystone species of prairie grasslands, are burrowing rodents which live in colonies. Because of habitat fragmentation, urban development, sylvatic plague, poisoning, and recreational shooting, prairie dog populations are greatly reduced, and they are a Species of Special Concern in Colorado. No colonies are present in the study area, although small colonies are present south of the study area.

3.15.1.6 Northern Leopard Frog (*Rana pipiens*)

Northern leopard frog is potentially present in wetland areas and is a Species of Special Concern in Colorado.

3.15.2 Fisheries Existing Conditions

No fisheries are present in the study area since First Creek is an intermittent stream.

3.15.3 Wildlife and Fisheries Impacts

Wildlife impacts would include loss of some mature trees in the northeast quadrant of I-70 and E-470 as well as loss of disturbed grassland. Because of wider road surface areas, habitat connectivity would

decrease. Traffic noise levels would increase, potentially lessening areas of active wildlife use. As with any human development, wildlife species sensitive to human disturbance, such as raptors, are likely to decrease in abundance or abandon the area, while other wildlife species adapted to urban development, such as red fox and raccoon, are likely to increase in abundance.

No-Action Alternative. As planned development continues in the study area, impacts would occur to wildlife resources. No fisheries are present in the study area.

Preferred Alternative. Tree groves which provide nesting and roosting sites for birds would be impacted by the Preferred Alternative. Additionally, construction of the Preferred Alternative would impact undeveloped lands that provide wildlife habitat in the study area. No fisheries are present in the study area.

3.15.4 Wildlife and Fisheries Mitigation

No fisheries mitigation is required since no fisheries are present in the study area. The following mitigation measures are proposed to limit impacts to wildlife resources:

- ▶ As possible, retention of large trees that have the potential to serve as raptor nesting habitat as specified by CDOW wildlife biologist or project biologist.
- ▶ Removal of any trees with nests would be performed outside of the nesting period to be confirmed by CDOW. New three-inch caliper trees would be planted at a 1:1 replacement ratio when the area is landscaped which would replace the removed trees.
- ▶ Bird nest removal would be timed to avoid active/nesting seasons and/or birds would be actively excluded. If necessary, nest surveys would be conducted immediately prior to construction.
- ▶ Removal of any bank swallow nests in the First Creek culverts under I-70 would be performed

1 outside of the nesting period to be confirmed by
2 CDOW.

- 3 ▶ Addition of culverts for small wildlife to cross I-
4 70, E-470, and other roadways.
- 5 ▶ Use of temporary and permanent erosion con-
6 trol measures to limit impacts to the First Creek
7 channel, consistent with the project stormwater
8 management plan.

38 habitat consists of forests or wooded areas that con-
39 tain many tall, aged, dying, and dead trees (Martell,
40 1992). No designated critical or essential eagle hab-
41 itat occurs in the study area. No large lakes, reser-
42 voirs, or rivers occur in the study area. Several large
43 cottonwoods that could provide bald eagle perching
44 or roosting sites exist at the old farm site in the First
45 Creek drainage south of I-70 and in the northwest
46 quadrant of the interchange. Bald eagles may be
47 occasional transients in the study area.

9 3.16 THREATENED AND ENDANGERED 10 SPECIES

11 3.16.1 Existing Conditions

12 Habitat assessments were conducted in 2000 and
13 2003 to determine if potential habitat for threatened
14 and endangered species was present in the study
15 area. The 2005 U.S. Fish and Wildlife Service
16 (USFWS) list of threatened, endangered, and pro-
17 posed threatened species potentially occurring in
18 this area of Adams and Arapahoe Counties includes:

- 19 ▶ Bald eagle - federally and state threatened
- 20 ▶ Black-footed ferret - federally endangered
- 21 ▶ Preble's meadow jumping mouse - federally
22 and state threatened
- 23 ▶ Mexican spotted owl - federally threatened
- 24 ▶ Ute ladies'-tresses orchid - federally threatened

25 Any additional surveys for threatened and endan-
26 gered species would be conducted prior to con-
27 struction. Descriptions of each wildlife species
28 habitat and their potential for presence in the study
29 area are discussed below. All references can be
30 found in the *Wildlife Assessment* (ERO, 2005) that
31 was completed for the EA.

32 3.16.1.1 Bald Eagle (*Haliaeetus Leucocephalus*)

33 Bald eagles are primarily winter residents in Colo-
34 rado, although nesting along the Colorado Front
35 Range has increased in recent years (CDOW, 2001).
36 Most nesting in Colorado occurs near lakes, reser-
37 voirs, or along rivers. Typical bald eagle nesting

48 3.16.1.2 Black-footed Ferret (*Mustela nigripes*)

49 Current USFWS criteria for defining potential black-
50 footed ferret habitat consist of any black-tailed prai-
51 rie dog town or complex greater than 80 acres in
52 area (USFWS, 1989). Although the Colorado Natu-
53 ral Heritage Program (CNHP) reports that there are
54 historical records in the area for this species, the
55 study area does not meet the criteria for black-
56 footed ferret habitat in the 1989 USFWS guidelines.
57 No prairie dog colonies are present in the study
58 area, although several small colonies are present
59 south of the study area. Black-footed ferret are very
60 unlikely to occur in the study area.

61 3.16.1.3 Preble's Meadow Jumping Mouse 62 (*Zapus hudsonius preblei*)

63 The study area does not provide appropriate habitat
64 for Preble's meadow jumping mouse since the
65 structured tree and shrub habitat criteria of the
66 USFWS' *Interim Survey Guidelines for Preble's*
67 *Meadow Jumping Mouse* (revised May 19, 1999) is
68 not present, and the area is isolated from known
69 populations of this species. Letters received from
70 the USFWS in April 2001 and June 2003 exclude
71 the area from potential habitat for Preble's meadow
72 jumping mouse. Therefore, a survey is not neces-
73 sary.

74 3.16.1.4 Mexican Spotted Owl (*Strix occidentalis* 75 *Lucida*)

76 Mexican spotted owl habitat is forests and canyons.
77 No habitat for this species is present in the study
78 area.



3.16.1.5 Ute Ladies'-tresses Orchid (*Spiranthes diluvialis*)

A survey for Ute ladies'-tresses orchid is not required under USFWS guidelines since First Creek is not a perennial tributary to the South Platte River.

3.16.1.6 Other Species

Since no depletions to the South Platte River are anticipated as a result of construction, no impacts are anticipated to downstream populations of least tern, pallid sturgeon, piping plover, or whooping crane.

3.16.2 Threatened and Endangered Species Impacts

No-Action Alternative. This alternative would have no direct impacts upon any threatened and endangered wildlife or plant species.

Preferred Alternative. The Preferred Alternative is not anticipated to directly impact any threatened and endangered wildlife or plant species. The study area lacks the typical habitat for the wildlife and plant species described above. Bald eagles could occasionally forage in and near the study area. Construction of the Preferred Alternative is not expected to directly impact bald eagles or their nesting habitat, although minor foraging habitat would be impacted.

3.16.3 Threatened and Endangered Species Mitigation

Since no threatened and endangered species would be affected by the Preferred Alternative, no mitigation is required.

3.17 HISTORIC AND ARCHAEOLOGICAL RESOURCES

3.17.1 Historic and Archaeological Resources

Historic and archaeological resources are protected under the National Historic Preservation Act (NHPA) of 1966 (as amended), which sets forth the

process federal agencies must follow when planning undertakings that have the potential to affect sites eligible for or listed on the National Register of Historic Places (NRHP). Pursuant to Section 106 of NHPA and 36 CFR 800, the Advisory Council on Historic Preservation's implementing regulations, the Area of Potential Effect (APE) established for the EA was surveyed for historic and archaeological properties in 2000 and 2004 (see **Figure 3-19**).

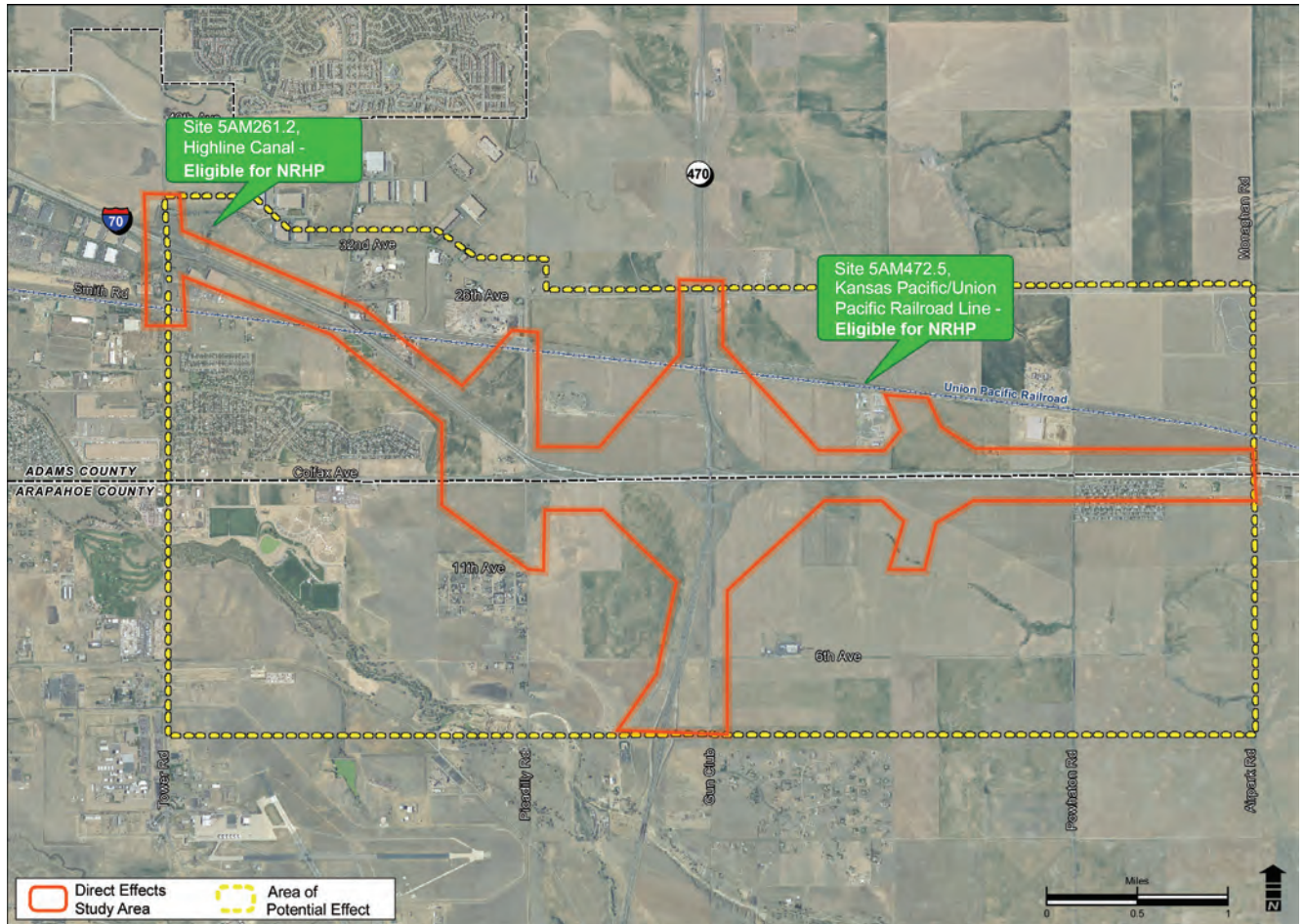
Eight historic sites, one prehistoric site, and four isolated finds are located within the APE. The sites include two homestead remnants, one of which has an associated wagon road, a windmill, two farmsteads, a segment of irrigation canal, a segment of Colfax Avenue, and a segment of railroad grade; the isolates consist of individual artifacts such as prehistoric stone tool debris and fragments of historic bottle glass.

Two of the sites are eligible for listing on the NRHP (Site 5AM261.2, a segment of the Highline Canal; and Site 5AM472.5, a segment of Kansas Pacific/Union Pacific Railroad Line). Colfax Avenue as it traverses Arapahoe County is an NRHP eligible resource. However, the portion of Colfax within the study area (Site 5AH2914.1) has been realigned and rebuilt, and therefore does not convey the setting, feel, or association necessary to support the eligibility of the entire resource. The remaining sites and isolated finds have been determined not eligible for the NRHP. Pertinent correspondence with the State Historic Preservation Officer (SHPO) specific to these findings is located in **Appendix A**.

3.17.2 Native American Consultation

Preservation regulations (36 CFR 800) mandate that federal agencies must involve interested Native American tribes in the planning process for federal undertakings. Consultation with a Native American tribe recognizes the government-to-government relationship between the United States government and sovereign tribal groups. Federal agencies must be sensitive to the fact that historic properties of religious and cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands beyond modern reservation boundaries. Con-

Figure 3-19
Historic and Archaeological Resources Eligible for NRHP



1 sulting tribes are offered the opportunity to identify
2 concerns about cultural resources and comment on
3 how a project might affect them. If it is found that a
4 project would impact cultural resources that are elig-
5 ible for inclusion on the NRHP and are of religious
6 or cultural significance to one or more consulting
7 tribes, their role in the consultation process may
8 also include participation in resolving how best to
9 avoid, minimize, or mitigate those impacts. By
10 describing the proposed undertaking and the nature
11 of known cultural sites, and consulting with the
12 interested Native American community, CDOT and
13 FHWA strive to effectively protect areas important
14 to American Indian people.

15 In July 2003, CDOT Native American liaison Dan
16 Jepson contacted 12 federally recognized tribes
17 with an established interest in Adams and Arapahoe
18 Counties. The tribes invited via letter to participate
19 as consulting parties included:

- 20 ▶ Apache Tribe of Oklahoma
- 21 ▶ Cheyenne and Arapaho Tribes of Oklahoma
- 22 ▶ Comanche Nation of Oklahoma
- 23 ▶ Kiowa Tribe of Oklahoma
- 24 ▶ Cheyenne River Sioux Tribe
- 25 ▶ Crow Creek Sioux Tribe



- 1 ▶ Oglala Sioux Tribe
- 2 ▶ Pawnee Nation of Oklahoma
- 3 ▶ Rosebud Sioux Tribe
- 4 ▶ Northern Arapaho Tribe
- 5 ▶ Northern Cheyenne Tribe

6 The Comanche Nation of Oklahoma and the Kiowa
7 Tribe of Oklahoma responded to the solicitation,
8 each indicating the desire to be a consulting tribe
9 for the undertaking. Neither tribe indicated that they
10 had concerns or issues and that the Preferred Alter-
11 native would not affect properties of religious and
12 cultural significance. Both tribes would be notified
13 if human remains, items of cultural patrimony or
14 other artifacts related to Native American occupa-
15 tion of the study area are exposed during construc-
16 tion.

17 By initiating, encouraging, and facilitating Native
18 American consultation, FHWA and CDOT have ful-
19 filled their legal obligations in this regard as stipu-
20 lated in the Section 106 and Advisory Council
21 regulations.

22 3.17.3 Paleontological Resources

23 A paleontologic field survey of the study area was
24 conducted on June 1, 2003. The paleontological
25 study area was sized to encompass the maximum
26 area of potential impact to potentially significant
27 paleontologic resources.

28 The field survey consisted of spot checks of vegeta-
29 tion-free areas within the study area for surface fos-
30 sils, exposures of potentially fossiliferous rocks, and
31 areas in which fossiliferous rocks or younger poten-
32 tially fossiliferous surficial deposits could be
33 exposed or otherwise impacted during construction.
34 Prior to the field survey, literature and museum
35 record searches were conducted to assess the pale-
36 ontologic sensitivity of the study area and the geo-
37 logic units present within it.

38 Previously documented fossil occurrences from just
39 west of the study area are recorded in the databases
40 of the Denver Museum of Nature and Science, and

41 include plant fossils from the Denver Formation
42 (DMNH fossil localities 1682, 2235, and 2236). No
43 fossils were found during the field survey, and no
44 exposures of Denver Formation are present within
45 the study area.

46 3.17.4 Historic and Archaeological Resources 47 Impacts

48 **No-Action Alternative.** The No-Action Alternative
49 would have no impacts on historic and archaeologi-
50 cal resources.

51 **Preferred Alternative.** Kansas Pacific/Union Pacific
52 Railroad (5AM472.5): A new bridge structure will
53 be built over the Kansas Pacific (now Union Pacific)
54 Railroad. The new overpass will carry a northbound
55 on-ramp to E-470. It will extend for a length of 300
56 feet and will feature a 24-foot vertical clearance
57 over the railroad. Although final design is pending,
58 the new overpass is anticipated to be 27 feet wide.
59 Design will likely require placement of a new pier
60 in the railroad right-of-way that will be in line with
61 the piers of two existing structures. The new over-
62 pass will be immediately adjacent to the two exist-
63 ing railroad overpasses. Like the proposed bridge,
64 the existing overpasses are both 300 feet long and
65 feature vertical clearances of 24 feet over the rail-
66 road. The existing bridges need to be widened by
67 10 feet. CDOT, on behalf of FHWA, has determined
68 that these improvements will result in no adverse
69 effect to the historic Kansas Pacific/Union Pacific
70 Railroad.

71 Colfax Avenue Segment (5AH2914.1): The original
72 alignment of Colfax Avenue east of Picadilly Road
73 was destroyed during the construction of I-70 in the
74 mid-1960s. At that time the Colfax Avenue moniker
75 was applied to the south frontage road, which was
76 built as part of the I-70 project. The existing south
77 frontage road along I-70 between Picadilly Road
78 east to Powhaton Road is signed as Colfax Avenue.
79 To provide space for the ramps and connecting
80 roadways between Picadilly Road and E-470, and
81 space for the ramps at the I-70/Harvest Road inter-
82 change, the existing south frontage road would be
83 relocated to the south between E-470 and
84 Powhaton Road. CDOT, on behalf of FHWA, has

1 determined that these proposed improvements
 2 would result in no adverse effect to Site
 3 5AH2914.1, as this part of the roadway already
 4 lacks historic integrity.

5 High Line Canal Segment (5AM261.2): There would
 6 be no project impacts to the eligible segment (Site
 7 5AM261.2) of the High Line Canal. CDOT, on
 8 behalf of FHWA, has determined that this would
 9 result in no historic properties affected.

10 **Table 3-18** summarizes the effect determination of
 11 the eligible properties in the APE.

Table 3-18
Effect Determination of Eligible Historic Properties
in the Study Area

Name	Site #	Effect Determination
Kansas Pacific/Union Pacific Railroad	5AM472.5	No adverse effect
Colfax Avenue (non-supporting segment)	5AH2914.1	No adverse effect
High Line Canal Segment	5AM261.2	No historic properties affected

Source: Colorado SHPO.

12 There would be no archaeological resource
 13 impacts.

14 3.17.5 Paleontological Resources Impacts

15 Despite the lack of exposed bedrock within the
 16 study area, it is likely that the Denver Formation
 17 occurs at a shallow depth because it was mapped as
 18 a surficial geologic unit by Trimble and Machette
 19 (1979). It was not possible, however, to ascertain
 20 the depth of bedrock during the field survey.

21 Depending upon the depth of the excavations for
 22 the bridge piers and retaining walls, paleontologi-
 23 cally sensitive bedrock and the fossils preserved
 24 within it could be impacted.

25 3.17.6 Historic and Archaeological Resources 26 Mitigation

27 In the event that cultural materials are exposed dur-
 28 ing the construction process, all activity would be
 29 immediately suspended in the area of discovery.
 30 The CDOT Staff Archaeologist would be notified in
 31 order for the cultural materials to be properly evalu-
 32 ated for NRHP significance.

33 3.17.7 Paleontological Resources Mitigation

34 Because of the paleontologic sensitivity of the Den-
 35 ver Formation, a qualified paleontologist would
 36 monitor construction activities in all areas where
 37 construction impacts to this geologic unit are likely
 38 to occur. When the design plans are finalized, the
 39 CDOT Staff Paleontologist would examine them in
 40 order to estimate the scope and locations of proba-
 41 ble construction impact to the Denver Formation
 42 and the scope and locations of paleontological
 43 monitoring work, if any, which are required.

44 If any subsurface bones or other potential fossils are
 45 found anywhere within the study area during con-
 46 struction, the CDOT Staff Paleontologist would be
 48 notified immediately to assess their significance.

47 3.18 HAZARDOUS WASTE

49 Hazardous waste may be encountered during the
 50 construction of a transportation project. Therefore, it
 51 is important to identify properties that may contain
 52 contamination prior to right-of-way acquisition and
 53 construction. Hazardous waste is defined as any
 54 waste product that is considered flammable, corro-
 55 sive, reactive, or toxic. Hazardous waste can be
 56 found in various forms and can originate from a
 57 variety of sources. Examples of potential sites that
 58 may contain hazardous waste include landfills, ser-
 59 vice stations, industrial areas, railroad corridors, and
 60 mine sites. It is important to be aware of known haz-
 61 ardous waste sites so they can be avoided or their
 62 impacts minimized.

63 CDOT's standard process for assessing the potential
 64 for encountering hazardous waste prior to right-of-



1 way acquisition and construction is a two-phased
 2 approach. Phase One involves the completion of an
 3 Initial Site Assessment (ISA) that generally provides
 4 background information on sites that may contain
 5 hazardous waste. A Modified Phase I Environmental
 6 Site Assessment (MESA) is a frequently conducted
 7 version of an ISA. Phase Two is a Site Investigation
 8 (SI) that typically includes a subsurface investigation
 9 and analytical testing of soil and/or groundwater to
 10 further assess the type and extent of contamination
 11 that may be present. The need for conducting an SI
 12 is based on the outcome of the ISA.

13 Carter & Burgess conducted a MESA dated January
 14 24, 2006, to evaluate the potential for encountering
 15 soil and/or groundwater contamination within the

16 study area. The MESA is based on information
 17 obtained from a review of environmental regulatory
 18 records, historical topographical maps and aerial
 19 photographs, Colorado Oil and Gas Conservation
 20 Commission records, and an on-site inspection.

21 3.18.1 Hazardous Waste Existing Conditions

22 Land use within the study area has historically been
 23 agricultural in nature. Industrial/light industrial and
 24 mixed-use development exists in localized areas in
 25 the vicinity of the study area.

26 In January 2006, an MESA was completed for an
 27 approximate two-mile radius from the study area.
 28 **Figure 3-20** shows the MESA study area.

Figure 3-20
Hazardous Waste Sites



1 Review of the environmental regulatory records
 2 database revealed 36 sites of potential environment
 3 contamination. These sites included 8 registered
 4 hazardous waste generators, 1 Emergency Response
 5 Notification (ERNS) site, 1 Resource Conservation
 6 Recovery Act (RCRA) Corrective Action site, 14
 7 Underground Storage Tank (UST) sites, 13 Leaking
 8 Underground Storage Tank sites, 3 Colorado Stor-
 9 age Tank Trust Fund sites, 1 above-ground storage

10 tank site, 7 Facility Index System sites, one Colo-
 11 rado ERNS site, and one Department of Defense site
 12 (Buckley Air Force Base). **Table 3-19** lists sites of
 13 potential concern discovered during the assessment
 14 of the study area.

15 After evaluating the degree of potential hazards pre-
 16 sented by these sites, the list of sites was reduced to
 17 the 24 sites shown on **Figure 3-20** and in **Table 3-19**.

Table 3-19
Sites of Potential Hazardous Waste Concern Based on Federal and State Records

Map ID #	Site Name	Site Address	Identified Environmental Issues
1	Crown Lift Trucks	1770 E. 32nd Place	Small quantity generator of hazardous waste
2	VWR International	17750 E. 32nd Place	Small quantity generator of hazardous waste
3	17900 E. 32nd Ave.	17900 E. 32nd Avenue	Reported releases of oil or hazardous substances
4	Ames Construction	18450 E. 28th Avenue	Air permit
5	Wagner Equipment Co.	18000 E. Smith Road	Small quantity generator of hazardous waste Air permit Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case open
6	Case Power & Equipment	18000 E. 22nd Avenue	Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed
7	Wagner Equipment Co.	18201 E. 22nd Avenue	Underground petroleum storage tanks
8	Super Valu Holding Inc.	1983 Tower Road	Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed
9	Albertsons Dist. Center	2780 N. Tower Road	Small quantity generator of hazardous waste Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed
10	Loreal USA Sales Inc.	19503 E. 34th Drive	Large quantity generator of hazardous waste
11	Sprint Denver Web Hosting	3431 N. Windsor Drive	Underground petroleum storage tanks



Table 3-19 (continued)
Sites of Potential Hazardous Waste Concern Based on Federal and State Records

Map ID #	Site Name	Site Address	Identified Environmental Issues
12	Co. Dept. of Transportation	18800 E. Colfax Avenue	Hazardous waste corrective action completed 1997 Small quantity generator of hazardous waste
13	M&M Auto Reconditioning	19900 E. Colfax Avenue	Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed
14	Buckley Air Force Base		Department of Defense site
15	Provisioners	21200 E. 31st Circle	Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed
16	Sulzer Bingham Pumps Inc.	21201 E. 31st Circle	Leaking underground petroleum storage tank - case closed
17	Schlumberger Well Service	21250 E. 31st Circle	Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed
18	Ames Construction	20790 E. Smith Road	Underground petroleum storage tanks Small quantity generator of hazardous waste
19	Don Sessions	21481 E. Colfax Avenue	Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed
20	Ringsbyland Trust	SEC 1, T4S, R66W	Underground petroleum storage tanks
21	E-470 Public Highway Authority	1650 Gun Club Road	Small quantity generator of hazardous waste
22	Watkins Compressor Station	24650 E. Smith Road	Underground petroleum storage tanks Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed Leaking underground petroleum storage tank - case closed
23	Silco Oil/Barn Store	28100 E. Colfax Avenue	Underground petroleum storage tanks Above ground petroleum storage tanks Leaking underground petroleum storage tank - case open
24	Aurora Airpark	28580 E. Colfax Avenue	Underground petroleum storage tanks Leaking underground petroleum storage tank - case open

1 Of these sites, one site of concern was the former
 2 Silco Oil/Barn Store (Site #23) located along Colfax
 3 Avenue at the east end of the study area. No sites of
 4 concern have been identified within the study area.

5 A review of the former Silco Oil/Barn Store file at
 6 the Colorado Division of Oil and Public Safety
 7 revealed that a Leaking Storage Tank Event was
 8 reported there on February 1, 1999. Records indi-
 9 cate that petroleum product was released from
 10 underground piping into the surrounding soil and

1 groundwater. During investigation of the release, 12
2 groundwater monitoring wells were installed. A
3 subsurface soil and groundwater remediation sys-
4 tem began operation in March 2000.

5 Data from the groundwater monitoring wells indi-
6 cate that shallow groundwater flows to the west-
7 northwest under the I-70 right-of-way, the total
8 extent of the plume is unknown, and the water table
9 is about 40 feet below the ground level.

10 In addition to the Silco Oil/Barn Store site, the
11 UPRR tracks traverse the study area and parallel the
12 north side of Smith Road (see **Figure 3-20**).

13 Although the railroad has not been identified as a
14 site of concern, historical railroad operations are
15 potential sources of contamination from herbicides,
16 petroleum hydrocarbons, and liquid spills from tank
17 cars.

18 3.18.2 Hazardous Waste Impacts

19 **No-Action Alternative.** The No-Action Alternative
20 would have no impact on known hazardous waste
21 sites.

22 **Preferred Alternative.** The Preferred Alternative
23 would have no impact on known hazardous waste
24 sites. The Silco Oil/Barn Store site is located east of
25 Powhatan Road. No new construction or right-of-
26 way acquisition is anticipated east of Powhatan
27 Road. The UPRR right-of-way and railroad tracks
28 would not be directly affected by the Preferred
29 Alternative.

30 3.18.3 Hazardous Waste Mitigation

31 CDOT carefully considers the potential risks associ-
32 ated with hazardous waste on construction projects
33 and utilizes Section 250 of the *Standard Specifica-*
34 *tions for Road and Bridge Construction* (CDOT,
35 2005). Section 250 "Environmental Health and
36 Safety Management" provides for the protection of
37 the environment, persons and property from con-
38 taminants and includes special requirements for
39 addressing hazardous waste, if encountered.

40 Encountering hazardous waste in soils or groundwa-
41 ter with the Preferred Alternative is not anticipated.
42 Therefore, no Site Investigation (SI) is recom-
43 mended. Pay items and appropriate notes placed in
44 the final design plans as a precautionary measure
45 would adequately protect worker health and safety,
46 as well as provide the contractor and project engi-
47 neer with suitable measures in the event that con-
48 tamination is encountered from any source.

49 3.19 VISUAL RESOURCES

50 3.19.1 Existing Conditions

51 Visual character is highly correlated with existing
52 land use in the area. Existing land use within the
53 study area consists of a mixture of agricultural and
54 rural roadway/interstate land uses. The I-70/E-470
55 interchange is the largest feature of the study area
56 and is visible from many viewpoints in the area. The
57 UPRR runs through the study area along its northern
58 alignment with Smith Road.

59 Visual resources are considered as part of either the
60 foreground, middleground, or background visual
61 range. Foreground elements are those features near-
62 est to the viewer, and background elements are fea-
63 tures at a great distance from the viewer. The
64 middleground of a view is intermediate between the
65 foreground and background. Generally, the closer a
66 resource is to the viewer, the more dominant and
67 important it is in the visual range.

68 Within the study area, the foreground element is
69 pavement, with undeveloped, residential, or indus-
70 trial land adjacent to the roadways. The majority of
71 the study area is undeveloped. The middleground
72 views are primarily of agricultural lands and road-
73 way structures. Large power lines north and south of
74 the existing I-70/E-470 interchange are a substantial
75 feature of the foreground and middleground in the
76 eastern portion of the study area. The background
77 views to the west and northwest are of the Rocky
78 Mountains. Background views to the south and east
79 consist of agricultural land with scattered residential
80 and some light industrial development.



1 The City of Aurora expects the future land uses for
 2 the study area to consist of commercial, retail, light
 3 industrial, and open space.

4 Photos taken of the study area in February 2005 are
 5 on the following page.

6 3.19.2 Visual Impacts

7 This section describes impacts to the visual land-
 8 scape.

9

What would the project look like? The proposed action would add elevated ramps to the I-70/E-470 interchange (which already includes an elevated flyby and Ramp H as part of the No-Action Alternative), as well as an elevated interchange at Harvest Road. Picadilly Road would be relocated west of its existing location and would pass under I-70, reducing the visual effect to the current highway view for surrounding neighborhoods. There could be temporary impacts associated with construction. In general, construction of the interchanges and supporting structures would intensify the presence of transportation-related land uses in the viewshed.

Harvest Road would have a new bridge over I-70 and a new full interchange would be constructed at I-70 and E-470. These structures would dominate the foreground view for motorists approaching the I-70/E-470 interchange complex and for residents of the Foxridge Farm Mobile Home Park.

10



View west of the Powhatan Road overpass. Pavement, rural, and industrial land form the foreground view.

11



View south of the Powhatan Road overpass. Power lines and agricultural land uses dominate the middleground and background views.

12



Looking west from I-70. View of the existing I-70/E-470 interchange.

13



View south and west of Smith Road, toward Picadilly Road. The Rocky Mountains form the background view; I-70 and a residential development form the middleground view.

1 **No-Action Alternative.** Visual impacts associated
2 with the No-Action Alternative would occur as a
3 result of constructing the E-470 flyby over I-70 and
4 Ramp H, which are currently under construction.
5 The elevated structure would impact background
6 views of the Rocky Mountains (to the west) and
7 rural undeveloped lands (to the east) for those trav-
8 eling on I-70 and local roads. No additional impacts
9 would occur to area residents, motorists, bicyclists,
10 or pedestrians as a result of the No-Action Alterna-
11 tive.

12 **Preferred Alternative.** Visual impacts associated
13 with the Preferred Alternative would occur as a
14 result of constructing interchanges at Harvest Road,
15 Picadilly Road, and relocating portions of Colfax
16 Avenue. In general, construction of the interchanges
17 and supporting structures would intensify the pres-
18 ence of transportation-related land uses in the view-
19 shed. The Preferred Alternative would include three
20 levels of elevated structures, which would notice-
21 ably impact background views.

22 Under the Preferred Alternative, Picadilly Road
23 would be relocated west of its existing location and
24 would pass under new bridges which would carry I-
25 70 over Picadilly Road. Background views would
26 be somewhat obstructed by the elevated structures.
27 In the middleground and foreground, new transpor-
28 tation facilities would break up the views of rural,
29 undeveloped lands. Colfax Avenue along I-70 east
30 of Picadilly Road would be relocated south of its
31 current location and would be routed under E-470
32 toward elevated ramps connecting to I-70. Bridge
33 and ramp structures would include retaining walls,
34 which would block views from all directions and
35 would degrade background views for residents
36 southeast of I-70. Harvest Road would have a new
37 bridge over I-70, and a new full interchange would
38 be constructed at I-70 and E-470. These structures
39 would dominate the foreground view for motorists
40 approaching the I-70/E-470 interchange complex.

41 The Preferred Alternative is consistent with local
42 planning efforts. The land in the four quadrants of
43 the I-70/E-470 interchange is zoned for commercial
44 and light industrial uses and would consist of com-
45 mercial and Regional Activity Centers south of I-70

46 and light industrial activities north of I-70. Land in
47 the vicinity of the new interchanges at Harvest Road
48 and Picadilly Road is zoned for commercial, indus-
49 trial, and some residential uses. As these land uses
50 develop, the visual character of the study area will
51 change from a more rural undeveloped landscape
52 to an urban activity center, regardless of whether or
53 not the Preferred Alternative is constructed. The
54 transportation infrastructure that would come to
55 dominate the viewshed under the Preferred Alterna-
56 tive would be more consistent with the visual char-
57 acter associated with the types of lands uses that are
58 planned in the study area.

59 **3.19.3 Visual Resources Mitigation**

60 The following measures would reduce impacts to
61 the existing visual landscape:

- 62 ▶ All disturbed areas would be revegetated
63 throughout construction, occurring during each
64 seeding season.
- 65 ▶ All new structures, signing, and lighting would
66 be consistent with local standards and guide-
67 lines.
- 68 ▶ Architectural interest (such as texture, color, or
69 design) would be provided for retaining walls,
70 bridges, and other structural features. Wall
71 materials and design would be coordinated
72 with CDOT, local landowners, the E-470
73 Authority, and the City of Aurora, and will
74 match their surroundings.
- 75 ▶ Visual enhancements would be consistent with
76 the principles of Context Sensitive Solutions as
77 described in CDOT's *Context Sensitive Solu-*
78 *tions Policy Memo* dated October 31, 2005.

79 **3.20 ENERGY**

80 **3.20.1 Energy Impacts**

81 **No-Action Alternative.** The following impacts to
82 energy consumption would be expected with the
83 No-Action Alternative:



- 1 ▶ Vehicular fuel consumption would increase as
2 traffic congestion on I-70 and E-470 begins to
3 occur.
- 4 ▶ The No-Action Alternative would result in
5 slightly less energy use for roadway mainte-
6 nance than the Preferred Alternative since there
7 would be less roadway surface to maintain.
- 8 **Preferred Alternative.** The Preferred Alternative
9 would have the following impacts to energy con-
10 sumption:
 - 11 ▶ Energy consumption during construction would
12 be somewhat greater than with the No-Action
13 Alternative because of the need to construct
14 interchange ramps.
 - 15 ▶ Maintenance energy requirements would be
16 slightly greater with the Preferred Alternative
17 compared with the No-Action Alternative.
 - 18 ▶ Vehicular energy consumption would be
19 slightly less than the No-Action Alternative
20 because congestion would be less.

21 3.20.2 Energy Mitigation

22 Mitigation that would be implemented to reduce
23 energy consumption during construction includes:

- 24 ▶ Maximum use of on-site material to reduce
25 haulage requirements.
- 26 ▶ Proper maintenance of construction vehicles.
- 27 ▶ Turning off equipment when not in use.
- 28 ▶ Design of construction access roads and loca-
29 tion of construction staging areas to minimize
30 distances traveled.

31 3.21 CONSTRUCTION

32 3.21.1 Construction Impacts

33 **No-Action Alternative.** The No-Action Alternative
34 would have no construction-related impacts in the
35 study area at the time of this proposed action.

36 **Preferred Alternative.** There would be several
37 impacts associated with the construction of the Pre-
38 ferred Alternative. Construction-related impacts are
39 expected to be short term and include:

- 40 ▶ **Noise and Vibration.** The operation of various
41 types of machinery, such as heavy earth-moving
42 equipment, paving equipment, power tools,
43 pile drivers, and trucks would create an undesir-
44 able noise condition. Impacts from vibration are
45 also likely during the construction period.
- 46 ▶ **Air Quality.** Exhaust emissions and fugitive dust
47 would increase during construction as a result
48 of the operation of heavy equipment, lower traf-
49 fic speed (start/stop driving), and earth excava-
50 tion activities associated with construction.
- 51 ▶ **Water Quality.** If spills of fuel, oil, grease, or
52 other chemicals occur during construction
53 activities, they could pollute soils and/or
54 aquatic habitat and affect aquatic biota, espe-
55 cially in the First Creek swale. Sensitive aquatic
56 organisms would be most affected should spills
57 into waterways occur.
- 58 ▶ **Visual.** Stockpiles of earth materials, stacks of
59 construction materials, and parked equipment
60 may cause a temporary visual impact to the resi-
61 dents near the locations of construction activi-
62 ties.
- 63 ▶ **Access.** Local access to intersecting roads and to
64 residences would be maintained during con-
65 struction. However, limited access and minor
66 detours may be necessary at certain locations
67 during this period.

68 3.21.2 Construction Mitigation

69 Construction impacts would be mitigated by the
70 contractor through implementation of control mea-
71 sures during construction. These measures include:

- 72 ▶ Requiring the use of appropriate dust suppres-
73 sion measures to minimize dust impact associ-
74 ated with the construction activities.
- 75 ▶ Designing a suitable construction staging area,
76 and requiring that the contractor store materials

1 and equipment within that area to minimize the
2 visual impact.

- 3 ▶ Disturbance of vegetation and the creek chan-
4 nel would be kept to a minimum to reduce
5 water quality impacts. Construction contractors
6 would practice good management practices to
7 reduce the likelihood of chemical spills.
8 Cleanup of spills would be conducted in com-
9 pliance with Colorado hazardous waste regula-
10 tions in 6 CCR 1007-3.
- 11 ▶ Construction staging and traffic control plans
12 would be developed that minimize the interrup-
13 tion to traffic and access.
- 14 ▶ CDOT, the City of Aurora, and the E-470
15 Authority would provide adequate public
16 notice and maintain coordination with area resi-
17 dents and with the area's emergency service
18 providers to keep the public apprised of the
19 construction progress and to inform the public
20 of closures and detours.
- 21 ▶ The City of Aurora construction noise code
22 requirements limiting noise levels at the neigh-
23 borhood property lines to be no higher than 80
24 dBA between 5:00 p.m. and 7:00 a.m. and 75
25 dBA between 7:00 a.m. and 5:00 p.m. would
26 be enforced during construction.
- 27 ▶ Where feasible, construction percussion opera-
28 tions, and truck loading, hauling, and routing
29 would be scheduled during daytime hours and
30 managed to minimize noise and vibration levels
31 to surrounding neighborhoods.

32 The following BMPs would be used to mitigate
33 impacts to vegetation associated with the Preferred
34 Alternative:

- 35 ▶ Minimize the amount of disturbance and limit
36 the amount of time that disturbed areas are
37 allowed to be non-vegetated.
- 38 ▶ Avoid existing trees, shrubs, and vegetation to
39 the maximum extent possible, especially wet-
40 lands and riparian plant communities.
- 41 ▶ Salvage weed-free topsoil for use in revegeta-
42 tion.

43 Specific BMPs would be required during construc-
44 tion to reduce the potential for introduction and
45 spread of noxious weed species and include:

- 46 ▶ Weed mapping would be included in the con-
47 struction documents along with appropriate
48 control methods for noxious weeds.
- 49 ▶ Highway right-of-way areas would periodically
50 be inspected by CDOT and others during con-
51 struction and during post-construction weed
52 monitoring for invasion of noxious weeds.
- 53 ▶ Weed management measures would include
54 removal or burial of heavily infested topsoil,
55 chemical treatment of lightly infested topsoil,
56 limiting disturbance areas, phased seeding with
57 native species throughout construction, moni-
58 toring during and after construction, and other
59 chemical and/or mechanical treatments.
- 60 ▶ Use of herbicides would include selection of
61 appropriate herbicides and timing of herbicide
62 spraying, and use of a backpack sprayer in and
63 adjacent to sensitive areas such as wetlands and
64 riparian areas. In locations where spot applica-
65 tion is not practicable, a wildlife biologist
66 would inspect the area prior to spraying to
67 ensure crucial habitat would not be impacted.
- 68 ▶ Certified weed-free hay and/or mulch would be
69 used in all revegetated areas.
- 70 ▶ Fertilizers would neither be used nor stored on
71 the project site.
- 72 ▶ Supplemental weed control measures may be
73 added during design and construction planning.

74 Preventative control measures for design and con-
75 struction may include:

- 76 ▶ **Native Plants:** Use of native species in revegeta-
77 tion sites.
- 78 ▶ **Weed Free Forage Act:** Materials used for the
79 project would be inspected and regulated under
80 the Weed Free Forage Act, Title 35, Article
81 27.5, CRS.



1 ▶ **Topsoil Management:** When salvaging topsoil
2 from on-site construction locations, the poten-
3 tial for spread of noxious weeds would be con-
4 sidered. Importing topsoil onto the project site
5 would not be allowed.

6 ▶ **Equipment Management:** Equipment would
7 remain on designated roadways and stay out of
8 weed-infested areas until the areas are treated.
9 All equipment would be cleaned of all soil and
10 vegetative plant parts prior to arriving on the
11 project site.

12 3.22 CUMULATIVE IMPACTS

13 This section addresses the cumulative impacts of the
14 No-Action and Preferred Alternatives. Cumulative
15 impacts are defined as “the impact on the environ-
16 ment which results from the incremental impact of
17 the action when added to other past, present, and
18 reasonably foreseeable future actions regardless of
19 what agency (federal or non-federal) or person
20 undertakes such other actions” (40 CFR 1508.7).

21 The environmental resources addressed under
22 cumulative impacts are those that have been identi-
23 fied as resources of particular concern that could be
24 potentially impacted by the proposed action. The
25 cumulative effects analysis addresses the “incremen-
26 tal impacts” of the proposed action related to those
27 resources and compares them to the impacts that
28 would occur from all reasonably foreseeable activi-
29 ties without the proposed action.

30 3.22.1 Methodology

31 The cumulative impacts study area was chosen to
32 represent the extent of land use impacts from the
33 Preferred Alternative, which includes reconstructing
34 the E-470 interchange complex at I-70 and building
35 two new interchanges on I-70 at Picadilly and Har-
36 vest Roads. Generally, a four-mile radius is consid-
37 ered to be the outside limit of such impacts. To
38 ensure that land use impacts were fully captured, an
39 eight-mile diameter study area surrounding the pro-
40 posed I-70/E-470 interchange complex was

41 selected. **Figure 3-21** shows the boundaries of the
42 cumulative impacts study area.

43 Through scoping and coordination with EPA, it was
44 decided by the consultant team and resource agen-
45 cies (EPA, USACE, CDOW) that the four most
46 important issues to be analyzed for cumulative
47 impacts are land use changes, noise, wildlife and
48 wetlands. For these analyses, data were derived
49 from the *1987 E-470 Environmental Overview*,
50 DRCOG mapping, CDOW - Natural Diversity Infor-
51 mation Source mapping, USACE 404 permit appli-
52 cations, USFWS - National Wetlands Inventory
53 mapping, field research, and aerial photography.
54 Data on reasonably foreseeable land use and trans-
55 portation projects was gathered from Adams
56 County, Arapahoe County, the USACE, the City of
57 Aurora, and CDOT.

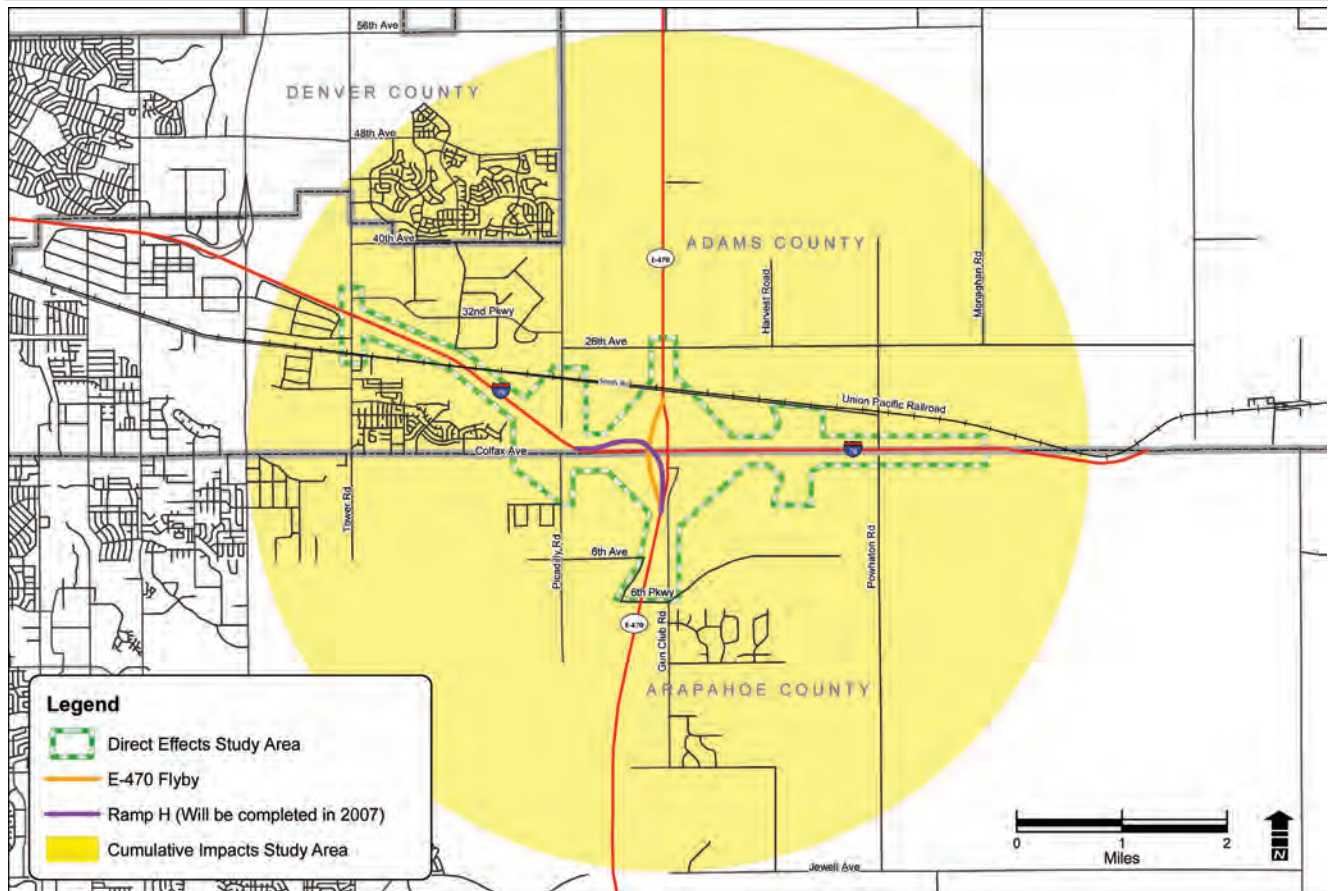
58 3.22.2 Past and Existing Conditions

59 This section describes the conditions of the E-470
60 corridor from 1987 to the present. The corridor
61 includes portions of Douglas, Adams, and Arapahoe
62 Counties; the City and County of Denver; the Town
63 of Parker, and the Cities of Aurora, Commerce City,
64 Brighton, and Thornton.

65 **Land Use.** Prior to the construction of E-470 almost
66 20 years ago, a majority of the land along the E-470
67 corridor was used for agricultural, ranching, and
68 low-density residential purposes. The southern seg-
69 ment of the corridor area consisted of scattered,
70 low-density, usually large lot residential subdivi-
71 sions of middle to upper income level families seek-
72 ing a more rural life style. Because of the undulating
73 topography of this area, agricultural activities were
74 not the predominant feature. Some commercial/
75 retail and office park developments were evident in
76 the vicinity of I-25 South and SH 83.

77 The more consistent topography in the central and
78 airport sections of the E-470 corridor accommo-
79 dated predominantly agricultural and ranching
80 activities. Scattered residential buildings were
81 inhabited mostly by farmers and ranchers who
82 either owned their agricultural land or had sold it or

Figure 3-21
Cumulative Impacts Study Area



1 leased back portions of it to continue farming operations.
 2

3 DRCOG maps quantifying the extent of urbanization
 4 between 1920 and 2000 in the metropolitan
 5 Denver region show that land uses changed very little
 6 between 1920 and 1980. However, between
 7 1980 and 2000, rapid urbanization occurred in the
 8 western part of the study area, which is consistent
 9 with the completion of the first three segments of
 10 E-470 in 1991, 1999, and 2003, respectively. The
 11 extent of urbanization in the study area in 1940,
 12 1960, 1980, and 2000 is shown in **Figure 3-22**.

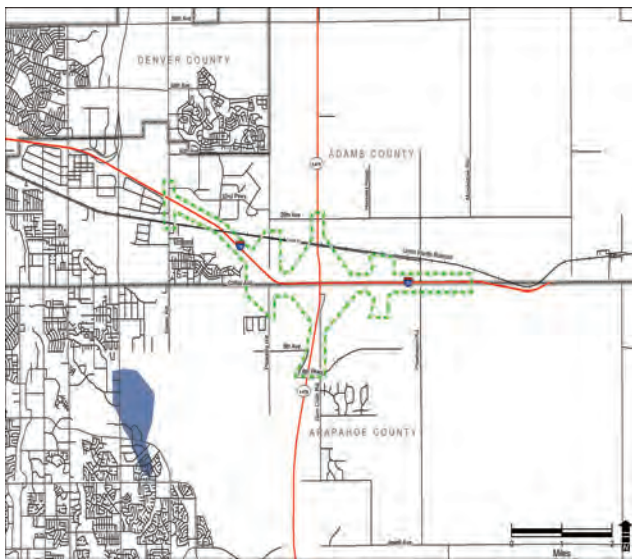
13 Since the construction of E-470, land along the completed southern portions of the highway between I-25 and East Mississippi Avenue have been converted from vacant or agricultural uses to residential and commercial uses. Between Smoky Hill Road

18 and East Mississippi Avenue, commercial uses are
 19 generally located closer to E-470 with residential
 20 developments behind them. In some locations, the
 21 larger residential developments occur within 200
 22 feet of the highway.

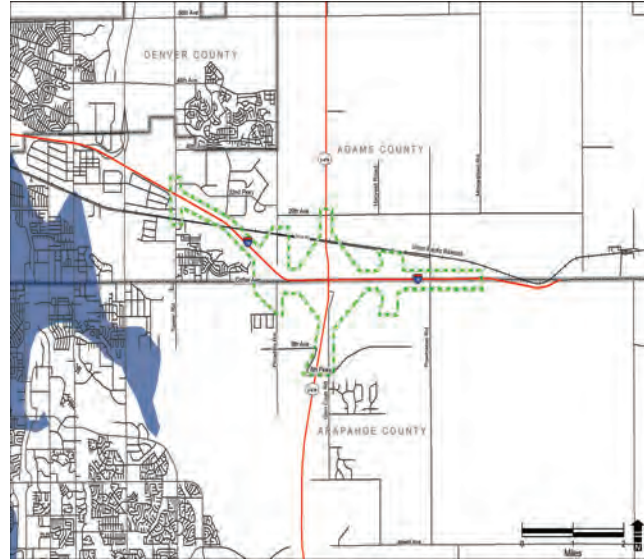
23 The northern and southern quadrants of the existing
 24 I-70/E-470 interchange are dominated by agricultural uses. Approximately 75 percent of the land immediately adjacent to the I-70/E-470 interchange is undeveloped. The remaining 25 percent consists of low-density residential (east of Gun Club Road and south of 6th Parkway), mixed-use and multifamily residential (Murphy Creek east of E-470 and south of Mississippi Avenue), and light industrial uses (Prologis Park 70 between the UPRR and E-470).



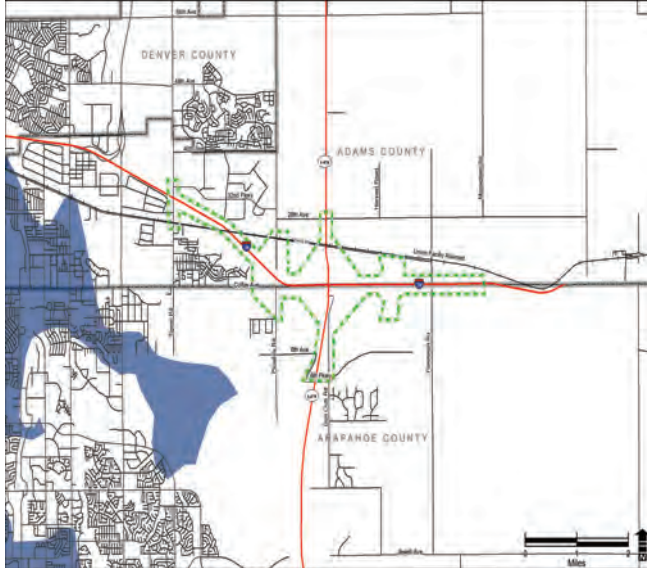
Figure 3-22
Extent of Urbanization in the Study Area: 1940, 1960, 1980, and 2000



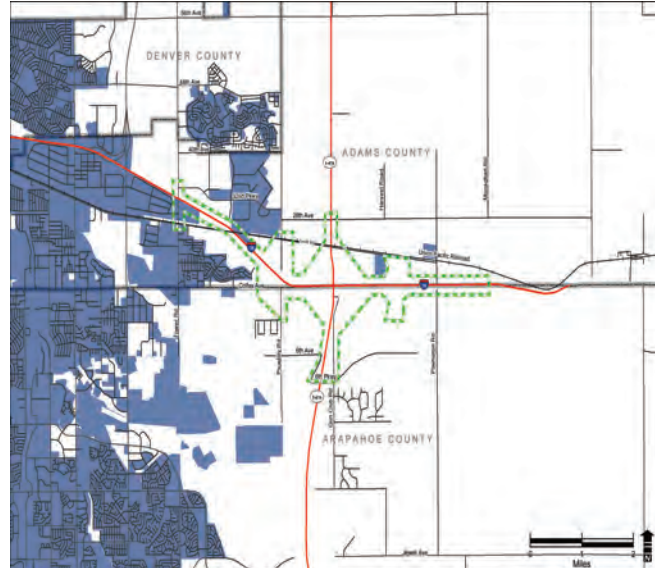
1940



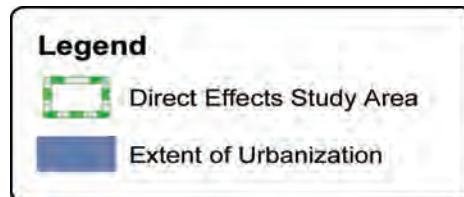
1960



1980



2000



1 Agricultural land uses give way to light industrial
 2 and medium-density residential developments in
 3 the northwestern portion of the study area. The
 4 southwestern portion of the study area is inter-
 5 spered with mixed-use and light industrial land
 6 uses. Buckley Air Force Base is the predominant fea-
 7 ture located south and west of SH 30 in the south-
 8 western corner of the study area.

9 The area along E-470 is projected to continue to
 10 experience major growth. According to the *1987 E-
 11 470 Environmental Overview*, areas along E-470
 12 were expected to capture 41 percent of the regional
 13 population growth between 1980 and 2010 without
 14 the construction of E-470. With the construction of
 15 E-470, the area in 1987 was projected to capture 52
 16 percent of the population growth. Because of the
 17 construction of DIA and continued strong market
 18 forces, the 1987 estimate may have increased over
 19 time. Along the newly completed northern portion
 20 of E-470, new development is already in place and
 21 developers are making additional plans to build
 22 new office, retail, and residential developments.

23 **Noise.** Prior to construction of E-470, noise levels in
 24 the corridor were typical for rural and suburban
 25 environments and were dependent on the distance
 26 to nearby noise sources, usually the nearest road or
 27 highway. Major sources for noise in the area
 28 included I-70, Buckley Air Force Base, and the
 29 UPRR. DIA was not yet constructed. Three measure-
 30 ments were taken outside the immediate study area
 31 to estimate the overall noise environment existing at
 32 surrounding residential areas as shown in **Figure 3-
 33 16** on page 3-39 and summarized in **Table 3-20**.

34 Most noise levels were typically 5 to 10 dBA lower

35 than the 66 dBA NAC. Receivers that were closer
 36 than 100 feet to roads, or were near the airfield or
 37 railroad, experienced noise levels at, or a couple of
 38 decibels above, the 66 dBA NAC.

39 Most residential areas in the study area today are
 40 over 1,000 feet from the highway, well outside the
 41 66-decibel noise contour around E-470. These resi-
 42 dences typically experience noise levels that range
 43 from 50 to 60 decibels. The major source of noise in
 44 these areas is the closest road or highway. Noise
 45 from Buckley Air Force Base and DIA also contrib-
 46 ute to the noise levels in the study area. Since the
 47 construction of E-470, new development along the
 48 highway has been planned so that noise-sensitive
 49 uses are located outside of the noise contour.

50 **Wildlife.** According to the wildlife report prepared
 51 for the *E-470 Corridor Environmental Overview*,
 52 wildlife habitat in the proposed 50-mile corridor
 53 consisted primarily of shortgrass prairie and some
 54 riparian habitat along drainages. Within the cumula-
 55 tive study area, the Coal Creek riparian habitat was
 56 of particular interest, as was a homerange habitat for
 57 a herd of approximately 35 to 50 pronghorns. This
 58 shortgrass prairie habitat was located north of I-70
 59 and south of 104th Avenue, where DIA and Peña
 60 Boulevard are currently located. Aerial photography
 61 in the report showed that raptors of various species,
 62 including the bald eagle, used many of the drain-
 63 ages and wetlands for nesting, roosting, and forag-
 64 ing. Numerous prairie dog towns existed,
 65 supporting burrowing owl populations. There were
 66 no fishery resources of concern within the cumula-
 67 tive study area.

Table 3-20
Noise Measurements Outside the Study Area

Site ID	Activity Category	Location	Monitored Noise Level (dBA) During Peak Hours	
			a.m.	p.m.
A	B	Gun Club Road (south)	58.0	58.3
B	B	Future Harvest Road and East 6th Parkway	54.7	56.6
C	B	Foxridge Farm Mobile Home Park	60.1	58.2



1 According to wildlife habitat mapping provided by
 2 the CDOW-Natural Diversity Information Source,
 3 these species could be present in the cumulative
 4 study area today: bald eagle (portions of the study
 5 area contain roosting sites and are included in the
 6 winter range for this species) and other raptors, bur-
 7 rowing owl, prairie dogs (colonies may be located
 8 throughout the study area), and white tailed deer (a
 9 portion of their overall range crosses the study area
 10 and they are known to occur along the riparian area
 11 associated with Sand Creek). First, Coal, and Sand
 12 Creeks are intermittent streams providing habitat for
 13 area wildlife.

14 A portion of the overall range for mule deer and
 15 pronghorn occurs east of Picadilly Road, but there
 16 are no known migration corridors, resident popula-
 17 tions, or population concentrations of these species
 18 within the study area. In addition, the study area
 19 falls within the overall range for the Preble's
 20 meadow jumping mouse, but is not included in the
 21 occupied range for this species.

22 **Wetlands.** Historically, wetlands in the E-470 corri-
 23 dor were associated with First and Coal Creeks. The

24 E-470 Corridor Environmental Overview described
 25 28 wetlands of varying function and quality cover-
 26 ing 58.01 acres within the proposed 50-mile E-470
 27 right-of-way.

28 Today, there are approximately 154 acres of wet-
 29 lands in the cumulative impacts study area
 30 (National Wetland Inventory, 2004). These wet-
 31 lands vary by type and function, and are generally
 32 located along Coal Creek south of the interchange,
 33 and First Creek north of the interchange.

34 **3.22.3 Planned Development and Transporta-**
 35 **tion Actions**

36 **Table 3-21** includes development projects which
 37 are reasonably foreseeable, are identified in area
 38 plans, and are expected to occur regardless of the
 39 proposed improvements to the I-70/E-470 inter-
 40 change. These projects include those that are under
 41 construction or have been approved, as well as
 42 those that are known by planners or developers to
 43 be reasonably certain, but which had not been
 44 approved or permitted as of August 2005.

Table 3-21
Reasonably Foreseeable Developments

Development Name	Type	Acres	Stage	Location
Adonea	Residential	447.5	Site Plan/Plats Approved	Northwest corner of Alameda and Powhaton Road.
Airways Park	Commercial/Industrial	195	Planning Stages	Smith Road and Tower Road. An industrial/business park with finished commercial and industrial sites.
APS Site	Residential	100	N.A.	Between 6th Parkway and future 6th Avenue Ext., east of Cross Creek. Site for high and middle school.
Aurora Commerce Center	Commercial/Industrial	162	Plats Approved	Bordered by 26th Avenue, E-470, Smith Road, and Picadilly Road. Business and industrial, distribution.
Bounds Sell Coakes	Residential	444	Proposed	West of E-470, south of I-70. 3,263 dwelling units.
Buckboard	Commercial	NA	Inactive	South of 6th Avenue and 0.25 mile west of Picadilly Road.

**Table 3-21 (continued)
Reasonably Foreseeable Developments**

Development Name	Type	Acres	Stage	Location
Celtic IV parcel	Residential	323	N.A.	Between Alameda Avenue and future 6th Avenue extension, approximately 1.0 mile east of E-470. Tarco/CLS.
Celtic V parcel	Residential	149	N.A.	Between 6th Parkway and future 6th Avenue extension, approximately 1.5 miles east of E-470.
Celtic VI parcel	Residential	149	N.A.	Between 6th Parkway and future 6th Avenue extension, approximately 1.5 miles east of E-470.
Coal Creek Reserve	Residential	615	Proposed	South of Jewell Avenue. Proposed adult community.
Conservatory of the Plains	Residential	490	Approved for Construction	Between Hampden and Jewell Avenues, west of E-470.
Cross Creek	Residential	218	Under Construction	East of Gun Club Road, south of 6th Avenue. 1,070 dwelling units, commercial development.
Day-Hartland Property	Residential	194	N.A.	North of 26th Avenue, east of E-470. Rezoning application for E-470 Medium Density Residential.
Denver International Business Center	Commercial	450	Under Construction	West of E-470, south of Peña Boulevard. Commercial, hospitality and residential development.
Eastern Hills	Residential	3,385	Plats Approved	Between Alameda and Yale Avenues, Harvest Road to Hayesmount.
EastGate Business Center	Commercial/Industrial	295	Planning Stages	Northwest corner of I-70/E-470. Aurora. Light industrial and distribution warehouse.
EastPark 70-Master Plan	Commercial	110	Under Construction	Southwest corner of Smith Road and Himalaya Road. Master plan for industrial park.
First Creek Ranch	Mixed-Use	320	Master Plan Approved	East of Sand Creek Ranch development.
Green Valley Ranch	Mixed-Use	2,212	Planning Stages	Between 26th and 56th Avenues bounded by Picadilly Road and Powhaton Road. 70 percent single family; commercial, retail, school, parks, golf course.
Horizon City Center - RealtiCorp	Mixed-Use	503	Planning Stages	Southwest corner of I-70 and the E-470 toll road. To include more than 500 homes and 5 million square feet of commercial/retail/office space.



**Table 3-21 (continued)
Reasonably Foreseeable Developments**

Development Name	Type	Acres	Stage	Location
Intermodal Facility at Front Range Airport	Transit	50	Not Funded	Front Range Airport.
International Airport Commerce Center	Commercial	880	Proposed	South of DIA along 56th Avenue, east side of E-470. Office, retail, industrial distribution.
Majestic Commercenter	Commercial/ Industrial/ Office	1,000	Under Construction	I-70 and Tower Road.
Murphy Creek	Mixed-Use	1,277	Under Construction	East of E-470, south of Mississippi Avenue. Residential and mixed used development, golf course community.
Northeast Plains	Residential	1,674	Proposed	East of Gun Club Road, between Alameda and I-70.
Prologis Park 70	Commercial/ Industrial	182	Under Construction	The intersection of E-470 and I-70. 2.9 million square feet of distribution and warehouse space at build out.
Proposed golf course & conference center	Commercial	N.A.	Site Plan	East of the DIA Business Center.
Sand Creek Ranch	Mixed-Use	480	Proposed	Southeast corner of Powhaton and Alameda. Residential/commercial.
Singletree at DIA	Residential	141	Under Construction	North of 56th Avenue, west of Himalaya, Aurora.
Southlands	Mixed-Use	300	Under Construction	Northeast corner of E-470 near Smokey Hill Road.
Sterling Hills	Residential	435	Under Construction	South of Jewell, east of Tower Road.
Traditions	Residential	290	Under Construction	Southeast corner of 6th Avenue and Harvest Road; northeast corner of Harvest Road and Alameda Avenue. Single family.
TransPort	Commercial	6,300	Proposed	Northeast of town of Watkins; north of I-70, south of 56th Avenue, at Front Range Airport.
Wal-Mart at Gateway Park IV East	Commercial	NA	Complete	Northwest corner of I-70 and Tower Road. Supercenter.

**Table 3-21 (continued)
Reasonably Foreseeable Developments**

Development Name	Type	Acres	Stage	Location
Windler Homestead/Pulte Homes	Mixed-Use	711	Under Construction	Aurora. Northeast, northwest and southwest corner of 48th Avenue and E-470, plus the northeast corner of 52nd Avenue, plus the northeast corner of 48th Avenue and Gun Club Road. Up to 22.7 million square-feet of commercial and 1,748 residential homes.
WorldPort	Commercial	40	Proposed	South of Peña Boulevard between 68th and 71st Avenues.

1 **Table 3-22** includes transportation actions that are
 2 expected to occur within the study area regardless
 2 of whether or not the Preferred Alternative is con-
 3 structed.

4 Adams County, Arapahoe County, and the City of
 5 Aurora have identified E-470 along I-70 as a strong
 6 employment growth area and have assigned com-
 7 patible land uses throughout the study area. Land
 8 use plans have included the assumption of new
 9 interchanges at I-70 within the study area. For this
 10 reason, the No-Action Alternative would have the
 11 greatest incremental impact to land uses. In the

12 absence of interchanges at Picadilly and Harvest
 13 Roads, regional commercial land uses would likely
 14 shift towards 6th Parkway at the E-470 interchange.
 15 This would result in incremental impacts to wet-
 16 lands, floodplains, riparian habitat, and wildlife.

17 Construction of the Preferred Alternative would be
 18 more consistent with planned land uses in the study
 19 area. Regional commercial land uses would
 20 develop away from and, therefore, avoid existing
 21 wetlands, floodplains, and riparian and wildlife hab-
 22 itat, resulting in fewer incremental impacts to these
 23 resources.

**Table 3-22
Reasonably Foreseeable Transportation Actions**

Jurisdiction	Location	Description	Status
City of Aurora	Tower Road between I-70 and 38th Avenue	Reconstruction and widening of Tower Road from I-70 northward to 38th Avenue. Phase II would complete widening to the City limits at 44th Avenue.	Phase II construction scheduled 2005/2006.
City of Aurora	Picadilly Road: 26th Avenue to 38th Avenue	Construct the street to four-lane arterial standards, including median landscaping. Property owners are responsible for curb, gutter, walk, and the outside 18 feet of pavement on each side.	Design and construction in 2008.
City of Aurora	6th Avenue from Airport Boulevard to Tower Road	The entrance to Buckley Air Force Base at 6th Avenue (SH 30) would be widened from two lanes to a six-lane arterial with a raised median from Airport Boulevard to Tower Road.	Construction anticipated in 2007.
RTD and CDOT	I-70 East Corridor/I-225 Corridor	FasTracks - Denver metro regional transit improvements	In the NEPA process.

Sources: CDOT State Transportation Improvement Program, 2005-2010; Aurora Capital Improvement Program, 2004; City of Aurora; Adams County; Arapahoe County.



1 **Noise.** As development has followed E-470 into the
2 area, traffic and traffic-related noise has increased
3 on local roads. However, some of the local traffic
4 has moved onto E-470, drawing heavier traffic and
5 noise from local roads. Large development projects
6 and transportation actions are expected to occur
7 within the study area regardless of whether or not
8 the Preferred Alternative is constructed. As property
9 development within the cumulative study area con-
10 tinues, noise would increase near roads as traffic
11 increases. The Preferred Alternative would attract
12 incremental traffic volume, but the dominant effect
13 of the interchange installations would be to redi-
14 stribute the interstate and E-470 bound traffic away
15 from Gun Club Road and onto a local network of
16 Colfax, Picadilly, and Harvest Roads. Existing resi-
17 dential subdivisions located south of the study area
18 near Harvest Road and East 6th Parkway and near
19 Picadilly Road and East 6th Avenue would experi-
20 ence increased traffic noise levels approaching or
21 exceeding the Colorado NAC as a result of these
22 2030 traffic changes. Noise analyses were not con-
23 ducted for these specific residential neighborhoods;
24 however, they were monitored to establish existing
25 noise levels as noted in **Table 3-20**.

26 2030 traffic projections developed using the
27 DRCOG regional model for the No-Action Alterna-
28 tive (that would retain the existing I-70 ramps at
29 Gun Club Road) show that the Gun Club Road daily
30 traffic south of Colfax Avenue would average
31 12,000 vehicles per day. Traffic projections devel-
32 oped for the Preferred Alternative (that removes the
33 I-70 ramps at Gun Club and provides full inter-
34 changes for I-70 at Harvest Road and at Picadilly
35 Road) show the 2030 Gun Club Road traffic volume
36 would average 4,000 vehicles per day. Official traf-
37 fic counts on Gun Club Road in 2004 found that
38 daily traffic was 3,600 vehicles on the average day.
39 In the absence of interchanges at Picadilly and Har-
40 vest Roads, noise levels would remain similar to
41 existing in the immediate interchange areas but
42 would increase on I-70, E-470, and local arterial
43 roads, which would have to accommodate planned
44 growth. The No-Action Alternative focuses inter-
45 state-destined traffic onto E-470 and Gun Club
46 Road, increasing the noise along those locations.

47 The Preferred Alternative is estimated to better dis-
48 tribute traffic, and, therefore, better distribute noise
49 across a network of local arterials with interstate
50 access.

51 Construction of the Preferred Alternative would
52 result in increased noise levels around new inter-
53 changes, particularly around Picadilly and Harvest
54 Road arterials. However, some traffic would utilize
55 the interchanges and related improvements instead
56 of local roads, drawing heavier traffic and noise
57 away from local roads and adjacent land uses.

58 Planned business and residential development
59 inside the study area and projected growth outside
60 the study area would generate new traffic demand
61 on the local and highway systems. Anticipation of
62 this growth has resulted in planned capacity and
63 linkage improvements in the local roadway network
64 concurrent with development. These improvements
65 would occur independently of the proposed action.
66 Traffic composition and distribution would likely
67 change from the existing traffic patterns because of
68 future network modifications and the proposed
69 interchange.

70 Because there is minimal difference (.001 percent)
71 between future traffic resulting from building the or
72 not building the Preferred Alternative, and because
73 2030 traffic volumes are expected to exceed 20,000
74 vehicles per day on major arterials such as Harvest
75 and Picadilly Roads, increased noise levels and
76 impacts are expected to existing neighborhoods
77 located along Picadilly Road and outside the study
78 area south of East 6th Parkway.

79 **Wildlife.** Since the time that E-470, DIA, and Peña
80 Boulevard were constructed, there has been a gen-
81 eral loss and degradation of wildlife habitat as new
82 development has followed these projects into the
83 cumulative study area. It is unclear how this has
84 affected populations of specific species. However, it
85 is reasonable to assume that wildlife populations
86 have declined in the area, especially those that are
87 sensitive to noise and human activity. As undevel-
88 oped and agricultural lands in the cumulative study
89 area are developed, a large amount of the wildlife

1 habitat would be removed and individual popula-
2 tions would likely be displaced.

3 Wildlife within the study area depends upon the
4 riparian habitat associated with the First and Sand
5 Creek drainages. In the absence of an interchange at
6 Picadilly Road, regional commercial land uses
7 would likely shift towards 6th Parkway/E-470,
8 potentially impacting Sand Creek and associated
9 wildlife. If a new interchange were not constructed
10 at Harvest Road/I-70, residential development
11 would occur in the north. While there is a prairie
12 dog colony in this area, impacts to prairie dog habi-
13 tat from residential development would not differ
14 substantially from those incurred by the light indus-
15 trial/office development planned in this area.

16 Construction of the Preferred Alternative would be
17 more consistent with planned land uses in the study
18 area. Regional commercial land uses would
19 develop away from existing riparian and wildlife
20 habitat, resulting in fewer impacts to wildlife.

21 **Wetlands.** According to USACE records, 5.18 acres
22 of wetlands have been impacted in the cumulative
23 study area, not including E-470. Most of this
24 impacted acreage was not replaced through mitiga-
25 tion because of the small size covered by each of
26 more than 30 permits. Additional impacts can be
27 expected as development occurs on undeveloped
28 and agricultural lands in the cumulative study area.

29 Indirect, induced growth impacts associated with
30 the No-Action Alternative would result in greater
31 incremental impacts to wetlands than would the
32 Preferred Alternative. In the absence of interchanges
33 at Picadilly and Harvest Roads, regional commercial
34 land uses would likely shift towards 6th Parkway at
35 the E-470 interchange. Under this scenario, the
36 most intensive development could occur near the
37 riparian area associated with the Sand Creek corri-
38 dor. Indirect effects to wetlands are discussed in
39 detail in the *Indirect Effects/Induced Growth Tech-*
40 *nical Report* prepared for this EA (**Appendix D**).

42 **3.22.4 Conclusion**

43 The incremental impact of the Preferred Alternative
44 does not result in effects that cause an unacceptable
45 deterioration in the human quality of life. Its impact
46 to study area wetlands and wildlife habitat would be
47 less than the No-Action Alternative. The Preferred
48 Alternative is consistent with local planning efforts.
49 Adams County, Arapahoe County and the City of
50 Aurora have already identified E-470 and I-70 as a
51 strong growth area. DRCOG has projected large
52 increases in population and employment within the
53 study area. All of these agencies have assumed that
54 by 2030 there would be two new interchanges on
55 I-70 on either side of the I-70/E-470 interchange. In
56 the absence of the proposed improvements,
57 planned commercial land uses would likely shift
58 from the interchange locations south to areas not
59 currently planned for development that contain sub-
60 stantial environmental resources. For this reason,
61 the Preferred Alternative has less of an impact to the
62 resources of concern than the No-Action Alterna-
63 tive.

64 **3.22.5 Mitigation**

65 The following mitigation measures could reduce the
66 proposed action's portion of the cumulative impacts
67 to the resources of concern:

- 68 ▶ The City of Aurora has implemented zoning and
69 comprehensive plans that assume open space
70 set asides and that encourage Smart Growth
71 development. These general principles should
72 be specifically applied to new development
73 proposals (see letter from the City of Aurora in
74 **Appendix A**).
- 75 ▶ Commitments by the City of Aurora to enforce
76 Smart Growth principles and enforce open
77 space set asides are recommended.
- 78 ▶ The City of Aurora, which has zoning jurisdic-
79 tion over much of the E-470 corridor, does not
80 permit new residential zoning where existing or
81 projected airport noise may exceed day-night
82 noise level (Ldn) 60 decibels.



- 1 ▶ Implementation of a setback requirement has
2 been discussed by the City of Aurora and is rec-
3 ommended to minimize noise impacts.
- 4 ▶ Addition of cross culverts for small urban mam-
5 mals.
- 6 Creek impacts would be minimized and mitigated,
7 as directed by the USACE in the Section 404 permit-
8 ting process.

9 3.23 PERMITS REQUIRED

10 The following permits or coordination would be
11 required for the Preferred Alternative and would be
12 obtained prior to construction:

- 13 ▶ **National Pollutant Discharge Elimination Sys-**
14 **tem (NPDES)** issued by the CDPHE. This storm-
15 water discharge permit would be required to
16 assure the quality of stormwater runoff.
- 17 ▶ **Section 404 permit** issued by the USACE. This
18 permit would be required for filling in Waters of
19 the U.S. located in the interchange area.
- 20 ▶ **Section 402 permit** issued by the CDPHE. This
21 permit would be required for dewatering of
22 construction areas, if necessary.
- 23 ▶ **Permits for storm sewer crossings.**
- 24 ▶ **Erosion control/grading permit issued by the**
25 **CDPHE.**
- 26 ▶ **State Access permit**, issued by CDOT, is
27 required for all requests for new or modified
28 access to E470/I70. Any existing accesses
29 adversely affected by the proposed action will
30 be notified of the proposed changes.
- 31 ▶ **Construction Access permits** from CDOT,
32 Adams County, and the City of Aurora for
33 detours and lane closures along I-70, E-470, and
34 other roads that may be affected during con-
35 struction.
- 36 ▶ **Fugitive Dust permit** is issued by CDPHE, Air
37 Pollution Control Division. It may be required if

38 more than 25 acres of land is impacted and/or
39 construction duration is longer than six months.

- 40 ▶ **Other Local permits**, such as utility or survey.
- 41 ▶ **Floodplain permits**, issued by FEMA include a
42 Conditional Letter of Map Revision and Letter of
43 Map Revision.

44 3.24 IRREVERSIBLE AND IRRETRIEV- 45 ABLE COMMITMENTS OF 46 RESOURCES

47 Implementation of the Preferred Alternative would
48 involve a commitment of a range of natural, physi-
49 cal, human, and fiscal resources. Land that would
50 be used in the construction of the Preferred Alterna-
51 tive would be considered an irreversible commit-
52 ment during the time period that the land is used.

53 The Preferred Alternative would remove the existing
54 Gun Club Road interchange ramps before the life of
55 that structure is reached. This interchange was
56 intended to be temporary when E-470 was origi-
57 nally built until the full I-70/E-470 interchange
58 could be constructed.

59 Considerable amounts of fossil fuels, labor, and
60 construction materials, such as cement, aggregate
61 material, and bituminous material, would be
62 expended in the construction of the Preferred Alter-
63 native. Additionally, large amounts of labor and nat-
64 ural resources would be used in the fabrication and
65 preparation of construction materials. These materi-
66 als are generally not retrievable. However, they are
67 not in short supply and their use would not have an
68 adverse effect on continued availability of these
69 resources. Any construction would also require allo-
70 cation of funds which could be used by other
71 projects.

72 Both build and no-build alternatives may affect
73 environmental resources not regulated at the fed-
74 eral, state, or local level. Such impacts would
75 include the consumption of natural resources such
76 as fossil fuels and raw materials like gravel. The type
77 of alternative selected may also affect social

1 resources such as landfill capacity. In most cases,
 2 such impacts cannot be quantified, and cannot
 3 entirely be avoided. It is recognized that these
 4 impacts should be minimized to the extent practica-
 5 ble.

6 Sustainable practices incorporated into the project
 7 planning, construction, and maintenance can mini-
 8 mize resource impacts. As part of its environmental
 9 ethic and policy, CDOT encourages its staff, con-
 10 sultants, and contractors to identify and utilize
 11 opportunities and methods to reduce the impact of
 12 projects and programs on environmental resources
 13 through innovative programs and by providing flexi-
 14 bility in project planning and construction for the

15 use of sustainable processes and materials. This may
 16 include such concepts as natural resource conserva-
 17 tion; waste minimization; materials reuse; minimal
 18 use of native virgin materials; conservation and effi-
 19 cient use of water and energy; air pollution preven-
 20 tion, preference for “green” purchasing such as
 21 recycled; minimally processed and packaged items;
 22 and preference for locally-available resources.
 23 CDOT encourages the identification and incorpora-
 24 tion of proven alternative materials that are as long
 25 or longer-lasting as traditional materials, and which
 26 require the same or less amount of maintenance, as
 27 long as such materials do not impact CDOT’s ability
 28 to meet its primary obligations for providing a safe
 29 and efficient transportation system.

30 3.25 MITIGATION AND BENEFITS SUMMARY

31 A summary of mitigation and benefits is depicted in **Table 3-23** and **Table 3-24**.

Table 3-23
Mitigation Measures for the Preferred Alternative

Resources and Impacts	Mitigation or Benefit
Land Use and Zoning	No mitigation is necessary for land use impacts. See Section 3.4.3, Right-of-Way, for mitigation measures associated with the acquisition of property.
Indirect Effects	<p>Typical mitigation for the indirect growth-related impacts of a project includes the adoption of Smart Growth policies, open space acquisition, and/or the implementation of transportation demand management policies and design standards.</p> <p>Mitigation that could be considered for local jurisdictions includes:</p> <ul style="list-style-type: none"> ▶ Commitments to enforcing Smart Growth policies as evidenced in the differential figures of the impacts shown in Table 3-1 (see letter from the City of Aurora in Appendix A committing to Smart Growth Principles). ▶ Commitments for open space set asides or acquisitions, particularly along the floodplains of Sand Creek and First Creek. ▶ Adequate and timely investments in supportive infrastructure, such as the local street system underway as demonstrated in the No-Action Alternative.
Indirect Effects (continued)	<ul style="list-style-type: none"> ▶ Commitments to appropriate design standards to minimize air pollution and traffic impacts (development in the vicinity of the new interchanges would replace rural, undeveloped land potentially impacting visual quality and quality of life for residents currently living in this mostly rural area).
Farmland	Because there are no impacts to prime or unique farmlands or farmlands of statewide importance, no mitigation is required.



Table 3-23 (continued)
Mitigation Measures for the Preferred Alternative

Resources and Impacts	Mitigation or Benefit
Social	No social mitigation is needed.
Environmental Justice	Because there would be no disproportionate adverse impacts to low-income or minority populations in the study area, no mitigation measures are required. Mitigation for noise, visual, and construction-related impacts are addressed in Section 3.9.4, Section 3.19.3, and Section 3.21.2, respectively.
Right-of-Way and Relocation	Acquisition of land for right-of-way would begin when the proposed action is fully designed, funded, and moves toward construction. Right-of-way acquisition for the I-70/E-470 interchange complex would comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended, which contains specific requirements that govern the manner in which a government entity acquires property for public use. The purpose of the Uniform Act is to provide a uniform policy for fair and equitable treatment of persons displaced from their homes, businesses, or farms as a result of federal and federally assisted programs. The law is designed to ensure just compensation for all acquired properties and minimal impact to the current owners.
Right-of-Way and Relocation (continued)	The Uniform Act requires that a property owner be notified of the interest to acquire their property before a real property appraisal is completed. Each property owner is given the opportunity to accompany the appraiser during the inspection of the property. Just compensation is established based on a current appraisal. The owner of real property acquired for right-of-way would be compensated at fair market value, in accordance with the Uniform Act, state statutes, and CDOT policies and procedures. No owner would be required to surrender possession of the real property until paid the agreed purchase price or the amount deemed to be just compensation has been deposited with the court for the benefit of the owner. Other entities, such as the City of Aurora, may acquire the property on behalf of CDOT but would be bound by the requirements of the Uniform Act.
Economic	During the construction phase, good communication with emergency service providers, local businesses, government agencies, and residents is recommended with regard to traffic delays and access changes. Such notifications could be accomplished through radio and public announcements, newspaper notices, and on-site signage. If access to a business is compromised, alternate access routes would be provided during construction.
Transportation (including pedestrians and bicyclists)	The Preferred Alternative does not require mitigation.
Parks and Recreation Resources	There are no existing parks, recreational facilities, or designated open space in the study area. Therefore, there would be no impacts to parks or recreational facilities, and no mitigation is required. The areas that are zoned for parks/open space and plans for recreational facilities have already taken this proposed action into consideration.
Air Quality	No mitigation for air quality is necessary.
Noise	Noise mitigation for the Preferred Alternative was found to be not reasonable or feasible.

**Table 3-23 (continued)
Mitigation Measures for the Preferred Alternative**

Resources and Impacts	Mitigation or Benefit
<p>Water Resources and Water Quality</p>	<p>The use of standard erosion and sediment control BMPs in accordance with Erosion Control and Storm Water Quality Guide, CDOT, 2002, would be included in the final design plans. A drainage master plan would be prepared in cooperation with the Urban Drainage and Flood Control District, E-470, CDOT, the City of Aurora, and the Counties of Adams and Arapahoe, ensuring that new interchange drainage facilities are compatible with adjacent facilities.</p> <p>All work on the proposed action shall be in conformity with Subsection 107.25 and Section 208 of the <i>CDOT Standard Specifications for Road and Bridge Construction</i>. As previously mentioned, the proposed action's location falls under the CDPHE Phase I and Phase II Storm Water Regulations and would follow the requirements of CDOT's MS4 permit. Specifically, the two CDOT Storm Water Management Programs that would apply are the Construction Sites Storm Water Management Program and the New Development and Redevelopment Planning Procedures for Storm Water Management.</p> <p>After a highway project is identified, the permanent BMP planning process under MS4 is to determine if there would be water quality impacts. If there are, permanent BMPs are required. The permanent BMPs should be included in the proposed action's preliminary design, including cost consideration. Once this design, is underway, an environmental review can be performed that includes the conceptual BMPs. As the environmental document is being prepared, final determination on the BMPs is made. Once this is completed, field review and preliminary design modifications are conducted, which is then followed by final BMP design and CDOT review.</p> <p>Through continuous collaboration with the flyby design team, the E-470 Authority, and CDOT, the interim and ultimate condition analyses for the full I-70/E-470 interchange were coordinated so that permanent BMPs designed for the flyby phase would also be used in the full I-70/E-470 interchange. This is documented in the <i>I-70/E-470 Flyby Phase I Plan</i>, February 2005. The flyby did not impact the Harvest Road interchange area or the Picadilly Road interchange area; therefore, new water quality facilities have been proposed for those areas and are described in the <i>I-70/E-470 Interchange Complex Preliminary Storm Drainage Design Report</i>, (Parsons Brinckerhoff, 2006). This report would be submitted to CDOT before the completion of the EA process. Proposed permanent BMP water quality facilities were preliminarily sized using the Water Quality Control Volume (WQCV) equation presented in the <i>Urban Drainage and Flood Control District (UDFCD) Urban Storm Drainage Criteria Manual (USDCM) Volume 3, Best Management Practices</i>. This equation bases the size of the basin on the amount of impervious area contributing to the basin. All permanent BMPs were designed to capture 100 percent of the runoff from the impervious surface.</p> <p>The following specific BMPs from the <i>Erosion Control and Storm Water Quality Guide</i>, CDOT, 2002, would be required during construction to reduce construction-related and/or long-term impacts to water resources:</p> <ul style="list-style-type: none"> ▶ Adjacent disturbed fill slopes would be revegetated with native plant species to protect exposed soils from erosion. ▶ Disturbance to vegetated areas would be minimized, and revegetation of disturbed vegetated surfaces would occur within seven days of earthwork as required by the Colorado Discharge Permit System regulations. Where temporary or permanent seeding operations are not feasible because of seasonal constraints (e.g., summer and winter months), mulch and mulch tackifier would be applied to protect soils from erosion.



Table 3-23 (continued)
Mitigation Measures for the Preferred Alternative

Resources and Impacts	Mitigation or Benefit
Water Resources and Water Quality (continued)	<ul style="list-style-type: none"> ▶ Sediment catch basins would be built during construction and permanently maintained to capture the sand from the road surface during winter sanding operations. ▶ Where appropriate, slope drains would be used to convey concentrated runoff from the top to bottom of disturbed slopes. Slope and cross-drain outlets would be constructed to trap sediment. ▶ Storm drain inlet barriers would be used where appropriate to trap sediment before it enters the cross-drain. ▶ Check dams would be used where appropriate to slow the velocity of water through road-side ditches and in swales. ▶ Temporary retention ponds would 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 can include the following: extended detention basins with sediment fore-bays, wetland grass swales, wetland grass buffers, and constructed wetland basins. Non-structural BMPs can include litter and debris control, and landscaping and vegetative practices. ▶ Settling ponds for effluent from dewatering operations would be used, if needed. ▶ During the design, the CDOT Hydraulic Engineer and Landscape Architect would review the project plans and provide comments as necessary.
Wetlands and Other Waters of the U.S.	Because no wetlands would be impacted, wetland mitigation would not be required.
Floodplains	<p>Mitigation measures would be required to minimize impacts to the First Creek floodplain. New construction within regulated floodplains requires compliance with FEMA regulations and criteria. The design of all roadway, drainage, and structural features would be in accordance with these criteria, as well as local jurisdictional requirements. This would require close coordination during the design process with several parties, including FEMA, CDOT, UDFCD, the City of Aurora, and any affected property owners.</p> <p>As noted previously, there is a Master Plan for drainage improvements on First Creek. This report was prepared in anticipation of future developments, such as including the I-70/E-470 interchange complex. One of the purposes of such a report is to determine potential drainage problems and impacts of future development on the drainage system, and to develop proposed improvements to reduce these impacts. Implementation of various proposed improvements may be required as a mitigation measure, which would minimize risk associated with the action. These measures would also restore and preserve the natural and beneficial floodplain values.</p>

Table 3-23 (continued)
Mitigation Measures for the Preferred Alternative

Resources and Impacts	Mitigation or Benefit
Floodplains (continued)	In addition to permanent measures to help control future flooding, other temporary measures would be required along First Creek during construction of the interchange. This includes use of standard CDOT and UDFCD erosion control techniques to minimize impacts to the drainage-way. Implementation of Best Management Practices (BMPs) would be required to help control erosion and sedimentation within the drainage basin. This would also improve water quality for the runoff being delivered further downstream.
Wild and Scenic Rivers	Since no wild and scenic rivers are present in the study area, no mitigation is necessary.
Wildlife and Fisheries	<p>No fisheries mitigation is required since no fisheries are present in the study area. The following mitigation measures are proposed to limit impacts to wildlife resources:</p> <ul style="list-style-type: none"> ▶ As possible, retention of large trees that have the potential to serve as raptor nesting habitat as specified by CDOW wildlife biologist or project biologist. ▶ Removal of any trees with nests would be performed outside of the nesting period to be confirmed by CDOW. New trees would be planted when the area is landscaped which would replace the removed trees. ▶ Bird nest removal would be timed to avoid active/nesting seasons and/or birds would be actively excluded. If necessary, nest surveys would be conducted immediately prior to construction. ▶ Removal of any bank swallow nests in the First Creek culverts under I-70 would be performed outside of the nesting period to be confirmed by CDOW. ▶ Addition of culverts for small wildlife to cross I-70, E-470, and other roadways. ▶ Use of temporary and permanent erosion control measures to limit impacts to the First Creek channel, consistent with the project stormwater management plan.
Threatened and Endangered Species	Since no threatened and endangered species would be affected by the Preferred Alternative, no mitigation is required.
Historic and Archaeological Resources	<p>In the event that cultural materials are exposed during the construction process, all activity would be immediately suspended in the area of discovery. The CDOT Staff Archaeologist would be notified in order for the cultural materials to be properly evaluated for NRHP significance.</p> <p>Because of the paleontologic sensitivity of the Denver Formation, a qualified paleontologist would monitor construction activities in all areas where construction impacts to this geologic unit are likely to occur. When the design plans are finalized, the CDOT Staff Paleontologist would examine them in order to estimate the scope and locations of probable construction impact to the Denver Formation and the scope and locations of paleontological monitoring work, if any, which are required.</p> <p>If any subsurface bones or other potential fossils are found anywhere within the study area during construction, the CDOT Staff Paleontologist would be notified immediately to assess their significance.</p>



Table 3-23 (continued)
Mitigation Measures for the Preferred Alternative

Resources and Impacts	Mitigation or Benefit
Hazardous Waste	<p>CDOT carefully considers the potential risks associated with hazardous waste on construction projects and utilizes Section 250 of the <i>Standard Specifications for Road and Bridge Construction</i> (CDOT, 2005). Section 250 “Environmental Health and Safety Management” provides for the protection of the environment, persons and property from contaminants and includes special requirements for addressing hazardous waste, if encountered.</p> <p>Encountering hazardous waste in soils or groundwater with the Preferred Alternative is not anticipated. Therefore, no Site Investigation (SI) is recommended. Pay items and appropriate notes placed in the final design plans as a precautionary measure would adequately protect worker health and safety, as well as provide the contractor and project engineer with suitable measures in the event that contamination is encountered from any source.</p>
Visual Resources	<p>The following measures would reduce impacts to the existing visual landscape:</p> <ul style="list-style-type: none"> ▶ All disturbed areas would be revegetated with native grasses as soon as practicable. ▶ All new structures, signing, and lighting would be consistent with local standards and guidelines. ▶ Architectural interest (such as texture, color, or design) would be provided for retaining walls, bridges, and other structural features. Wall materials and design would be coordinated with CDOT, local landowners, the E-470 Authority, and the City of Aurora. ▶ Visual enhancements would be consistent with the principles of Context Sensitive Solutions as described in CDOT’s <i>Context Sensitive Solutions Policy Memo</i> dated October 31, 2005.
Energy	<p>Mitigation that would be implemented to reduce energy consumption during construction includes:</p> <ul style="list-style-type: none"> ▶ Maximum use of on-site material to reduce haulage requirements. ▶ Proper maintenance of construction vehicles. ▶ Turning off equipment when not in use. ▶ Design of construction access roads and location of construction staging areas to minimize distances traveled.
Construction	<p>Construction impacts would be mitigated by the contractor through implementation of control measures during construction. These measures include:</p> <ul style="list-style-type: none"> ▶ Requiring the use of appropriate dust suppression measures to minimize dust impact associated with the construction activities. ▶ Designing a suitable construction staging area, and requiring that the contractor store materials and equipment within that area to minimize the visual impact. ▶ Disturbance of vegetation and the creek channel would be kept to a minimum to reduce water quality impacts. Construction contractors would practice good management practices to reduce the likelihood of chemical spills. Cleanup of spills would be conducted in compliance with Colorado hazardous waste regulations in 6 CCR 1007-3.

Table 3-23 (continued)
Mitigation Measures for the Preferred Alternative

Resources and Impacts	Mitigation or Benefit
<p>Construction (continued)</p>	<ul style="list-style-type: none"> ▶ Construction staging and traffic control plans would be developed that minimize the disruption to traffic and access. ▶ CDOT, the City of Aurora, and the E-470 Authority would provide adequate public notice and maintain coordination with area residents and with the area’s emergency service providers to keep the public apprised of the construction progress and to inform the public of closures and detours. ▶ The City of Aurora construction noise code requirements limiting noise levels at the neighborhood property lines to be no higher than 80 dBA between 5:00 p.m. and 7:00 a.m. and 75 dBA between 7:00 a.m. and 5:00 p.m. would be enforced during construction. ▶ Construction percussion operations, and truck loading, hauling, and routing would be scheduled during daytime hours and managed to minimize noise and vibration levels to surrounding neighborhoods. <p>The following BMPs would be used to mitigate impacts to vegetation associated with the Preferred Alternative:</p> <ul style="list-style-type: none"> ▶ Minimize the amount of disturbance and limit the amount of time that disturbed areas are allowed to be non-vegetated. ▶ Avoid existing trees, shrubs, and vegetation to the maximum extent possible, especially wetlands and riparian plant communities. ▶ Salvage weed-free topsoil for use in revegetation. <p>Specific BMPs would be required during construction to reduce the potential for introduction and spread of noxious weed species and include:</p> <ul style="list-style-type: none"> ▶ Weed mapping would be included in the construction documents along with appropriate control methods for noxious weeds. ▶ Highway right-of-way areas would periodically be inspected by CDOT and others during construction and during post-construction weed monitoring for invasion of noxious weeds. ▶ Weed management measures would include removal or burial of heavily infested topsoil, chemical treatment of lightly infested topsoil, limiting disturbance areas, phased seeding with native species throughout construction, monitoring during and after construction, and other chemical and/or mechanical treatments. ▶ Use of herbicides would include selection of appropriate herbicides and timing of herbicide spraying, and use of a backpack sprayer in and adjacent to sensitive areas such as wetlands and riparian areas. In locations where spot application is not practicable, a wildlife biologist would inspect the area prior to spraying to ensure crucial habitat would not be impacted. ▶ Certified weed-free hay and/or mulch would be used in all revegetated areas. ▶ No fertilizers would be stored on the project site. ▶ Supplemental weed control measures may be added during design and construction planning.



Table 3-23 (continued)
Mitigation Measures for the Preferred Alternative

Resources and Impacts	Mitigation or Benefit
Construction (continued)	<p>Preventative control measures for design and construction may include:</p> <ul style="list-style-type: none"> ▶ Native Plants: Use of native species in revegetation sites. ▶ Weed Free Forage Act: Materials used for the project would be inspected and regulated under the Weed Free Forage Act, Title 35, Article 27.5, CRS. ▶ Topsoil Management: When salvaging topsoil from on-site construction locations, the potential for spread of noxious weeds would be considered. Importing topsoil onto the project site would not be allowed. ▶ Equipment Management: Equipment would remain on designated roadways and stay out of weed-infested areas until the areas are treated. All equipment would be cleaned of all soil and vegetative plant parts prior to arriving on the project site.

Table 3-24
Local Commitments for Cumulative Impacts

Resource and Impacts	Mitigation of Benefit
Cumulative Impacts	<p>The following mitigation measures could reduce the proposed action's portion of the cumulative impacts to the resources of concern:</p> <ul style="list-style-type: none"> ▶ The City of Aurora has implemented zoning and comprehensive plans that assume open space set asides and that encourage Smart Growth development. These general principles should be specifically applied to new development proposals (see letter form the City of Aurora in Appendix A). ▶ Commitments by the City of Aurora to enforce Smart Growth principles and enforce open space set asides are recommended. ▶ The City of Aurora, which has zoning jurisdiction over much of the E-470 corridor, does not permit new residential zoning where existing or projected airport noise may exceed day-night noise level (Ldn) 60 decibels. ▶ Implementation of a setback requirement has been discussed by the City of Aurora and is recommended to minimize noise impacts. ▶ Addition of cross culverts for small urban mammals. <p>Creek impacts would be minimized and mitigated, as directed by the USACE in the Section 404 permitting process.</p>



CHAPTER 4.0: COMMENTS AND COORDINATION

1

2 An extensive amount of public and agency coordi-
3 nation has occurred throughout all phases of the
4 planning and design process for the I-70/E-470 inter-
5 change complex. Public coordination has involved
6 meetings with citizens, property owners, busi-
7 nesses, and developers. These meetings involved
8 telecommunications, written communications,
9 meetings with small groups and homeowners asso-
10 ciations, and public meetings.

11 Agency coordination has been ongoing since the
12 beginning of the EA. Extensive staff meetings have
13 been held with the planning and engineering
14 departments of the jurisdictions along the E-470 cor-
15 ridor. Other agencies that have provided input to
16 the design process include CDOT, utility compa-
17 nies, water and sanitation districts, and the rail-
18 roads.

19 Meetings have been held with DRCOG to verify
20 design year traffic forecasts for E-470 and the inter-
21 changes and to verify assumptions made for land
22 use changes. Coordination with DRCOG would
23 continue throughout design in order to ensure ade-
24 quate accommodation of the proposed action in the
25 regional planning process.

26 4.1 PUBLIC INVOLVEMENT ACTIVITIES

27 4.1.1 Communication Methods

28 Several communication methods were used
29 throughout the EA process to inform the public of
30 study progress, issues and upcoming meetings. The
31 E-470 Web site was used with a link to project infor-
32 mation and a page for submitting comments and
33 questions. Three newsletters have been issued to
34 date. A fourth newsletter is planned to be issued in
35 conjunction with the public hearing to be held dur-
36 ing the public review period, tentatively scheduled
37 for late summer 2006. An initial mailing list was
38 developed using data from the Tax Assessor offices
39 in Adams and Arapahoe Counties. Sign-in sheets at
40 the public meetings were used to augment the mail-

41 ing list. An initial Scoping Meeting was held on
42 April 30, 2003, with representatives of CDOT, the
43 E-470 Authority, and FHWA. Monthly coordination
44 meetings have been held throughout the planning
45 process with representatives of CDOT, the E-470
46 Authority, the FHWA, and the City of Aurora. Quar-
47 terly meetings were held with the Technical Advi-
48 sory Committee, including DRCOG, Arapahoe and
49 Adams Counties, the UPRR, DIA, and the District
50 Wildlife Manager for Colorado DOW.

51 4.1.2 Low-Income and Minority Populations 52 Outreach

53 Specialized outreach to low-income and minority
54 populations was conducted as part of the public
55 involvement process to gather comments and con-
56 cerns regarding the proposed action. Outreach
57 included mailings that announced upcoming meet-
58 ings and described the project process. Distribution
59 of fliers to businesses and residences in the study
60 area occurred prior to every open house. In addi-
61 tion, a Spanish translator attended the public open
62 houses to answer questions and facilitate com-
63 ments, and project material was translated and
64 available.

65 4.1.3 Public Meetings

66 To date, five public meetings have been held to dis-
67 cuss the study process, to detail the Purpose and
68 Need, to describe the development and screening
69 of alternatives, and to receive comments on the Pre-
70 ferred Alternative. The public meetings were held
71 on May 20, 2003; July 14, 2004; February 22,
72 2005; and October 19, 2005. A public hearing will
73 be held during the public comment period, now
74 anticipated to be held in late summer 2006. An
75 additional meeting with neighborhood groups was
76 held on June 10, 2003. A summary of those meet-
77 ings and the public comments received are in the
78 following sections.



1 **4.13.1 Public Open House: May 20, 2003**

2 An open house meeting was held on May 20, 2003,
3 from 4:00 p.m. to 8:00 p.m. at the E-470 Authority
4 administration office, 22470 East 6th Parkway,
5 Aurora, Colorado. The meeting provided the public
6 an opportunity to learn about the current EA and
7 preliminary engineering study being performed for
8 the Authority of the I-70/Gun Club Road inter-
9 change area. Staff of E-470 Authority, CDOT,
10 FHWA, and the City of Aurora attended the meet-
11 ing. Staff from consultants Parsons Brinckerhoff,
12 Felsburg Holt & Ullevig, and Carter & Burgess also
13 attended.

14 Approximately 25 members of the public attended.
15 Eight people completed comment sheets. Copies of
16 the statement of Purpose and Need were available.

17 Display boards of the study area and environmental
18 survey results, as well as boards illustrating the
19 many concept plans of alternatives were placed
20 around the meeting room. Agency and consultant
21 staff members were available to answer questions
22 and to explain the display material. The following
23 comments were received from the public by staff
24 and are categorized by issue:

25 **Noise**

26 1. Main issues are noise, and development. Desire
27 to have the study compare area noise pre-E-470
28 with the current and future conditions. The
29 noise from E-470 comes across the Coal Creek
30 valley to Thunderbird Estates. Added local traf-
31 fic on Gun Club and excessive speeds (up to
32 100 mph) are also a concern. Truck noise in the
33 late night/early morning hours was very obtru-
34 sive.

35 2. Some persons thought the loop alternate would
36 reduce noise and visual impacts.

37 **Design**

38 3. Concern that the future interchange should pre-
39 serve the current movements including access
40 between E-470 and Colfax west.

41 4. The access road to Gun Club needed to be
42 wider, at least four lanes plus left-turn and right-
43 turn lanes.

44 5. Interested in how future site access would work.
45 Flexibility in site design needed that could shift
46 the south frontage road (relocated Colfax) to
47 pass through the future development to permit
48 buildings to front on both sides of the road.

49 6. Concern about potential impacts of Harvest
50 Mile Road in backyards. Would like to make
51 presentation to E-470 Board on traffic and safety
52 ideas, including 6th Parkway, Picadilly, and
53 Harvest.

54 7. Get rid of the traffic signals!

55 8. Not clear from displays if improvements at Pica-
56 dilly and Harvest are being considered.

57 **Construction**

58 9. An area contractor expressed the need for early
59 construction. Says he instructs all his suppliers
60 to use E-470 to insure on-time delivery of mate-
61 rials.

62 10. Need to build the improvements ASAP.

63 **Other**

64 11. There was an underground stage stop west of
65 E-470 in the vicinity of 6th Avenue.

66 12. Flooding occurs adjacent to the New World
67 development west of Picadilly. Picadilly itself
68 has been overtopped in past floods.

69 13. What is in the "hazardous material" sites?

70 14. One person asked how the project would be
71 financed, and was pleased to learn that toll reve-
72 nue bonds were contemplated.

73 15. Take tolls off the 6th Parkway ramps for better
74 Gun Club access.

1 Wildlife

2 16. There is a population of toads that live under-
3 ground south of I-70, west of E-470.

4 17. There is a raptor nest south of Colfax and east of
5 the old motel on Colfax.

6 **4.1.3.2 Meeting with Thunderbird Estates Home-**
7 **owner's Association and New World West**

8 A meeting was held with the Thunderbird Estates
9 Homeowners Association (HOA) and New World
10 West on June 10, 2003, from 7:30 p.m. to 9:00
11 p.m., at the residence of Richard and Bonnie Rader
12 (71 Algonquian Street, Aurora, Colorado). This
13 meeting was part of the regular monthly meeting of
14 the Thunderbird Estates HOA. The meeting was
15 held as a follow-up to the Public Open House held
16 on May 20, 2003, to provide the group with an
17 additional opportunity to learn about the current EA
18 and preliminary engineering study for the I-70/Gun
19 Club Road interchange area. Ken Frantz of the E-
20 470 Authority, Wes Goff of CDOT Region 1, and
21 Jack Tone of Parsons Brinckerhoff attended the
22 meeting.

23 Eight members of the public attended.

24 Handouts of the exhibits showing the study area,
25 environmental survey results, and the Purpose and
26 Need statement were distributed, as well as 8.5 x 11
27 copies of the two latest concept plans. Jack Tone
28 explained the project concept using large-scale
29 drawings, including one showing the potential first
30 stage of construction consisting of the bypass road-
31 way for the E-470 mainlanes and ramp connections
32 from E-470 to the existing I-70/Gun Club inter-
33 change.

34 There was overwhelming support from the group
35 for the first stage of the interchange project to con-
36 struct the flyby roadway for E-470 through traffic to
37 bypass the four traffic signals. All thought this would
38 greatly improve safety and would improve the
39 safety of turning traffic at the I-70 interchange. Some
40 noted that keeping the through traffic moving would
41 also reduce the noise from trucks slowing and accel-
42 erating from the stoplights. In answer to questions, it
43 was noted that about half of the peak period traffic

44 was through traffic, and that the bypass roadway
45 would reduce traffic through the signalized intersec-
46 tions by some 50 percent.

47 The subject of noise is of great concern to the resi-
48 dents. They note that the sound from E-470 south of
49 6th Parkway is very obtrusive, particularly from traf-
50 fic passing over the Coal Creek bridge. Copies of a
51 statement from the Thunderbird Estates HOA dated
52 June 2003 commenting on the EA (see **Appendix B**),
53 as well as a letter from Fred Mould of the Gun Club
54 Estates HOA (see **Appendix B**), were distributed.

55 The two concepts for the ultimate improvements for
56 the E-470/I-70 interchange were discussed. The
57 group felt that the loop alternative was preferable
58 since it would have one fewer level and thus lower
59 noise and visual impacts. The group also favored
60 the retention of connecting ramps between E-470
61 and Colfax west of Picadilly to keep more traffic on
62 E-470 and out of the Gun Club interchange.

63 The group asked if the May 20 meeting had turned
64 up any new facts about the study area. It was noted
65 that the information about the historic underground
66 stage stop was new, although its location is well
67 outside the limits of probable construction. Also,
68 the presence of a raptor nest near the eastbound
69 Colfax off ramp and the presence of large numbers
70 of toads in the area had been brought out. Many of
71 the residents at this meeting confirmed that the
72 toads were quite widespread, particularly along
73 Coal Creek.

74 In answer to questions, it was noted that the final EA
75 was scheduled to be completed in late 2003 and a
76 public hearing was planned for early 2004.

77 **4.1.3.3 Public Outreach and Public Scoping Meeting**
78 **Open House: July 14, 2004**

79 A public outreach and public scoping meeting open
80 house was held on July 14, 2004, at the E-470
81 Authority administration office, 22470 East 6th
82 Parkway, Aurora, Colorado.



1 Mailing List Development

2 An initial mailing list of approximately 4,650 resi-
3 dences was compiled by using data from the Tax
4 Assessor Offices of Arapahoe County, Adams
5 County, and Strasburg. The boundary and parcel
6 information used to generate the database included
7 the following areas:

- 8 ▶ On the south side of I-70: from Tower Road to
9 the west and Hayesmount Road to the east and
10 from I-70 south to Jewell Road.
- 11 ▶ On the north side of I-70: from Tower Road to
12 the west and Monaghan Road to the east and
13 from I-70 north to 56th Avenue.
- 14 ▶ Strasburg east of the study area.

15 Newsletter

16 A newsletter was mailed on June 15, 2004, to the
17 compiled list announcing the public meeting to be
18 held on July 14, 2004, at the administrative office of
19 the E-470 Authority. The newsletter included a
20 description of the public meeting date, the project
21 study area and project description, the E-470 flyby
22 immediate improvements, the environmental pro-
23 cess and current environmental studies underway,
24 survey information, and a comment sheet. Also
25 included was a Spanish section, which included a
26 description of the study area and comment sheet.
27 The E-470 Web site and project e-mail address was
28 noted as a resource for making comments and add-
29 ing one's name to the mailing list.

30 Public Notifications

31 A follow-up post card announcing the July 14,
32 2004, public meeting was mailed on July 7, 2004,
33 to the 4,650 residents on the mailing list.

34 Legal notices were included in the *Denver Post* and
35 the *Rocky Mountain News* on June 30, 2004, and
36 the *Aurora Sentinel* on July 1, 2004.

37 Public Scoping Meeting - July 14, 2004

38 The Public Scoping Meeting for the EA was held on
39 July 14, 2004, from 4:30 p.m. to 7:30 p.m. at the E-
40 470 Public Highway Authority administration
41 offices located at 22470 E. 6th Parkway, Aurora,
42 CO. The meeting was conducted in an open house
43 format with a slide presentation given at 6:00 p.m.

44 The slide presentation described the expanded
45 study area, the proposed action, project elements,
46 the environmental process, current environmental
47 studies underway, and project schedule.

48 Approximately 53 citizens attended the open house
49 presentation. During the open house and following
50 the slide presentation, the public was given the
51 opportunity to ask questions and discuss project
52 issues with the consultant team. A Spanish-speaking
53 interpreter was available for people requiring trans-
54 lation services.

55 Attendees were encouraged to submit written com-
56 ments. As of July 30, 2004, a total of 25 comments
57 has been received 6 from the public scoping meet-
58 ing comment sheets, 2 newsletter responses, 5 e-
59 mails and 12 from the project Web site. Those pub-
60 lic comments and comments recorded by consult-
61 ant team members at the public meeting are
62 summarized below.

63 Interchange at Picadilly Road

64 1. Residents north of Smith Road were very sup-
65 portive of a bridge and interchange at Picadilly,
66 while residents near Picadilly Road are not sup-
67 portive of the interchange.

68 2. Need to improve 6th Avenue/Parkway west of
69 E-470 to Picadilly to get to the new Picadilly
70 interchange.

71 3. Concern for increased traffic on Picadilly Road;
72 ultimately Picadilly would need improvements
73 south to handle increased traffic. One resident
74 believes there is less traffic on Picadilly.

- 1 4. Concerned that improvements only upgraded in 40
2 the vicinity of the interchange would create 41
3 congestion on the remainder if not improved 42
4 also. Don't just improve near Colfax Avenue. "It 43
5 would be unsafe and irresponsible to do other- 44
6 wise." 45
- 7 5. "I would object to the elimination of access to 46
8 I-70 until and unless access to Picadilly direct 47
9 via 6th Parkway is available and Picadilly is 48
10 improved to handle the traffic with on and off 49
11 ramps available at I-70."
- 12 6. Please address the 11th and Picadilly exit from 50
13 New World West; it is a line-of-sight problem 51
14 both for Picadilly and 11th in both directions. 52
- 15 7. Tower triangle area needs freeway access west- 53
16 bound onto I-70. Tower Road interchange is 54
17 poorly regulated by lights. Need Picadilly inter- 55
18 change to avoid trains at the crossing and what 56
19 has become a traffic nightmare because of soc- 57
20 cer fields at Colfax/Dunkirk. 58
- 21 **Interchange at Harvest Road** 59
- 22 8. Support for Harvest Road interchange to have 60
23 better access to I-70 east. Also better access 61
24 west for mobile home park. 62
- 25 9. More residential development is planned at 63
26 Harvest Road resulting in more need for an 64
27 interchange there than at Picadilly Road. Two 65
28 interchanges are not necessary. 66
- 29 10. What is the development plan for Harvest Road? 67
- 30 **Elimination of Access to I-70 from Gun Club Road** 68
- 31 11. Residents are concerned about loss of free 69
32 access and added out-of-direction travel in order 70
33 to access I-70 once Gun Club Road access is 71
34 removed. "Make ramps at 6th Parkway toll- 72
35 free!" 73
- 36 12. Several hundred current residents and several 74
37 hundred more in new developments are 75
38 planned. Residents currently use I-70 as the pri- 76
39 mary east-west commuting route. If access is 77
78
79
- eliminated it would push a lot of traffic south 80
onto Jewel and Iliff and greatly slow the com- 81
mute. It would also route a large amount of traf- 82
fic through a residential subdivision with a 30 83
mph speed limit. This is already a very danger- 84
ous road at that location because of the trash 85
haulers that travel that portion of Gun Club. 86
13. Forces residents of Murphy Creek to use E-470 87
toll to access I-70 - "We already pay enough 88
taxes without you subjecting us to toll roads." 89
14. Taking Jewell to cross over Gun Club is very 90
dangerous and there have been several horrible 91
accidents at this intersection and one known 92
fatality. A light should be installed at Jewell 93
immediately to eliminate this dangerous cross- 94
ing. 95
15. A resident of Murphy Creek and a frequent user 96
if E-470 fully supports improving this inter- 97
change. Feels it is important to take Gun Club 98
road south if this interchange remains available. 99
The only users are local to that area. The road 100
also preceded the tollway; those of us who use 101
Gun Club are also some of your best customers 102
because E-470 is at our back doorstep. 103
- 64 **E-470 Immediate Improvements "Fly-By"**
16. Questions regarding how access would work at 104
I-70 when flyby is built. 105
17. A developer in the immediate area representing 106
the development of approximately 3,000 homes 107
supports efforts to improve the transportation 108
network through the construction of the E-470 109
interchange and its associated improvements. 110
18. Interchange looks too complicated. 111
19. Traffic signals at I-70/E-470 are dangerous. Traf- 112
fic queues up past Colfax. 113
20. "While you are studying the flyovers, please 114
consider the current access as folks are proceed- 115
ing east on I-70 and the I-70 bypass (Colfax). 116
Presently as folks are heading east on I-70, 117
speed limit is 70 or 75 mph as they round the 118
119



1 curve over the I-70 bypass, consideration is
2 NOT given to those heading east from Colfax to
3 merge onto I-70. The folks are concentrating on
4 exiting onto E-470 to the south and are not
5 yielding to the merging traffic. I don't know if
6 the current plan would correct the situation, but
7 I'm surprised there haven't been accidents in
8 this area due to the merging problem."

9 **Property Impacts**

- 10 21. Several residents expressed concern for how
11 their properties would be impacted and what
12 direct impacts mean to the owners.
- 13 22. Property owners east of Gun Club wanted to
14 know how the Colfax extension and relocated
15 Gun Club Road would affect their property.
- 16 23. Concern for loss of "rural" setting. Residents
17 expressed the reason for moving to the area was
18 to escape urban areas and now feel the pro-
19 posed interchanges would cause growth near
20 their properties.
- 21 24. Picadilly interchange would affect property
22 owners on Picadilly adversely by their inability
23 to have safe access to their homes and safer lev-
24 els of pollution.
- 25 25. Stephen Bacon of Colorado Interstate Gas was
26 concerned about a gas line monitoring station
27 located at the west edge of the Prologis property
28 near the Picadilly Road alignment tying into
29 Smith Road. They also have a large station
30 located between the Prologis site and the Har-
31 vest Road section line. He stated he has seen
32 drawings of a road connecting the Prologis site
33 to Harvest Road which may (depending on the
34 alignment) cut across interstate right-of-way and
35 possibly some of their buildings and equipment.
- 36 26. Steve Schafhausen of Land Inc. working for East
37 Cherry Creek Water and Sanitation District also
38 has concerns about the alignment of Harvest
39 Road tying into Smith Road at the section line.
40 There are plans to run a major water line along
41 the Harvest Road section line and for a pump

42 station to be built in the vicinity of the Harvest
43 Road section line and Smith Road. Parsons
44 Brinckerhoff is coordinating with him to get
45 plans and documentation for this proposed
46 water line and pump station.

47 27. What is the impact on Watkins?

48 **Potential Environmental Issues**

- 49 28. Objection to the Picadilly Interchange and I-70 -
50 "Please do not destroy the natural situation of
51 the area. Eagles nest nearby and foxes run
52 through the road and our community."
- 53 29. Increased traffic would mean increased air and
54 noise pollution for the whole New World subdi-
55 vision.
- 56 30. The impact area is the habitat for an endangered
57 toad but also for local fox, coyotes, and prairie
58 dogs. If you have question or would like pic-
59 tures of the flooding or endangered toad, please
60 call.
- 61 31. If the area in the southeast quadrant of the E-
62 470/I-70 interchange develops, would First
63 Creek need to be maintained as an open water
64 feature?
- 65 32. Concern for frequent flooding on Picadilly Road
66 south of Colfax Avenue.

67 **General**

- 68 33. Residents of Thunderbird Estates and Murphy
69 Creek would like to be more involved and
70 informed of the decisions being made and sug-
71 gest that HOA representatives be included in
72 regular meetings and possibly making coordina-
73 tion meeting minutes available to them.
- 74 34. Developer Tom Morrill of HMB Partners inter-
75 ested in coordinating plans for Colfax Avenue
76 relocation in southwest quadrant.
- 77 35. Representative of residential developer was
78 interested in the project schedule, particularly
79 beyond where the posted schedule ended,

- 1 regarding when improvements are going to be
2 constructed.
- 3 36. 26th Avenue needs access to E-470 and a better
4 access to I-70. Completion of an I-70 and Air-
5 park Road interchange would allow a short-cut
6 access to DIA.
- 7 37. When and how would 6th Avenue be con-
8 nected to 6th Parkway?
- 9 38. When would the 6th Parkway extension be con-
10 structed through to SH 30?
- 11 39. One resident was opposed to the City of
12 Aurora's plan to make Picadilly a major arterial,
13 when most of the growth according to a map
14 she carried was shown to the east.
- 15 40. Make sure that the analysis considered all the
16 growth happening east of the primary study area
17 (Watkins and Front Range Airport).
- 18 41. Several individuals asked for copies of the land
19 use plan and growth projections graphics used
20 in the presentation material. Also asked for a
21 copy of the *City of Aurora Comprehensive Plan,*
22 2003 and to be kept informed of when new aer-
23 ials photos are complete.
- 24 **Expressions of Concern**
- 25 42. One resident was disappointed to see who the
26 members of the E-470 Board are and believes
27 the interests that are represented by the Board
28 are obvious. Resident fails to see how the com-
29 munity is represented. "The use of "public
30 informed" is very truthful, but not involved."
- 31 43. A community member asked "why" with
32 regards to having the E-470 and I-70 signalized
33 intersections prior to it even opening and
34 believes it comes down to financial and political
35 issues not the risk of lives.
- 36 44. One person remembered a "guarantee" of free
37 access for those that were directly affected by
38 the E-470 construction at E-470 and I-70 at Gun
39 Club Road.
- 40 45. Safety and frustration of all E-470 users and
41 local traffic at the signals south of I-70.
- 42 46. "Who would benefit from an interchange,
43 developers? Who would benefit from your pro-
44 posals? Not us who live near by. Don't do it!"
- 45 47. "My opinion on E-470 is not a good one. In fact
46 I will never use E-470. It is not set up right, trav-
47 elers who are used to paying a toll on a thruway
48 would pick up their ticket when entering and
49 stop and pay only once when they exit. Who-
50 ever set up all the toll booths every 3 miles or so
51 is an idiot!"
- 52 48. Public meeting attendee wanted to know why
53 more CDOT representatives weren't present.
- 54 **4.1.3.4 Public Open House: February 22, 2005**
- 55 A public open house meeting was held on February
56 22, 2005, from 4:30 p.m. to 7:30 p.m. at the E-470
57 Authority administration office, 22470 East 6th
58 Parkway, Aurora, Colorado.
- 59 **Overview of Meeting**
- 60 The meeting was conducted in an open house for-
61 mat with slide presentations given at 5:00 p.m. and
62 6:00 p.m.
- 63 The slide presentation described the Purpose and
64 Need, the alternatives development and screening
65 process, status of environmental studies, and project
66 schedule.
- 67 Approximately 60 people attended the open house.
68 During the open house and following the slide pre-
69 sentation, the public was given the opportunity to
70 ask questions and discuss project issues with the
71 consultant team. A Spanish-speaking interpreter was
72 available for people requiring translation services.
- 73 Attendees were also encouraged to submit written
74 comments. As of March 9, 2005, four written com-
75 ments had been received on public meeting com-
76 ment sheets. These comments and comments
77 recorded by consultant team members at the public
78 meeting are summarized below.



1 **Summary of Written Comments**

- 2 1. Concern that noise walls were promised by Mr.
3 Delozier along E-470 from 6th Parkway to Coal
4 Creek; prefers Alternative 9; wants to see all
5 Gun Club construction vehicles use the flyby;
6 wants to see all construction vehicles during
7 Picadilly and Harvest Mile Roads interchange
8 construction on I-70; construct emergency
9 access only from Colfax and Gun Club at I-70
10 eastbound.
- 11 2. Same noise wall comment as above; restrict all
12 construction traffic from Gun Club between I-70
13 and Mississippi; wants to see a citizen participa-
14 tion committee on this project; wants to know
15 ambient noise prior to the construction of E-
16 470; wants a written response to written com-
17 ment.
- 18 3. Stresses that Mr. Delozier promised them a
19 noise wall if they supported the flyover; would
20 like the promise fulfilled.
- 21 4. Owns property north of I-70 at proposed Har-
22 vest Road interchange location; wants to know
23 if the right-of-way for a waterline can be put in
24 the roadway right-of-way; wants to know who
25 would acquire right-of-way and fund construc-
26 tion; would there be any access restrictions on
27 adjacent properties?
- 28 5. Concerns regarding impacts to the New World
29 West development from the Picadilly/Colfax
30 interchange, including wetlands near frontage
31 road and Picadilly; unsafe exits from 11th Ave-
32 nue and homes south of 11th Avenue; disrup-
33 tion to wildlife including hawks and prairie
34 dogs; concerned about Picadilly Road becom-
35 ing a truck route; concerned about noise and air
36 pollution because of height of flyby.

37 **Follow-up to Date on Written Comments**

38 Written responses were provided to the above par-
39 ties.

40 **Summary of Verbal Comments**

41 **Picadilly**

- 42 1. Study team needs to address how Picadilly Road
43 and Colfax Avenue would be configured when
44 the land in the southwest quadrant of I-70 and E-
45 470 (Horizon City Center) is developed.
- 46 2. What improvements could be made to Picadilly
47 Road immediately adjacent to the New World
48 West residential subdivision?
- 49 3. Questions/complaints about plans to widen Pic-
50 adilly to the south, and making it a major arte-
51 rial. These people were more focused on
52 Picadilly Road itself as opposed to the inter-
53 change.
- 54 4. Concerned that Picadilly Road must be
55 improved because it is narrow and it floods; res-
56 ident did not comment much on the inter-
57 change alternatives.
- 58 5. A resident that lived on Picadilly Road was con-
59 cerned about added traffic to substandard road-
60 way with vertical curve deficiencies. Also
61 concerned with existing drainage problems near
62 Picadilly Road.
- 63 6. Improving 6th Parkway and Picadilly Road with
64 a new I-70 interchange would be a good alter-
65 nate to Gun Club Road interchange.
- 66 7. Residents of New World West (along Picadilly
67 Road south of Colfax) had concerns with a new
68 interchange going in at Picadilly Road and not
69 getting the proper/needed improvements to the
70 existing Picadilly Road along their develop-
71 ment. The main issue is that there is very little
72 sight distance with the existing profile of the
73 road and a major increase in traffic would make
74 an already unsafe condition worse.

75 **Design**

- 76 8. A few people agreed that the combined Gun
77 Club/E-470 interchange would be very com-

- plex; agreed with screening out these alternatives.
9. A couple of people were anxious to see more detail on what the Picadilly and Harvest Road interchanges would look like.
10. A couple of people from Thunderbird Estates were worried that the No-Action Alternative would prevail and Gun Club interchange would remain.
11. Why not move E-470 back to the original plan in a more easterly location?
12. The existing “left on green arrow only” at the westbound I-70 on-ramp at E-470 causes back-ups on northbound E-470 past the Colfax/Gun Club intersection. Traffic on westbound Gun Club Road wishing to go to westbound I-70 cannot get into the back-ups lanes of E-470 and have to either sit in the other E-470 through lanes before forcing themselves into the leftmost lane or must wait through many traffic cycles before finding a slight gap to slip into. The citizen says a local law enforcement officer said there has not been a decrease in the number of accidents at the westbound on-ramp intersection. Citizen suggested two options. First option: return the signal configuration to what was there before to allow left turns to the westbound on-ramp on regular green lights. Second option: the E-470 Authority should allow free access on the northbound E-470 ramp at 6th Parkway to allow motorists plenty of time to get into the leftmost E-470 lane.
13. Discussions with Fire Department - concerned about lack of access to I-70 at Gun Club Road. If Harvest Road access is provided, it would maintain existing response times. Wants to maintain South Frontage Road between Powhaton and Harvest Roads.
- Other**
14. Needed clarification of the need of the proposed improvements.
15. Wants study team to be aware of the large amount of underground toads that are in the area.
16. There is a serious problem with flooding in the area around E-470 south of the interstate; it does not appear that the FEMA floodplain boundaries are correct.
17. Dialogue dealing with questions about noise and the NEPA process in general.
18. Did not understand what we mean by “safety” as a need. This was explained but perhaps there are others for whom this is not clear. (Study team may want to think about a different description in the future.)
19. Two gentlemen who are out-of-town developers were concerned about how a developer would be able to pay for the bridge over I-70 on Harvest Road. They had other questions as to who would pay for each part of the project.
20. Owners of the former motel on Colfax were concerned about potential loss of property and having embankment for relocated Picadilly Road blocking the view of the mountains. They are considering proposals for redevelopment of the property.
21. If I-70/Gun Club ramps are closed, take the tolls off the 6th Parkway ramps.
22. On eastbound I-70 approaching the Colfax exit, the existing signing causes 20 to 30 vehicles per day to inadvertently exit at Colfax thinking its I-70; these vehicles then make a U-turn on Colfax to get back to eastbound I-70. The citizen states that one sign shows “Toll Road” ahead in the same area as the sign indicating to exit for Business Route 70.
23. The movement from eastbound Colfax to southbound Gun Club Road is difficult/time-consuming during heavy traffic. Trucks often sit in the middle of eastbound Colfax lane to make a left turn onto northbound E-470. They need to either wait through four or five signal cycles in



1 this lane or use the right, free-flow lane and try
2 to immediately cross the multiple southbound E-
3 470 lanes to get to the E-470 left-turn lane to
4 westbound I-70. Citizen suggests that we figure
5 out a way to keep the left-turning trucks from
6 the eastbound Colfax center lane. Also com-
7 mented same as verbal comment #20.

8 Follow-up To Date on Verbal Comments

- 9 ▶ Comment 12: Jim Bemelen discussed this with
10 Ken DePinto (CDOT Region 1 Traffic Opera-
11 tions Engineer). Ken said there were numerous
12 broadside accidents at the on-ramp intersection
13 prior to modifying the signal, which is what
14 prompted the change. Ken would look at the
15 accident data at the westbound on-ramp inter-
16 section as well as the section of E-470 between
17 Colfax and the westbound on ramp. Ken would
18 also look at the signal timing to see if there is
19 anything can be done to provide more "gaps"
20 for the citizen's desired traffic maneuver.
- 21 ▶ Comment 22: Jim Bemelen discussed this with
22 Ken DePinto (CDOT Region 1 Traffic Opera-
23 tions Engineer) who would look at the signing
24 to see if a modification is prudent.
- 25 ▶ Comment 23: Jim Bemelen discussed this with
26 Ken DePinto (CDOT Region 1 Traffic Opera-
27 tions Engineer) who would take a look to see if
28 something can be done such as adding a thru/
29 right overhead sign or pavement arrow. Either
30 Ken or Jim would contact commentator with the
31 findings.

32 4.1.3.5 Public Open House Meeting: October 19, 33 2005

34 A public open house meeting was held on October
35 19, 2005, from 4:30 p.m. to 7:00 p.m. at the E-470
36 Authority administrative offices, 22470 East 6th
37 Parkway, Aurora, Colorado.

38 Overview of Meeting

39 The meeting was conducted in an open house for-
40 mat with brief presentations given at 5:00 p.m. and
41 6:00 p.m.

42 The presentation described the Purpose and Need,
43 the alternatives development and screening process,
44 status of environmental studies, and project sched-
45 ule. The early implementation of Ramp H from
46 northbound E-470 to westbound I-70 was also dis-
47 cussed.

48 Approximately 25 citizens attended the open house.
49 During the open house and during the presentation,
50 the public was given the opportunity to ask ques-
51 tions and discuss project issues with the consultant
52 team.

53 Attendees were also encouraged to submit written
54 comments. As of November 10, 2005, only one
55 written comment had been received on public
56 meeting comment sheets. Three letters were
57 received. These comments and comments recorded
58 by consultant team members at the public meeting
59 are summarized below.

60 Summary of the Written Comments

- 61 1. Letter filed at the October 19th meeting
62 expressed concerns about noise from E-470 and
63 Gun Club Road traffic, danger from traffic using
64 Gun Club to reach I-70 to avoid tolls on E-470,
65 heavy truck traffic on Gun Club, and noise from
66 "jake brakes." Letter also noted concern that the
67 City of Aurora was planning to improve Gun
68 Club Road as a result of the flyby improvement.
- 69 2. Letter was identical to that above.
- 70 3. Comment sheet noted a primary concern about
71 Picadilly Road being widened to six lanes. They
72 are concerned about the new interchange caus-
73 ing increased traffic on Picadilly. Also con-
74 cerned about flooding west of Picadilly. Safe
75 access to their driveway from Picadilly should
76 be addressed.
- 77 4. Expressed support for the I-70/E-470 inter-
78 change and also requested that Tower Road be
79 extended from Colfax south to 6th Avenue to
80 ease traffic on Airport Boulevard.

1 5. Follow-up letter dated October 30, 2005, with
2 questions on the 1601 process and traffic
3 impacts on Gun Club Road. Requested by
4 phone a copy of information on the “non-com-
5 pete” provisions of any E-470 agreements with
6 Aurora and Arapahoe County.

7 **Follow-up on Written Comments**

8 Written responses were provided to all of the above
9 parties.

10 **Summary of Verbal Comments**

11 **Traffic**

- 12 1. Concerned about the dangers of high-speed traf-
13 fic on Gun Club Road with the addition of the E-
14 470 flyby.
- 15 2. Concerned about truck traffic on Picadilly, espe-
16 cially dump trucks, and wants to know if it is
17 going to become a designated truck route.
- 18 3. Expressed concern over the traffic from the I-70
19 eastbound exit at Gun Club turning onto Colfax
20 Avenue and the long wait time because people
21 do not know what lane they should be in.
- 22 4. Concern about if additional stop lights would be
23 installed.
- 24 5. There is a signal north of I-70 at E. 19th Avenue
25 that has cameras for detecting traffic. A car is not
26 noticed in the left-turn lane, only the right lane.
- 27 6. Wants to know if a gas station has been planned
28 in the study area. He wants to know how a pos-
29 sible gas station would affect planning and bot-
30 tlenecking.
- 31 7. Concern was expressed over bottlenecking
32 coming onto Picadilly from 6th Avenue.

33 **Design**

- 34 8. Concerned about Picadilly Road being six lanes.
35 Said that the citizens thought it was only going
36 to be four lanes.

- 37 9. Concerned that Picadilly is not part of the
38 impact area. Resident was not aware that Pica-
39 dilly would be six lanes.
- 40 10. Someone wanted to know how far south Har-
41 vest Road would extend, specifically if it would
42 intersect the landfill.
- 43 11. Someone wanted to know if the jog of Missis-
44 sippi was being moved or changed.

45 **Other**

- 46 12. Expressed concern about the signing from east-
47 bound I-70 to W. Colfax. Say that traffic thinks
48 that continuing along the mainline would put
49 them onto E-470 so traffic exits onto W. Colfax.
50 Expressed the same comment at the last meeting
51 but nothing was done.
- 52 13. What would Harvest Road service? Who would
53 pay for the construction of Harvest Road?
- 54 14. Concerned that there is a wetland at Picadilly
55 and the frontage road and that the wetland
56 would be paved over.
- 57 15. Concerned about noise levels and wants to
58 make sure that they would be studied. Espe-
59 cially concerned about the noise from E-470
60 and compared it to the tire noise from I-225.
- 61 16. What would the speed limit be on Harvest and
62 Picadilly?

63 **Follow-up on Verbal Comments**

64 Comment 3: Jim Bemelen discussed this with Ken
65 DePinto (CDOT Region 1 Traffic Operations Engi-
66 neer). Ken looked at the signing last spring, but did
67 not agree there was a problem. However, he re-
68 investigated the signing and did not see that a modi-
69 fication was prudent.

70 Comment 5: CDOT Traffic Operations personnel
71 found a faulty video card in the signal controller
72 and reprogrammed the detection zones. The prob-
73 lem has been corrected.



1 4.2 AGENCY INVOLVEMENT

2 Agency coordination has been continuous through-
3 out the EA process. Monthly coordination meetings
4 have been held with planning and engineering staff
5 at CDOT, the E-470 Authority, the FHWA, and the
6 City of Aurora. Quarterly meetings have also been
7 held with a Technical Advisory Committee com-
8 prised of DRCOG, Arapahoe and Adams Counties,
9 the UPRR, DIA, and the District Wildlife Manager
10 for Colorado DOW. Additional coordination meet-
11 ings have been held with staff of the EPA.

12 4.3 REMAINING PUBLIC INVOLVEMENT

13 A fourth newsletter is planned for fall 2006. A pub-
14 lic comment period for the final EA is scheduled for
15 November 2006. A public hearing would be held
16 during the public comment period.