

## 4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section summarizes the results of the environmental analyses conducted for this EA. The resource areas that were studied were selected based on the characteristics of the study area and on input from the public and stakeholders. The resources that were considered and the analyses performed are consistent with NEPA, its implementing regulations, and with CDOT and FHWA guidelines.

A study area and a project area were identified for the purposes of this EA. Due to the variety and nature of the built and natural environmental resources evaluated as part of this EA, the study area identifies in general terms the vicinity of and location of the Proposed Action. The project area identifies the area within which physical project improvements may be made. The project area is shown on **Figure 4-1**, and the study area is depicted on **Figure 1-2**.

Based on the characteristics of the study area and input from resource agencies, stakeholders and the public, the following resource topics were identified for analysis:

- ▶ Land Use, Socio-Economics, and Community
- ▶ Right-of-way and Displacements
- ▶ Parks and Recreation
- ▶ Air Quality
- ▶ Traffic Noise and Vibration
- ▶ Historical and Archaeological Resources
- ▶ Paleontology
- ▶ Soils and Geology
- ▶ Farmlands
- ▶ Water Resources, Floodplains, and Water Quality
- ▶ Vegetation and Wildlife
- ▶ Noxious Weeds
- ▶ Special Status Species
- ▶ Wetlands and Other “Waters of the U.S.”
- ▶ Hazardous Materials
- ▶ Visual Character
- ▶ Construction Impacts
- ▶ Utilities
- ▶ Cumulative Impacts

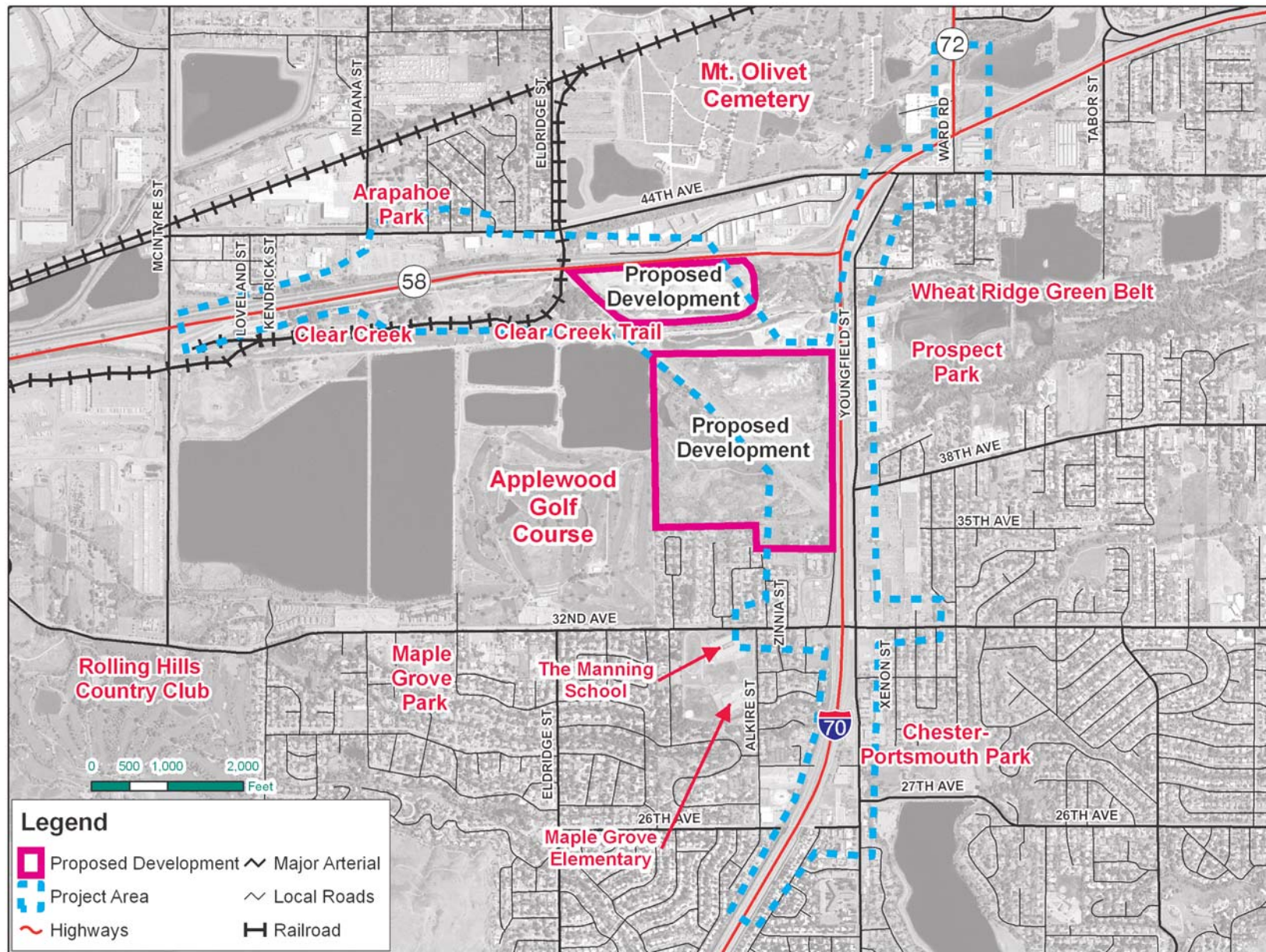


Figure 4-1  
Project Area

Wild and scenic rivers do not occur in the vicinity of the study area and therefore, have no potential for project-related impacts and are not discussed further.

This section presents the results of the analysis for each of these resource topics. Within each resource subsection, the resource is introduced, and appropriate regulations, guidelines and/or evaluation methods are outlined, followed by:

- ▶ **Current Conditions** – describes the resource as it exists today and future/past conditions as necessary
- ▶ **Environmental Consequences** – discusses the impacts on the resource that would be expected under both the Proposed Action and the No-Action Alternative
- ▶ **Mitigation** – describes the mitigation measures that have been identified to address adverse impacts that would be expected with the Proposed Action

It is important to note that when adverse impacts were predicted, efforts were first made to avoid or minimize the adverse impacts. Mitigation measures were then developed to address adverse impacts that could not be avoided.

The discussion for each resource includes:

- ▶ Temporary impacts and mitigation measures associated with the construction of the Proposed Action
- ▶ Permanent impacts and mitigation measures associated with the long-term operation of the Proposed Action

## ***4.1 Land Use, Socio-Economics, and Community***

This section describes land use and the social, economic, and community characteristics of the study area. In addition, this section presents the consequences (both positive and adverse) that the No-Action Alternative and the Proposed Action would have on the local area and the measures to avoid, minimize, and mitigate adverse impacts.

### **4.1.1 Land Use**

Land uses in the study area have been identified using a variety of available information sources, including:

- ▶ Site reconnaissance
- ▶ Aerial photograph review
- ▶ DRCOG 2030 MetroVision Plan (DRCOG 2005a)
- ▶ City of Wheat Ridge Comprehensive Plan and Addendum (City of Wheat Ridge 1999, City of Wheat Ridge 2005)
- ▶ City of Lakewood Comprehensive Plan (City of Lakewood 2003)

- ▶ Jefferson County Central Plains Community Plan (Jefferson County Planning and Zoning [JCPZ] 2004)
- ▶ Jefferson County North Plains Community Plan (JCPZ 1989)

#### *4.1.1.1 Historical Conditions*

Historically the land uses surrounding I-70 and SH 58 were predominantly rural in nature with agricultural land use and scattered residential development present. Over the last 30 years, the area has become more developed. I-70 was completed through the area in 1968.

#### *4.1.1.2 Current Conditions*

##### *Areas along Youngfield*

The I-70/32<sup>nd</sup> Avenue interchange area is an area of economic interest for the City of Wheat Ridge. The Applewood Village Shopping Center along the east side of Youngfield Street between 32<sup>nd</sup> and 38<sup>th</sup> Avenue includes a Wal-Mart, a King Soopers, Applejack Liquors, various restaurants, retail stores, and commercial fronts. This retail shopping center is one of the largest in the City of Wheat Ridge and is identified as a community commercial center in the City of Wheat Ridge Comprehensive Plan (City of Wheat Ridge 1999). Other retail uses exist southeast of Youngfield Street/32<sup>nd</sup> Avenue and northwest of the I-70/32<sup>nd</sup> Avenue interchange, including a motel and a restaurant. A church is situated on the southwest side of the I-70/32<sup>nd</sup> Avenue interchange. Areas east and west of the retail development are primarily residential.

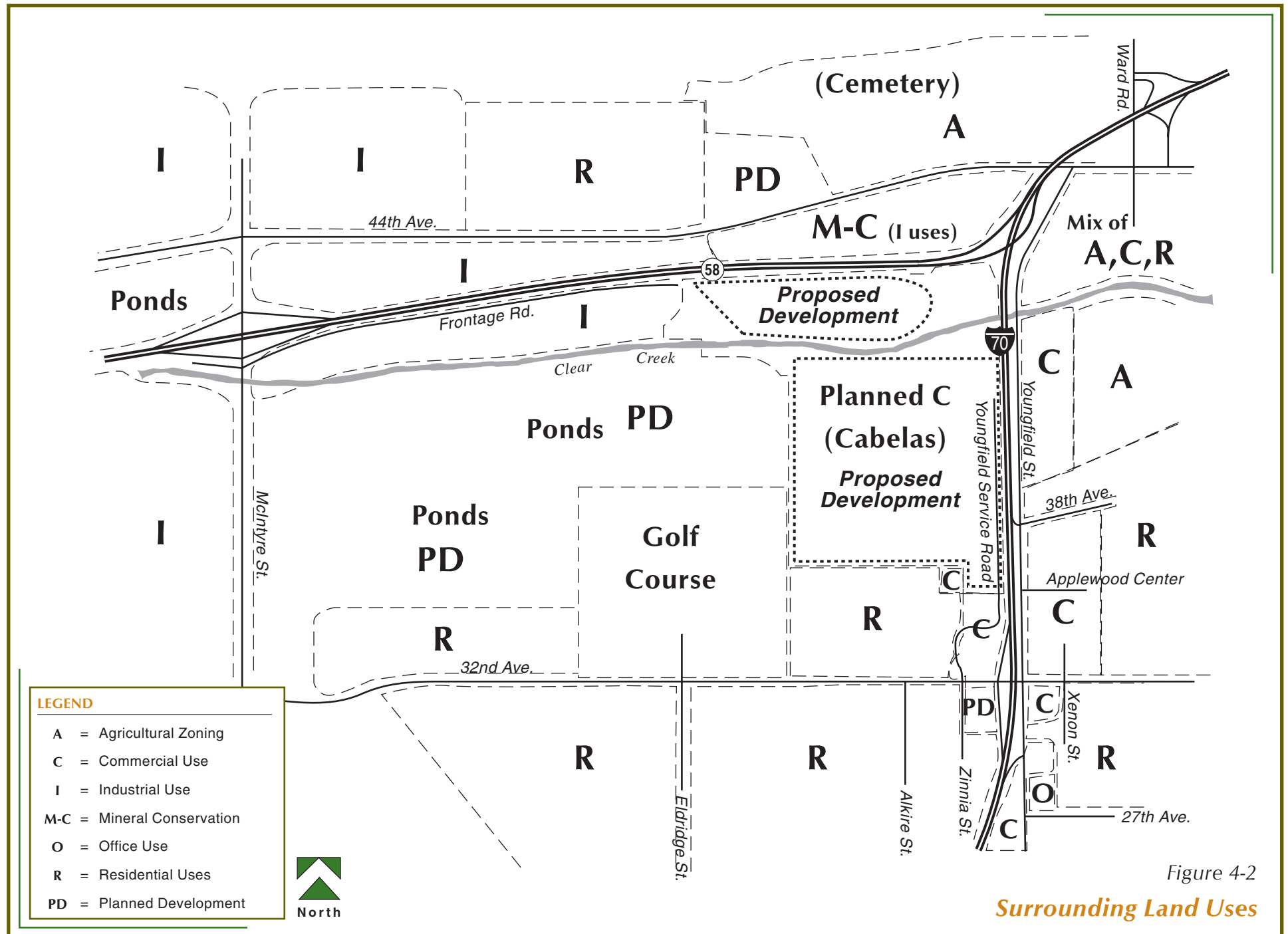
**Figure 4-2** shows the existing and planned land uses within the study area. West of I-70, beyond the retail and commercial properties, residential uses, including the Applewood neighborhood, exist along both sides of 32<sup>nd</sup> Avenue. The Applewood Golf Course is located north of 32<sup>nd</sup> Avenue at Eldridge Street, and Maple Grove Park is located south of 32<sup>nd</sup> Avenue near McIntyre Street. Several water storage ponds owned by Coors are located west and north of the golf course.

Retail and commercial properties are located along Youngfield Street north of 27<sup>th</sup> Avenue. The areas east of Youngfield Street are primarily residential. Maple Grove Reservoir and Chester-Portsmouth Park are located east as 27<sup>th</sup> Avenue traverses into 26<sup>th</sup> Avenue.

##### *I-70/SH 58 Interchange Area*

Along the north side of the study area adjacent to SH 58 and the I-70/SH 58 interchange, much of the development is industrial. This is the case along the south side of 44<sup>th</sup> Avenue between McIntyre Street and Youngfield Street. A mix of residential and industrial uses exists along the north side of 44<sup>th</sup> Avenue, including the Fairmount neighborhood and Arapahoe Park. The Mount Olivet Cemetery occupies a large tract of land north of 44<sup>th</sup> Avenue and east of Eldridge Street. A truck stop and, several retail, commercial, and residential structures are located adjacent to the area where Ward Road terminates at 44<sup>th</sup> Avenue.





**LEGEND**

- A = Agricultural Zoning
- C = Commercial Use
- I = Industrial Use
- M-C = Mineral Conservation
- O = Office Use
- R = Residential Uses
- PD = Planned Development



Figure 4-2

Surrounding Land Uses

Directly southwest of the I-70/SH 58 interchange is a former aggregate mine with a proposed land use of a business park (north of Clear Creek) and community commercial center (south of Clear Creek). Both of these land uses include retail, office, or commercial uses and benefit from proximity to I-70, as identified in the City of Wheat Ridge Comprehensive Plan (City of Wheat Ridge 1999).

Several recreational land uses exist in the study area, such as the Clear Creek bicycle/ pedestrian trail, which runs along Clear Creek. West of I-70, the trail is maintained by Jefferson County Open Space, and east of the I-70 the trail is part of the City of Wheat Ridge Green Belt. **Section 4.3 Parks and Recreation** further discusses parks and recreational land use in the study area.

#### **4.1.1.3 Future Conditions**

A series of inactive aggregate pits that were undergoing reclamation at the time of this EA are located southwest of the SH 58/I-70 Interchange. According to the Jefferson County *Central Plains Community Plan*, the land was previously zoned as commercial/industrial. The City of Wheat Ridge has annexed two large tracts of land in the area southwest of the I-70/SH 58 interchange and has identified the area as an urban growth area with potential office, commercial, and retail land use (City of Wheat Ridge 2005). Land use in the area southwest of the I-70/SH 58 interchange will change from an aggregate mine to retail and commercial use, as identified in the *City of Wheat Ridge Comprehensive Plan*, as amended in 2005 (City of Wheat Ridge 1999).

The proposed development area includes approximately 800,000 ft<sup>2</sup> of commercial and retail uses, including the construction of a 225,000 ft<sup>2</sup> Cabela's store (which has recently been reduced to 185,000 ft<sup>2</sup>) and an additional 575,000 ft<sup>2</sup> of other retail and commercial development. Cabela's is a retail store for outdoor, fishing, and hunting products. In comparison, the Colorado Mills shopping center, which is located southwest of the proposed development at the intersection of I-70, Colfax, and Colorado Mills Boulevard (Indiana Street), has 1.1 million ft<sup>2</sup> of retail space with 18 anchor stores and 200 retailers. The Denver West Village shopping center is situated west of Colorado Mills and south of proposed development. This shopping center is 325,000 ft<sup>2</sup> and offers services that compliment the Colorado Mills shopping center.

DRCOG provides information on the forecasted 2030 land uses for the entire metropolitan area (DRCOG 2005a). DRCOG's land use forecasts include population, household and employment estimates by traffic analysis zone (TAZ). The metropolitan area includes a total of 2,664 TAZs. The TAZs within the study area are shown in **Figure 4-3**. DRCOG has added a new TAZ (2665) to specifically account for the proposed development southwest of the I-70/SH 58 interchange. The 2030 land use forecasts for the TAZs in the study area are shown in **Table 4-1**.

The land use forecasts in TAZ 2665 are based on the current development proposal, which includes retail, hotel and office uses. All other TAZs in the study area represent DRCOG's land use forecasts. Overall, the study area is expected to experience a 22 percent increase in population and the number of households and a 52 percent increase in employment over the existing land uses.

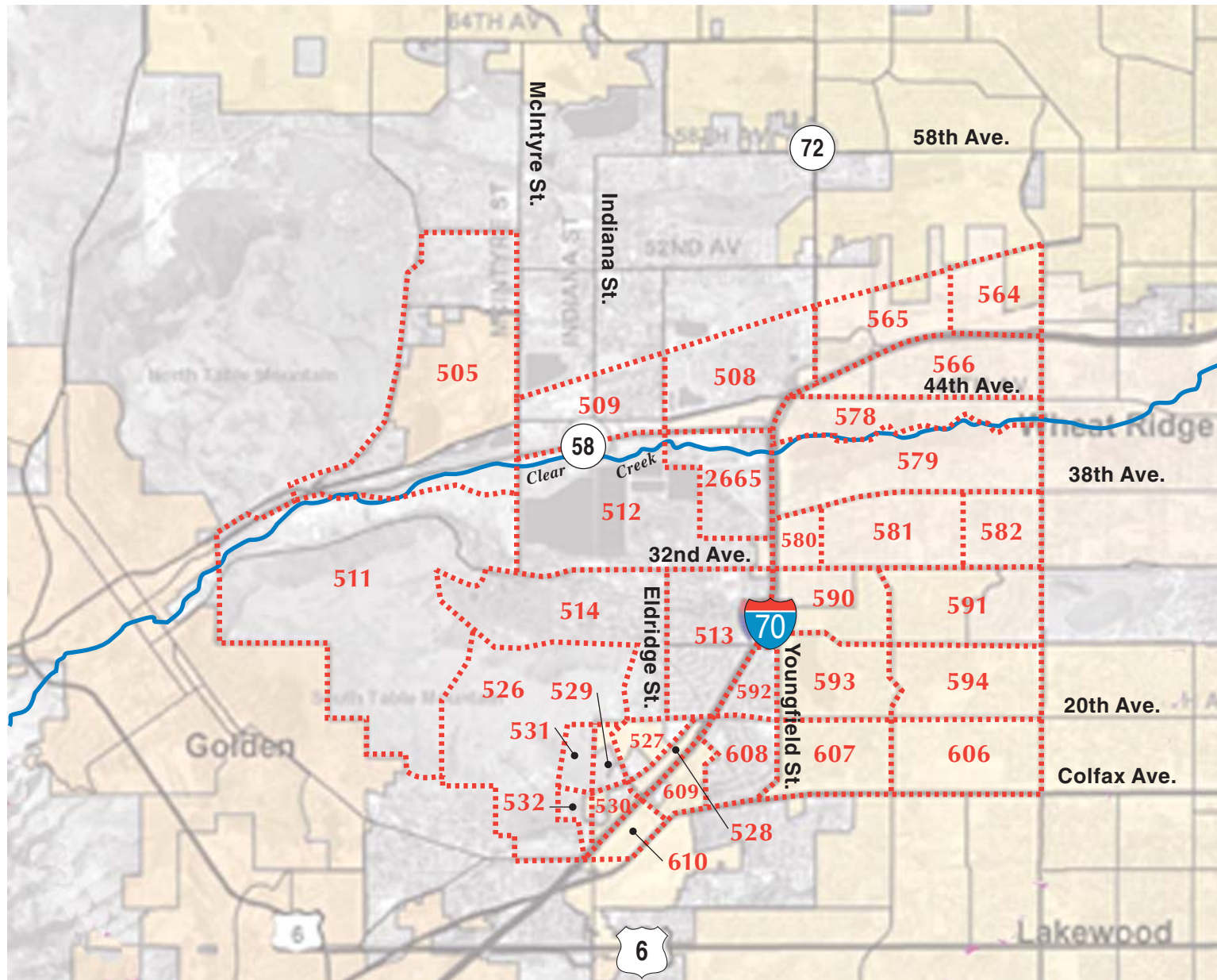


Figure 4-3

Study Area Traffic Analysis Zones



North SOURCE: DRCOG 2005

Table 4-1 Existing and 2030 Population and Employment

TAZ	Acres	Population		Households		Employment	
		2005	2030	2005	2030	2005	2030
505	1,020	275	996	108	393	988	1,181
508	410	32	53	11	18	438	2,072
509	288	372	370	151	151	1,414	1,439
511	1,381	79	125	36	57	134	277
512*	708	518	518	226	226	123	1,263
2665*	195	0	0	0	0	0	1,425
513	354	1,715	1,872	669	734	266	266
514	478	1,239	1,233	472	472	50	68
526	760	442	440	178	178	950	1,489
564	209	33	415	13	166	1,305	1,582
565	254	23	31	16	22	881	1,070
566	334	2,216	3,023	962	1,319	971	1,252
578	288	943	1,151	531	652	981	1,183
579	458	1,507	1,641	648	709	683	707
580	66	152	178	63	74	1,089	1,139
581	268	1,593	2,241	683	966	76	106
582	201	1,453	1,946	601	809	255	260
590	244	1,136	1,277	447	505	662	715
591	322	1,777	1,884	762	812	127	128
592	100	866	958	421	468	99	118
593	258	912	944	367	382	265	269
594	317	1,550	1,648	683	730	228	241
<b>Totals</b>		<b>18,833</b>	<b>22,944</b>	<b>8,048</b>	<b>9,843</b>	<b>11,985</b>	<b>18,250</b>
TAZ traffic analysis zone							
* project location specific TAZ							



#### *4.1.1.4 Environmental Consequences*

##### *No-Action Alternative*

Existing land use patterns would continue until they are altered or replaced by other land uses in response to market forces and community expansion pressures. Development, such as the proposed development, will occur regardless of the Proposed Action because of the overall population growth occurring in the Denver Metropolitan area. However, the No-Action Alternative would not be fully supportive of the future land use identified by the City of Wheat Ridge, including the proposed development.

##### *Proposed Action*

The proposed development for the I-70/SH 58 interchange area, including the construction of Cabela's, is consistent with the goals and policies contained in the City of Wheat Ridge Comprehensive Plan (City of Wheat Ridge 1999) because it includes the land uses and development standards envisioned by the City.

The proposed traffic improvements are not expected to impact existing or planned land use patterns in the study area, except for land acquired for right-of-way (see **Section 4.2 Right-of-Way and Displacements**). The areas surrounding the Proposed Action are for the most part developed with the exception of the area southwest of the I-70/SH 58 interchange, although this area previously operated as an aggregate mine. The partial or complete purchase of individual residences and businesses would be required for the improvements under the Proposed Action. While such purchases may affect individual property owners, the adjacent land use patterns would not change.

#### *4.1.1.5 Mitigation*

Land use is controlled by local agencies through planning and zoning requirements. The Proposed Action is consistent with local plans, and no mitigation is required. Right-of-way acquisitions and displacements are addressed in **Section 4.2 Right-of-way and Displacements**.

### **4.1.2 Social and Economic Conditions**

This section describes the social and economic characteristics of the study area, including community services, community facilities, and community cohesion. These characteristics were identified using a variety of available information sources including:

- ▶ Site reconnaissance
- ▶ DRCOG 2030 MetroVision Plan (DRCOG 2005a)
- ▶ Colorado Department of Local Affairs (DOLA) demographic information (DOLA 2004)
- ▶ U.S. Census Bureau data (U.S. Census Bureau 2000)

- ▶ City of Wheat Ridge Comprehensive Plan and Addendum (City of Wheat Ridge 1999, City of Wheat Ridge 2005)
- ▶ Jefferson County Central Plains Community Plan (JCPZ 2004)
- ▶ Jefferson County North Plains Community Plan (JCPZ 1989)
- ▶ City of Lakewood Comprehensive Plan (City of Lakewood 2003)

#### **4.1.2.1** *Current Conditions*

##### *Demographics*

Colorado has experienced rapid population growth over the last few decades. Although there has been some slow down in the first part of the 21<sup>st</sup> century, population growth is expected to maintain a steady increase in the coming years. According to DOLA, the reasons for continued population growth in Colorado include the strong U.S. economy, the general above average population growth in the western U.S., and the decentralization tendencies away from the eastern United States and the west coast.

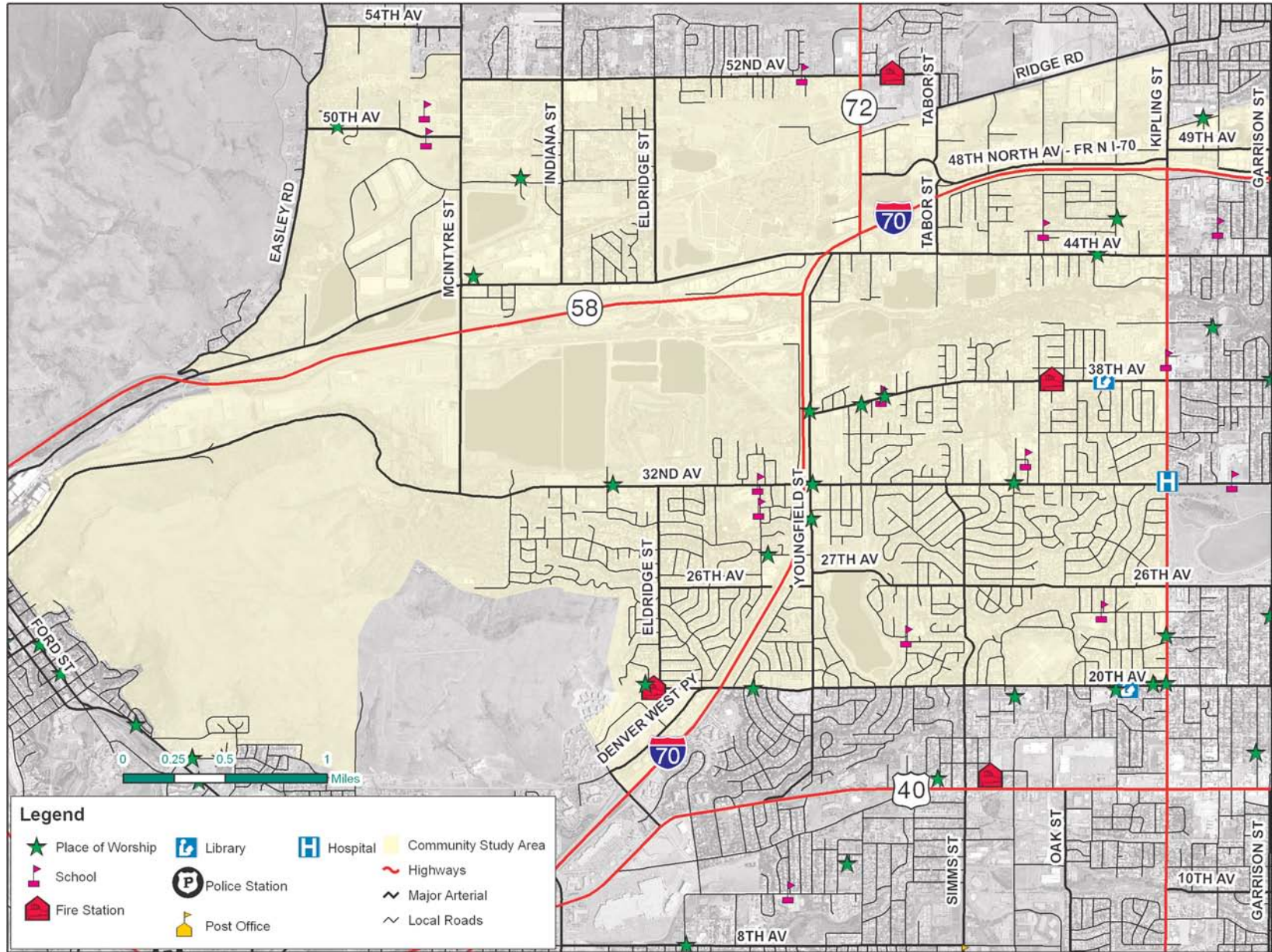
Jefferson County gained population from 1985 to 2000 at an average rate of 1.45 percent per year, but lost inhabitants between 2001 and 2003 (DOLA 2004). Jefferson County is forecasted to grow in population by 10.8 percent by 2015 and by 30.9 percent by 2030, as reported by DRCOG (DRCOG 2005a). The City of Wheat Ridge has maintained a steady population of around 30,000 for over 25 years and accounts for 5.8 percent of the Jefferson County population (City of Wheat Ridge 1999). In the 2000 Census, the population of Lakewood was 144,126, which is a 13.9 percent increase from the 1990 census (U.S. Census 2000).

As presented in **Table 4-1**, the population in the study area is expected to increase by 22 percent between 2005 and 2030. The number of households in the study area is predicted to increase from 8,048 to 9,843, which is an 18 percent increase. The average household size in the City of Wheat Ridge is 2.4 persons, in unincorporated Jefferson County it is 2.6 persons, and in the City of Lakewood it is 2.3 persons. Approximately three percent of the housing units in the City of Wheat Ridge, Lakewood, and unincorporated Jefferson County are currently vacant. Approximately 77 percent of the housing units in unincorporated Jefferson County and 61 percent in the City of Lakewood are owner occupied, while only 53 percent in the City of Wheat Ridge are owner occupied (U.S. Census 2000).

Minority and low-income populations are further discussed in **Section 4.1.3** *Environmental Justice Evaluation* and the *Environmental Justice Evaluation Technical Report* (FHU 2006b).

##### *Community Services and Facilities*

Community facilities such as schools, libraries, and places of worship, are important community resources. These facilities not only provide needed services but also serve to bind and enrich the community for residents and visitors. They are a key component to maintaining the character and cohesiveness of the community. Community facilities in the vicinity of the study area are shown on **Figure 4-4**.



North SOURCE: U.S. Census 2000

Figure 4-4

Community Facilities



There are several types of community facilities located within the study area including: several churches and schools, two fire stations, and one library. The nearest schools are Maple Grove Elementary and The Manning School, which are located on 32<sup>nd</sup> Avenue and Alkire Street. The Maple Grove Grange and Golden Goal Sports Complex recreational facility also serve as community facilities within the area.

The Maple Grove Grange is located on the east side of Youngfield Street north of 31<sup>st</sup> Avenue. The Grange was constructed in 1951 and still functions today. Many groups utilize the Grange, including scouts, square and round dance groups, the historical society, and Kiwanis. Grange members and associated groups, such as the Cub Scouts, participate in community projects like Adopt-a-Highway, Beads for Premies, and Ag in the Classroom. The Grange also serves as a rental facility approximately 15 to 20 times per month. Activities such as folk dancing, Jeep club, Colorado Wood Carvers, and weddings occur at the Grange for a rental fee that supplements financial needs to keep the Grange running. The Grange is identified as one of the main community facilities within the study area (National Grange 2006).

Golden Goal Sports Complex is located on the west side of I-70 on 29<sup>th</sup> Avenue and serves as a recreational facility for adults and youth within the study area. The facility has indoor soccer and lacrosse leagues, room rentals for meetings and parties, and a weight training area. According to the complex owner, some members access the facility by utilizing the 26<sup>th</sup> Avenue pedestrian bridge over I-70.

No minority community centers of activity, such as shopping centers or churches serving predominantly minority populations, were identified in the study area.

### *Community Cohesion and Connections*

SH 58 and I-70 have few crossing roadways, limiting movement across these transportation corridors. Residential land use along 32<sup>nd</sup> Avenue and the series of former aggregate pits (many converted to water storage) west of I-70 and south of SH 58 limit connections between 32<sup>nd</sup> Avenue and the existing SH 58 frontage road within the study area. With limited roadway access, emergency vehicle access to the area southwest of the I-70/SH 58 interchange is also limited. The area is served by the Fairmount Fire Protection District and West Metro Fire Protection District. The Fairmount Fire Protection District station is located at 4755 Isabell Street, which is located north of the study area between McIntyre and Indiana Streets, while the West Metro Fire Protection District station is located at 1545 Robb Street which is southwest of the study area. Letters from the Fairmount Fire Protection District and West Metro Fire Protection District discussing emergency access to the area south of the I-70/SH 58 interchange are included in **Appendix B**.

Pedestrian and bicycle mobility within the study area is served by the Clear Creek Trail, which allows accessibility to areas adjacent to SH 58 and I-70. Otherwise, pedestrians, bicyclists, and vehicle traffic must cross I-70 along 32<sup>nd</sup> Avenue through the interchange and the Youngfield Street/32<sup>nd</sup> Avenue intersection or cross SH 58 at McIntyre Street.

The 26<sup>th</sup> Avenue pedestrian bridge over I-70 serves as a connection between communities located east and west of I-70 at 26<sup>th</sup> Avenue. Sidewalks throughout the study area along main road corridors also serve to connect communities and allow access to shopping areas and



community services and facilities. Crosswalks are located at many intersections and in areas where schools are located. The existing pedestrian bridge at 26<sup>th</sup> Avenue is not ADA-compliant, does not provide ramp access for bicyclists, and has low visual quality. The bridge structure is concrete with steep steps and no ramps.

A survey regarding the pedestrian bridge was taken at the open house on November 30, 2005 (MGA 2005). Thirty-five people responded to the survey, with 24 of those people indicating that they, or members of their family, use the bridge. Frequency of utilization of the bridge was included in the survey. Five people indicated that they used the bridge daily, three used it about once a week, three used it several times a week, four used it once a month and nine indicated using the bridge several times a year. Uses for the bridge included:

- ▶ Bicycle access across I-70
- ▶ Use during leisure walks
- ▶ Use to access shops on the east side of I-70
- ▶ Use to access the sports complex or to go to church
- ▶ Use back and forth to school
- ▶ Accessing friends' houses across the highway

Several survey respondents indicated that they would like a pedestrian structure constructed that accommodated bicycles (bicycles currently have to be carried, or pushed up a steep channel on the stairs) and was ADA-compliant with ramp access.

### *Economic Conditions*

Employment trends in the study area would be dominated by the construction of planned retail and commercial development southwest of the I-70/SH 58 interchange. Employment within the TAZs previously presented in **Table 4-1** totaled approximately 11,985 jobs in 2005. Employment in the TAZs is expected to increase to more than 18,250 jobs by 2030, which is an increase of 52 percent. Of the 18,250 jobs, 2,688 or approximately 15 percent are expected to be from the proposed development southwest of the I-70/SH 58 interchange.

The Applewood Village Shopping Center serves as an economic contributor in the Wheat Ridge area. The center draws shoppers from the study area and surrounding area. Because the center is one of the largest in the City of Wheat Ridge, a large portion of the City of Wheat Ridge tax base is derived from the shopping center. The tax base within the study area is derived from numerous industries as indicated in **Table 4-2**.

**Table 4-2 Industry Profiles for the City of Wheat Ridge, Unincorporated Jefferson County, and the City of Lakewood**

Industry	Wheat Ridge Industries by %	Unincorporated Jefferson County Industries by %	Lakewood Industries by %
Services	41	28	35
Public Administration	4	11	5
Miscellaneous	7	8	9
Agriculture and Mining	2	2	1
Construction	7	7	7
Manufacturing	8	16	5
Transportation, Communication and Public Utilities	2	4	3
Wholesale Trade	4	2	3
Retail Trade	21	19	23
Finance, Insurance, and Real Estate	4	3	9

*Source: DRCOG 2005b*

**4.1.2.2 Environmental Consequences**

**No-Action Alternative**

*Social/Community Considerations*

Under the No-Action Alternative, the proposed transportation improvements would not be constructed and would not promote the most efficient use of the existing transportation corridors.

The No-Action Alternative would not directly affect current community facilities. Under the No-Action Alternative the substandard, non-ADA compliant pedestrian crossing over I-70 at 26<sup>th</sup> Avenue would remain. While access to community facilities in the vicinity of the project is generally adequate at the present time, increased congestion and system disruptions could worsen in the future.

Emergency access across SH 58 would be limited to McIntyre Street, and traffic congestion at the I-70/32<sup>nd</sup> Avenue interchange would limit access along 32<sup>nd</sup> Avenue. An additional access would be provided with the 40<sup>th</sup> Avenue underpass, which is part of the local agency projects. Correspondence from local emergency providers is provided in **Appendix B**.

*Economic Conditions*

The No-Action Alternative would not fully support the future business and economic development identified by the City of Wheat Ridge. Localized congestion at some interchanges could have operational and cost implications to some existing businesses and could limit the potential for development of some sites. Without the improvements, the local shopping centers may suffer from economic loss as some consumers would choose a less congested, easier

accessible shopping area to access for goods and products. Other nearby shopping areas, which are not located in the City of Wheat Ridge, include Colorado Mills and Denver West.

### *Proposed Action*

#### *Social/Community Considerations*

Construction of the Proposed Action would support regional growth and the proposed development through 2030.

#### *Community Services and Facilities*

Of the community facilities located within the study area, only two are expected to have right-of-way impacts from the proposed improvements: Ridgeview Baptist Church and The Maple Grove Grange. The Baptist church on 38<sup>th</sup> Avenue and Youngfield would have right-of-way impacts on the west side of the parking lot. The Grange would have right-of-way impacts on the westerly edge of the property. Both of the right-of-way impacts are expected to be minor in nature and would not impact the function of the facility. **Section 4.2 Right-of-Way and Displacements** discusses specific right-of-way impacts for the Proposed Action.

#### *Community Cohesion and Connections*

Several positive community impacts are expected as a result of the proposed improvements. Accessibility, safety, and access across SH 58 to the proposed development and also to the Clear Creek Trail would be improved. Sidewalks would be provided over the SH 58 crossing and along Cabela Drive. Access to the Jefferson County Open Space Clear Creek Trail from 32<sup>nd</sup> Avenue would be maintained by the construction of the north and south sections of Cabela Drive and associated multi-use sidewalk. Driver experience would be improved due to easier access and accessibility of facilities. Bicycle/pedestrian facility improvements that are part of the Proposed Action are discussed in **Chapter 2 Alternatives** and depicted on **Figure 2-12**.

The new pedestrian crossover at 27<sup>th</sup> Avenue would create a positive impact for community cohesion. The new crossover would be ADA compliant with ramp access. The improved structure would attract bicycle users, which currently do not use the structure due to lack of ramps, and would improve access the shopping areas and the Clear Creek Trail.

*Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks*, directs federal agencies to (1) identify and assess environmental health risks and safety risks that may disproportionately affect children, and (2) ensure that policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. The Proposed Action will not pose a health risk to children. The Proposed Action includes numerous school safety and bicycle and pedestrian improvements as discussed earlier in **Sections 2.4.7** and **2.4.8** and shown in **Figures 2-12** and **2-13**.

#### *Economic Conditions*

Economic impacts from the Proposed Action are expected to be positive in nature. No notable loss of real property or property tax revenue for the study area is expected from the proposed improvements. The transportation improvements are expected to improve accessibility to retail and commercial facilities currently located on Youngfield Street and those proposed west of I-70, such as Cabela's.

The proposed development southwest of the I-70/SH 58 interchange is expected to draw regional and out-of-state tourists/shoppers who would see the development as an attraction. The Proposed Action would provide the needed transportation system to support the economic gains expected from the proposed development. In total, tax collections are estimated to be \$10.5 million annually from the development, benefiting the City of Wheat Ridge, Jefferson County, Jefferson County school district, and the State of Colorado (King and Associates, Inc 2005).

Construction costs associated with the improvements would have beneficial short-term impacts on the local economy. Construction workers for the improvements are generally expected to be drawn from the existing local workforce or outside contractors, resulting in a positive impact. Short-term economic benefits would also be realized during the construction period from workers buying supplies and meals from local retail stores.

#### **4.1.2.3 Mitigation**

The Proposed Action has been developed to provide transportation benefits to the local community, to the Cities of Wheat Ridge and Lakewood and unincorporated Jefferson County, and the region. Throughout the development of the Proposed Action, a strong emphasis has been placed on avoiding adverse impacts to the local community and economy. Where such impacts could not be avoided, the impacts have been minimized. This effort has included an ongoing dialog with members of the community and local agencies. The public and agency involvement efforts are summarized in **Chapter 6 Public and Agency Involvement**. Mitigation that has been developed through this ongoing dialog includes:

- ▶ Access to the Clear Creek trail across SH 58 from 44<sup>th</sup> Avenue via the new SH 58/Cabela Drive interchange
- ▶ Replacement of the bike route access to the Clear Creek trail along the Youngfield Service Road with a detached 10 ft wide multi-use sidewalk along Cabela Drive that would access the Clear Creek trail via the existing pedestrian bridge crossing Clear Creek; and a 10 ft wide multi-use sidewalk on the north side of 40<sup>th</sup> Avenue that would provide access to the trail at the existing trailhead immediately southwest of the I-70/SH 58 interchange via the relocated frontage road north of 40<sup>th</sup>
- ▶ School safety improvements along 32<sup>nd</sup> Avenue in the vicinity of The Manning School and Maple Grove Elementary
- ▶ Replacement of the 26<sup>th</sup> Avenue pedestrian bridge with an ADA-compliant structure at 27<sup>th</sup> Avenue
- ▶ Sidewalk improvements along 32<sup>nd</sup> Avenue and Youngfield Street in the vicinity of the I-70/32<sup>nd</sup> Avenue interchange
- ▶ Public involvement and coordination with the local community will continue during design and construction

Impacts from right-of-way and displacements are addressed in **Section 4.2 Right-of-Way and Displacements**.



### 4.1.3 Environmental Justice Evaluation

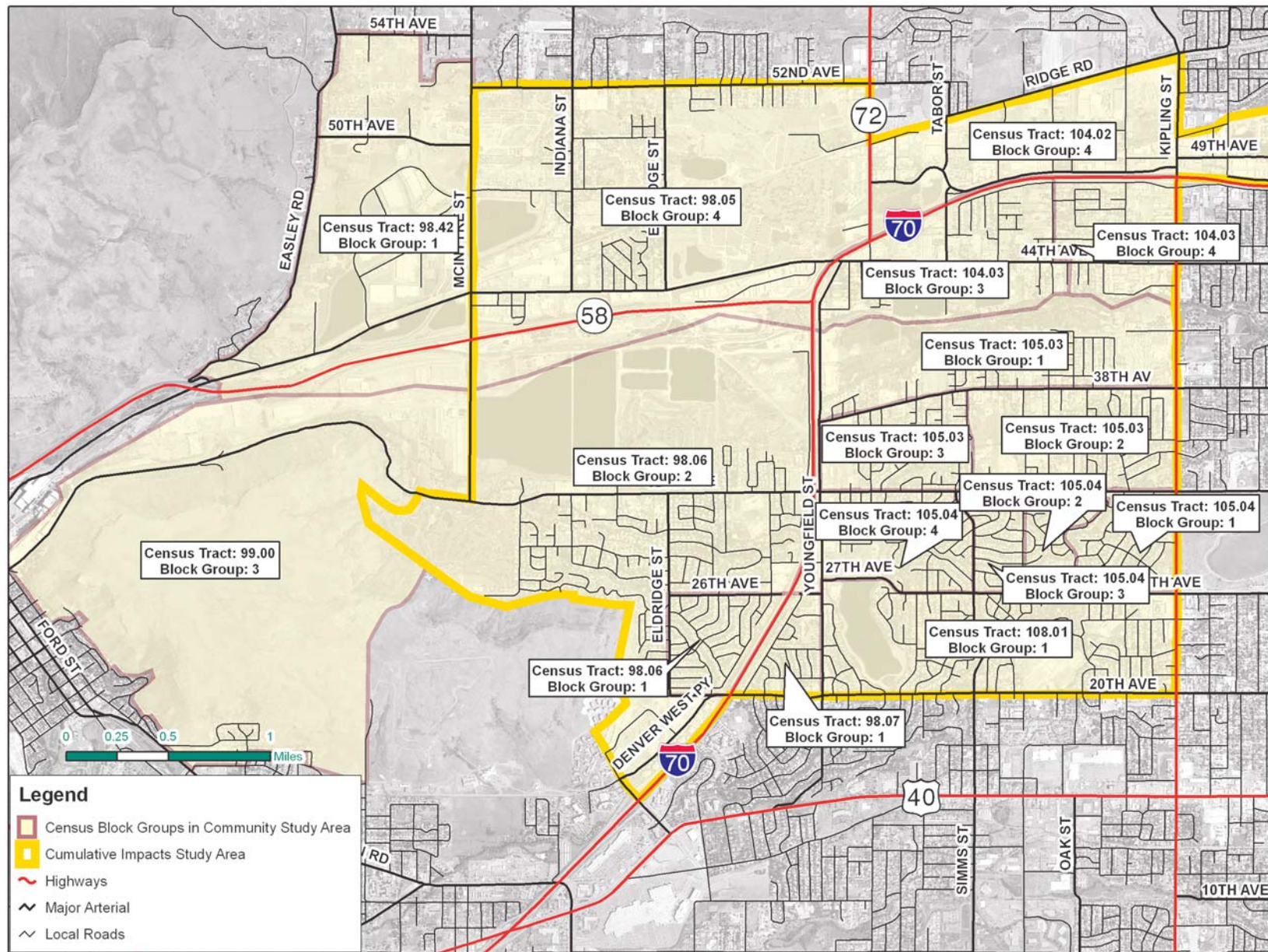
This section describes the demographics surrounding the proposed project. To provide a meaningful and focused analysis, a community study area (see **Figure 4-5**) has been identified, including census block groups that are within, and adjacent to, the proposed project. The community study area is larger than the project area or study area and is specific to the environmental justice evaluation. These areas have been selected to provide a focused characterization of the populations that would be most affected by the project. As appropriate, comparison data for the State of Colorado and/or Jefferson County is also provided.

An understanding of the demographic character of the area is important to provide a basis for assessing impacts to the local community. It is also important in evaluating the project with regard to environmental justice requirements. A discussion of environmental justice requirements and principles is provided below followed by the demographic analysis.

Environmental justice refers to social equity in sharing the benefits and the burdens of specific projects or programs. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, was issued in 1994 to address this issue. The Executive Order directs that each federal agency “shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

FHWA Order 6640.23 (1998), entitled *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, defines minority populations and low-income populations as: “any readily identifiable group of minority or low-income persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be affected by a proposed FHWA program, policy, or activity.” Minorities constitute races and ethnic groups, and include these U.S. Census Bureau-identified groups: Black/African Americans, American Indian/Alaskan Natives, Asians, Native Hawaiian/Pacific Islanders, and Hispanics. In the 2000 census, Hispanics are treated as an ethnic group distinct from racial groups, thus a person could be Hispanic and white or another race.

Low-income is defined as persons/families with incomes at or below the Department of Health and Human Services or Census Bureau poverty guidelines. CEQ (CEQ 1997) guidance on environmental justice states that “the selection of the appropriate unit of geographical analysis may be a governing body’s jurisdiction, a neighborhood, a census tract, or other similar unit that is chosen so as not to artificially dilute or inflate the affected minority population.” CEQ further adds that “minority populations should be identified where either (a) the minority population of the affected area exceeds 50 percent or (b) the population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.” The CEQ guidelines do not specifically state the percentage considered meaningful in the case of low-income populations.



North SOURCE: U.S. Census 2000

Figure 4-5

Community Study Area

FHWA Order 6640.23(1998) sets out FHWA's policy regarding environmental justice, which includes: "When determining whether a particular program, policy, or activity will have disproportionately high and adverse effects on minority and low-income populations, FHWA managers and staff should take into account mitigation and enhancement measures and potential offsetting benefits to affected minority and low-income populations. Other factors that may be taken into account include design, comparative impacts, and the relative number of similar existing systems in non-minority and non-low-income areas."

In addition, FHWA has embraced the following objectives for environmental justice:

- ▶ To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects on minority populations and low-income populations
- ▶ To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- ▶ To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations

In February 2005, CDOT issued guidelines (CDOT 2005b) to assist in implementing Executive Order 12898 and FHWA Order 6640.23. The guidelines provide generalized information describing the process to be used for environmental justice analysis, the tools to be used in the public involvement program, the data to be collected, descriptions of impacts to be evaluated and mitigation possibilities. Specific procedures for the identification of minority and low-income populations using census data are also included.

#### *4.1.3.1 Current Conditions*

##### *Minority Populations*

**Table 4-3** presents population data and minority population percentages for the census block groups included in the community study area. These same statistics are presented for the State of Colorado and Jefferson County for comparison. Based on the information presented in **Table 4-3**, the following observations can be made about the demographics of the community study area:

- ▶ The census block groups in the community study area vicinity generally have similar proportions of minorities as Jefferson County, and smaller proportions than the State of Colorado as a whole.
- ▶ Hispanics make up the largest proportion of the total minority population in the community study area. Several block groups in the eastern portion of the community study area have Hispanic populations greater than the Jefferson County average.

Other minority populations (Black/African American, Native American, Asian/Pacific Islander) were generally found in proportions similar to Jefferson County averages.



Table 4-3 Demographics of the Community Study Area – 2000

Area	Total	Minority Populations (%)				
		Black/ African American	Native American	Asia / Pacific Islander	Hispanic or Latino <sup>1</sup>	Total Minority <sup>2</sup>
State of Colorado	4,301,261	3.8	1.0	2.3	17.1	25.5
Jefferson County	527,056	<b>0.9</b>	<b>0.8</b>	<b>2.4</b>	<b>10.0</b>	<b>15.1</b>
<b>Census Block and Tract Groups in the Community Study Area (see Figure 4-5)</b>						
Tract 98.05 Block Group 4	1602	0.0	<b>1.1</b>	0.8	8.1	10.1
Tract 98.06 Block Group 1	1061	0.3	0.8	0.5	2.5	4.5
Tract 98.06 Block Group 2	2556	0.2	0.5	1.4	3.5	6.2
Tract 98.07 Block Group 1	1003	0.6	0.4	0.8	8.1	12.3
Tract 98.42 Block Group 1	320	0.0	0.3	1.3	1.3	4.1
Tract 99 Block Group 3	859	0.5	0.6	<b>4.5</b>	4.9	12.5
Tract 104.02 Block Group 4	1276	<b>1.1</b>	0.5	0.3	<b>11.1</b>	13.6
Tract 104.03 Block Group 3	1066	<b>1.0</b>	<b>1.5</b>	2.1	<b>14.4</b>	<b>20.7</b>
Tract 104.03 Block Group 4	2142	<b>2.0</b>	<b>0.9</b>	1.8	<b>15.8</b>	<b>22.4</b>
Tract 105.03 Block Group 1	1575	0.5	<b>1.0</b>	1.3	<b>10.7</b>	15.0
Tract 105.03 Block Group 2	2236	0.6	0.7	1.0	<b>10.2</b>	13.6
Tract 105.03 Block Group 3	1073	0.0	0.2	1.7	5.1	8.1
Tract 105.04 Block Group 1	677	0.0	0.4	2.1	3.4	7.1
Tract 105.04 Block Group 2	628	0.0	0.2	0.2	2.7	4.3
Tract 105.04 Block Group 3	517	0.4	0.2	1.0	3.5	7.2
Tract 105.04 Block Group 4	1146	0.4	0.3	2.3	3.8	7.9
Tract 108.01 Block Group 1	2553	0.5	0.6	1.2	6.7	9.9
Total of Block Groups	22,290	0.6	0.7	1.4	7.8	11.5
<b>Source:</b> U.S. Census Bureau Year 2000 data						
<sup>1</sup> Hispanic/Latino can be of any race						
<sup>2</sup> Total minority includes all individuals except non-Hispanic whites						
Percentages shown in <b>BOLD</b> exceed the county percentages (also shown in <b>BOLD</b> for comparison)						

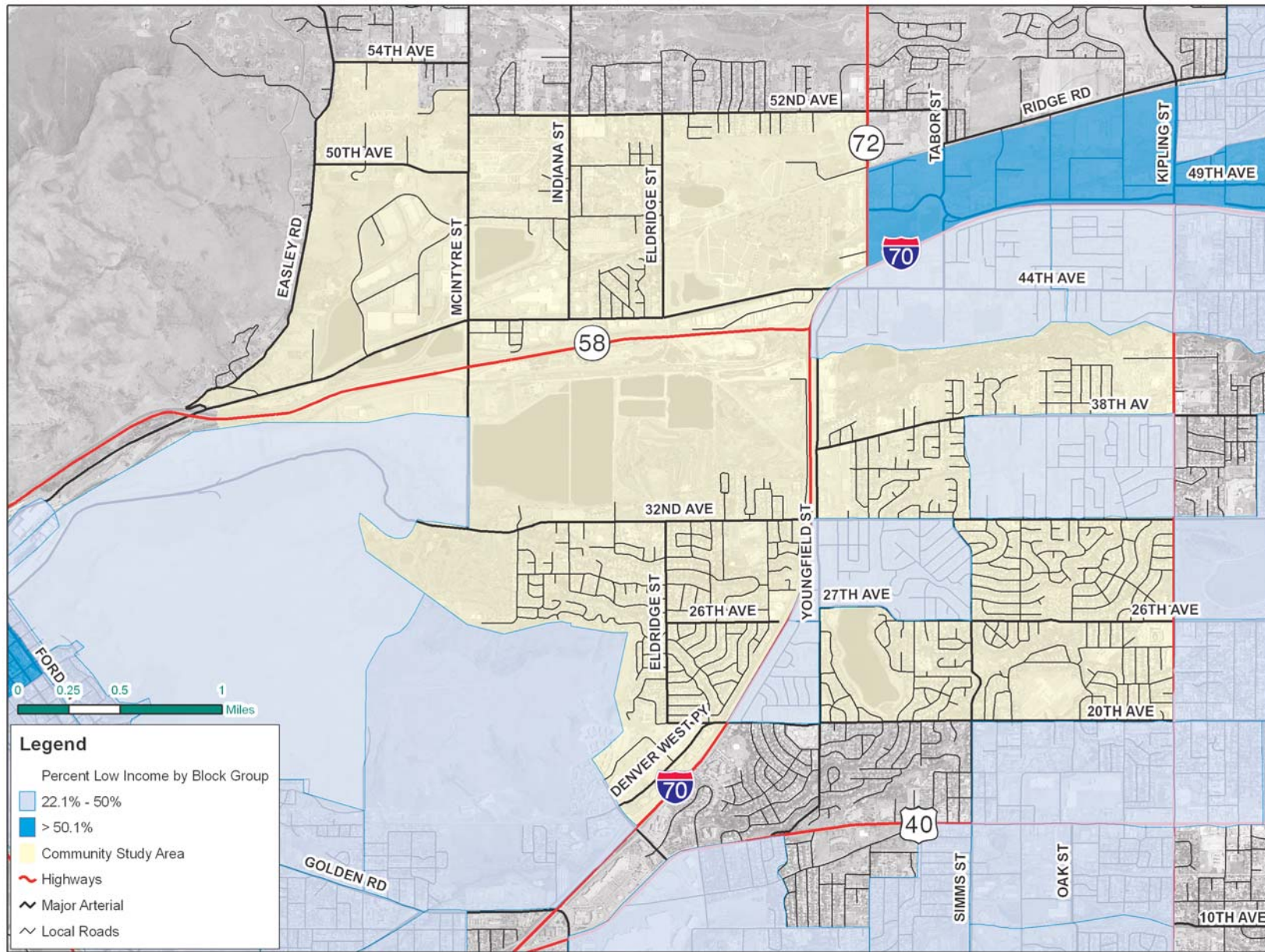


*Low-Income Populations*

**Figure 4-6** highlights census block groups that have a higher percentage of low-income households than the Jefferson County percentage. **Table 4-4** presents the low-income percentages by block group. According to census block data, the portion of the study area with the highest percentage of low-income populations is north of I-70 and east of Highway 72. As shown on **Figure 4-6** and **Table 4-4**, several other block groups scattered through the southern portion of the community study area also exceed the Jefferson County low-income percentage. Further discussion of the methodology for determination of low-income populations is discussed in the *Environmental Justice Evaluation Technical Report* (FHU 2006b).

**Table 4-4 Low-Income Households**

Area	Low-Income Households (%)
Jefferson County	<b>22%</b>
<b>Census Block and Tract Groups in the Community Study Area (see Figure 4-5)</b>	
Tract 98.05, Block Group 4	10.1%
Tract 98.06, Block Group 1	17.7%
Tract 98.06, Block Group 2	7.5%
Tract 98.07, Block Group 1	<b>38.2%</b>
Tract 98.42, Block Group 1	19.8%
Tract 99.00, Block Group 3	<b>28.5%</b>
Tract 104.02, Block Group 4	<b>72.9%</b>
Tract 104.03, Block Group 3	<b>33.1%</b>
Tract 104.03, Block Group 4	<b>47.4%</b>
Tract 105.03, Block Group 1	21.9%
Tract 105.03, Block Group 2	<b>35.2%</b>
Tract 105.03, Block Group 3	16.5%
Tract 105.04, Block Group 1	21.8%
Tract 105.04, Block Group 2	9.1%
Tract 105.04, Block Group 3	10.1%
Tract 105.04, Block Group 4	<b>24.2%</b>
Tract 108.01, Block Group 1	18.6%
<small>Source: U.S. Census Bureau Year 2000 data, HUD Section 8                      Percentages shown in <b>BOLD</b> exceed the county percentages (also shown in <b>BOLD</b> for comparison)</small>	



North SOURCE: U.S. Census 2000

Figure 4-6

Low-Income Population by Census Block

### *Public and Agency Involvement Relevant to Environmental Justice*

An extensive public and agency involvement program has been implemented and is on-going. Specific elements of this program are discussed in **Chapter 6 Public and Agency Involvement** and the *Environmental Justice Evaluation Technical Report* (FHU 2006b). Although low-income and minority groups will not be disproportionately impacted through right-of-way acquisition or displacements, special outreach activities to low-income and minority populations were conducted. The special outreach activities consisted of dissemination of project information through a bilingual (Spanish/English) newsletter that was mailed to residents in the study area and the availability of a Spanish/English translator at the November 30, 2005 open house. A copy of the bilingual newsletter is included in **Appendix B**.

#### *4.1.3.2 Environmental Consequences*

Community and environmental justice considerations have been fully integrated into the alternative development process for this project from the beginning and thus, have been considered during scoping, alternatives development, public and agency involvement and environmental analysis. Throughout this process, efforts have been made to avoid and minimize adverse impacts to the community in general including minority and low-income populations and to incorporate features into the project to address the concerns of the communities.

#### *No-Action Alternative*

Under the No-Action Alternative no additional right-of-way would need to be acquired. However, the No-Action Alternative would not promote the most efficient use of the existing transportation corridors. The No-Action Alternative would not be fully supportive of future land use and transportation needs identified by the cities of Wheat Ridge and Lakewood. Under the No-Action Alternative, low-income and minority populations present within the study area would continue to experience the traffic congestion problems that currently exist and are experienced by all populations; however, the impacts would increase proportional to higher levels of congestion as traffic congestion increases.

#### *Proposed Action*

The Proposed Action would result in numerous benefits to the local community, cities of Wheat Ridge and Lakewood, and Jefferson County. Traffic congestion at several points within the study area would be reduced resulting in decreased travel time for minority and low-income populations, as well as others traveling in the study area. The Proposed Action would replace facilities affected by construction in accordance with City of Wheat Ridge and/or Jefferson County criteria, which meets ADA requirements. Several of the enhancements will benefit not only ADA individuals but also low-income individuals that walk or bicycle to bus stops. Improvements include:

- ▶ Pedestrian access across I-70 by replacing the pedestrian bridge at 26<sup>th</sup> Avenue with an ADA-compliant structure at 27<sup>th</sup> Avenue
- ▶ Sidewalk access across I-70 and SH 58

- ▶ School zone safety along 32<sup>nd</sup> Avenue adjacent to the Manning and Maple Grove Elementary schools

Several criteria were utilized to determine if the Proposed Action would have a disproportionate or adverse effect on low-income or minority populations including: relocations of residences and low-income or minority owned businesses, displacement of businesses that provide jobs for minority and/or low-income populations, displacement of places of worship or community centers, and other environmental impacts. Benefits from the project are expected to be equitably shared across demographic groups and communities.

Construction of the Proposed Action would require the relocation of approximately two residential dwellings and seven businesses. As further described in **Section 4.2 *Right-of-Way and Displacements***, residents and business owners would receive relocation benefits in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

Information obtained through site visits, public meetings, and interviews with impacted business owners, and the 2000 Census and assessor's website, did not suggest that minority or low-income populations would be disproportionately impacted as a result of the residential and business relocations. It is likely that minority and/or low-income individuals are employed in some or all of the retail businesses that would be displaced. Employees may need to find other employment if one or more of these businesses do not relocate locally. However, comparable jobs are likely to be available for this limited number of employees due to the substantial number of jobs to be generated by the proposed development and existence of other employment options in the area. The Proposed Action will not affect traffic that would result in increased noise and air quality impacts in areas where low-income and/or minority populations have been identified. A more detailed discussion of the residential and business relocations is included in the *Environmental Justice Evaluation Technical Report* (FHU 2006b).

#### **4.1.3.3 Mitigation**

The Proposed Action has been developed to provide transportation benefits to the local community, cities, and the region. Throughout the development of the Proposed Action, a strong emphasis has been placed on avoiding adverse impacts to the local community. This effort has included an on-going dialog with members of the community and local agencies to minimize right-of-way acquisitions and displacements. Right-of-way acquisitions have been minimized. Improved pedestrian facilities will benefit community cohesion and connections for all residences in the area, including any low-income and minority populations.

## **4.2 *Right-of-Way and Displacements***

Land must be purchased from property owners adjacent to existing right-of-way (these are referred to as property acquisitions) to provide additional right-of-way needed to construct improvements included in the Proposed Action. If residences or businesses occupy the property to be acquired, the displacement of residents or businesses could result (these are referred to as displacements). In other cases, only a portion of the land will be necessary (partial acquisitions), leaving the remainder viable for the existing or planned land use.



Temporary construction easements will also be needed to construct the Proposed Action. A temporary construction easement is a right granted for a specific period of time so that the contractor can use the land for temporarily access or to stage materials during the construction process. Land with a temporary easement is not needed once construction is complete. Once it expires, the rights granted return to the property owner. A permanent easement is a right granted by a property owner that entitles the easement holder specific use of the property. The property owner's rights to use the land are determined by the agreement for the permanent easement.

Right-of-way acquisition is done in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended), as described below in **Section 4.2.3 Mitigation**. The purpose of the Uniform Act is to provide consistent and equitable treatment of all persons displaced from their homes, businesses or farms.

A full acquisition requires the complete purchase of a property and relocation of the tenants and/or owners. A partial acquisition only requires a portion of the property and does not require tenant and/or owner relocation.

#### **4.2.1 Current Conditions**

The project lies within an urbanized area characterized by retail, commercial, light industrial and residential land uses. Public right-of-way exists for roadways and highways. Public land also contains schools, parks and other public facilities. The existing width of public roadway right-of-way is as follows:

- ▶ I-70 – 300 to 310 ft
- ▶ SH 58 – 250 to 300 ft
- ▶ Youngfield Street – 70 to 90 ft
- ▶ 26<sup>th</sup> Avenue – 50 to 60 ft
- ▶ 27<sup>th</sup> Avenue – 50 to 60 ft
- ▶ 32<sup>nd</sup> Avenue – 60 to 80 ft
- ▶ 44<sup>th</sup> Avenue – 80 to 90 ft

Land use in the study area was discussed previously in **Section 4.1 Land Use, Socio-Economics, and Community**.

## 4.2.2 Environmental Consequences

### No-Action Alternative

The No-Action Alternative would not require any additional right-of-way nor any displacements.

### Proposed Action

Property acquisitions associated with the Proposed Action are summarized in **Table 4-5**.

**Table 4-5 Property Acquisitions**

Parcel Number	Street Address	Acquired Right-of-way [square feet (ft <sup>2</sup> )]	Current Use
<b>27<sup>th</sup> Avenue / Youngfield Street</b>			
<b>Full Acquisitions</b>			
39-293-00-032	2635 Youngfield Street	101,055	Nursery/Residence
39-293-00-031	2665 Youngfield Street	20,944	Commercial
39-293-00-030	2675 Youngfield Street	20,180	Residence
39-293-00-041	Vacant Land	2,457	Vacant Land
<b>Subtotal:</b>		<b>144,636</b>	
<b>Partial Acquisitions</b>			
39-293-00-029	2700 Youngfield Street	1,350	Commercial
39-293-14-002	2801 Youngfield Street	7,000	Commercial
39-293-00-035	12907 W. 26 <sup>th</sup> Avenue	1,400	Residence
39-293-00-038	2690 Youngfield Street	2,000	Cleaners
39-293-00-039	2680 Youngfield Street	300	Commercial
<b>Subtotal:</b>		<b>12,050</b>	
<b>Total for Area:</b>		<b>156,686</b>	
<b>32<sup>nd</sup> Avenue / Youngfield Street</b>			
<b>Full Acquisitions</b>			
39-292-00-012	3210 Youngfield Street	19,363	Gas Station
39-292-00-013	12751 - 12759 32 <sup>nd</sup> Avenue	22,318	Retail
39-292-07-035	3200 Youngfield Service Road	7,257	Vacant Land
39-292-07-034	Vacant Land	9,243	Vacant Land
<b>Subtotal:</b>		<b>58,181</b>	
<b>Partial Acquisitions</b>			
39-292-05-010	12601 W. 32 <sup>nd</sup> Avenue	5,400	Commercial
39-292-05-008	3400 Youngfield Street	5,200	Commercial
39-292-11-021	12525 W. 32 <sup>nd</sup> Avenue	3,100	Bank
39-292-11-020	12515 W. 32 <sup>nd</sup> Avenue	750	Commercial
39-293-04-012	12700 W. 32 <sup>nd</sup> Avenue	1,000	Commercial
39-293-04-013	3190 Youngfield Street	6,600	Gas Station
39-293-00-012	3150 Youngfield Street	1,900	Commercial
39-293-00-003	12930 W. 32 <sup>nd</sup> Avenue	100	Residence

**Table 4-5 Property Acquisitions (Continued)**

Parcel Number	Street Address	Acquired Right-of-way [square feet (ft <sup>2</sup> )]	Current Use
39-293-00-005	3195 Zinnia Street.	400	Residence
29-293-06-001	13180 W. 32 <sup>nd</sup> Avenue	200	Residence
39-293-06-013	13194 W. 32 <sup>nd</sup> Avenue	200	Residence
39-292-09-007	3220 Alkire Court	1,000	Residence
39-292-09-008	3229 Zinnia Street	1,100	Residence
39-292-07-036	3200 Youngfield Service Road	1,100	Vacant Land
39-292-07-033	3300 Youngfield Service Road	35,000	Vacant Land
39-292-07-021	3301 Youngfield Service Road	5,000	Hotel
39-292-12-005	3200 Youngfield Service Road	8,900	Vacant Land
39-292-07-030	12851 W. 32 <sup>nd</sup> Avenue	5,700	Commercial
<b>Subtotal:</b>		<b>82,650</b>	
<b>Total for Area:</b>		<b>140,831</b>	
<b>44<sup>th</sup> Avenue / Holman Street – SH 58/Cabela Drive Interchange</b>			
<b>Partial Acquisitions</b>			
39-193-01-004	14452 W. 44 <sup>th</sup> Avenue	26,050	Industrial
39-193-01-003	14352 W. 44 <sup>th</sup> Avenue	2,800	Industrial
30-244-01-001	14802 W. 44 <sup>th</sup> Avenue	128,300	Industrial
30-244-00-001	15200 State Highway 58 Frontage Road	143,200	Vacant Land
<b>Subtotal:</b>		<b>300,350</b>	
<b>Total for Area:</b>		<b>300,350</b>	
<b>Total Right-of-Way Area for Full Acquisition</b>		<b>202,817</b>	
<b>Total Right-of-Way Area for Partial Acquisition</b>		<b>395,050</b>	
<b>Total Right-of-Way Acquisition</b>		<b>597,867</b>	

The owners and tenants of properties noted as full acquisitions above may be eligible for relocation benefits (see **Table 4-6**), which are further described in Section 4.2.3 *Mitigation*.

**Table 4-6 Displacements**

Parcel Number	Street Address	Number of Occupancies	Current Use
39-293-00-032	2635 Youngfield Street	2	Nursery/Residence
39-293-00-031	2665 Youngfield Street	1	Commercial
39-293-00-030	2675 Youngfield Street	1	Residence
39-292-00-012	3210 Youngfield Street	1	Gas Station
39-292-00-013	12751 – 12759 32 <sup>nd</sup> Avenue	4	Retail
<b>Total Displacements</b>		<b>9</b>	

Permanent and temporary easements would be required to facilitate construction and preserve right-of-way for slopes, utilities, trails, etc. These quantities have not been calculated at this time but would be defined in final design.

### ***Minimization***

In the development of the conceptual design for the Proposed Action, efforts were made to avoid and minimize right-of-way and relocation impacts to the extent feasible. This was done through adjusting alignments to avoid impacts as well as the use of retaining walls where feasible.

### **4.2.3 Mitigation**

Property acquisition for right-of-way will conform to the requirements set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and the Uniform Relocation Act Amendments of 1987 (as amended).

For all real property acquired, CDOT will offer the property owner just compensation. Also, under Colorado Revised Statute 38-1-121, CDOT is required to pay the reasonable cost of the property owner's appraisal, provided:

- ▶ The estimated value of the property to be acquired is more than \$5,000
- ▶ The appraisal is made using sound, fair, and recognized appraisal practices consistent with the law
- ▶ Two signed originals of the appraisal are submitted to CDOT within the 90 days of the date of notification of the property owner of this statute. Relocation benefits would be provided for eligible businesses and residents (owners, occupants, and tenants) that will be displaced by acquisition

### ***Relocation Planning***

Prior to relocation, CDOT staff will prepare a relocation analysis. The relocation analysis will enable the relocation activities to be planned so that the problems associated with the displacement of individuals, families, and businesses are recognized, and solutions are developed to minimize the adverse impacts of displacement. The scope of planning will be based on the complexity and nature of the anticipated displacements, including the evaluation of program resources available to carry out timely and orderly relocations. The relocation study will include the following:

- ▶ A current estimate of the number of households to be displaced, including information such as owner/tenant status, estimated value and rental rates of property to be acquired, family characteristics, and special consideration of impacts on minorities, the elderly, large families, and the handicapped, when applicable



- ▶ An estimate of the number of comparable replacement dwellings in the area (including the price ranges and rental rates) that are expected to be available to fulfill the needs of those households displaced (when an adequate supply of properties for displacees to be relocated into is not available, CDOT must take actions or make assurances to address the inadequate supply before it can start any relocation activities)
- ▶ An estimate of the number, type, and size of businesses and nonprofit organizations to be displaced and the approximate number of employees that may be affected
- ▶ Consideration of any special advisory services that may be necessary from CDOT and cooperating agencies

### *Relocation Assistance*

Relocation assistance advisory services will include:

- ▶ Determining the relocation needs of each person to be displaced and explaining the relocation benefits and other assistance for which the person may be eligible
- ▶ Providing current and continuing inventory of available residential and business properties to purchase or lease, and information about such properties
- ▶ Minimizing hardships to persons adjusting to relocation by providing counseling, advice, and other sources of assistance that may be available and other help as may be appropriate
- ▶ Supplying the person to be displaced with appropriate information concerning federal, state, and local housing programs administered by the Small Business Administration, and other programs offering assistance to the displaced persons, as well as technical help to persons applying for such assistance

### *Relocation Payments*

The relocation payments provided to those displaced are determined by eligibility guidelines based on federal regulations. For eligible businesses, this includes reimbursement of actual reasonable and necessary moving and related expenses and certain reestablishment costs, or a fixed payment in lieu of all other possible relocation benefits. For eligible residences, this includes reimbursement of moving and related expenses, a replacement housing benefit for owners or a rental supplement for renters. The rental supplement payment may also be used towards the down payment for the purchase of a replacement dwelling to encourage renters to become property owners. The replacement housing benefit and rental supplement benefit have certain monetary limitations; however, these limitations can be exceeded in certain circumstances.

### 4.3 Parks and Recreation

Parks and recreation areas are important community facilities that warrant consideration under NEPA. The consequences of the No-Action Alternative and Proposed Action relative to parks and recreation are presented in this section.

Additionally, publicly-owned parks are afforded protection under Section 4(f) of the Department of Transportation Act (23 USC 138, 49 USC 303). Section 4(f) protects public parks and recreation lands (as well as wildlife and waterfowl refuges and historic sites) from use for transportation projects unless there is no prudent and feasible alternative to using that land, and unless the transportation project includes all possible planning to minimize harm. Recent legislation has modified Section 4(f) to provide for *de minimis* use under certain circumstances where the function is not affected. Section 4(f) use of parks and recreation facilities is addressed in **Chapter 5 Section 4(f) De Minimis Impact Determination**.

Public parks and recreation areas acquired, developed, or improved with grant funds provided by the Federal Land and Water Conservation Fund Act are protected, under Section 6(f) of the Act, from conversion to uses other than public outdoor recreation. A file review was performed at Colorado State Parks on January 20, 2006, for potential Land and Water Conservation Fund sites located within the project area. No Land and Water Conservation Fund funded sites were identified within the project area.

#### 4.3.1 Current Conditions

There are currently four parks, several recreational trails, an open space area, and a privately-owned golf course located within or immediately adjacent to the project area (see **Figure 4-7**). Information about the ownership, size and amenities of the parks was obtained from park inventory data provided by several local municipalities and websites. Specific information for each park facility is presented in **Table 4-7**.

Table 4-7 Parks and Recreational Facilities

Park or Recreation Resource	Owner/ Management	Address/ Location	Size/Facilities	Any Land and Water Conservation Fund Improvements?
Applewood Golf Course	Applewood Golf Course	14001 West 32 <sup>nd</sup> Avenue	18-hole golf course constructed in 1961, grass and mat driving ranges, golf shop, snack bar,	No
Arapahoe Park	Prospect Recreation District	4450 Indiana Street	8-acre park with handicapped-accessible playground and picnic shelter with four eight-foot tables and two charcoal grills, two baseball/softball diamonds, one basketball court, and a horseshoe pit. There are approximately five acres of turf grass.	No
Chester Portsmouth Park	City of Lakewood	12555 West 27 <sup>th</sup> Avenue	13-acre park with walking path, playground, parking	No
Maple Grove Park	Prospect Recreation District	14600 West 32 <sup>nd</sup> Avenue	11-acre park with baseball/softball diamond, two regulation-sized youth football fields, one basketball court, a playground, a volleyball court, a horseshoe pit, three picnic shelters, and several charcoal grills. There are approximately seven acres of turf grass. A community building is available for rental	No
Prospect Park	Prospect Recreation District	W. 44 <sup>th</sup> Avenue/Robb Street	45-acre park with baseball/softball field, football field, basketball and tennis court, bike path/trails, playground, picnic tables, pavilions, fishing in West Prospect Lake and Bass lake, restrooms and concessions area.	No
Wheat Ridge Greenbelt/ Wheat Ridge Open Space	City of Wheat Ridge	Wheat Ridge	300-acre greenbelt offers with areas for walking, and biking. Several parks are adjacent to the greenbelt.	No
Clear Creek Trail	City of Wheat Ridge Jefferson County Open Space		The Clear Creek Trail begins at the confluence of the South Platte River and Clear Creek near I-25 and 74 <sup>th</sup> Avenue in west Commerce City and temporarily ends at Washington Street and Clear Creek in Golden. The city of Wheat Ridge manages 5-miles of the Clear Creek trail between Harlan and Youngfield. To the west of Youngfield the trail is managed by Jefferson County Open Space. The trail is approximately 10 feet in width for the majority of the trail.	No
Trail along 32 <sup>nd</sup> Avenue	Jefferson County	South side of 32 <sup>nd</sup> Avenue	Trail is separated from the 32 <sup>nd</sup> Avenue by a concrete berm or landscaped buffer.	No

Source: Colorado State Parks 2006



SOURCE: Jefferson County 2005  
Prospect Park Recreation District 2005

Figure 4-7

**Parks and Recreational Trails**



### 4.3.2 Environmental Consequences

#### 4.3.2.1 No-Action Alternative

The No-Action Alternative would not impact parks or recreational resources.

#### 4.3.2.2 Proposed Action

Impacts to parks and recreational trails from the Proposed Action are summarized in **Table 4-8** and discussed below. Impacts to public parks and trails are also discussed in **Chapter 5 Section 4(f) De Minimis Impact Documentation**.

**Table 4-8 Summary of Parks and Recreational Trails Impacts**

Park or Recreation Resource	No-Action Alternative	Proposed Action	Section 4(f) Use
Applewood Golf Course	No Impacts	No Impacts	No
Arapahoe Park	No Impacts	No Impacts	No
Chester Portsmouth Park	No Impacts	Approximately -0.006 acre	Yes
Maple Grove Park	No Impacts	No Impacts	No
Prospect Park	No Impacts	No Impacts	No
Wheat Ridge Greenbelt/ Wheat Ridge Open Space	No Impacts	No Impacts	No
Clear Creek Trail	No Impacts	Approximately 2,400 -feet of the trail would be relocated	Yes
Trail along 32 <sup>nd</sup> Avenue	No Impacts	Approximately 1,100 feet of the trail would be affected	No

#### *Chester Portsmouth Park*

Proposed reconfiguration of the intersection at Youngfield Street and 27<sup>th</sup> Avenue would require the acquisition of approximately 0.004 acre from the southwestern corner of Chester Portsmouth Park. This right-of-way acquisition is limited to curb and gutter. The impacts would not affect existing recreational use of the park. Disturbances at the park would consist of the relocation of a small portion of sidewalk along the southeastern corner.

#### *Clear Creek Trail*

The existing Clear Creek trail that parallels the SH 58 frontage road would be realigned to provide for the new road connection to the new SH 58/Cabela Drive interchange. Approximately 2,400 feet of the Clear Creek Trail would be relocated as a result of the Proposed Action. The current alignment of the trail beginning at Clear Creek would be realigned to the south of the railroad bridge with a grade-separated structure with the railroad

and south of the new SH 58/Cabela Drive intersection until reconnecting with the existing trail to the west.

### *Trail along 32<sup>nd</sup> Avenue*

The trail along 32<sup>nd</sup> Avenue is a detached sidewalk located within the right-of-way for 32<sup>nd</sup> Avenue, although the trail is maintained by Jefferson County Open Space. Approximately 1,100 feet of the detached sidewalk along 32<sup>nd</sup> Avenue would be replaced with an attached sidewalk. This trail would remain adjacent to 32<sup>nd</sup> Avenue within the existing 32<sup>nd</sup> Avenue right-of-way, and the recreational use of the trail would continue. Since the replacement of the detached sidewalk with an attached sidewalk will not substantially impair the continuity of the trail, Section 4(f) does not apply (FHWA 2005).

### **4.3.3 Mitigation**

Avoidance, minimization, and mitigation of impacts to parks and recreation resources are detailed in the following section for each impacted area. Specific mitigation measures may be refined or modified during final design and after public comment.

#### *4.3.3.1 Chester Portsmouth Park*

Sidewalks along Youngfield and 27<sup>th</sup> Avenue, adjacent to Chester Portsmouth Park, are not contiguous and are not ADA compliant in areas. The Proposed Action improvements will include creating a wider continuous sidewalk from the Chester Portsmouth park to the 27<sup>th</sup> Avenue and Youngfield intersection and north along Youngfield. This wider sidewalk will create a safer and more accessible route to the park from the southwest side.

#### *4.3.3.2 Clear Creek Trail*

The Clear Creek trail will be realigned from the existing trail crossing of Clear Creek to west of the new SH 58/Cabela Drive interchange. The trail will cross beneath the railroad spur in a grade-separated structure.

#### *4.3.3.3 Trail along 32<sup>nd</sup> Avenue*

Several improvements and modifications along 32<sup>nd</sup> Avenue will be made as a result of and as mitigation for the Proposed Action including:

- ▶ Replacement of the 32<sup>nd</sup> Avenue trail along the south side of 32<sup>nd</sup> Avenue from Alkire Street to Cabela Drive with attached sidewalk with curb and gutter
- ▶ Construction of new sidewalk along the north side of 32<sup>nd</sup> Avenue from Braun Court to Xenon street to improve pedestrian access to The Manning School and Maple Grove Elementary and to replace sidewalk affected by reconstruction of 32<sup>nd</sup> Avenue

## 4.4 Air Quality

The Clean Air Act of 1970 and its amendments led to the establishment by the USEPA of National Ambient Air Quality Standards (NAAQSs) for several criteria air pollutants: carbon monoxide (CO), sulfur dioxide, ozone (O<sub>3</sub>), suspended particulate matter (PM<sub>10</sub>), nitrogen dioxide and lead (see **Table 4-9**). In 1997, USEPA changed the O<sub>3</sub> standard averaging time from 1 hour to 8 hours and added a new standard for very fine particulate matter (PM<sub>2.5</sub>).

Under the Clean Air Act, cities and regions are required to determine their compliance with the NAAQSs. Areas that did not meet a NAAQS are classified as nonattainment for that NAAQS. Areas that met the NAAQS are classified as attainment areas. These classifications are long term and do not change often. The Denver metropolitan area has been in attainment of the sulfur dioxide, nitrogen dioxide and lead NAAQSs since monitoring began more than 30 years ago. The Denver metropolitan region had been a nonattainment area for CO, O<sub>3</sub> (1-hour), and PM<sub>10</sub> since the early 1970s, so those three pollutants have historically been concerns in the study area. A number of successful air quality improvement actions over many years have resulted in cleaner air and in the Denver region meeting all of the NAAQS that were in force in 2001. The Denver region was reclassified by USEPA as an attainment/maintenance area in 2001 and 2002 for CO, O<sub>3</sub> (1-hour), and PM<sub>10</sub> and regional maintenance plans are now in effect for all of these pollutants.

**Table 4-9 National Ambient Air Quality Standards**

Pollutant	Averaging Time	Primary Standard
Carbon Monoxide (CO)	8 hours	9 ppm
	1 hour	35 ppm
Sulfur Dioxide	Annual	0.030 ppm
	24 hours	0.14 ppm
Ozone (O <sub>3</sub> )	8 hour	0.08 ppm
	1 hour	0.12 ppm
Particulate Matter <10 µm (PM <sub>10</sub> )	Annual	50 µg/m <sup>3</sup>
	24 hours	150 µg/m <sup>3</sup>
Particulate Matter <2.5 µm (PM <sub>2.5</sub> )	Annual	15 µg/m <sup>3</sup>
	24 hours	65 µg/m <sup>3</sup>
Nitrogen Dioxide (NO <sub>x</sub> )	Annual	0.053 ppm
Lead	Quarterly	1.5 µg/m <sup>3</sup>
Note: ppm = parts per million µg/m <sup>3</sup> = micrograms per cubic meter µm = micrometers SOURCE: USEPA 2005b		

Non-attainment areas for the new PM<sub>2.5</sub> and 8-hour O<sub>3</sub> NAAQSs were designated by USEPA in 2004. No areas in Colorado have been designated as nonattainment for PM<sub>2.5</sub>, so it is not a major issue in the state. The current State Implementation Plan for particulate matter covers only PM<sub>10</sub>, and new requirements will not be added until the plan must be updated. However, the Denver region exceeded the 8-hour O<sub>3</sub> standard several times in 2002 and 2003. In response to these exceedences, agencies in the Denver region developed an Early Action Compact for reducing O<sub>3</sub>. The Early Action Compact includes strategies for reducing emissions of ozone-forming precursor pollutants (volatile organic compounds [VOCs] and oxides of nitrogen [NO<sub>x</sub>]). The Early Action Compact requires attainment of the 8-hour O<sub>3</sub> NAAQS no later than 2007. USEPA designated the Denver region as nonattainment for the 8-hour O<sub>3</sub> standard in April 2004. The nonattainment designation for the Denver region is deferred as long as the region meets the milestones of the Early Action Compact. USEPA formally approved the Early Action Compact in August 2005.

Of the NAAQS pollutants, motor vehicles tend to be significant sources of CO, NO<sub>x</sub> and particulate matter as vehicle exhaust includes direct emission of these pollutants. Vehicles also generate particulate matter from road dust and brake and tire wear. Ground-level ozone is not emitted directly from vehicles but rather is the product of a complex reaction between NO<sub>x</sub> and VOCs, both of which vehicles emit so vehicles can be contributors to O<sub>3</sub> pollution. Heavy duty engines can emit sulfur dioxide but are not major sources of it. Motor vehicles have not been significant sources of lead since the advent of unleaded gasoline several decades ago.

Due to the past and present air quality difficulties, infrastructure projects that might exacerbate the air quality problems must meet certain requirements before they can proceed. In general, projects like the one proposed must be analyzed with respect to their potential impact on air quality at both the regional and local level. More detailed information regarding the air quality analysis can be found in the *Air Quality Impact Assessment* (FHU 2006c).

#### **4.4.1 Current Conditions**

The transportation and circulation system evaluated for air quality impacts consisted of the major highways and surface streets within the project area. These included I-70, SH 58, Youngfield Street, 44<sup>th</sup> Avenue and 32<sup>nd</sup> Avenue.

##### **4.4.1.1 NAAQS Monitoring Data Overview**

There are several air quality monitoring stations in the Denver region that measure the criteria air pollutants. None of these stations are within the study area. The active stations closest to the study area and the data used for the EA from each are:

- ▶ Arvada (CO, O<sub>3</sub>)
- ▶ National Renewable Energy Laboratory-Golden (O<sub>3</sub>)
- ▶ 225 W. Colfax Avenue (PM<sub>10</sub>)
- ▶ CAMP-downtown Denver (PM<sub>2.5</sub> nitrogen dioxide, O<sub>3</sub>)



The active stations are outside the study area, but overall these stations provide the monitoring data nearest the study area. Monitoring stations at other locations have been active in the past. The most recent complete data set from these stations is for 2005.

### *Carbon Monoxide*

For the CO station, the 2005 measured values for NAAQS comparison for 1 hour and 8 hour are 3.6 ppm and 1.7 ppm, respectively. These values are below their respective NAAQS. Measured concentrations of CO in the Denver region have not violated the NAAQS since 1995 (CAQCC 2004a).

### *Particulate Matter*

For the PM<sub>10</sub> station, the 2005 measured values for NAAQS comparison for 24 hours and annual average are 68 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 27  $\mu\text{g}/\text{m}^3$ , respectively. For the PM<sub>2.5</sub> station, the 2005 measured values for NAAQS comparison for 24 hours and annual average are 27  $\mu\text{g}/\text{m}^3$  and 9.4  $\mu\text{g}/\text{m}^3$ , respectively. These values are below their respective NAAQS. Measured concentrations of PM<sub>10</sub> in the Denver region have not violated the NAAQS since 1993 (CAQCC 2004a), and the PM<sub>2.5</sub> standard has never been violated during the relatively brief monitoring period.

### *Ozone*

Nitrogen dioxide is an O<sub>3</sub> precursor. For the nitrogen dioxide station, the 2005 measured value for NAAQS comparison for annual average is 0.026 parts per million (ppm). For the O<sub>3</sub> stations, the 2005 range of measured values for NAAQS comparison for 1 hour is 0.095 to 0.098 ppm and for 8 hours is 0.078 to 0.079 ppm. All of these values are below their respective NAAQS. Measured concentrations of 1-hour O<sub>3</sub> in the Denver region have not violated the NAAQS since 1987 (CAQCC 2001a). Measured concentrations of 8-hour O<sub>3</sub> in the Denver region violated the NAAQS most recently in 2003.

Because O<sub>3</sub> is a regional pollutant and both O<sub>3</sub> and O<sub>3</sub> precursors can be transported over great distances before causing O<sub>3</sub> problem areas, control measures need to be on a regional or larger basis to be effective. To that end, the Early Action Compact (CAQCC 2004b) includes several emission reduction strategies for the northern Front Range area to reduce future O<sub>3</sub> concentrations. O<sub>3</sub> is analyzed from a regional perspective by DRCOG.

#### *4.4.1.2 Assessment Approach*

An air pollution impact would be realized from a project if it were to cause an exceedence of a NAAQS, make NAAQS exceedences worse, or delay timely attainment of a NAAQS. Such air pollution impacts generally are evaluated on both regional and local bases. Regional impacts generally are examined by the responsible metropolitan planning organization (DRCOG) through transportation and air quality planning activities. Localized impacts from CO are assessed through "hot spot" computer modeling following procedures developed by USEPA. There are no approved procedures for hot-spot modeling or other quantitative localized analysis for the other NAAQS pollutants, so they are assessed qualitatively. PM<sub>10</sub>, O<sub>3</sub>, toxic air pollutants from mobile sources and construction impacts were assessed in general qualitative terms.

Following CDOT’s process, areas likely to become air pollution hot-spots are identified based primarily on traffic volumes and congestion, and a determination is then made whether a detailed analysis is needed for each area. Generally, the need for hot-spot analysis of intersections is assessed with respect to three criteria, as suggested by USEPA:

1. Will the LOS of a project intersection be D, E or F?  
or –
2. Will the project affect locations identified in the State Implementation Plan as sites of actual or potential violations of the CO NAAQS?  
or –
3. Is a project intersection one of the top three in the State Implementation Plan with respect to traffic volume or worst LOS?

The goal of the selection process is to choose the most congested and heavily trafficked intersections for CO analysis as a worst case representation of all the project intersections. If an intersection does not meet one of the above criteria, it is unlikely to be a hot-spot and need not be assessed further. If the most congested intersections do not produce hot-spot problems, less congested intersections would not either.

In general, the traffic modeling showed that the Proposed Action would improve study area intersection LOS over the No-Action Alternative (see **Table 4-10**), but there would still be some congested intersections. For this project, two intersections from the Proposed Action were calculated to have an LOS of E or worse in 2030 (see **Table 4-10**) and were selected for CO hot-spot analysis. The two intersections were Ward Road and the I-70 westbound ramps and Ward Road and 44<sup>th</sup> Avenue. These intersections were modeled for existing (2005) conditions and predicted future (2030) conditions.

**Table 4-10 Study Area Intersection Levels of Service**

Intersection Level of Service (AM/PM)			
Intersection	Existing	2030 No-Action	2030 Proposed Action
Ward Road and I-70 Ramps	F/E	F/F	F/F
Ward Road and 44 <sup>th</sup> Ave.	B/E	E/F	C/D
Zinnia St. / 32 <sup>nd</sup> Ave.	A/A	E/F	B/B
Youngfield St. / 32 <sup>nd</sup> Ave.	C/D	F/F	C/C
Eastbound I-70 Ramp to Youngfield St.	B/F	C/F	C/C

*Source: FHU 2005*

CO concentrations at representative receptor locations at the intersections were modeled using the CAL3QHC computer model, as suggested in USEPA guidance. The CAL3QHC program calculates the hourly CO concentrations for each receptor for multiple wind directions. Year 2005 and 2030 vehicle emission factors from MOBILE6 were obtained from the Air Pollution Control Division. Meteorological conditions were simulated by using stability class D and wind

speed of 1 meter per second. CO concentrations were corrected for elevation. The PM peak traffic hour was used as it generally had worse congestion than the AM peak hour.

#### 4.4.1.3 Modeled Concentrations

The CO concentrations calculated for 2005 are shown in **Table 4-11**. The model results show 1-hour and 8-hour CO concentrations that were all below their respective NAAQS. The maximum 1-hour PM CO concentration in 2005 was calculated to be 10.2 ppm, which is below the NAAQS of 35 ppm. The maximum 8-hour CO concentration is predicted to be 5.3 ppm, which is below the NAAQS of 9 ppm.

**Table 4-11 Maximum Modeled Carbon Monoxide Concentrations**

Intersection	1-Hour CO Result (ppm)			8-Hour CO Result (ppm)		
	2005	No-Action 2030	Proposed Action 2030	2005	No-Action 2030	Proposed Action 2030
Ward Road and I-70 Ramps	10.7	7.3	7.2	5.6	3.9	3.9
Ward Road and 44 <sup>th</sup> Ave.	10.6	6.7	6.8	5.6	3.6	3.6

*SOURCE: FHU 2006c*

#### 4.4.2 Environmental Consequences

The air quality impact analysis consisted of a regional conformity evaluation and local “hot spot” modeling for CO. Both the No-Action Alternative and Proposed Action were assessed. Several air pollutants were evaluated qualitatively as previously described.

##### 4.4.2.1 Regional Conformity

The transportation conformity process is the mechanism used by the responsible metropolitan planning organization (DRCOG) to assure that requirements of the Clean Air Act are met for transportation improvements. The metropolitan planning organization models transportation systems and air quality to ensure that, in the aggregate, existing and proposed transportation projects will conform to relevant air quality implementation plans, maintenance plans and the NAAQS.

Individual projects can demonstrate regional conformity by being part of a conforming fiscally-constrained Regional Transportation Plan (RTP), which looks at longer-range transportation planning and projects likely to proceed in the next 20 years. The 2030 RTP and the 2007-2012 TIP are the adopted fiscally-constrained conforming plan and program for the DRCOG. The Proposed Action is in the 2007-2012 TIP, so regional conformity has been demonstrated for the Proposed Action.

#### *4.4.2.2 Local Conformity/Carbon Monoxide*

Individual projects must demonstrate that they will not violate the NAAQS in localized areas, known as “hot-spots.” Among the NAAQS pollutants, an approved quantitative method for hot-spot analysis is available only for CO. Potential CO hot-spots were identified through a preliminary evaluation of intersections in the study area (see **Table 4-10**).

Both the No-Action Alternative and Proposed Action were modeled for 2030 CO concentrations. CO concentrations are predicted to decrease at the target intersections in the future, even with higher traffic volumes. This is primarily because vehicles will be emitting less CO in the future. The maximum 2030 1-hour CO concentration predicted for either of the intersections was 7.3 ppm (see **Table 4-11**), which is below the NAAQS of 35 ppm. The maximum 8-hour CO concentration predicted for 2030 for either of the intersections was 3.9 ppm (see **Table 4-11**), which is below the NAAQS of 9 ppm. Therefore, no CO hot spots in violation of the NAAQS are predicted, and no mitigation is necessary.

#### *4.4.2.3 Particulate Matter*

Unlike CO pollution, quantitative tools for analysis of PM<sub>10</sub> and PM<sub>2.5</sub> pollution have not been developed and approved for mobile sources. Therefore, a qualitative process was used for the analysis.

The active PM<sub>10</sub> monitor nearest the study area is at 225 West Colfax Avenue. There have been no exceedences of the PM<sub>10</sub> standard at this station for more than a decade, which indicates that PM<sub>10</sub> pollution has been sustainably reduced from previous levels. The most relevant PM<sub>10</sub> components from mobile sources are re-entrained fugitive dust and tailpipe emissions, which account for about half the total PM<sub>10</sub> emissions in the Denver area.

The Final Rule redesignating the Denver area from nonattainment to attainment/maintenance status for PM<sub>10</sub> became effective on October 16, 2002. This redesignation also included approval of a Maintenance Plan for PM<sub>10</sub> for the Denver area (CAQCC 2001b). These types of plans are required to ensure maintenance of the relevant NAAQS for at least 10 years. The Maintenance Plan included a number of strategies to reduce future PM<sub>10</sub> emissions to demonstrate maintenance of the NAAQS for 2002 and beyond. These reductions will come mostly from lower tailpipe emissions, better street sanding procedures and ongoing vehicle inspection/maintenance requirements of the AIR Program. Street sanding is controlled by Colorado Air Quality Commission Regulation No. 16 and is expected to be the biggest contributor to PM<sub>10</sub> control for the Denver area. The Maintenance Plan also includes control of estimated PM<sub>10</sub> emissions from road construction activities.

The Proposed Action was added to the RTP in June 2006, so regional conformity for PM<sub>10</sub> has been demonstrated.

Re-entrained road dust from traffic on I-70 and SH 58 could be a major source of PM<sub>10</sub> in the study area. The Proposed Action would not greatly affect traffic flow on I-70 or SH 58. PM<sub>10</sub> is the subject of a comprehensive Maintenance Plan that recognizes road sources and includes PM<sub>10</sub> control strategies that were designed to ensure continued attainment of the PM<sub>10</sub> NAAQS throughout the Denver region. Therefore, the Proposed Action is not expected to cause or contribute to violations of the PM<sub>10</sub> NAAQS or interfere with the Maintenance Plan or its goals.

Relative to the Proposed Action, the No-Action Alternative may have slightly higher VMT, lower traffic speeds and greater overall congestion in the study area.

#### **4.4.2.4 Ozone**

O<sub>3</sub> is a regional pollutant and as such is controlled at a regional level. Emissions of O<sub>3</sub> precursors nearby a particular location are typically not of the greatest significance because the precursors need time to mix and the right weather conditions must be present before O<sub>3</sub> is formed. In that time, the pollutants can drift a considerable distance. The regional emission modeling is performed by DRCOG and considers all of the sources of O<sub>3</sub> precursors. Any of the future alternatives for the EA as well as any other projects in the Denver O<sub>3</sub> maintenance area must, in the aggregate, conform to the O<sub>3</sub> State Implementation Plan and the Early Action Compact and be compatible with regional O<sub>3</sub> concentration reductions to comply with the NAAQS. The regional air quality plan is the appropriate way to consider O<sub>3</sub> impacts.

The Proposed Action is expected to reduce the total VMT in the study area and to improve vehicle speeds during peak traffic hours. Both of these changes will serve to reduce the overall emission of O<sub>3</sub> precursors in the study area, compared to the No-Action Alternative.

#### **4.4.3 Air Toxics**

On February 3, 2006, FHWA released its interim guidance on when and how to analyze Mobile Source Air Toxics (MSATs) in the NEPA process for highways. The following discussion is in accordance with the interim guidance.

MSATs are a subset of the 188 air toxics defined by the Clean Air Act. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline (USEPA 2000).

USEPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. Most air toxics, as they are called, originate from human-made sources, including on-road mobile sources (automobiles), non-road mobile sources (e.g., airplanes), area sources (e.g. dry cleaners) and stationary sources (e.g., factories or refineries). USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources (USEPA 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. Through the rule, USEPA examined the impacts of existing and newly promulgated mobile source control programs, including the reformulated gasoline



program, the national low emission vehicle standards, the Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and the proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Through this rule, USEPA identified six priority MSATs: acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1,3-butadiene (USEPA 2001).

Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent. As a result, USEPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. USEPA is preparing another rule under authority of Section 202(l) of the Clean Air Act that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

#### 4.4.3.1 *Unavailable Information for Project Specific MSAT Impact Analysis*

This EA includes a basic assessment of the likely MSAT emission impacts from this project. However, the available technical tools do not allow prediction of the project-specific health impacts of the emission changes associated with the alternatives. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps faces technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. *Emissions: The USEPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model—emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, USEPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.*

*These deficiencies compromise the use of MOBILE 6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.*

- 2. Dispersion: The tools to predict how MSATs disperse are also limited. USEPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of CO to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. Research is being conducted on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.*
- 3. Exposure Levels and Health Effects: Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for USEPA's standard 70-year cancer assessments, particularly because unsupported assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.*

#### 4.4.3.2 Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs.

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some emissions either are statistically associated with adverse health outcomes through epidemiological studies or that animals demonstrate adverse health outcomes when exposed to large doses. Exposure to toxics has been a focus of a number of USEPA efforts. Most notably, USEPA conducted the *National Air Toxics Assessment* to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of local exposure, the modeled estimates illustrate the levels of various toxics when aggregated to a national or State level.

USEPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The USEPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at <http://www.epa.gov/iris>. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from USEPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- ▶ Benzene is characterized as a known human carcinogen
- ▶ The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure
- ▶ Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals
- ▶ 1,3-butadiene is characterized as carcinogenic to humans by inhalation
- ▶ Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure
- ▶ Diesel exhaust is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases
- ▶ Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies

Benzene is unique among the six priority MSATs in that it is present both in fuel and in tailpipe emissions, while the other priority MSATs are generally only in tailpipe emissions. Therefore, benzene emissions can come from more sources than the other priority MSATs and are directly affected by more regulatory controls such as Tier 2 and reformulated gasolines.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by USEPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes, particularly respiratory problems (South Coast Air Quality Management District 2000, The Sierra Club 2004, and Environmental Law Institute 2005). Much of this research is not specific to MSATs, but instead surveys the full spectrum of both NAAQS and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, the studies do not provide information that would be useful to alleviate the uncertainties listed above and enable a more comprehensive evaluation of the health impacts specific to this project.

#### *4.4.3.3 Relevance of Unavailable or Incomplete Information*

Because of the uncertainties described above, FHWA believes a quantitative assessment of the effects of air toxic emissions on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects. Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have “significant adverse impacts on the human environment.”

This air quality analysis provides a qualitative analysis of MSAT emissions relative to the various alternatives, and has acknowledged that all of the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain. Because of this uncertainty, the health effects from these emissions cannot be estimated.

#### *4.4.3.4 Project-Level MSAT Analysis*

As described above, FHWA believes the technical shortcomings of emissions and dispersion models and the uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects from the Proposed Action. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the transportation project level, it is possible to qualitatively assess the levels of future MSAT emissions under the Proposed Action. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found online at: [www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm](http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm).

Even though FHWA has not identified reliable quantitative methods to accurately estimate the health impacts of MSATs, it is possible to assess qualitatively future MSAT emissions under the project alternatives. In general, MSAT emissions increase with numbers of vehicles, with VMT and/or with congestion. There are several such traffic characteristics targeted for improvement by the Proposed Action that may affect MSAT emissions. A new interchange is proposed for SH 58 at Cabela Drive. The I-70 interchange with 32<sup>nd</sup> Avenue will be reconfigured with pair of hook ramps on either side of I-70. Completion of Cabela Drive will provide a local connection between these new interchanges. The Proposed Action is intended to improve traffic flow, provide more direct routes for major traffic movements and alleviate congestion at several overcapacity intersections.

For both alternatives in this EA, the amount of MSATs emitted would be related to the VMT and congestion, assuming that other variables such as fleet mix are the same for each alternative. The No-Action Alternative was calculated to have more total VMT than the Proposed Action in the study area by about one percent (see **Section 4.4.2.3**). Lower speeds result in higher MSAT emissions and the No-Action Alternative is expected to have higher MSAT emissions than the Proposed Action because of greater congestion for an equivalent VMT.

Regardless of the alternative chosen, emissions in the design year will likely be lower than present levels as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

Because of the specific characteristics of the Proposed Action, there may be localized areas where VMT would increase and other areas where VMT would decrease. Therefore, corresponding localized increases and decreases in MSAT emissions may also occur. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections that would be built at Cabela Drive and 32<sup>nd</sup> Avenue and the new interchange on SH 58. However, even if these increases do occur, they too will be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations. Traffic volumes and congestion should be markedly reduced at the I-70/32<sup>nd</sup> Avenue interchange under the Proposed Action relative to the No-Action Alternative. This is notable for sensitive receptors such as The Manning School along 32<sup>nd</sup> Avenue, where VMT is predicted to be reduced by about five percent under the Proposed Action. Based on this analysis, it is likely that the Proposed Action will result in lower MSAT emissions over the No-Action Alternative.

In total, the Proposed Action in 2030 is expected to have reduced MSAT emissions in the project area relative to No-Action, due to the reduced VMT associated with more direct routing, and due to EPA's MSAT reduction programs. MSAT levels could be higher in some locations than others, but current tools and science are not adequate to quantify the differences. On a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will cause substantial MSAT emission reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.



#### **4.4.3.5 Sensitive Receptors**

Air toxics from mobile sources are most likely to affect receptors close to roads as this is where concentrations of air toxics from mobile sources will be highest. Locations where people spend extended periods of time are likely to be the most sensitive receptors. These types of locations include homes, schools and hospitals. There are several of these types of receptors along roads in the study area that may be modified by the Proposed Action.

The Manning School and approximately 30 homes front 32nd Avenue. Approximately 18 homes and Arapahoe Park front 44th Avenue. Approximately 13 homes front Youngfield Street. Approximately six homes would be along the proposed Cabela Drive near 32nd Avenue. The Clear Creek bike path passes under I-70. Many homes adjoin I-70 south of 32nd Avenue.

#### **4.4.4 Mitigation**

Given that air pollutants are not predicted to exceed the NAAQS in the future as a result of implementing either of the alternatives, mitigation measures for air quality are not necessary for the project. Future emissions from on-road mobile sources will be minimized globally through several federal regulations. The Denver area maintenance plans for CO, O<sub>3</sub> and PM<sub>10</sub> will serve to avoid and minimize pollutant emissions from project area roads. Standard emission minimization measures for construction activities are recommended.

## 4.5 Traffic Noise and Vibration

This section presents the analysis that was performed as part of this EA to assess potential impacts from traffic noise to properties neighboring the proposed improvements. Existing land uses bordering both existing and potential roads in the study area are variable. Many residences, businesses and some undeveloped lands abut the various roads of interest in the study area. Residential areas are typically the land use most sensitive to traffic noise impacts and many residents are close to roads examined for the project (see **Figure 4-8**). Other sensitive uses include parks, schools and hospitals. More detailed information regarding the noise analysis can be found in the *Noise Impact Assessment Report* (FHU 2006d).

Two future alternatives were considered in the EA, and each alternative was considered for potential traffic noise impacts. The first alternative was the No-Action Alternative where the future road layout did not include any new improvements from this project, but improvements expected to be made to study area roads by local agency projects and the CDOT-planned I-70/SH 58 interchange project. The second alternative was the Proposed Action, which included the future road improvements being considered by the EA. These alternatives were previously described in **Chapter 2 Alternatives**.

There are no federal requirements directed specifically to traffic-induced vibration. Studies that have been done to assess the impact of operational traffic-induced vibrations have shown that both measured and predicted vibration levels are less than any known criteria for structural damage to buildings (FHWA 1995). Often, normal indoor activities like closing doors have been shown to create greater levels of vibration than highway traffic. Therefore, vibration from highway traffic is not a significant concern for the Proposed Action.

Vibration from road construction could be a concern, if specific construction techniques such as pile driving or blasting were used. Concerns about construction-generated vibrations would depend on these types of activities occurring very close to vibration-sensitive locations. At present, it is not expected that these types of construction techniques would be necessary for the EA alternatives. If such construction techniques are necessary at a specific location, the vibration concerns can be addressed on a case-by-case basis and appropriate mitigation action taken for the specific situation. Therefore, vibration from road construction was not examined in detail in the analysis.

### 4.5.1 Basics of Sound

Sound is created when an object vibrates and radiates part of that energy as acoustic pressure or waves through a medium, such as air, water, or a solid. Sound and noise are measured in units of decibels (dB). The dB scale is logarithmic, not linear. As an example, two identical noise sources, each producing 60 dB, will produce 63 dB when operated together. Likewise, a 10-dB increase in sound levels represents ten times as much sound energy.

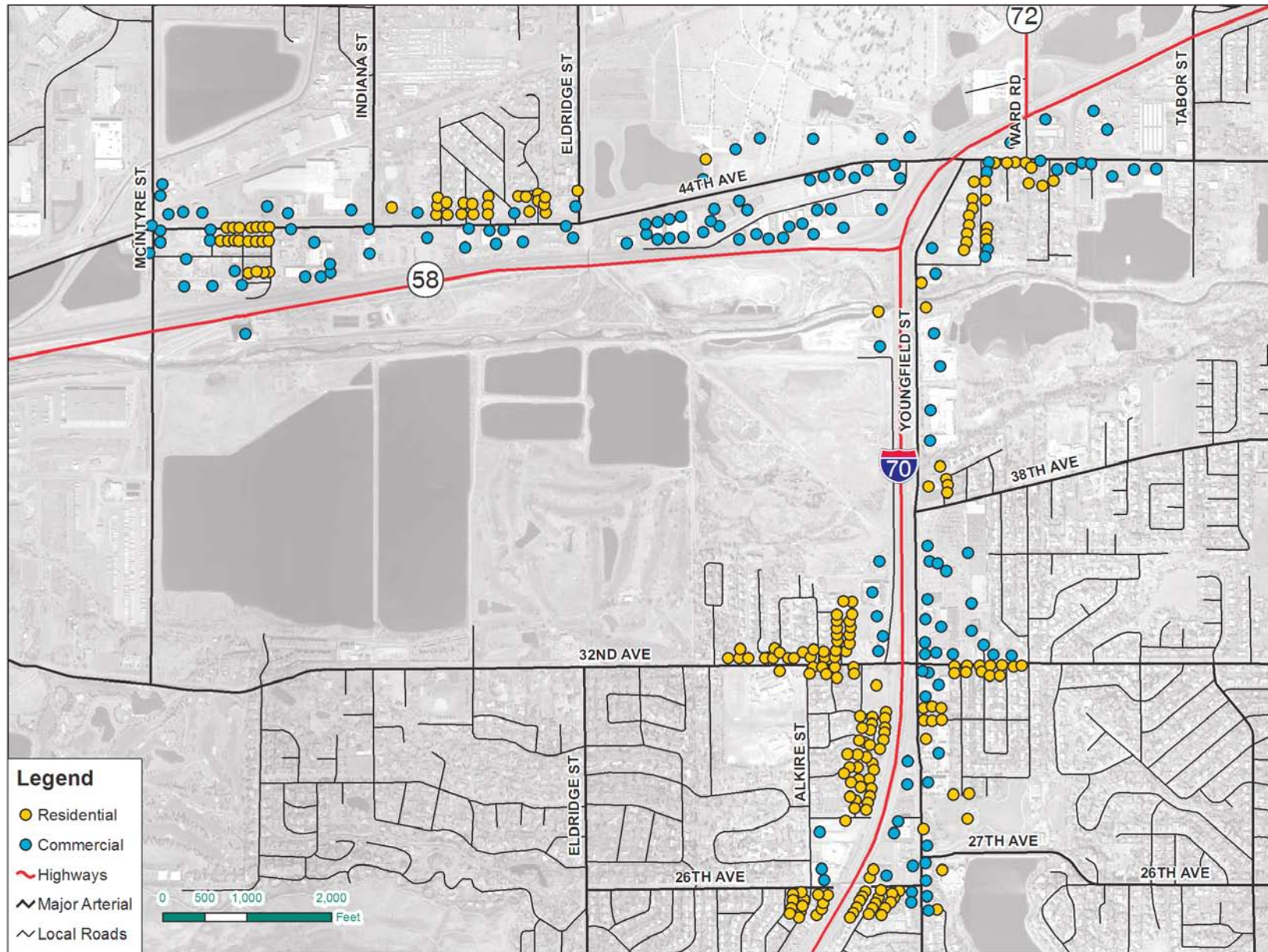


Figure 4-8

Noise Sensitive Areas along Study Corridors

The human ear can accommodate a wide range of sound energy levels, including pressure fluctuations that increase by more than a million times. The human ear is not equally receptive to all frequencies of sound-producing vibrations. A-weighting of sound levels by frequency is a method used to approximate how the human ear would perceive a sound, mostly by reducing the contribution from lower frequencies by a specified amount. A-weighted sound levels are reported in dBA. Most people will not notice a difference in loudness of sound levels of less than 3 dBA, which is a two-fold change in the sound energy. Most people relate a 10-dBA change in sound levels to a doubling of sound loudness.

Sound levels diminish with distance from the source because of spreading, atmospheric absorption, interference from other objects, and ground effects. “Hard” ground (such as asphalt) and “soft” ground (such as grass) transmit sound differently. “Hard” ground is more reflective and will produce louder sound levels farther from the source. With traffic noise over “hard” ground, a 3-dBA increase in noise could be caused by doubling the traffic volume or cutting the distance from the roadway in half.

Traffic noise tends to fluctuate over time in accordance with traffic volumes, vehicle types, and speeds. This fluctuation makes it difficult to describe the noise impact through a single value. Nonetheless, FHWA and CDOT use the one-hour equivalent sound level ( $L_{eq}$ ) as the metric for assessing traffic noise impacts. The  $L_{eq}$  is the “average” of the fluctuating noise levels over the time period, or the constant noise level that would produce the same sound energy over the time period as the fluctuating noise level. On busy roads and highways, the loudest traffic noise generally occurs when the largest traffic volume can travel at the highest speed, not when traffic becomes overly congested and slows.

#### **4.5.2 Noise Analysis Approach**

The purpose of the noise analysis was to assess traffic noise on properties near the proposed project roads and conclude whether noise impacts may occur and whether noise mitigation considerations are necessary in the project design. The analysis included major roads that would be changed or built by the project but did not include the small neighborhood streets.

The overall traffic noise analysis was based on measurements of existing noise conditions and on computer modeling of traffic noise for both existing (2005) and expected future (2030) traffic conditions. Current conditions, the Proposed Action, and the No-Action Alternative were examined. Measurements of existing traffic noise were performed at several locations in the study area (FHU 2006d). Computer modeling was used to predict both the existing and the expected future average traffic noise, focusing on potential impacts to the most sensitive receivers. For the impacted areas, various mitigation measures were evaluated and select mitigation actions were recommended, as appropriate.

Potential impact from traffic noise was assessed on the basis of the noise levels’ relationship to CDOT’s Noise Abatement Criteria (NAC) (see **Table 4-12**). The CDOT NAC for residences and other Category B receivers is an exterior  $L_{eq}$  of 66 dBA, and for commercial areas (Category C) is an  $L_{eq}$  of 71 dBA for the peak hour. Under CDOT guidelines, equaling or exceeding the NAC is viewed as a noise impact and triggers an investigation of noise mitigation measures. For further comparison, typical noise levels are shown in **Figure 4-9**.



A “substantial” noise increase would also be considered a noise impact and lead to evaluation of traffic noise mitigation actions. A “substantial” noise increase is when the future noise level is expected to increase by 10 dBA or more over existing levels at any location modeled.

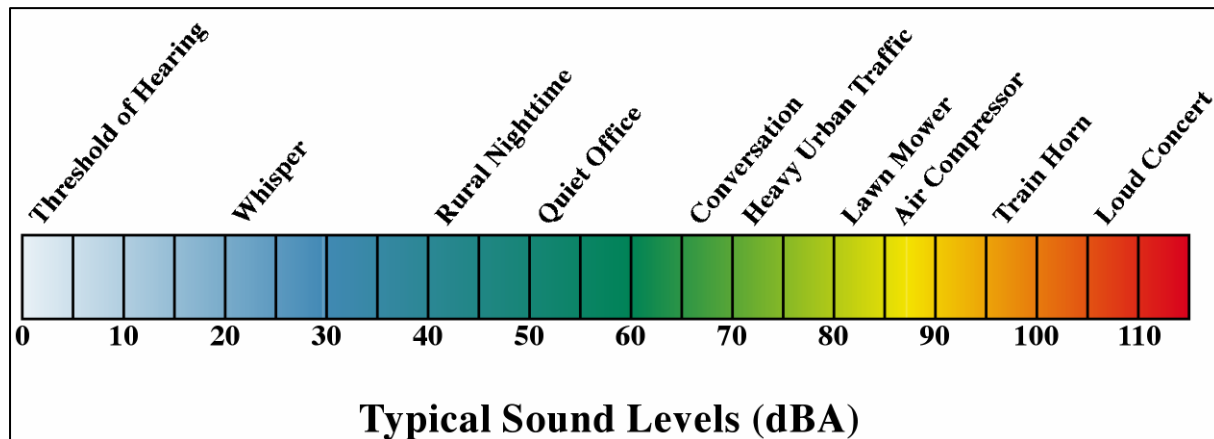
For noise impacts, the “peak hour” refers to the highest traffic noise hour, which may or may not correspond to the hour of most traffic. Traffic noise can actually decrease during rush hour due to lower vehicle speeds from overloaded and congested roads.

Table 4-12 Noise Abatement Criteria

Land Use Category	CDOT NAC (L <sub>eq</sub> )	Description of Land Use Category
A	56 dBA exterior	Tracts of land in which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks, or open spaces which are recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	66 dBA Exterior	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, picnic areas, playgrounds, active sports areas, and parks.
C	71 dBA Exterior	Developed lands, properties or activities not included in categories A and B above.
D	None	Undeveloped lands.
E	51 dBA Interior	Residences, motels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

SOURCE: CDOT 2002b

Figure 4-9 Typical Noise Levels



SOURCE: Department of Housing and Urban Development, 1991



#### **4.5.2.1 Noise Measurements**

Short-term (10-minute) traffic noise measurements were performed at eight locations in the study area to document existing ambient conditions across the study area and to use in developing the computer models. The locations included residential, park, commercial and undeveloped areas along the project corridors. This approach spread the measurements over a variety of locations in the study area and adjacent to a range of road types.

#### **4.5.2.2 Noise Modeling**

Computer modeling was performed for both current conditions and expected future conditions. Modeling was used because day-to-day variations in traffic or weather conditions that affect noise levels cannot be captured or quantified by brief noise measurements alone, and because future noise levels can not be measured before they exist. Modeling results represent typical average traffic conditions.

The ultimate purpose of the models was to show whether future traffic noise levels caused by the proposed project would be high enough to impact neighboring properties in the study area. The traffic noise modeling software used for the analyses was FHWA's Traffic Noise Model (TNM) Version 2.5.

The existing traffic conditions that were modeled included the current road configurations and traffic volumes. The two 2030 alternatives, the Proposed Action and the No-Action Alternative, were modeled based on projected 2030 traffic and the corresponding roads for each alternative. The conditions examined in these analyses used LOS C traffic volumes for I-70 and the afternoon peak hour traffic volumes for the smaller highways and arterials, as the afternoon hour generally had more traffic than the morning peak hour.

TNM was used to calculate noise levels at approximately 350 discrete receiver locations at major buildings or parks within about 500 feet of a model roadway (FHU 2006d). The modeled roadways were those roads that would be built or changed by the Proposed Action. The same receiver locations were used in each model for consistency.

#### **4.5.3 Current Conditions**

The existing traffic noise conditions were assessed through a combination of measurements and modeling. The traffic noise assessment focused on the major roads that are of importance to the proposed project.

##### ***Noise Measurements***

The short-term noise measurements were performed at eight locations (see **Figure 4-10**) in the afternoon within the study area to document existing ambient conditions. The results (see **Table 4-13**) indicate that the traffic noise environment did not exceed the applicable CDOT NAC at any of the measurement locations during the measurement periods. However, one result was close to the NAC (Location 8) and may reach or exceed the NAC under different traffic conditions. In addition, some of the results were meant to be representative of traffic noise

levels for different land uses that are nearby (Location 6) and may exceed the NAC for the adjacent properties.

**Table 4-13 Noise Measurement Results**

Location Number	Location	L <sub>eq</sub> (dBA)	Land Use Category	CDOT NAC (dBA)
1	Clear Creek bike path	62	B	66
2	Arbor House (14600 W. 32 <sup>nd</sup> Ave.)	57	B	66
3	Manning School (13200 W. 32 <sup>nd</sup> Ave.)	59	B	66
4	3200 block Youngfield Service Rd.	59	C	71
5	14300 block W. 44 <sup>th</sup> Ave.	62	B	66
6	4300 block N. Xenon St.	67	D	None
7	12800 block W. 26 <sup>th</sup> Ave.	62	C	71
8	13500 block W. 32 <sup>nd</sup> Ave.	65	B	66

SOURCE: FHU 2006d

#### 4.5.3.1 Existing Noise Barriers

There currently are several traffic noise barriers in the study area that are protecting numerous homes. There is a barrier on the west side of I-70 beginning about 31<sup>st</sup> Avenue and extending south out of the study area. There is a barrier on the east side of I-70 beginning about 27<sup>th</sup> Avenue and extending south to the end of the study area. There is a barrier on the southeast side of I-70 beginning about Tabor Street and extending to the northeast out of the study area. There is a barrier on the west side of the Youngfield Service Road north of 32<sup>nd</sup> Avenue. More information on these barriers is provided in **Section 4.5.5 Mitigation**

#### 4.5.3.2 Noise Model Results

More than 350 noise receivers were modeled (see **Figure 4-11**) for existing conditions. Fifty of the model receivers were calculated to have existing traffic noise at or above the respective NAC during the PM peak hour (see **Figure 4-12** and **Table 4-14**). These included both Category B properties (homes and churches) and Category C properties (businesses). The Category B properties currently equaling or exceeding the NAC include:

- ▶ Ten homes along 32<sup>nd</sup> Avenue west of I-70 in Applewood
- ▶ Two homes along 32<sup>nd</sup> Avenue east of I-70 in Maple Grove
- ▶ Four homes along 31<sup>st</sup> Avenue

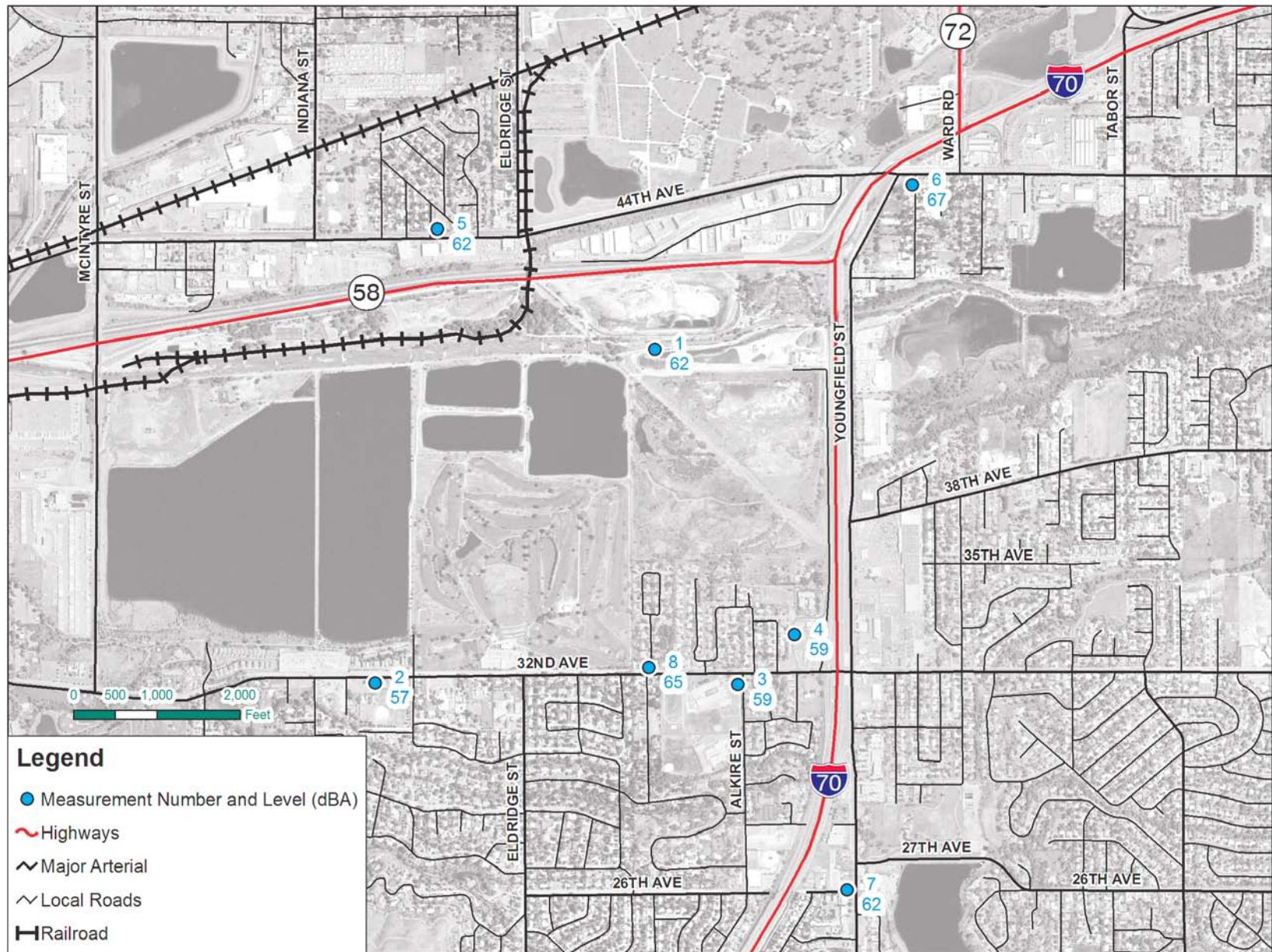


Figure 4-10

**Noise Measurement Locations**



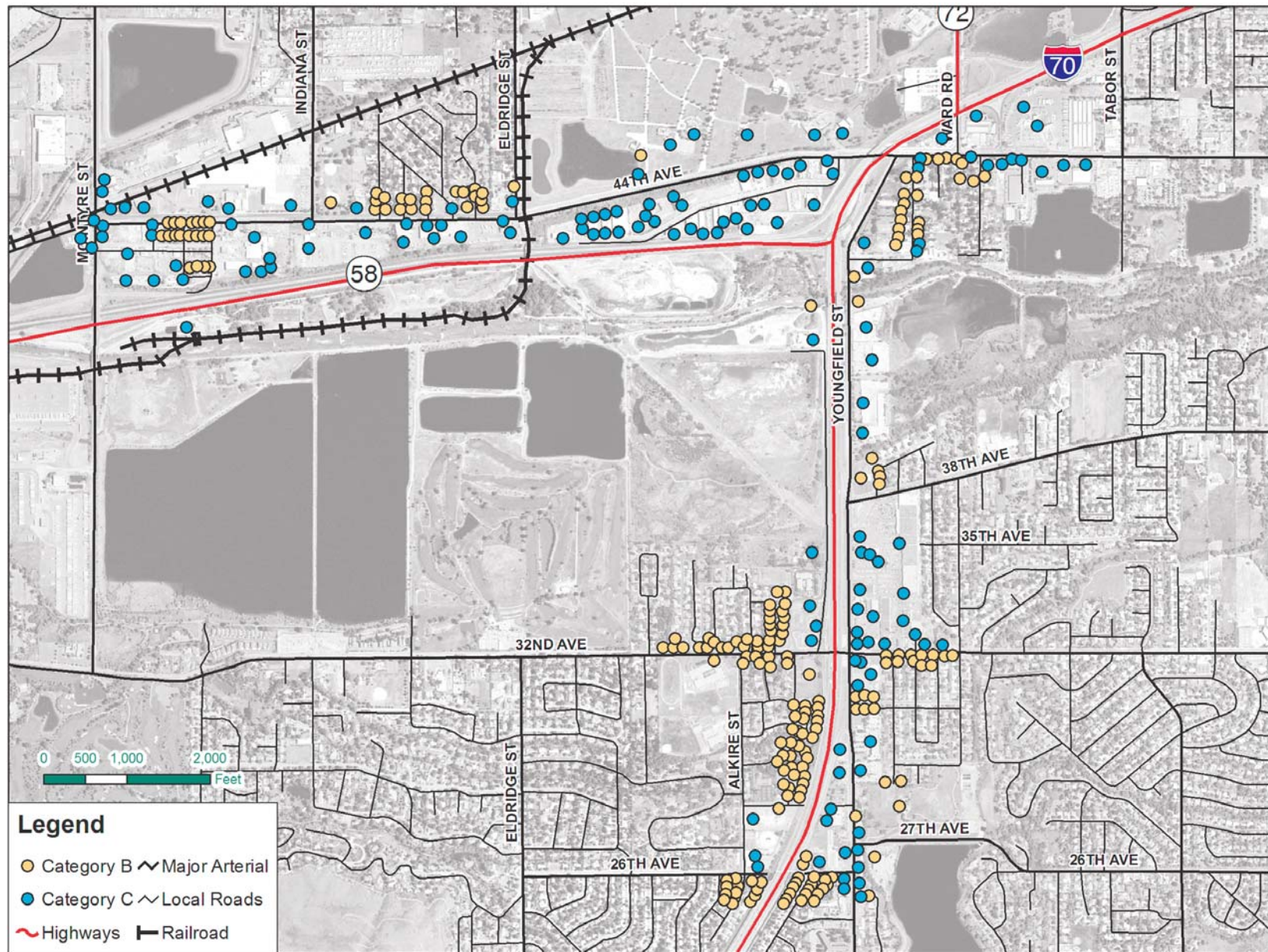


Figure 4-11

Noise Model Receiver Locations



North SOURCE: FHU 2006c



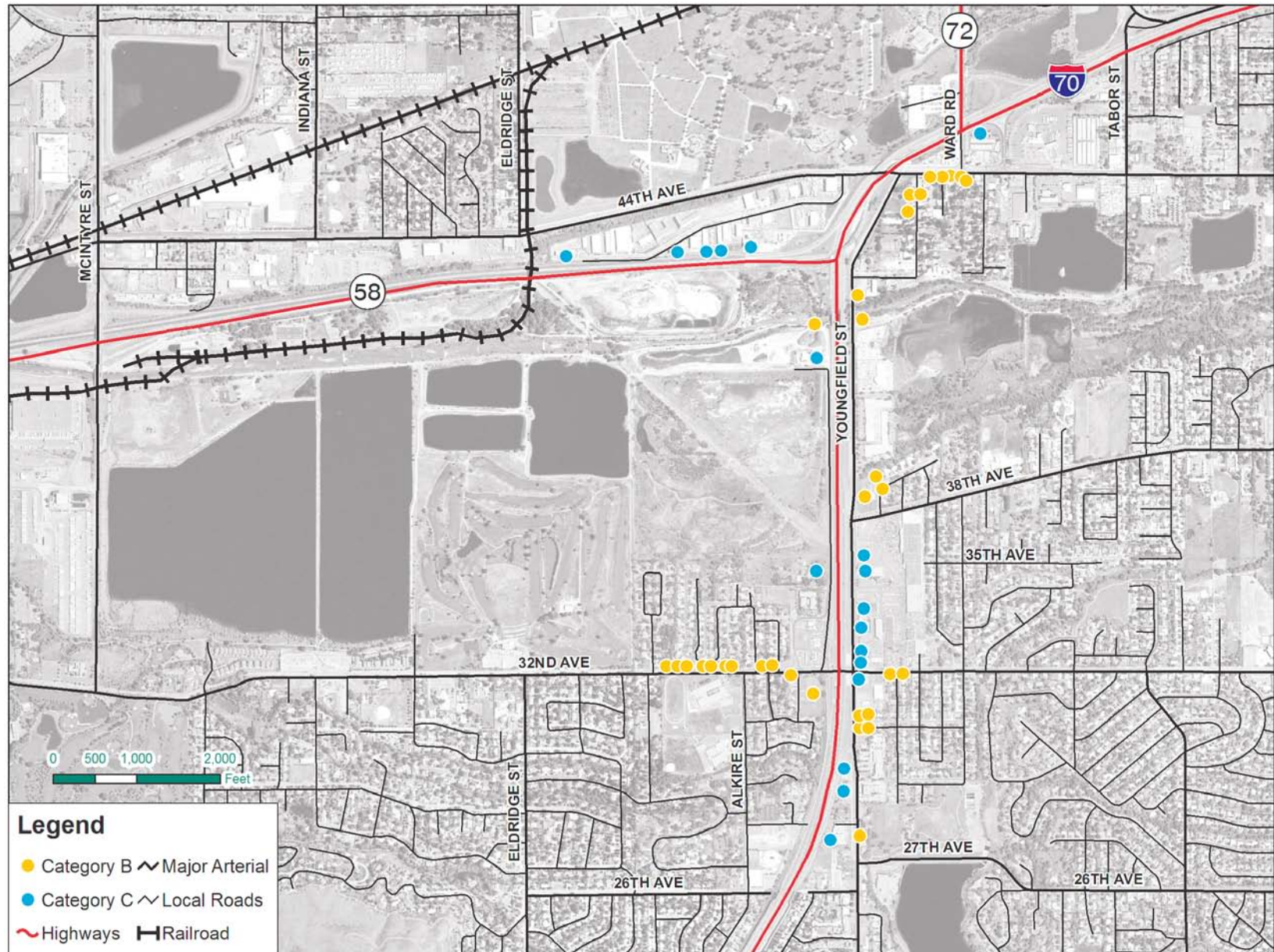


Figure 4-12

Noise Impacted Areas from Existing Conditions Model



North SOURCE: FHU 2006c



- ▶ Two homes along 38th Drive
- ▶ Two homes along Youngfield Street
- ▶ Eight homes along 44<sup>th</sup> Avenue in Nicholas Gardens
- ▶ Ridgeview Baptist Church along Youngfield Street
- ▶ Applewood Community Church along 32<sup>nd</sup> Avenue
- ▶ A short portion of the Clear Creek bike path (two locations modeled)

Noise levels were estimated to equal or exceed the CDOT Category C NAC for 13 businesses along I-70 and five businesses along SH 58. Category C areas by definition are less sensitive to traffic noise than Category B areas.

The existing conditions model results agree with the measurement results; noise along 32<sup>nd</sup> Avenue is near/above the Category B NAC, and noise at I-70/44<sup>th</sup> Avenue is above the Category B NAC.

**Table 4-14 Impacted Receivers from Noise Models**

Receiver	Existing (dBA)	No-Action Alternative (dBA)	Proposed Action (dBA)	Land Use
B001	70.6	71.7	70.6	Category B: 12700 block 31st Ave.
B002	70.9	72.0	71.0	Category B: 12700 block 31st Ave.
B030	65.7	66.0	65.9	Category B: 2800 block Zang Way
B033	65.8	66.1	66.0	Category B: 2800 block Zang Way
B034	68.2	68.7	67.6	Category B: 12900 block 32nd Ave.
B039	73.7	74.3	74.3	Category B: 4100 block Youngfield St.
B048	67.9	68.6	68.1	Category B: 12700 block 31st Ave.
B049	67.7	68.4	67.7	Category B: 12700 block 31st Ave.
B070	65.6	66.1	65.6	Category B: 12600 block 31st Ave.
B150	72.5	73.0	72.9	Category B: 3800 block Youngfield St.
B192	64.0	65.9	65.5	Category B: 15300 block 44th Ave.
B193	64.1	66.0	65.6	Category B: 15300 block 44th Ave.
B194	63.9	65.8	65.5	Category B: 15300 block 44th Ave.
B195	64.0	65.9	65.5	Category B: 15200 block 44th Ave.
B196	64.5	66.4	66.0	Category B: 15200 block 44th Ave.
B197	64.5	66.4	66.0	Category B: 15200 block 44th Ave.
B198	64.4	66.3	65.9	Category B: 15200 block 44th Ave.
B215	64.9	66.7	66.3	Category B: 4400 block Holman St.
B218	64.6	66.4	66.3	Category B: 4400 block Holman St.
B222	64.7	66.5	66.1	Category B: 4400 block Gladiola St.
B228	64.6	66.4	65.9	Category B: 4400 block Gladiola St.
B235	64.9	66.7	66.1	Category B: 4400 block Gardenia St.
B352	69.3	70.4	70.3	Category B: 12400 block 44th Ave.

Table 4-14 Impacted Receivers from Noise Models (Continued)

Receiver	Existing (dBA)	No-Action Alternative (dBA)	Proposed Action (dBA)	Land Use
B353	68.9	69.8	69.7	Category B: 12400 block 44th Ave.
B354	67.2	68.0	67.9	Category B: 12300 block 44th Ave.
B357	68.9	69.9	69.8	Category B: 12400 block 44th Ave.
B358	69.2	70.1	70.0	Category B: 12500 block 44th Ave.
B372	68.1	68.2	68.2	Category B: 4300 block Xenon St.
B373	66.8	67.0	67.0	Category B: 4300 block Xenon St.
B377	66.5	66.4	66.5	Category B: 4300 block Xenon St.
B462	66.0	67.8	67.1	Category B: 13400 block 32nd Ave.
B463	66.3	68.1	67.3	Category B: 3200 block Beech Ct.
B464	66.6	68.4	67.6	Category B: 3200 block Beech Ct.
B466	66.9	68.7	67.9	Category B: 3200 block Arbutus St.
B467	66.8	68.6	67.8	Category B: 3200 block Arbutus St.
B470	66.7	68.5	67.8	Category B: 13200 block 32nd Ave.
B471	66.8	68.6	67.9	Category B: 13200 block 32nd Ave.
B473	65.9	67.7	66.9	Category B: 3200 block Alkire Ct.
B474	66.8	68.6	67.9	Category B: 3200 block Alkire Ct.
B478	64.9	66.5	65.8	Category B: 13100 block 32nd Ave.
B479	65.1	66.6	65.9	Category B: 13100 block 32nd Ave.
B482	65.2	66.6	66.1	Category B: 3100 block Zinnia Ct.
B483	67.2	68.4	68.2	Category B: 3100 block Zinnia St.
B484	66.3	68.0	67.4	Category B: 3200 block Zinnia Ct
B489	65.3	66.0	66.3	Category B: 3100 block Zinnia St.
B494	60.8	62.0	67.5	Category B: 3300 block Youngfield St.
B502	69.6	69.9	69.9	Category B: 12600 block 38th Dr.
B503	66.0	66.2	66.3	Category B: 12600 block 38th Dr.
B511	67.6	68.8	68.7	Category B: 12600 block 32nd Ave.
B516	66.3	67.8	67.5	Category B: 12500 block 32nd Ave.
B526	65.0	66.7	66.3	Category B: 12500 block 32nd Ave.
B527	65.4	67.1	66.8	Category B: 3100 Wright St.
B533	64.9	66.5	66.4	Category B: 3100 Ward Ct.
B539	68.5	69.7	70.3	Category B: 2800 block Youngfield St.
B900	66.2	66.2	66.2	Category B: Clear Creek Trail
B901	66.4	66.0	66.1	Category B: Clear Creek Trail
C035	71.9	72.4	73.4	Category C: 3400 block Youngfield St.
C109	68.8	71.2	70.5	Category C: 4300 McIntyre St.
C117	70.6	71.4	71.9	Category C: 15000 block 44th Ave.
C120	71.3	72.3	72.9	Category C: 13600 block 43rd Dr.
C126	73.6	60.8	61.1	Category C: 13200 block 43rd Dr.
C127	73.5	60.5	60.9	Category C: 13200 block 43rd Dr.
C130	72.3	60.7	61.1	Category C: 13100 block 43rd Dr.

Table 4-14 Impacted Receivers from Noise Models (Continued)

Receiver	Existing (dBA)	No-Action Alternative (dBA)	Proposed Action (dBA)	Land Use
C131	72.1	73.2	72.7	Category C: 3100 block Youngfield St.
C132	73.5	73.8	74.1	Category C: 2800 block Youngfield St.
C133	69.9	70.3	72.1	Category C: 2800 block Youngfield St.
C134	72.1	72.4	74.0	Category C: 2800 block Youngfield St.
C136	76.5	76.9	76.6	Category C: 3000 block Youngfield St.
C141	71.6	72.7	72.2	Category C: 3200 block Youngfield St.
C142	71.5	72.6	72.1	Category C: 3200 block Youngfield St.
C143	71.6	72.8	72.4	Category C: 3200 block Youngfield St.
C144	70.1	70.8	71.1	Category C: 12900 block 43rd Dr.
C151	72.4	72.5	72.5	Category C: 4100 block Youngfield Service Rd.
C153	72.0	72.8	72.6	Category C: 3500 block Youngfield St.
C154	71.6	72.3	72.1	Category C: 3400 block Youngfield St.
C155	71.3	72.2	71.8	Category C: 3400 block Youngfield St.
C156	70.2	71.1	70.4	Category C: 3100 block Youngfield St.
C159	72.8	61.1	61.1	Category C: 13300 block 43rd Dr.
C277	71.5	72.8	72.8	Category C: 12300 block 44th Ave.
C355	70.8	71.6	71.6	Category C: 12300 44th Ave.

Source: FHU 2006d

#### 4.5.4 Environmental Consequences

The No-Action Alternative and the Proposed Action are described in **Chapter 2 Alternatives**. The traffic noise modeling effort was conducted as described in **Section 4.5.2** to assess whether future noise levels along the project corridors for the alternatives will exceed the relevant CDOT NAC or cause a substantial noise increase. If so, noise mitigation measures protecting these areas were considered and evaluated following CDOT guidelines (see **Section 4.5.5 Mitigation**).

##### 4.5.4.1 Modeled Noise Levels

Noise models were constructed as described in **Section 4.5.2.2**. Traffic model runs were made for the major project roads using predicted future (2030) traffic volumes and road layouts for both the No-Action Alternative and Proposed Action.

##### 2030 No-Action Alternative Model Results

Model results for the 2030 No-Action Alternative (see **Figure 4-13**) are very similar to the existing conditions results. The traffic noise patterns are similar, with the comparable future noise levels pushed out a bit farther from the roads due to increased traffic volumes, so the impacted areas are slightly larger overall in 2030.



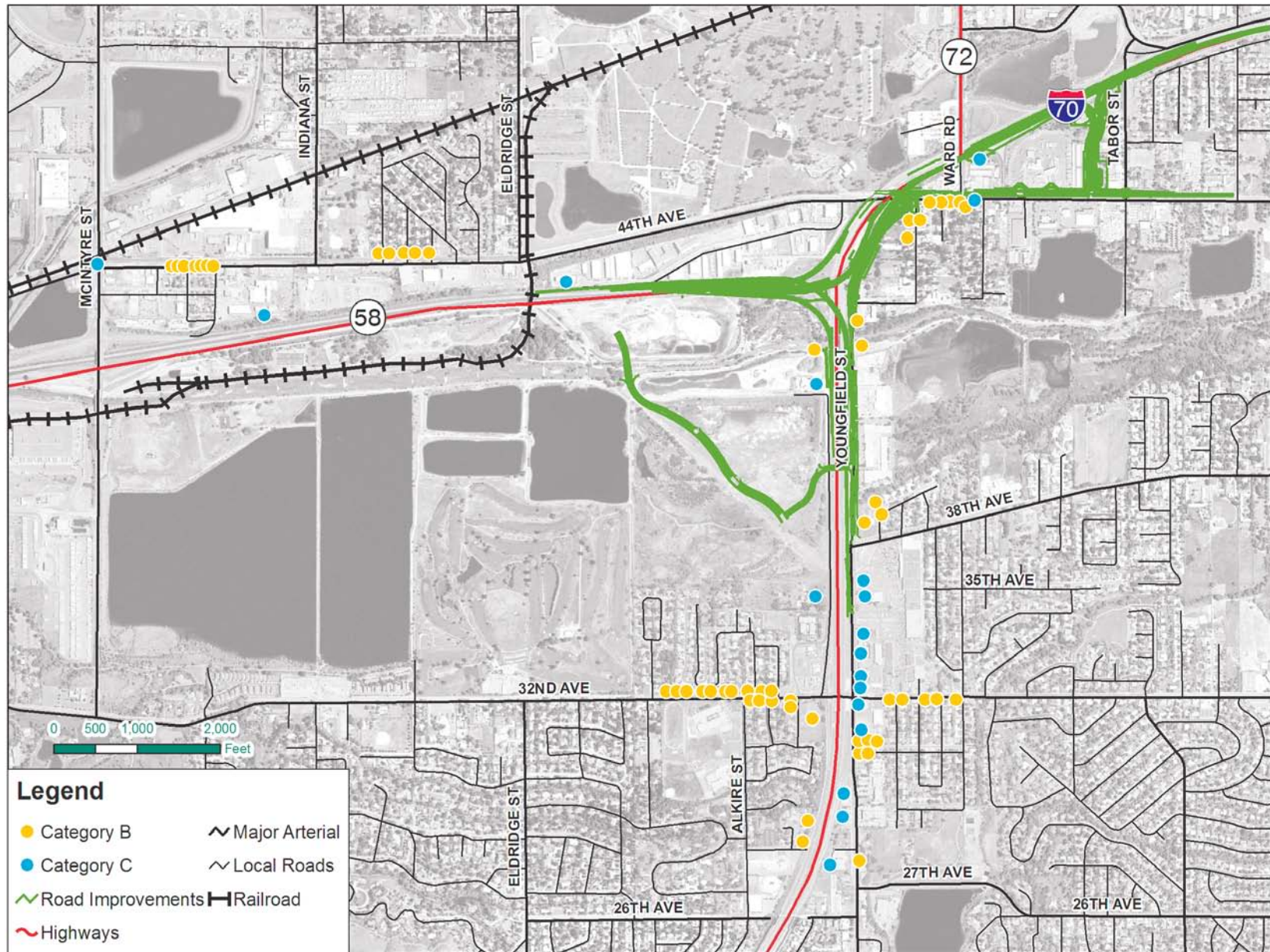


Figure 4-13

Noise Impacted Areas from 2030 No Action Model



North SOURCE: FHU 2006c

Seventy-three of the model receivers were calculated to have traffic noise above the respective NAC during the PM peak hour (see **Figure 4-13**). These included both Category B properties (homes and churches) and Category C (business) properties (see **Table 4-14**).

The Category B properties predicted to be impacted are:

- ▶ Fifteen homes along 32<sup>nd</sup> Avenue west of I-70 in Applewood
- ▶ Five homes along 32<sup>nd</sup> Avenue east of I-70 in Maple Grove
- ▶ Five homes along 31<sup>st</sup> Avenue east of Youngfield Street
- ▶ Two homes on the 2800 block of Zang Way west of I-70 in Applewood
- ▶ Two homes along 38<sup>th</sup> Drive
- ▶ Two homes along Youngfield Street
- ▶ Eight homes along 44<sup>th</sup> Avenue in Nicholas Gardens
- ▶ Twelve homes along 44<sup>th</sup> Avenue in Fairmount (two groups)
- ▶ Ridgeview Baptist Church along Youngfield Street
- ▶ Applewood Community Church along 32<sup>nd</sup> Avenue
- ▶ A short portion of the Clear Creek trail (two locations modeled)

Noise levels were estimated to exceed the CDOT Category C NAC for 14 businesses along I-70, one business along 44<sup>th</sup> Avenue, one business along McIntyre Street, and two businesses along SH 58. None of the receivers were predicted to increase by 10 dBA or more.

### *2030 Proposed Action Model Results*

Model results for 2030 with Proposed Action (see **Figure 4-14**) are also similar to the existing conditions results and the 2030 No-Action Alternative model results. The traffic noise patterns are similar, with the comparable future noise levels pushed out a bit farther from the roads due to increased traffic volumes, so the impacted areas are slightly larger overall in 2030.

It should be noted that the Proposed Action would install hook ramps to eastbound I-70 at about 27<sup>th</sup> Avenue (see **Figure 4-15**). This would require removal of approximately 1,000 feet of an existing noise barrier on the southeast side of I-70. The Proposed Action must replace the removed noise barrier with a comparably functioning barrier, so the Proposed Action includes a new approximately 900-foot section of barrier that curves to the northwest and follows the new off ramp (see **Figure 4-15**). For the analysis, this was viewed as replacement of an existing feature and not a mitigation measure, so this was part of the base case of the Proposed Action.

Seventy-two of the model receivers were calculated to have traffic noise above the respective NAC during the PM peak hour (see **Figure 4-14**). These included both Category B properties (homes and churches) and Category C (business) properties (see **Table 4-14**).



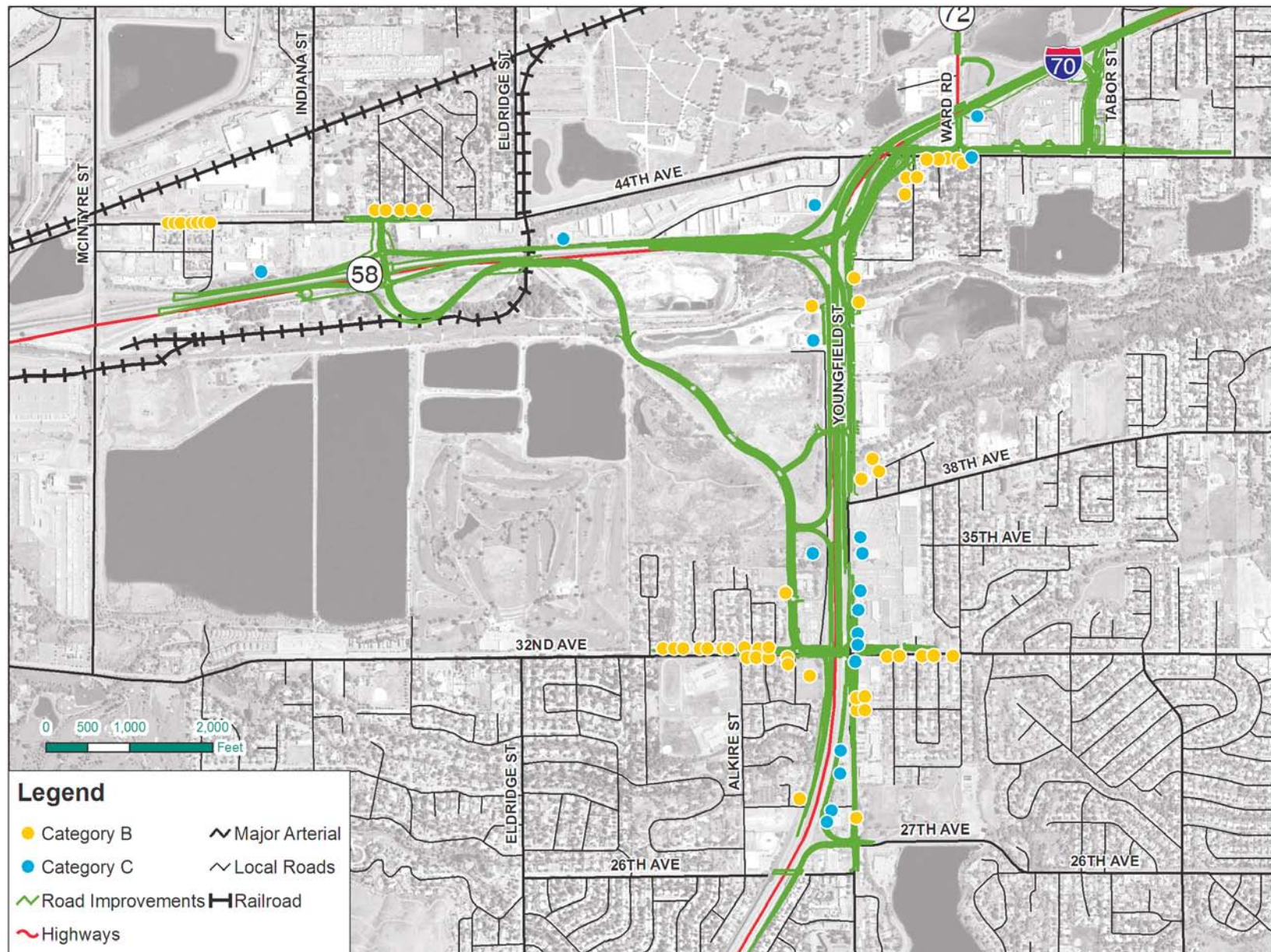


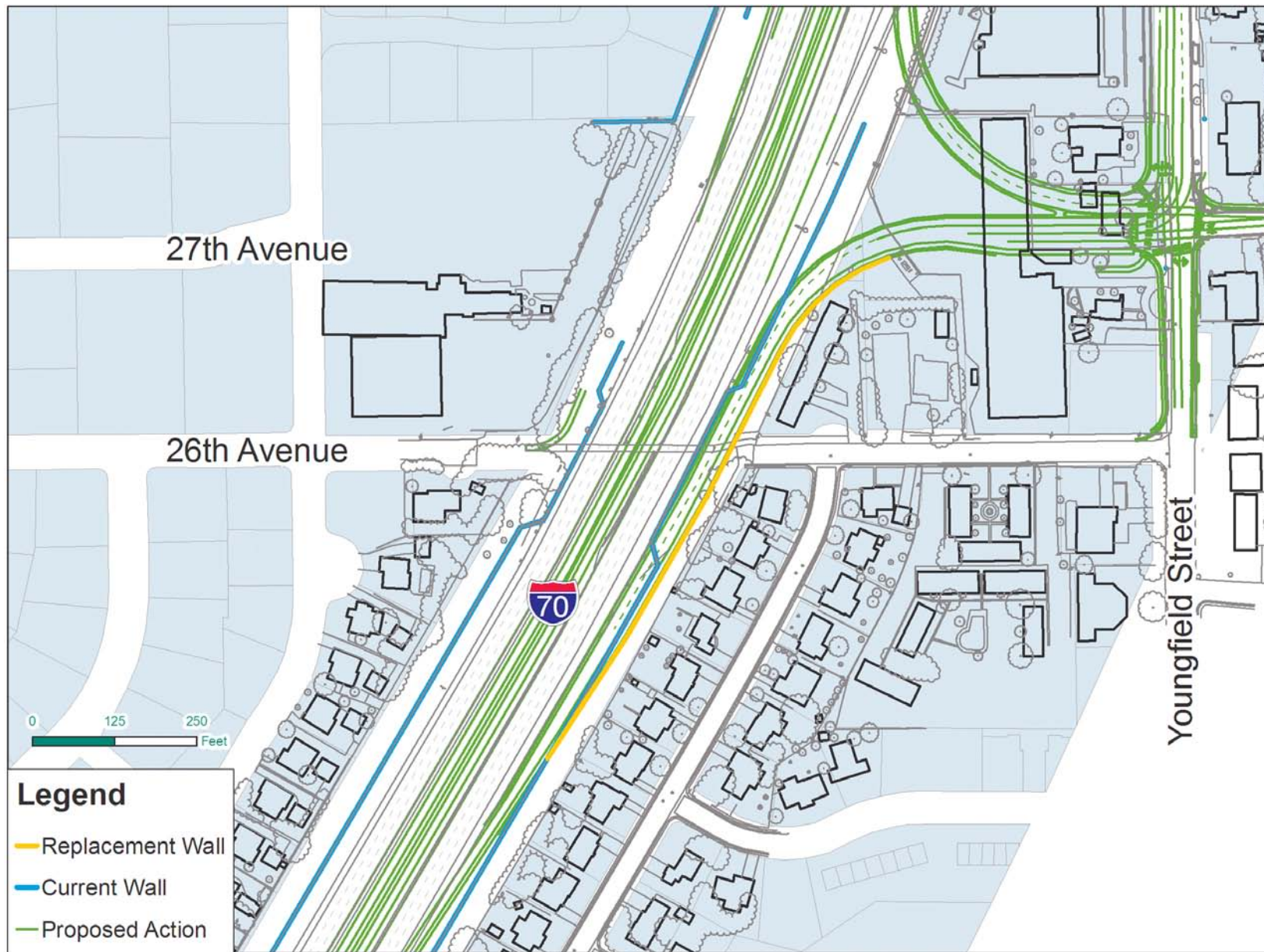
Figure 4-14

**Noise Impacted Areas from 2030 Proposed Action Model**



North SOURCE: FHU 2006c





**Legend**

- Replacement Wall
- Current Wall
- Proposed Action

Figure 4-15

**Proposed Replacement Noise Barrier**



North SOURCE: FHU 2006c

The Category B properties predicted to be impacted are:

- ▶ Fifteen homes along 32<sup>nd</sup> Avenue west of I-70 in Applewood
- ▶ Five homes along 32<sup>nd</sup> Avenue east of I-70 in Maple Grove
- ▶ Four homes along 31<sup>st</sup> Avenue
- ▶ One home on the 2800 block of Zang Way west of I-70 in Applewood
- ▶ One home along Cabela's Drive in Applewood
- ▶ Two homes along 38<sup>th</sup> Drive
- ▶ Two homes along Youngfield Street
- ▶ Eight homes along 44<sup>th</sup> Avenue in Nicholas Gardens
- ▶ Twelve homes along 44<sup>th</sup> Avenue in Fairmount (two groups)
- ▶ Ridgeview Baptist Church along Youngfield Street
- ▶ Applewood Community Church along 32<sup>nd</sup> Avenue
- ▶ A short portion of the Clear Creek trail (two locations modeled)

Noise levels were estimated to exceed the CDOT Category C NAC for 14 businesses along I-70, one business along 44<sup>th</sup> Avenue, one business along McIntyre Street, and two businesses along SH 58. None of the receivers were predicted to increase by 10 dBA or more. These results are nearly identical to the No-Action Alternative.

#### **4.5.5 Mitigation**

The traffic noise results indicated that 72 receivers will equal or exceed the CDOT NAC under the Proposed Action (see **Section 4.5.4 Environmental Consequences**). Therefore, traffic noise mitigation measures for those areas were investigated. It is important to note that mitigation measures are not guaranteed to be selected for impacted areas, but mitigation measures must be evaluated.

Traffic noise impacts affected multiple geographic areas and multiple land uses. Several types of mitigation were considered. Noise barriers are a common mitigation action and were evaluated, but other kinds of mitigation were also considered (FHU 2006d).

For a variety of reasons (FHU 2006d), barriers appeared to be the only viable mitigation action and were the only mitigation evaluated in detail. CDOT's goal for noise barriers is a reduction of 10 dBA with a minimum reduction of 5 dBA.

There are several existing barriers in the study area. The existing noise barriers and locations evaluated for new noise barrier placement are shown in **Figure 4-16**. To permit the evaluations, barriers protecting the impacted areas were developed for the computer models and the models were re-run to assess barrier effectiveness. After the minimum parameters for an effective barrier were established in a given area for a feasible barrier (if possible), each barrier was processed through a reasonability assessment according to CDOT guidance. The feasibility and reasonableness of each barrier determined whether specific barriers were recommended. CDOT guidelines state that a traffic noise mitigation action is unreasonable if the cost is more than \$4,000 per receiver per decibel of noise reduction. It is nearly always unreasonable to construct barriers for isolated receivers based on these guidelines.

The topography of the project corridor plays a very important role in the overall noise environment. There are some topographic changes from project roads to the adjoining areas in the study area, and this has a significant impact on the effectiveness and constructability of noise barriers. Because of the topographic changes, a model barrier may not be a constant height throughout its length even though the top elevation may be constant.

It is also important to note that the noise barriers could be either earth berms or constructed walls. Either material can be an effective noise barrier. However, berms require considerably more space to construct than walls. Throughout the study area, the impacted receivers tend to be rather close to the project roads. In many places, the minimum barrier may be rather tall (15 to 20 feet), which would require considerable space for a berm. Often, the road may be considerably higher in elevation than the receivers. This combination of constraints usually makes earth berms impractical or impossible choices for the noise barriers.

Physical placement of the barriers is also a consideration. In many places in the study area, there would be long-term ownership, access, maintenance and cost concerns if a mitigation measure is on private property. Therefore, the noise barriers evaluated in this analysis were intended to be located on road right-of-way.

The barrier evaluations that were performed for the analysis are described in detail in the technical report for noise (FHU 2006d). The overall model noise barrier findings are summarized in **Table 4-15**. Estimated traffic noise reductions from barriers that are recommended are summarized in **Table 4-16**. These recommendations were based on assumed specific project road designs. If the final designs in the future differ from that used in these evaluations, corresponding adjustments to the mitigation evaluations may be required.

From the feasibility and reasonableness evaluations for the barriers, traffic noise barriers are recommended for the following locations:

- ▶ Rebuild the existing barrier along I-70 near 27<sup>th</sup> Avenue that must be removed for the proposed eastbound I-70 hook ramps (this is replacement of an existing structure)
- ▶ Extend the existing noise wall along Youngfield Service Road (Cabela Drive) another 140 feet to the north



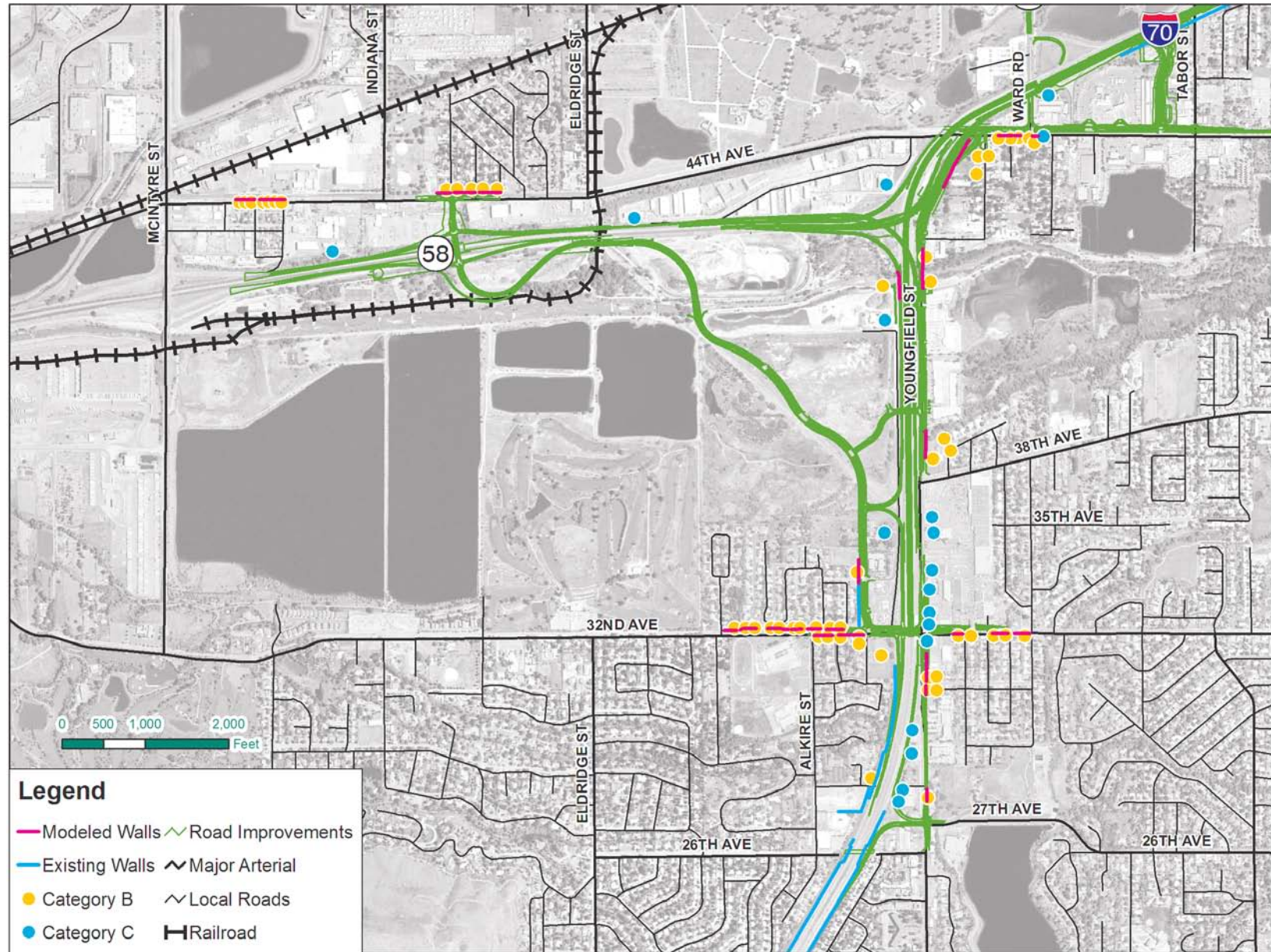


Figure 4-16

**Locations of Noise Mitigation Barriers Evaluated**

Table 4-15 Noise Mitigation Barrier Summary

Noise Impacted Area	Barrier Height (feet)	Barrier Length (feet)	\$/dB/Receiver	Feasible? <sup>1</sup>	Reasonable? <sup>1</sup>	Recommended?	Comment
<b>Category B</b>							
32 <sup>nd</sup> Ave. west of I-70	9	1,400	3,600	No	Yes	No	This was a series of 7 barrier segments along 32 <sup>nd</sup> Ave. Too many gaps for streets and driveways are required for these to be effective barriers.
32 <sup>nd</sup> Ave. east of I-70	10	500	5,800	No	No	No	This was a series of 3 barrier segments along 32 <sup>nd</sup> Ave. Too many gaps for streets and driveways are required for these to be effective barriers.
31 <sup>st</sup> Avenue east of Youngfield	9	230	6,000	No	No	No	Was not effective in reducing noise.
2800 block Zang Way	--	--	--	--	--	--	There is already a satisfactory noise barrier along I-70 protecting this home that will not be changed. No other mitigation is necessary.
Cabela Dr.	10	140	4,800	Yes	Yes	Yes	Recommended for the Proposed Action.
12600 block 38 <sup>th</sup> Dr.	13-50	325	could not calculate	No	No	No	Was not effective in reducing noise.
4100 block Youngfield Street	13	140	5,500	No	No	No	This was a pair of barriers. Could produce a driving hazard.
44 <sup>th</sup> Ave. east of I-70	13-20	950	could not calculate	No	No	No	This was a series of 4 barrier segments along 44 <sup>th</sup> Ave. and Youngfield St. It was not effective in reducing noise.
15200 to 15300 block 44 <sup>th</sup> Avenue	--	--	--	No	--	No	Driveways connecting to 44 <sup>th</sup> Avenue preclude barrier to these properties.
14500 to 14700 block 44 <sup>th</sup> Avenue	12	650	5,200	No	No	No	Gaps in the barrier for local streets would compromise the effectiveness of this barrier.
2800 block Youngfield Street	--	--	--	No	--	No	Driveway connecting to Youngfield St. precludes a barrier for this property.

(1) According to CDOT criteria.  
SOURCE: FHU 2006d

Table 4-16 Noise Mitigation Reductions from Recommended Barriers

Model Receiver	2030 Proposed Action Noise Level (dBA)		
	Without Barrier	With Barrier	Reduction
B494	67	58	9
B495	62	60	2

SOURCE: FHU 2006d

#### 4.6 Historic and Archaeological Resources

Historic resources are buildings, structures, districts (groups of buildings or structures), sites and objects meeting the minimum age criterion of 45 years. Typically 50 years is used as an age threshold; however, a 45 year-threshold is often applied in transportation projects to account for the lengthy process often required to complete these projects. Historic archaeological sites include ruins and remains associated with a wide variety of historical contexts, including settlement, agriculture, mining, transportation, military, and industrial enterprises. Archaeological resources are the physical traces of past human activity and may be either associated with prehistoric Native Americans or later historic non-indigenous peoples (e.g., Euroamericans, Asian emigrants and transplanted Africans). Prehistoric archaeological sites in the plains of Colorado may include surface scatters of lithic artifacts, remnants of hearths, stone circles/tipi rings, bison kill/processing sites, rock art, lithic material quarries, rockshelters, and (rarely) human burials.

Non-renewable historical and archaeological resources warrant protection if they are listed on, or determined to be eligible for inclusion in the National Register of Historic Places (NRHP). Sites of lesser but recognized importance also warrant consideration, including those listed or determined to be eligible for the State Register of Historic Places (SRHP) as well as those identified as important by local governmental agencies and historical commissions. The NRHP criteria, as specified in 36 CFR 60, are as follows:

“The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, association *and*

- A. That are associated with events that have made a significant contribution to the broad patterns of our history; *or*
- B. That are associated with the lives of persons significant in our past; *or*
- C. That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; *or*
- D. That has yielded, or may be likely to yield, information important in prehistory or history.”  
(This criterion applies mainly to archaeological sites)

Section 106 of the National Historic Preservation Act (as amended) directs federal agencies to take into account the effects of their undertakings on NRHP-listed or eligible resources. Due to this project partially including a federal interstate and the expectation of partial federal funding, the I-70/32<sup>nd</sup> Avenue Interchange Project is considered a federal undertaking. CDOT represents FHWA for the coordination of Section 106 consultation with the State Historic Preservation Officer (SHPO) and other consulting parties. Public input regarding historic and archaeological resources, provided through the EA public involvement process, is also taken into consideration. The Section 106 process involves the following series of steps, as specified in 36 CFR 800 – The Advisory Council on Historic Preservation’s regulations for Protection of Historic Properties:

- ▶ Identification and significance evaluation, as specified in 36 CFR 800.4
- ▶ Assessment of impacts by applying the Criteria of Adverse Effect found in 36 CFR 800.5
- ▶ Resolution of adverse effects, per 36 CFR 800.6

The resource identification and evaluation process involved several steps: 1) a file search; 2) reconnaissance surveys; 3) definition of an “Area of Potential Effect” (APE) around the proposed improvements; 4) intensive-level survey and documentation of historic buildings and lands; and 5) evaluating the significance of each historic or archaeological resource in terms of eligibility for the NRHP.

A file search for the project was completed by the Colorado Historical Society/Office of Archaeology and Historic Preservation (OAH) on September 15, 2005, in order to identify previously recorded historic and archaeological resources. Other records reviewed included the *Historic Trail Map of the Greater Denver Area* (Scott 1976), as well as historical site survey data collected by Jefferson County. The Jefferson County survey data were organized for planning purposes by geographic sub-area, and included:

- ▶ Historic sites identified in the Central Plains planning area, and depicted on a map in the *Central Plains Community Plan* (JCPZ 2004). These include sites listed on the NRHP, properties designated as County Historic Landmarks, historic railroad alignments, and all “Cultural Resources for Preservation” identified through a 1999-2000 survey sponsored by the Jefferson County Historical Commission
- ▶ Historic sites identified in the North Plains planning area, and depicted on a map in the *North Plains Community Plan* (JCPZ 1989)
- ▶ Historic sites identified in the Golden Vicinity survey area in the *Reconnaissance Survey Report, 1999-2002 Cultural Resource Survey of Unincorporated Jefferson County* (Jefferson County Historical Commission 2002)



Reconnaissance “windshield” surveys of the study area were completed on April 8, July 7, and August 15, 2005, to identify potentially historic resources and areas that would require a pedestrian archaeological survey. This effort was followed by review of Jefferson County Assessor’s online property records to determine dates of construction for buildings and structures identified as potentially historic. Properties with buildings erected in or before 1960 were evaluated for historic resources. Properties meeting this minimum age threshold were recorded onto Colorado Historical Society cultural resource inventory forms and formally evaluated for NRHP-eligibility. The cultural resource survey for the I-70/32<sup>nd</sup> Avenue Interchange EA is documented in a survey report commissioned by CDOT (FHU 2006e).

FHWA/CDOT consulted with the SHPO to define the limits of the project’s APE. The APE boundary was based upon the nature of the proposed improvements and their possible impacts on nearby historic resources. The APE boundary was adjusted over time to account for design changes.

#### **4.6.1 Historic Resources**

Historic resources identified within the APE include 19<sup>th</sup> and 20<sup>th</sup> Century farm buildings, dwellings, a carnation nursery, a grange building, and irrigation ditches. These sites are associated mainly with the historical contexts of agriculture, and post-World War urban growth in the Denver metropolitan area. General information about these properties is summarized in **Table 4-17**.

**Table 4-17 Historic and Archaeological Resources Identified within the Project Area of Potential Effects**

Site Number	Address	Site Type/Name	NRHP Eligibility
5JF3803	3475 Youngfield Service Road	Salter Farm	Eligible (Criterion C)
5JF4322	2635 Youngfield Street	Novacek's Carnation Nursery	Not Eligible
5JF4323	2665 Youngfield Street	Single family dwelling	Not Eligible
5JF4324	2675 Youngfield Street	Paleo Research Institute	Not Eligible
5JF4325	2680 Youngfield Street	Multi-unit commercial building	Not Eligible
5JF4326	2800 Youngfield Street	Farm	Eligible (Criterion A)
5JF4327	3130 Youngfield Street	Maple Grove Grange	Eligible (Criteria A,C)
5JF4328	12500 W. 32 <sup>nd</sup> Avenue	Truelson farmhouse and barn	Eligible (Criteria A,C)
5JF4329	13050 W. 32 <sup>nd</sup> Avenue	Single Family Dwelling	Not Eligible
5JF4332	14795 W. 44 <sup>th</sup> Avenue	Single Family Dwelling, now occupied By Grandview Landscape Irrigation Corporation	Not Eligible
5JF4333	4405 Holman Street	Single Family Dwelling	Not Eligible
5JF4334	4405 Gladiola Street	Single Family Dwelling	Not Eligible
5JF532.4	N/A	Rocky Mountain Ditch	Not Eligible
5JF4361.1	N/A	Bayou Ditch	Not Eligible
5JF4362.2	N/A	Reno-Juchem Ditch	Not Eligible

Only one of these properties was previously recorded: the Salter Farm containing a Tudor Revival-style farmhouse and outbuildings, located at 3475 Youngfield Service Road (5JF3803). The Salter Farm had been previously determined Officially Eligible for the SRHP. The survey also verified that a historic late 19<sup>th</sup> – early 20<sup>th</sup> Century farmhouse listed in the file search, at 2800 N. Youngfield Street (5F412), no longer exists; its location is now occupied by the multi-story building occupied by the Bureau of Land Management. **Figure 4-17** identifies the locations and types of historic sites in the project area.

Only four historic resources were evaluated as eligible for the NRHP. Summary information about these significant sites is presented below.

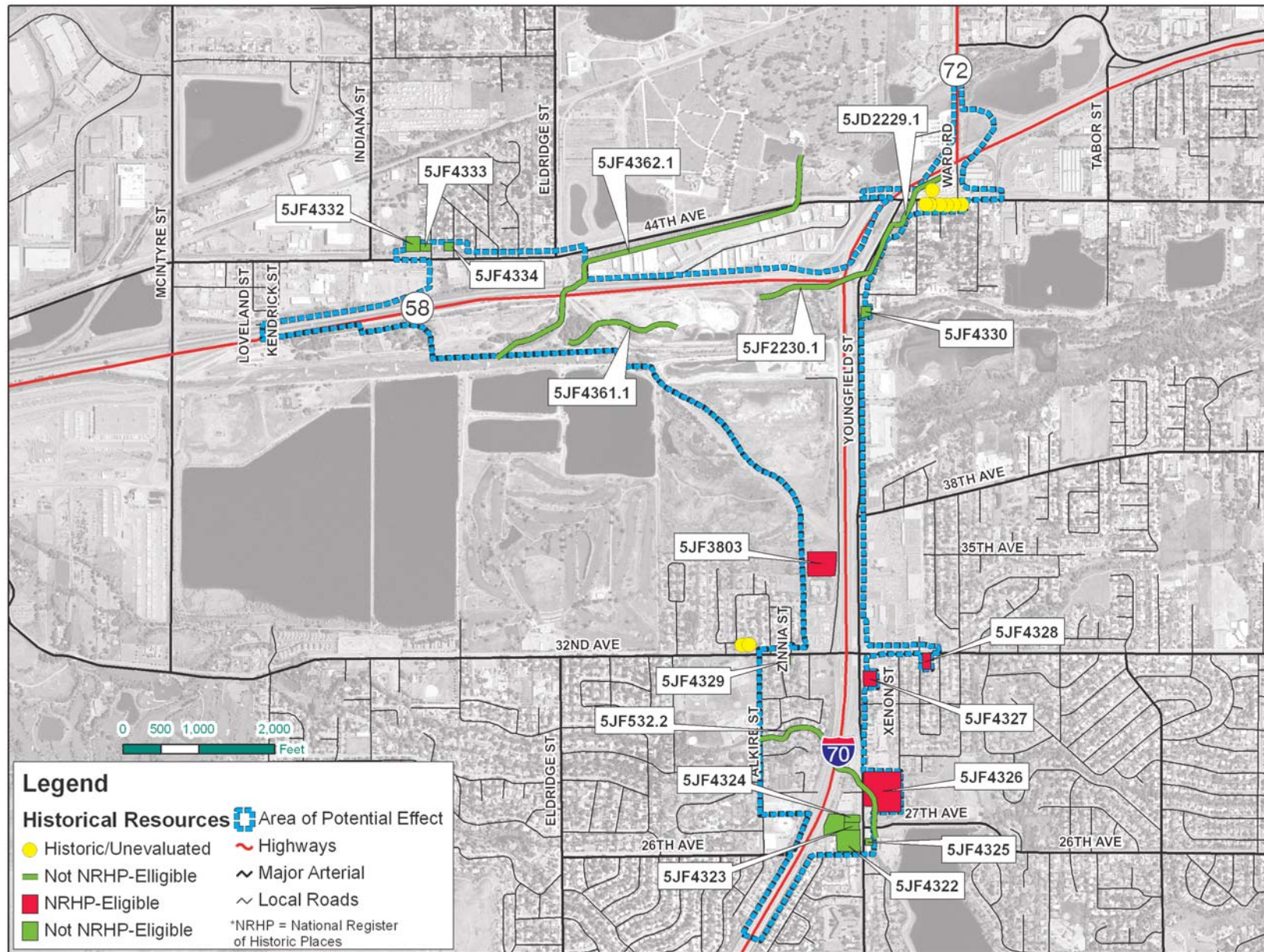


Figure 4-17

**Historic Resources Identified within the Area of Potential Effects**



North SOURCE: FHU 2006d



#### *4.6.1.1 Salter Farm (5JF3803)*

The Salter Farm is located on the west side of I-70 and Youngfield Service Road, a short distance north of W. 32<sup>nd</sup> Avenue (see **Figure 4-18**). The site, which occupies a remnant (2.758-acre) parcel of the 9.8-acre historical farm, contains a brick farmhouse built in 1939 and an unmodified substantial brick garage/apartment built in 1941 as well as several modern and historic agricultural outbuildings. Although the western portion of the farm parcel has been totally disturbed by grading and other earth-moving activity, the eastern portion of the parcel containing these contributing buildings is generally intact and includes, mature trees and other features associated with historic agricultural use of the property.

**Figure 4-18 Salter Farm (5JF3803)**



The Salter farmhouse and associated garage/apartment have been previously identified as significant. The farmhouse was identified by Jefferson County as a Priority 5 (highest priority) “Cultural Resource for Preservation” in the Central Plains planning area, as depicted on a map in the Central Plains Community Plan (JCPZ 2004). The latter determination was made as a result of a 1999-2000 survey sponsored by the Jefferson County Historical Commission. In 2005, this property was determined officially eligible by the SHPO for inclusion on the SRHP.

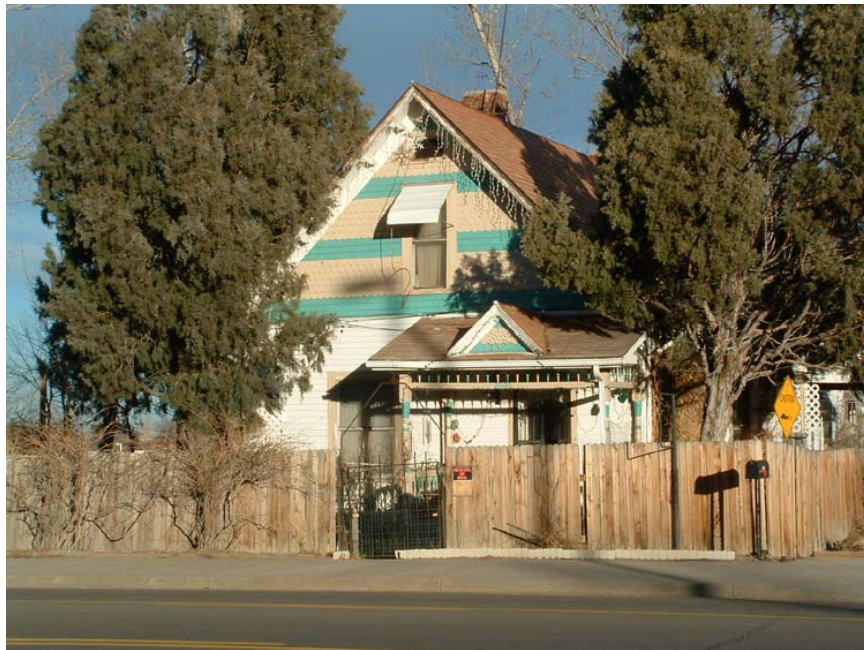


This brick farmhouse is an example of Tudor style brick residential architecture, a historical style that is uncommon in Colorado's agricultural areas. The Tudor style was popular in America between 1890 and 1940. The farmhouse retains character-defining characteristics of the style, and qualifies for inclusion on the NRHP under Criterion C. The associated 2-story brick garage/apartment, built of the same type of brick masonry as the farmhouse, also retains excellent integrity and contributes to the site's architectural significance. The other outbuildings on the property are nondescript, deteriorating agricultural structures that do not contribute to the site's architectural significance.

#### *4.6.1.2 Farm at 2800 Youngfield Street (5F4326)*

This 5.7-acre agricultural property on the east side of Youngfield Street may be the remnant of a larger farm, and contains a wood frame farmhouse built in 1889, a historic gabled wood frame barn, other small outbuildings, and pasture land (see **Figure 4-19**).

**Figure 4-19 Farm at 2800 Youngfield Street (5JF3803)**



The farmhouse on the property is a 1½ story, wood frame Folk Victorian style house clad with horizontal board siding. The dwelling is covered by a steeply-pitched front gable roof with wide overhanging open eaves and exposed scroll-sawn rafter tails. Large gabled dormers are placed on the north and south elevations. Decorative fish-scale shingles are applied to the face of all gables on the house. An open front porch on the façade features a shed roof with a small decorative gable, and turned spindle posts spanned by decorative beaded friezes. The house appears to be relatively unmodified, but its condition was evaluated as fair.

A historic wood frame barn is located north of the farmhouse. It is a rectangular-plan, front-gabled building clad with vertical board siding. The structure is covered by a moderately-pitched gable roof, and hayloft door is placed beneath the gable peak on the front (west) side of the building.

This property is associated with the agricultural history of the Applewood area of Jefferson County. The early history of this farm is unknown. Although very little information was found about the history of this specific farm, it is one of the few remaining 19<sup>th</sup> Century agricultural properties in the Applewood area. From the 1870s to the 1950s, the Applewood area of Lakewood and Wheat Ridge was well known as a fertile farming area producing a variety of crops including grains, fruits, and vegetables. Although the 5.7-acre farm may be a remnant of a larger farm property, it retains a cluster of agricultural buildings and pastureland that convey its association with this historically significant pattern of events that once formed the basis of the local economy. For these reasons, the property qualifies for inclusion on the NRHP under Criterion A.

#### *4.6.1.3 Maple Grove Grange (5JF4327)*

This property is a rectangular, 3,216 ft<sup>2</sup>, 1-story brick meeting hall building with rough-textured buff-colored brick walls and buttresses, a barrel roof, and a stepped parapet on the facade front (see **Figure 4-20**). The Maple Grove Grange No. 154 was organized as a farmers' cooperative association and local branch of a state-wide organization on February 27, 1907 in Jefferson County. The Grange is still active today as a social gathering place for community activities.

**Figure 4-20 Maple Grove Grange Building (5JF4327)**



The Maple Grove Grange building retains excellent architectural integrity and embodies both historical and architectural significance. Until recently, agriculture was the primary economic activity and land use in the Wheat Ridge area of Jefferson County. The grange organization housed in this building played an important role in the local agricultural community, and the building is an excellent example of grange/meeting hall architecture from the post-World War II period. For these reasons the property qualifies for inclusion on the NRHP under Criterion A and Criterion C.

#### *4.6.1.4 Truelson Farmhouse/Shadow Valley Farm (5JF4328)*

This site consists of a 2-story, brick farmhouse and an associated barn (enclosed by a newly built building), located on the southeast corner of West 32<sup>nd</sup> Avenue and Wright Court (see **Figure 4-21**). The Folk Victorian-style farmhouse was built in 1899 by Danish immigrant and farmer James Truelson. Truelson raised livestock, vegetables, and produced honey on the property, which was called Shadow Valley Farm, until approximately 1952. At that time, it was acquired by Conrad Becker, developer of the Applewood Shopping Center. The farmhouse's distinguishing features include a steeply-pitched side gable roof, pressed red brick walls, dressed sandstone sills, large dormers, and a projecting, open front porch with a brick closed rail and short Tuscan columns supporting a bellcast hip roof. The barn is hidden from view by the modern construction covering it.

**Figure 4-21 Truelson Farmhouse/Shadow Valley Farm (5JF4328)**



The Truelson or Shadow Valley Farm is evaluated as eligible for the NRHP under Criteria A and C. The farm was a successful, diversified agricultural operation that exemplified the agricultural possibilities in the greater Denver area in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. The property is associated with a significant “pattern of events”: agriculture in the Applewood area of Jefferson

County. Additionally, the farmhouse is a virtually unmodified, well-crafted example of the late 19<sup>th</sup> Century brick Folk Victorian and farmhouse architecture

#### **4.6.2 Archaeological Resources**

No archaeological sites have been identified to date within the project area. Although the project area includes elevated terrain on both the north and south sides of the Clear Creek floodplain, these areas have been subject to extensive aggregate mining and modern development, to the extent that there appears to be relatively low potential for the existence of any intact archaeological sites.

#### **4.6.3 Environmental Consequences**

##### *No-Action Alternative*

No impacts to significant historical or archaeological resources are expected to occur under the No-Action Alternative.

##### *Proposed Action*

The Proposed Action will minimally affect historic resources. Of the four NRHP-eligible historic resources identified within the APE for the Proposed Action, three will not be impacted. Only one site, the Maple Grove Grange building (5JF4327), will be impacted, but the impacts are judged to be minor. Consequences of the Proposed Action upon each of the three NRHP-eligible historic resources are described below:

##### *Salter Farm(5JF3803)*

The Proposed Action for this project involves the construction of a portion of Cabela Drive, a four-lane divided roadway, with a north-south alignment directly behind and along the west edge of the Salter Farm. The roadway will consist of four lanes (two 12-ft lanes in both directions), a 14-ft painted median separating the lanes, a 10-ft pedestrian/bicycle sidewalk on the west, and an 8-ft pedestrian sidewalk on the east side. The design of Cabela Drive was modified to avoid a take of property from the Salter farm by attaching the 8-ft sidewalk directly to the roadway, rather than shifting it to the east as a detached structure. A curving on-ramp from Cabela Drive to southbound I-70 will be constructed a short distance north of the Salter Farm. Although the original design of this on-ramp was located farther south and required a take of land from the Salter Farm, it was later shifted northward to avoid impacting the historic site. The proposed redesigned on-ramp now comes close to, but avoids, the northeastern corner of the site. Consequently, no direct impacts will occur to the Salter Farm.

The proposed new roadways (Cabela Drive and the southbound onramp to I-70) should not present a visual intrusion on the property that will diminish its significance. The historic setting surrounding the Salter Farm has already been completely transformed from historic agricultural to modern non-agricultural uses. A modern La Quinta hotel adjoins the farm on the south; Youngfield Service Road and I-70 border the farm's east side, and extensive earth-moving, including past gravel mining and more recent grading and re-contouring, surround the site's west and north sides. Similarly, the property's historic "auditory setting" has been greatly altered



by constant traffic carried by nearby I-70. Noise modeling results indicate that the Proposed Action would increase traffic noise levels at the site by approximately 1 dBA over the No-Action Alternative, due to the relocated I-70 ramp. This is a slight increase that would be imperceptible to the human ear. The changes in visual and auditory setting are not expected to diminish the qualities that make this property architecturally significant. Based on these factors, FHWA and CDOT have determined, and SHPO has concurred that the Proposed Action will result in *no adverse effect* to this property.

*2800 Youngfield Street (5FJF4326)*

Proposed transportation improvements in the vicinity of the 2800 Youngfield site are limited to restriping of Youngfield Street to the west of the site. No changes to the existing sidewalk on the west edge of the site are planned. There will be no direct impacts to the 2800 Youngfield property. The proposed improvements should cause no significant indirect impacts. Visual changes will be minimal. Youngfield Street is already a major arterial street, and noise modeling results indicate that the proposed action would result in a very slight (<1 dBA) decrease in traffic noise levels at the site compared the No-Action Alternative. This very slight decrease would be imperceptible to the human ear. On the basis of the above, FHWA and CDOT have determined, and SHPO has concurred, that the Proposed Action will result in a finding of *no historic properties affected* with respect to this property.

*Maple Grove Grange (5JF4327)*

The site occupies a rectangular, approximately 0.9-acre parcel, which includes the grange building surrounded on all sides by a gravel-paved area used for vehicular access and parking. The Grange building is currently set back approximately 50 ft from the street. The proposed addition of a right turn lane to Youngfield Street as part of the improvement of the existing Youngfield Street and 32nd Avenue intersection will require acquisition of a narrow strip of new right-of-way along the east side of Youngfield Street. This right-of-way acquisition will remove a very small (0.060-acre) strip of land from the 218.5-ft long west edge of the historic property. The new right-of-way will taper out from the southwest corner of the Grange property to a maximum width of 15.5 ft. This right-of-way acquisition constitutes less than 7% of the existing size of the site. The new curb and gutter with two access openings and a new sidewalk would be constructed. No curb and gutter or sidewalk currently exists. The new sidewalk would improve pedestrian access to the Grange building. Noise modeling results indicate that the Proposed Action would result in a very slight (<1 dBA) decrease in traffic noise levels at the site compared the No-Action Alternative. This very slight decrease would be imperceptible to the human ear. CDOT and FHWA have determined, and SHPO has concurred, the loss of a small portion of the gravel pavement in front of the building will not diminish the qualities which render the Maple Grove Grange significant, resulting in a determination of *no adverse effect*.

*Truelson Farmhouse/Shadow Valley Farm (5JF4328)*

Proposed transportation improvements in the vicinity of the Truelson farmhouse are limited to widening of the north side of West 32nd Avenue beginning approximately 60 ft east of the historic property, to accommodate a proposed new right turn lane at the West 32nd Avenue/Youngfield Street intersection. Acquisition of additional right-of-way will be required only from the north side of West 32nd Avenue, and there will be no direct impacts to the Truelson property. The proposed improvements should cause no significant indirect impacts, since the site is completely surrounded by modern residential and commercial development and thus has already lost its historic agricultural setting. West 32nd Avenue is already a major local

transportation route, providing access to the Applewood Shopping Center as well as Youngfield Street and the I-70/W. 32nd Avenue interchange. Noise modeling results indicate that the Proposed Action would not result in any change in traffic noise levels at the site compared the No-Action Alternative. On the basis of the above, FHWA and CDOT have determined, and SHPO has concurred, that the project will result in a finding of *no historic properties affected* with respect to this property.

#### **4.6.4 Mitigation**

The Proposed Action will not cause any *Adverse Effects* to historical resources, and therefore no mitigation is required. This has been established through completion of the Section 106 consultation process. Although no archaeological resources or undisturbed areas requiring pre-construction archaeological survey were identified, the possibility exists that buried archaeological materials may be unearthed during construction. Construction supervisory personnel should therefore be advised to immediately suspend any ground disturbing activity in the vicinity of a find and promptly notify the CDOT Staff Archaeologist who will evaluate the discovery, in accordance with Section 107.23 Archaeological and Paleontological Discoveries of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005c).

#### **4.6.5 Native American Consultation**

Section 106 of the National Historic Preservation Act (as amended) and the Advisory Council on Historic Preservation regulations (36 CFR 800.2[c][2][ii]) mandate that federal agencies coordinate with interested Native American tribes in the planning process for federal undertakings. Consultation with Native American tribes recognizes the government-to-government relationship between the United States government and sovereign tribal groups. In that context, federal agencies must 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.

Consulting tribes are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. If it is found that the project will impact cultural resources that are eligible for inclusion on the National Register of Historic Places and are of religious or cultural significance to one or more consulting tribes, their role in the consultation process may also include participation in resolving how best to avoid, minimize, or mitigate those impacts. By describing the proposed undertaking and the nature of any known cultural sites, and consulting with the interested Native American community, FHWA and CDOT strive to effectively protect areas important to American Indian people.

In January 2006, FHWA contacted the following fourteen federally-recognized tribes with an established interest in Jefferson County, Colorado, and invited them to participate as consulting parties (see **Appendix A**):

- ▶ Apache Tribe of Oklahoma
- ▶ Cheyenne and Arapaho Tribes of Oklahoma (two tribes administered by a unified tribal government)
- ▶ Cheyenne River Sioux Tribe (South Dakota)
- ▶ Comanche Nation of Oklahoma
- ▶ Crow Creek Sioux Tribe (South Dakota)
- ▶ Kiowa Tribe of Oklahoma
- ▶ Northern Arapaho Tribe (Wyoming)
- ▶ Northern Cheyenne Tribe (Montana)
- ▶ Oglala Sioux Tribe (South Dakota)
- ▶ Rosebud Sioux Tribe (South Dakota)
- ▶ Southern Ute Indian Tribe (Colorado)
- ▶ Standing Rock Sioux Tribe (North Dakota)
- ▶ Ute Mountain Ute Tribe (Colorado)
- ▶ Ute Tribe of the Uintah and Ouray Agency (“Northern” Ute) (Utah)

The Southern Ute Indian Tribe and Comanche Tribe of Oklahoma responded to the solicitation, each indicating the desire to be a consulting tribe for the undertaking. The tribes specified that they had no concerns or issues and that the project would not affect properties of religious and cultural significance. FHWA and CDOT have committed to notifying both tribes if cultural materials related to Native American occupation are discovered during any phase of construction, and to keep the tribes apprised of progress as the project develops. As a result of these actions, FHWA has fulfilled its legal obligations for tribal consultation under federal law.

#### ***4.7 Paleontology***

Paleontology is the study of fossilized remains and their relationship to the environment and its changes. Fossils are the remains, imprints or traces of once-living organisms preserved in rocks and sediments. Fossils commonly include bones and teeth, shells, wood, leaf impressions and footprints. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced. For these reasons, fossils are important for both scientific and educational purposes. The possibility exists for ground-disturbing transportation projects to encounter paleontological resources during construction, depending on the location of the project.

Fossils are protected by various laws, ordinances, regulations and standards at the federal and state levels of government. The Jefferson County and cities of Wheat Ridge and Lakewood have no regulations protecting paleontological resources at the county and city levels of government. Federal and state regulations covering the actions intended for the study area are described below.

- ▶ Archaeological and Historic Preservation Act of 1974 (Public Law 86-523, 16 USC 469-469c-2) – This act and its regulations and guidance cover activities at the study area. The act addresses survey, recovery, and preservation of significant paleontological data when such data may be destroyed or lost due to a federal, federally licensed, or federally funded project.
- ▶ Colorado’s Historical, Prehistorical and Archaeological Resources Act of 1973, (CRS 24-80-401 to 411, and 24-80-1301 to 1305) – This act defines permitting requirements and procedures for the collection of prehistoric resources on state lands, including paleontological resources, and actions that should be taken in the event that resources are discovered in the course of state-funded projects.

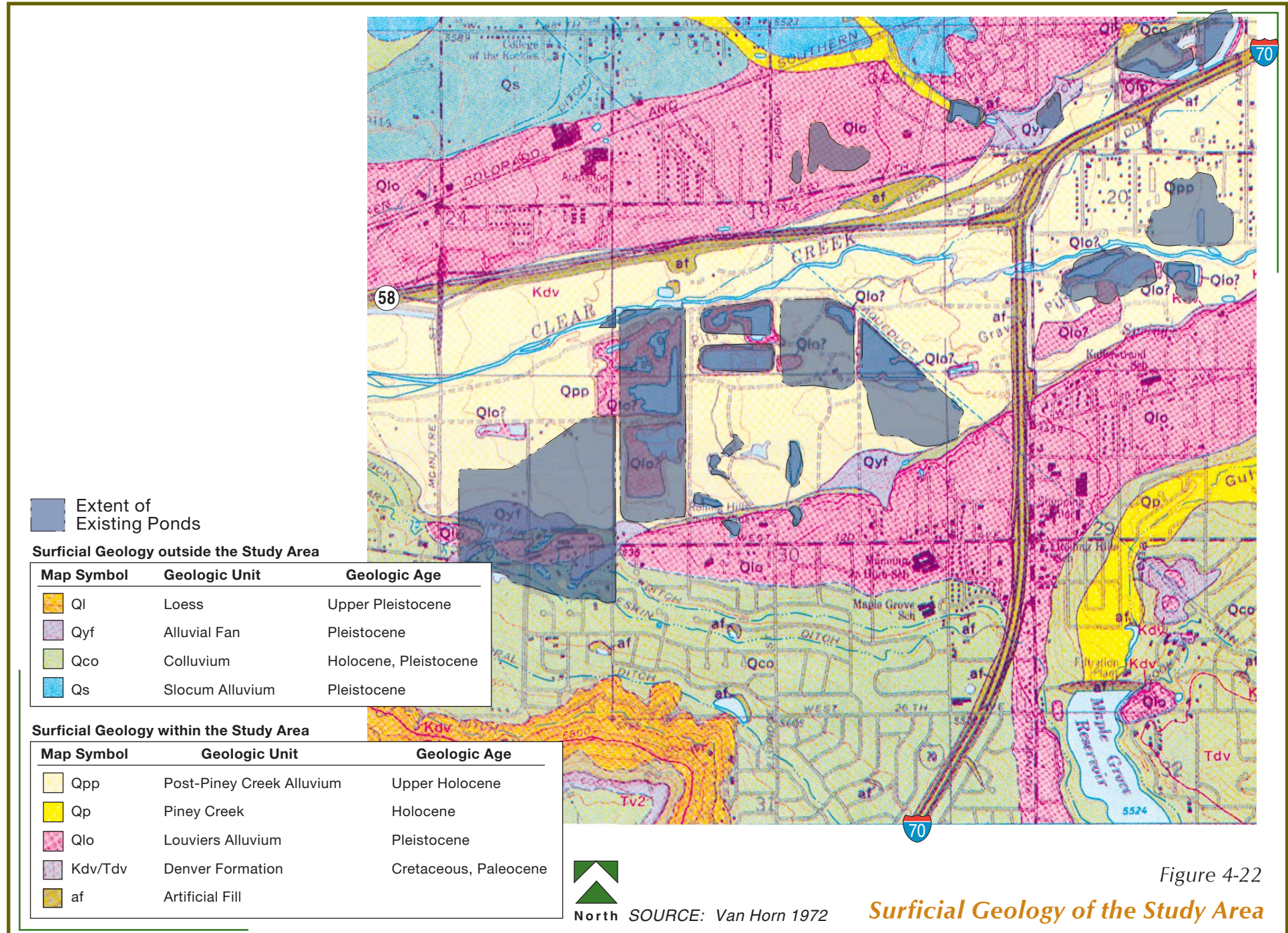
The information presented below was obtained from a paleontological survey conducted for the Northwest Corridor EIS (Rocky Mountain Paleontology 2006). The paleontological survey corridor extended through the study area along SH 58 from McIntyre Street to I-70 and along I-70 from the I-70/SH 58 interchange south to the I-70/C-470 interchange, which is located outside of the study area. The width of the paleontological survey corridor for this study was 600 feet (300 feet on either side of the centerline).

#### 4.7.1 Current Conditions

Denver’s Front Range counties are well known for their geological history and paleontological resources. Many important fossils have been collected in the Front Range area including dinosaur specimens of *Stegosaurus armatus*, *Diplodocus*, *Allosaurus*, and *Apatosaurus ajax*, which were collected near the town of Morrison, southwest of the study area. The geology and paleontology of the study area is potentially important because it contains rock formations consolidated from a historic time at the end of earth’s dinosaur period.

The study area is located on the bedrock formation called the Denver Formation. This formation was deposited at the end of the Cretaceous Period and start of the Tertiary Period. Additional deposits exist in the study area, these are alluvial deposits and are locally called the Louviers Alluvium (Pleistocene) and the post-Piney Creek Alluvium (upper Holocene) (see **Figure 4-22**). These formations were deposited by Clear Creek on top of the bedrock formation as a result of erosion and transport of upstream formations. These unconsolidated deposits are younger than the bedrock formation over which they lie.





North SOURCE: Van Horn 1972

Figure 4-22  
**Surficial Geology of the Study Area**

#### *4.7.1.1 Denver Formation*

The Paleocene and Upper Cretaceous Denver Formation consists of dark brown, yellowish-brown, and grayish-olive tuffaceous claystone, mudstone, and sandstone interbedded with scattered conglomerates (Bryant et al. 1981, Soister 1978, Trimble and Machette 1979). The Denver Formation is largely composed of altered andesitic (volcanic) debris. It is considered to have moderate to high paleontological sensitivity because it contains locally abundant and scientifically significant plant fossils (Brown 1943, 1962, Ellis et al. 2003, Johnson and Ellis 2002, Knowlton 1930) and a less abundant but scientifically important fossil vertebrate fauna (Eberle 2003, Middleton 1983). The geology and paleontology of the Denver Formation is the subject of active research by scientists and students at the Denver Museum of Nature and Science and University of Colorado Museum. The Denver Formation has a proven potential for producing scientifically important fossils; however, no fossilized remains have been recorded within or near the study area.

#### *4.7.1.2 Louviers Alluvium*

The Pleistocene (Wisconsinian) Louviers Alluvium consists of reddish to yellowish brown pebbly sand, coarse sand, cobble-sized gravel, and occasional boulders. It includes lenticular (lense-shaped) masses of silt and clay, commonly with contorted bedding (Lindvall 1979). The coarse-grained clasts (fragmented rock) are locally stained and cemented by manganese and iron oxides, are cross-bedded, and contain abundant mica. The unit is generally 15 to 20 feet thick (Lindvall 1979) and is as much as 60 feet above modern stream drainages (Trimble and Machette 1979). It has produced only scattered vertebrate fossils including the remains of mammoth, bison, horse, camel, jackrabbit, ground squirrel, and prairie dogs in the Denver area (Scott 1962, Scott 1963, unpublished University of Colorado Museum paleontological data). Since it contains few fossils, the Louviers Alluvium is considered to have low paleontological value.

#### *4.7.1.3 Piney Creek and Post-Piney Creek Alluvium*

The Piney Creek Alluvium consists of brown, light brown, and light to dark gray, slightly calcareous, sandy silt and clay overlying noncalcareous, clean to silty pebbly sand interbedded with sandy silt. Humic material (soil formed from the decomposition of plant and animal matter) is common in its upper 2 feet, while it contains interbedded gravel in its lower part. The Piney Creek Alluvium is typically 5 to 10 feet thick (Lindvall 1979, Trimble and Machette 1979). Post-Piney Creek Alluvium consists of light to dark grayish-brown clay, clean to slightly silty, pebbly sand, interbedded with sandy silt. In this unit, dark bluish-black humic bog clays are also present. In minor tributary stream valleys, this unit is as much as 5 feet thick (Lindvall 1979, Trimble and Machette 1979). Both the Piney Creek and Post-Piney Creek Alluvium are Upper Holocene in age and therefore are considered to be “recent” deposits. Holocene-aged deposits are too young to contain fossils but are known to contain the unfossilized remains of modern species. These units have low paleontological value.



## **4.7.2 Environmental Consequences**

### ***No-Action Alternative***

No impacts to paleontological resources will occur under the No-Action Alternative.

### ***Proposed Action***

Ground disturbance from construction activities associated with the Proposed Action may cause direct impacts (damage or destruction) to scientifically important paleontological resources. The potentially fossiliferous Denver Formation, the geologic unit of prime paleontological concern within the study area, could be encountered during excavation for bridge piers and retaining walls. It is impossible, however, to predict the precise location and extent of such impacts due to the unknown subsurface distribution of any fossils preserved within the geologic units cropping out within the study area. Direct impacts to scientifically important paleontological resources in younger, surficial deposits are possible, but unlikely.

## **4.7.3 Mitigation**

During project construction, CDOT may provide on-site paleontological monitoring of subsurface excavations that impact Denver Formation outcrop. Once project design plans are finalized, the CDOT staff paleontologist will examine them in order to estimate the scope of construction monitoring work, if any, required. A special condition requiring a paleontological monitor during construction will be attached to the construction project specifications if final design plans indicate the likelihood of affect to Denver Formation outcrop.

Although the paleontologic sensitivity of the surficial deposits (primarily alluvium) within the study area is low because they typically contain few fossils, construction personnel will be made aware of the potential to encounter fossils while excavating. If any subsurface bones, leaf impressions, or other potential fossils are found during construction, the CDOT paleontologist will be notified immediately to assess their significance and make further recommendations, in accordance with Section 107.23 *Archaeological and Paleontological Discoveries* of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005c).

## **4.8 Soils and Geology**

This section discusses the soil and geologic conditions in the study area that could potentially affect the project. To identify the geologic conditions, an initial geologic study was conducted (Kumar 2005). The scope of the study included conducting a field geologic reconnaissance and a review of applicable geologic literature. The geologic issues considered that could potentially impact the project include:

- ▶ Slope stability issues on existing embankments and channel banks
- ▶ Embankment settlement
- ▶ Swelling soils and bedrock
- ▶ Previous aggregate mining operations
- ▶ Uncontrolled fill
- ▶ Seismicity/faulting

#### **4.8.1 Current Conditions**

According to the *Surficial and Bedrock Geologic Map of the Golden Quadrangle, Jefferson County, Colorado* (Van Horn 1972), the regional geology of the study area consists of claystone, siltstone, and sandstone bedrock of the lower part of the Denver Formation from the Upper Cretaceous Period overlain by alluvium. Post-Piney Creek alluvium (Upper Holocene) is located in the vicinity of the Clear Creek floodplain and generally consists of cobbly gravels and some boulders. Louviers Alluvium (Pleistocene) is located in the vicinity further to the south and uphill from the Clear Creek floodplain and generally consists of silty sand.

##### **4.8.1.1 Unstable or Potentially Unstable Slopes**

The topography of the study area is relatively flat to moderately sloping with the exception of the steep roadway embankments located on I-70, SH 58, and associated with the Clear Creek channel banks. New embankments to be constructed for the project should be properly compacted, well-drained, and constructed to a stable slope configuration.

##### **4.8.1.2 Settlement**

Potential for excessive settlement of the natural soils under the weight of roadway embankments or structures is not apparent. However, there is the potential for settlement if uncontrolled fill is present and is not remediated. Due to aggregate mining operations in the area, there may be localized areas of uncontrolled fill. The potential for poorly compacted aggregate mining tailings is considerable. A previous study within the proposed development area uncovered a localized zone of silty tailings on the proposed development site with relatively loose density. It is probable that there are more similar deposits within this area.

##### **4.8.1.3 Swelling Soils and Bedrock**

Based on information of the local geology and the previous mining history of the area, the potential for swelling soils in the study area is low. The presence of primarily coarse-grained alluvial material indicates that it is unlikely that swelling soils will be encountered. However, the claystone bedrock generally does pose a risk of significant swelling potential. Structural foundations bearing in this stratum, such as the caissons for the new SH 58/Cabela Drive interchange and I-70 bridge over 32<sup>nd</sup> Avenue, will need to be designed with this in consideration. During the field reconnaissance, signs of significant heave and associated distress to roadways and nearby structures were not observed.



#### 4.8.1.4 Mining

Aggregate mining was performed in the study area and in the immediate vicinity in the past. A majority of the mining areas are currently being used as water storage ponds identified in **Figure 4-22**. Other mining activities that have occurred in the past near the study area consist of both surface and underground clay mines. The other mine areas are generally located approximately three to four miles west to southwest of study area based on the *Coal and Clay Mine Subsidence Hazard Study* (Amuedo and Ivey 1978).

#### 4.8.1.5 Faulting

There are no known potentially active faults that lie within the limits of the study area, according to the *Preliminary Quaternary Fault and Fold Map and Database of Colorado* (Widmann et al. 1998). The Golden Fault is located approximately five miles to the west of the study area. The Golden Fault is a thrust fault located along the eastern margin of the Rocky Mountain Front Range with a strike of approximately N23°W and an approximate dip of 50°W to 70°W. There has been no evidence to indicate that the Golden Fault has moved since deposition of the Verdos Alluvium (Pleistocene).

### 4.8.2 Environmental Consequences

#### *No-Action Alternative*

The No-Action Alternative would not involve any new construction. Therefore, this alternative would not be affected by soils and geologic conditions in the area.

#### *Proposed Action*

The project is not expected to affect geologic resources negatively. However, geologic resources could affect the project. Although potentially swelling bedrock is present in the study area, the potential effects of heave can be mitigated through engineering design. The swelling bedrock is generally overlain by a sufficient thickness of non-expansive alluvium.

Localized areas of uncontrolled fill, generally as a result of past aggregate mining activities, would be delineated through field reconnaissance and/or exploratory drilling, and can be removed and replaced.

#### 4.8.3 Mitigation

As in all roadway construction projects, a detailed geotechnical analysis of the surrounding subsurface will be required during the preliminary/final design process to determine the structural stability and load-bearing capacity of the geological formation within the limits of the proposed structures. The extent of these analyses is determined by federal, state, and local requirements. The results of the geotechnical analysis will be used to establish the design of the roadway and structures; such as bridge piers, retaining walls, and grade separation structures; and to establish erosion control procedures.

## **4.9 Farmlands**

The Farmland Protection Policy Act (FPPA) of 1981, as amended, protects prime and unique farmland as identified by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The purpose of the act is to minimize the extent to which federally-funded projects contribute to the unnecessary and irreversible conversion of farmland to non-agricultural uses. The FPPA requires that federal agencies comply with local government and private farmland programs and policies.

The NRCS has established four different classifications for farmlands. These four classifications include Prime Farmland, Statewide Important Farmlands, Unique Farmlands, and Local Important Farmlands.

Prime Farmland is defined as: “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of these crops when treated and managed, including water management, according to acceptable farming methods” (USDA 1981).

Unique Farmland is defined as: “land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables” (USDA 1981).

Farmland of Local Importance is defined as follows: “In some local areas, there is concern for certain additional farmlands for the production of food, feed, fiber, forage, and oilseed crops, even though these lands are not identified as having national or statewide importance. Where appropriate, these lands are to be identified by the local agency or agencies concerned. In places, additional farmlands of local importance may include tracts of land that have been designated for agriculture by local ordinance” (NRCS 2005).

Farmland of Statewide Importance is defined as: “land, in addition to prime and unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Criteria for defining and delineating this land are to be determined by the appropriate state agency or agencies. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable. In some states, additional farmlands of statewide importance may include tracts of land that have been designated for agriculture by state law” (NRCS 2005).

#### 4.9.1 Current Conditions

The NRCS uses a land evaluation and site assessment system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. The NRCS Farmland Conversion Impact Rating for Corridor Type Projects, Form NRCS-CPA-106, was submitted to the NRCS on December 5, 2005. According to the NRCS-CPA-106 form received from the NRCS on December 14, 2005 there is no Prime Farmland, Unique Farmland, Farmland of Local Importance, or Farmland of Statewide Importance present within the project corridor (see **Appendix A**).

#### 4.9.2 Environmental Consequences

##### *No-Action Alternative*

No prime and unique farmlands or farmlands of local or statewide importance will be affected by the No-Action Alternative

##### *Proposed Action*

The Proposed Action would not impact any Prime Farmland, Unique Farmland, Farmland of Local Importance, or Farmland of Statewide Importance.

#### 4.9.3 Mitigation

No mitigation measures are required as a result of the construction of the Proposed Action.

### 4.10 Water Resources, Floodplains, and Water Quality

An analysis of water resources, floodplains, and water quality issues was conducted as part of this EA. This included assessing current conditions, the consequences of the No-Action Alternative and the Proposed Action, and identifying the appropriate mitigation measures.

This section provides basic water resource, floodplain, and water quality information. The information within this section was derived from site visits; literature research; discussions with CDOT, CDPHE, City of Wheat Ridge, City of Lakewood, and Jefferson County staff; and a detailed analysis of the area. A more detailed and technical analysis can be found in the *Water Resources Technical Report* (FHU 2006f).

#### 4.10.1 Current Conditions

The study area is located within the 500 square mile (mi<sup>2</sup>) Clear Creek Watershed of which 446 mi<sup>2</sup> lies upgradient of the study area. The project is approximately 40 acres or 1/16 mi<sup>2</sup>, which represents approximately 0.012 percent of the total watershed.

Clear Creek originates at the continental divide 40 miles west of the study area near Loveland Pass and flows 11 miles to the east to its confluence with the South Platte River. This watershed includes parts of Jefferson County, Gilpin County, Clear Creek County and many

communities including Wheat Ridge, Golden, Central City, Blackhawk, Georgetown, Silver Plume and Idaho Springs. The Mount Evans Wilderness and the Roosevelt National Forest lie in the upper mountainous areas.

Land uses in the lower reaches of the watershed around Golden and the City of Wheat Ridge near the study area have gradually changed from prairie to grazing to farmland to urbanized areas. The current urban areas include a high percentage of residential, commercial and industrial uses. The foothills areas have experienced residential growth that is expected to continue. The population of the three counties has increased from 23,000 people in 1900; to 59,800 in 1950; to 531,100 in 2000.

#### *4.10.1.1 Irrigation Ditches*

Irrigation ditches within the study area are shown on **Figure 4-23**. Irrigation facilities within the study area include the Reno-Juchem Ditch, Coors Brewing Company ponds, Bayou Ditch, Wadsworth Ditch, Lee & Baugh Ditch, Slater Ditch, Slater/Moody Ditch, Swadley Ditch, Rocky Mountain Ditch, and Lee, Stewart & Eskins Ditch. A description of the ditches is included in the *Water Resources Technical Report* (FHU 2006f).

#### *4.10.1.2 Clear Creek*

Clear Creek is a perennial stream that lies south of and parallel to SH 58. It crosses under I-70 within the northeastern part of the study area (see **Figure 4-23**). Much of the lower reaches of this basin have been developed. Over the years the original drainage way within the study area has been mined for aggregate, straightened, and shaped into a semi-trapezoidal channel (shape of the stream channel banks and bottom). It has a low stream sinuosity (ratio of the stream length to the valley length), slight meandering, limited riparian (streamside) vegetation and steep stream banks in places. The channel has been stabilized in the study area with several grade control structures and riprap bank protection. These measures appear to have controlled the bank erosion and channel degradation.

Clear Creek has a Federal Emergency Management Agency (FEMA) regulatory floodplain delineation based upon a 100-year flow of 13,470 cubic feet per second (cfs). Flood Insurance Rate Map (FIRM) panels 08059C0193 E and 08059C0194 E include the study area and delineate the current 100-year flood limits (effective date of June 17, 2003). No changes to the floodplain have been documented on the FEMA website since this effective date.

The FEMA panels delineate the portions of Clear Creek that are in the 100-year flood zone. The 100-year flood zone includes special flood hazard areas inundated by the 100-year flood where base flood elevations have been determined. The 100-year flood zone areas vary in width from 200 to 750 ft within the study area (see **Figure 4-23**). The maximum flooding width occurs upstream of the I-70 bridge within the study area. The 100-year event overtops an access road that connects the SH 58 frontage road to several abandoned Clear Creek gravel pits and almost overtops the Burlington Northern Santa Fe Railway (BNSF) spur track to the Coors facility. The 100-year event does not overtop the existing bridges at I-70, McIntyre Street or Youngfield Street.



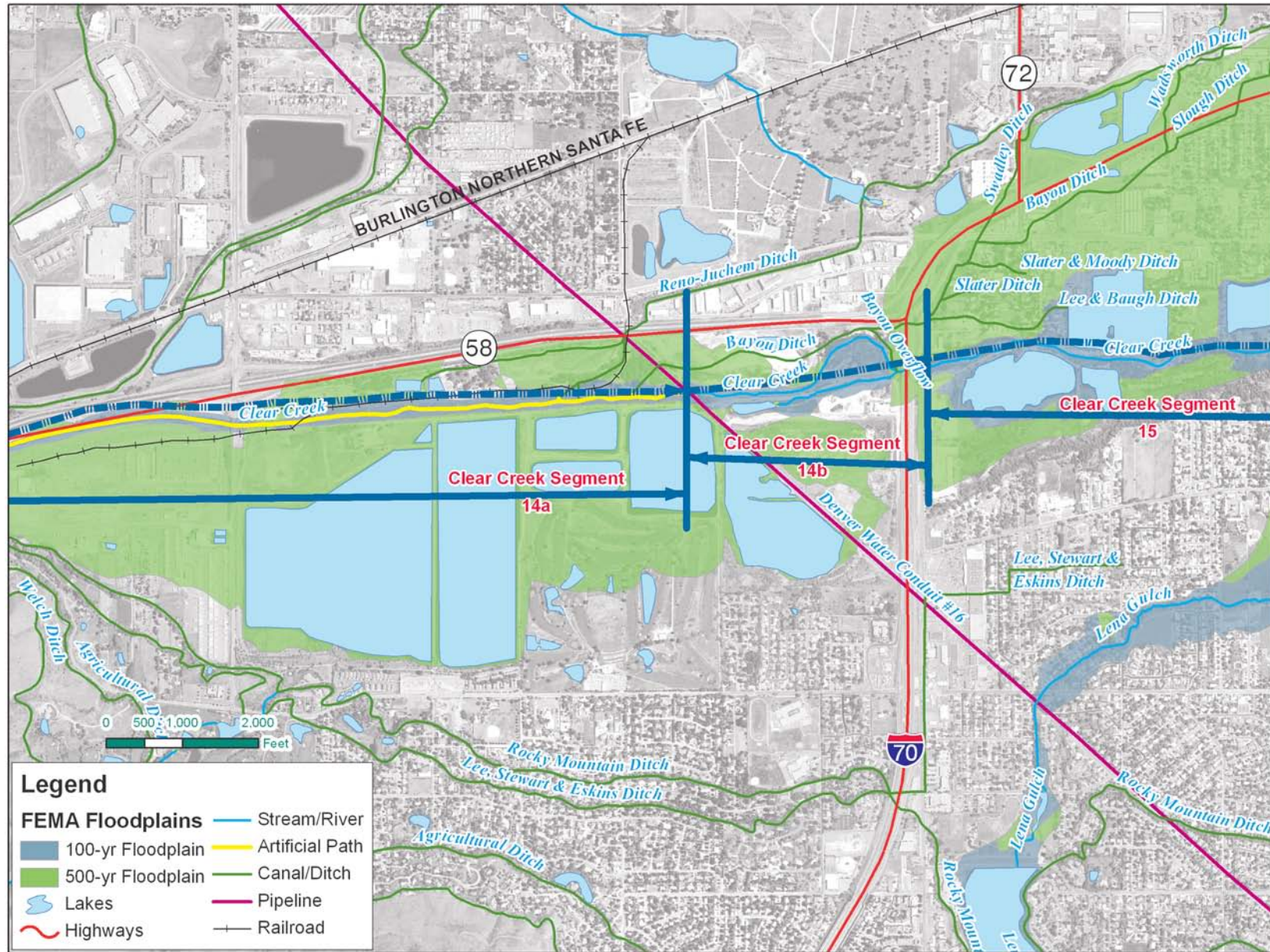


Figure 4-23  
Existing Floodplain and Irrigation Map

Areas in the over bank areas are delineated as the 500-year flood. The 500-year flood includes areas of the 500-year flood and areas of 100-year flood with average depths of less than 1 ft. The 500-year flood also includes areas with drainage areas less than 1 square mile and areas protected by levees from the 100-year flood. Stormwaters from the over banks adjacent to the floodplain sheet flow directly into the creek.

#### 4.10.1.3 Clear Creek Water Quality

Segments of Clear Creek within the study area are listed on the CDPHE Water Quality Control Commission Regulation No. 93 for the year 2006. This is also known as the Section 303(d) list for Water-Quality-Limited segments requiring a Total Maximum Daily Load (TMDL). Colorado is required by the USEPA to list those waters for which technology-based effluent limitations and other controls are not stringent enough to implement water quality standards. They are listed and described below.

- ▶ **Clear Creek Segment COSPCL14b** - This segment includes all of Clear Creek from Denver Water conduit #16 to Youngfield Street. This segment of Clear Creek is classified as an Aquatic Life Warm Water Class 2. This classification includes waters that are not capable of sustaining a wide variety of cold or warm water biota including sensitive species, due to physical habitat, water flows or levels or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species. It has an Existing Primary Contact Use (previously Recreational Classification of 1a) that includes waters in which primary contact uses have been documented or are presumed to be present. Additional beneficial uses include water supply and agriculture. It is impaired for aquatic life use and organic sediment.
- ▶ **Clear Creek Segment COSPCL15** - This segment includes Clear Creek from Youngfield Street to the confluence with the South Platte River. This segment of Clear Creek is classified as an Aquatic Life Warm Water Class 1 stream. These are waters that currently are capable of sustaining a wide variety of warm water biota, including sensitive species, or could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species. It is impaired for *Escherichia coli* (*E. coli*), aquatic life use and organic sediment.

Clear Creek Segment COSPCL14a has been deleted from the 303d list for the year 2006. It included the mainstem of Clear Creek from the Farmers Highline Canal diversion in Golden to the Denver Water Conduit 16. The Denver Water Conduit 16 traverses the study area, entering in the northwest corner and exiting through the southeast.

Since Clear Creek does not achieve the water quality standards for *E. coli* aquatic life use and organic sediment, it is listed as impaired and requires a TMDL analysis per the CDPHE – Water Quality Control Division (WQCD). Because a TMDL analysis is required for Clear Creek, CDOT designates the stream as “sensitive water”. Special conditions are required when stormwater enters a water body identified as sensitive waters. The special condition for Clear Creek TMDL that will be included within this project involves additional Best Management Practices (BMPs)



above and beyond the BMPs required by municipal stormwater permits that are used to capture 100 percent of the stormwater generated from the impervious area of the transportation facilities or remove 80 percent of the sediment transported in the water. The additional BMPs can be flexible in nature and can include structural, non-structure, or administrative BMPs, such as street sweeping, water quality monitoring program support, riparian vegetation enhancement, promoting citizen stream clean up programs, and stenciled discharge warnings on storm drains to educate the public with regard to aquatic risks that could result from putting pollutants down the storm drain.

#### 4.10.1.4 Municipal Separate Storm Sewer Systems

CDOT, Jefferson County, and the cities of Wheat Ridge and Lakewood have received authorization from the CDPHE–WQCD to discharge stormwater under the Colorado Discharge Permit System (CDPS) in accordance to the Colorado Water Quality Control Act. The Municipal Separate Storm Sewer System (MS4) permits authorize new or existing discharges composed of stormwater (and allowable non-stormwater discharges) from CDOT, Jefferson County, and the cities of Wheat Ridge and Lakewood designated urbanized areas into “waters of the United States” as defined by the Clean Water Act. The permits authorize the discharge of stormwater co-mingled with flows contributed by processed wastewater and stormwater associated with industrial activity, provided these discharges are permitted under a separate CDPS permit. The Terms and Conditions of the MS4 Permits require all entities to develop specific Stormwater Management Plans (SWMP). The development and implementation of these management plans increase the likelihood of maintaining and protecting local water quality conditions.

Work within the study area will have to comply with these MS4 permits and their regulatory-based conditions. CDOT will be responsible for managing stormwater coming from I-70, SH 58 and the CDOT right-of-way. The cities of Wheat Ridge and Lakewood and Jefferson County will be responsible for managing stormwater outside the CDOT right-of-way that is within their jurisdictional limits. The MS4 permit requirements for these entities have similarities and differences. The MS4 permit requirements for each entity are detailed in the *Water Resources Technical Report* (FHU 2006f).

Two MS4 Program elements that are similar to all of the above MS4 permits and are essential for protecting water quality include Construction and Post-Construction Stormwater Management Control Measures. The common goals of each MS4 Program are discussed below:

- ▶ **Construction Site Stormwater Management Minimum Control Measures** – Reduce the amount of stormwater pollution from construction sites (sediment, building materials, oil, etc.). Require, review, inspect, and enforce proper management practices and material disposal on construction sites including procedures for site plan review, inspections during construction, and reporting protocols to upper level CDOT management to ensure compliance. Require the construction site owners or operators to implement erosion and sediment control BMPs and to control other waste such as discarded building materials. Construction erosion and sediment control activities will adhere to the CDPS stormwater permit requirements, CDOT’s Erosion Control and Stormwater Quality guide, and CDOT’s Standard Specifications for Road and Bridge Construction.

- ▶ **Post–Construction Stormwater Management Minimum Control Measures** – Develop and implement comprehensive planning procedures and enforcement controls to reduce the discharge of pollutants after construction is complete from areas of new development and significant redevelopment. Develop and implement strategies which include a combination of structural and/or non-structural BMPs; ensure adequate long-term operation and maintenance of BMPs.

These program elements outline the construction and post-construction requirements for the Proposed Action. The goal is to minimize water quality impacts as a result of the Proposed Action and conform to the Clean Water Act.

#### *4.10.1.5 Groundwater*

Groundwater resources within the study area include shallow alluvial aquifers and deeper bedrock aquifers such as the Denver, Arapahoe, and Laramie-Fox Hills. Depths to groundwater of 0 to 250 ft are typical in the Denver Basin aquifers. Within the study area, depth to groundwater in young alluvial aquifers on or close to modern floodplains is typically ten feet or less below ground surface, and commonly less than five feet below ground surface. Depth to water table on higher terraces away from the modern floodplain is 10 to 20 ft or more below ground surface.

The basic standard applicable to all groundwater in the state is that “groundwater shall be free of pollutants” that could cause harm to humans or the environment. There are a series of basic quantitative standards for common groundwater pollutants which are based on designated uses of the groundwater as determined on an individual basis by the Water Quality Control Commission. According to the Water Quality Control Commission Regulation 42 “Site-Specific Water Quality Classifications and Standards for Ground Water,” the project area does not have a use designated for the groundwater; therefore, no specific quantitative groundwater standards are currently applicable.

#### **4.10.2 Environmental Consequences**

##### *No-Action Alternative*

Under the No-Action Alternative, stormwater would continue to discharge into Clear Creek.

##### *Proposed Action*

Consequences of the Proposed Action could possibly occur where the existing irrigation facilities (e.g. ditches, canals, and head gates) need to be crossed or relocated. The irrigation ditches in the study area are shown in **Figure 4-23**.

Impervious area within the study area would increase an estimated 20.54 acres (0.032 square mile) due to the Proposed Action. As stated above, the study area represents approximately 0.013 percent of the total watershed. The increase in impervious area under the Proposed Action would represent 0.007 percent of the total watershed. The potential increase in stormwater flows to Clear Creek due to a major storm event would be negligible. The time to



peak for a major storm from the 446 mi<sup>2</sup> watershed area upgradient of the study area is approximately 8 hours. The time to peak for any of the roadway areas would be in the 30 minute range. Since the peak timings are not close to each other, any rise in the Clear Creek channel due to runoff from the Proposed Action, would be negligible during a major storm.

A segment of the Clear Creek pedestrian path will be relocated as a part of the Proposed Action. About 1400 feet of this relocation will be in the higher over-bank portions of the 100-year floodplain of Clear Creek. It is planned that the path be built at grade or lower so that the conveyance of floodwaters in Clear Creek will not be impacted. The proposed configuration would not require coordination with FEMA because the floodplain elevation would not be adversely affected. If the proposed configuration can not be constructed, and the path requires placing fill in a portion of the floodplain, then FEMA coordination will be necessary. This will be confirmed during final design. This is the only location where the Proposed Action will have potential floodplain impacts.

Roadway runoff typically may contain the following pollutants:

- **Sediment** – solids such as sand, silt, and clays that are washed from paved surfaces or eroded from roadway slopes and become suspended in water. Sediment due to construction is a common water quality problem.
- **Heavy Metals** – metals such as zinc and copper from fuels, brake pads, and vehicle wear. In the past, lead was a common pollutant, but the use of unleaded gasoline has now substantially reduced this roadway contaminant.
- **Magnesium chloride and salt** – de-icers used on roads for winter maintenance
- **Oil and grease** – petroleum hydrocarbons deposited by vehicles on roadways and parking lots

The Proposed Action will include permanent drainage and water quality facilities, as described below in **Section 4.10.3 Mitigation**, to address these pollutants. In this regard, the Proposed Action will provide a substantial improvement over the No-Action Alternative, which lacks these facilities.

As described above, Clear Creek is currently impaired with respect to *E. coli*. and organic matter. These are not typical pollutants in roadway runoff, and the Proposed Action will not impact Clear Creek with respect to these pollutants.

Impacts water quality from the Proposed Action would occur where there is erosion during construction and where roadway runoff conveys pollutants into Clear Creek. New embankment material can easily be lost to erosion and wind and ultimately be deposited into nearby waterways. Grasses and shrubs hold soil together and limits erosion. Removal of this vegetation during construction increases erosion and potential water quality impacts. Potential erosion and streambank impacts can occur at new or modified stormwater discharge outlets. Unprotected stormwater outfalls could cause erosion of stream bank areas that could affect riparian (streamside) areas and water quality standards.

Potential groundwater impacts from the Proposed Action would occur during dewatering activity associated with construction such as bridge caisson and utility construction. Groundwater brought to the surface during dewatering activities may contain pollutants and sediment that would impact water quality standards if allowed to discharge directly to Clear Creek.

#### 4.10.3 Mitigation

Any impact to an irrigation facility will require an in-kind replacement. Stormwaters will not be allowed to co-mingle with irrigation waters, and the irrigation companies will be advised of any impacts that may occur to their irrigation system. The ditch companies will have the opportunity to review plans that call for impacts to their system. Any work on the irrigation facilities must occur during the non-irrigation season. Erosion and sediment control features will be placed at irrigation-ditch areas during construction. The sediment control features will be removed once 70 percent of pre-existing cover has been reached. Additional details regarding irrigation facilities and applicable references can be found in the *Water Resources Technical Report* (FHU 2006f).

Permanent drainage and water quality facilities (i.e. BMPs) are to be included with the final design to mitigate adverse impacts. The purpose of these BMPs is to protect the water quality of Clear Creek and by providing a discharge that is equal to or better than the current conditions. Work within the study area for the Proposed Action will comply with the MS4 permit requirements for each jurisdiction. Mitigating measures during construction will be outlined in the SWMP, which will include a detailed set of erosion control plans as part of the roadway design set. These plans will show temporary measures, such as silt fences, hay bales, soil retention blankets, inlet protection, and stabilized construction entrances.

The exact type of measure to be taken will be determined during final design. Mitigating measures after construction has been completed, such as permanent BMPs, will also be outlined in the detailed set of erosion control plans. These detailed plans will be reviewed during the design process by CDOT specialties including environmental, landscape, hydraulics and maintenance. Their input will be incorporated into the design. CDOT Region 6 maintenance personnel prefer water quality ponds as permanent methods. If CDOT has adequate access, they can maintain the ponds and remove the accumulated sediment. The CDOT MS4 permit requires a high rate of sediment removal and properly designed and maintained ponds can achieve that goal. CDOT Maintenance does not want water quality vaults since they are confined spaces and difficult to clean. Currently, there are only three CDOT employees that have confined space training (CDOT 2006). Other permanent methods of providing water quality will be considered. They will include landscape buffers and shallow flat swales. Although they have lesser sediment removal rate than ponds, they can help remove sediment in peripheral areas where other options are not available (CDOT 2006).

The construction activity associated with the Proposed Action may require dewatering and ultimate discharge into Clear Creek. Potential temporary dewatering will require a General Permit from CDPHE for dewatering discharges, which prevents direct discharge to Clear Creek and therefore controls any possible contaminants that would have otherwise entered Clear Creek. Temporary sedimentation ponds or filtering apparatus may be needed to remove sediment from groundwater prior to discharge. In addition, concrete washout basins may be

constructed and used as needed to protect state waters, such as Clear Creek during construction. If dewatering is necessary, groundwater brought to the surface will be managed according to Section 107.25 Water Quality Control of the *CDOT Standard Specifications for Road and Bridge Construction* (CDOT 2005c). Additional details and the applicable references regarding water quality can be found in the *Water Resources Technical Report* (FHU 2006f).

## 4.11 Vegetation and Wildlife

This section describes vegetation and wildlife resources present within the study area. The information provided in the section is based upon information provided by resource agencies, available literature and reports, and site-specific field surveys. A more detailed and technical analysis can be found in the *Vegetation Technical Report* (FHU and NRSI 2006a) and the *Wildlife Technical Report* (FHU, et al. 2006a).

The information gathered was used to describe current conditions and identify impacts to vegetation and wildlife resources and to develop mitigation measures for any impacts. Impact assessment and recommended mitigation measures were based on applicable federal and state statutes including Federal Executive Order 13112 *Invasive Species*, Colorado Noxious Weed Act, Colorado Senate Bill 40, and Federal Endangered Species Act.

### 4.11.1 Current Conditions

#### *Vegetation*

The study area is located within the plains grassland/shortgrass prairie ecosystem. The site includes an urban riparian corridor along Clear Creek at the base of the foothills of the Colorado Front Range. It also includes associated irrigation ditches and a narrow strip of more xeric mixed grasslands and rabbitbrush dominated shrublands. Six major vegetative community types and thirteen sub-communities were identified within the study area. The major community types include:

- ▶ **Grass and Forb Dominated Communities.** These communities include areas that are dominated by a cover of native and non-native grass and forb species. Some individual tree and shrub species may be present although they represent a very small proportion of the total cover. In the study area, these are primarily previously disturbed and developed sites that may consist of former facilities including roads, landfills, aggregate mines, storage sites, and building sites. Some of these sites have been revegetated with native or introduced grass species, while others have been allowed to recover with minimal intervention.
- ▶ **Shrub Dominated Communities.** Shrub dominated communities include areas that are dominated by a cover of shrubby species with very little tree overstory. Grass and forb species may be present beneath the shrubby canopy and scattered individual trees may also be present but do not account for a significant portion of the total cover. The most common shrub species are rabbitbrush in xeric upland sites, and willow species in riparian sites. Tree species consist primarily of Siberian elm and Russian olive -in the drier sites and boxelder crack willow, and green ash in the wetter sites.

- ▶ **Tree Dominated Communities.** These communities include areas that are dominated by a cover of tree species. Often there is also an understory of woody shrub species and an herbaceous ground cover. Native and non-native deciduous hardwood species are the most common trees found in the study area. Cottonwood – box elder dominated areas are either composed of large widely spaced older trees with a more or less open and grassy understory (gallery forest or open woodland) or are dominated by a dense stands of mixed-age trees with understory vegetation varying from sparse to dense (riparian forest).
- ▶ **Aquatic Communities.** Aquatic plant communities within the study area included areas characterized by permanently saturated soil with predominately herbaceous emergent and aquatic plants. The dominant herbaceous species in these areas included cattails, bulrush, three-square rush, baltic rush, Dudley’s rush, sedges including Nebraska sedge, spikerush, reed canary grass, and a large variety of other forbs and grasses. Primary shrubs associated with these wetland areas included coyote willow, yellow willow, whiplash willow, and alder. Most of these areas were associated with the Clear Creek channel, irrigation ditches, and stormwater drainage ditches associated with SH 58 and its frontage road. Areas of wetlands dominated by emergent species with hydrophytic grasses, sedges, rushes and forbs were identified on bars and benches within the Clear Creek channel. Potential habitat for sensitive species including the federally threatened Ute ladies’-tresses orchid (*Spiranthes diluvialis*) and the federally threatened Colorado butterfly plant (*Gaura neomexicana coloradensis*) existed within these areas in the study area. Several shallow water ponds were also included in the aquatic communities.
- ▶ **Open Water Areas.** Deep water sites are represented within the study area by the Coors Lakes south of Clear Creek, which are reclaimed aggregate mining sites, that today are used for process water by Coors Brewing Company. These deep water holding ponds are largely unvegetated.
- ▶ **Highway Rights of Way and Residential/Commercial.** Highway right-of-way includes narrow strips of land bounded by roadways. These areas are typically mowed frequently and are characterized by highly disturbed and compacted soils and harsh growing conditions, therefore they generally harbor a variety of weedy grasses and noxious forb species. In the study area they are dominated by non-native weedy and noxious weed species including cheat grass, smooth brome, crested wheatgrass, yellow sweet clover, white sweet clover, kochia, field bindweed, and Siberian elm and Russian olive trees. Highway right-of-way was evaluated along SH 58, McIntyre Street, West 32<sup>nd</sup> Avenue, the Youngfield Street Service Road, 44<sup>th</sup> Avenue, and I-70.

One hundred ninety-two species of plants were field identified within the study area. This represents a minimum inventory of plant species. Of those, 69 species or 36 percent were non-native species, many of which are listed on the Colorado Department of Agriculture and the Jefferson County Noxious Weed Lists (CDOA 2006, Jefferson County 2006). Noxious weeds are further discussed in **4.12 Noxious Weeds**. Additional description is provided in the Vegetation Technical Report (FHU and NRSI 2006a).



## *Wildlife*

Information related to wildlife species occurrence and potential habitat was provided by the Colorado Division of Wildlife (CDOW) (CDOW 2005, Nesler 2005, Winkle 2005), the U.S. Department of Interior Fish and Wildlife Service (USFWS) (USFWS 2002), and the Colorado Natural Heritage Program (CNHP) (Anderson and Stevens 2000).

While most of the wildlife habitat in the study area has been degraded by human activity, the riparian corridor associated with Clear Creek still functions as an east-west wildlife movement corridor and provides habitat for a wide range of vegetative and wildlife species. Of the habitat types identified in the study area, riparian habitat has perhaps the highest wildlife value, i.e. utilization by the largest number of individual wildlife species. Although affected by fragmentation and development, it provides a continuous connection between habitats in the foothills and mountains to the west, including North Table Mountain Open Space, South Table Mountain Open Space, the Jefferson County Open Space Clear Creek Trail, and the City of Wheat Ridge Greenbelt immediately to the east.

SH 58 acts as a barrier to north-south wildlife movement of wildlife that may be moving along the Clear Creek corridor. Between 1994 and 2005, CDOT and the Colorado State Patrol recorded 20 animal/vehicle collisions along SH 58 between approximately McIntyre Street and I-70 (CDOT 2006). Of those 20 animal/vehicle collisions, 50 percent involved deer. The type of species involved in the other 50 percent of the animal/vehicle collisions is unknown.

Downstream of the study area, the City of Wheat Ridge Parks and Recreation Department identifies the preservation of wetland and riparian areas as a habitat goal in the city's Open Space Management Plan (City of Wheat Ridge and ERO Resources Corporation 2002). The wildlife goal in the plan includes land stewardship that incorporates strategies to enhance habitat and minimize the land use impacts on wildlife in the City of Wheat Ridge Greenbelt along Clear Creek. The JCPZ defines riparian habitat as a "maximum wildlife quality area" in its Central Plains Community Plan (JCPZ 2004). This plan specifies a development review policy that minimizes degradation of these areas, specifically by not blocking access to them or negatively impacting the habitat.

In an arid setting, this riparian area attracts a variety of wildlife species, many of which are dependent on wetlands for all or part of their life cycles. This connectivity is illustrated by the fact that both cougars and black bears have been observed in the City of Wheat Ridge along the City of Wheat Ridge Greenbelt (Anderson and Stevens 2000, City of Wheat Ridge and ERO Resources Corporation 2002). Clear Creek provides habitat for 17 fish species including populations of brown trout, rainbow trout, and the Iowa darter (*Etheostoma exile*), a state listed sensitive species (CDOW 2005, Winkle 2005). However, because Clear Creek serves as a conduit for surface water flows and stormwater drainage, overall water quality has been reduced from its natural condition. Clear Creek water quality is further discussed in **Section 4.10 Water Resources, Floodplains, and Water Quality**.

Wetland and riparian (streamside) areas occur throughout the study area and include cattail/emergent marshes, beaver ponds, irrigation ditches, stormwater drainage ditches, willow-dominated scrub-shrub wetlands, and cottonwood-dominated riparian communities. MDG and Associates (1995) detected the northern leopard frog (*Rana pipiens*) in the City of Wheat Ridge

Greenbelt to the east of the study area, but the northern leopard frog has not been found since (Anderson and Stevens 2002, City of Wheat Ridge and ERO Resources Corporation 2002). The only amphibians observed in the study area were bullfrogs and the Woodhouse's toad. Hammerson (1999) notes that bullfrogs have displaced northern leopard frogs in many locations in Colorado because bullfrogs are more aggressive toward other species including other amphibians and more tolerant of elevated levels of water pollution.

The Coors water storage ponds provide loafing and feeding habitat for a variety of waterfowl, gull, wading bird, and shorebird species as well as feeding habitat for bats and insect eating bird species such as swallows and swifts. The ponds are likely to be especially important during migration. Bald eagles (*Haliaeetus leucocephalus*), a federally threatened species; osprey; and belted kingfishers have been observed fishing in the ponds.

Upland habitats within the study area include open grass and forb dominated vegetative communities, shrub dominated communities and forested areas. Grass-forb communities in the study area are characterized by a high percentage of exotic and weedy species including many species listed on the Colorado and Jefferson County noxious weed lists (CDOA 2006, Jefferson County 2006). Shrub communities are dominated by coyote willow along the ditches and the Clear Creek channel and by rabbitbrush on the more xeric uplands. Forested areas are made up almost exclusively of hardwood species predominated by cottonwoods, crack willow, boxelder, and green ash. While not as productive as riparian areas, the upland areas provide habitats for a variety of rodent, rabbit, ungulate, and predatory mammals as well as well as a large number of seed and insect eating bird species. Raptors and owls also utilize these sites as hunting areas for capturing rodents and small birds as well as for roosting and nesting sites in the forested areas. No raptor nests were observed during the field surveys in September 2005.

The plant communities within the study area provide forage and cover for a number of migratory and breeding birds including the yellow warbler, whitebreasted nuthatch, northern shoveler, American kestrel, and screech owl. Birds represent the bulk of the vertebrate diversity within the area. Representative small mammals which may be present in the area include the deer mouse, eastern cottontail rabbit, and prairie vole (*Microtus ochrogaster*). Larger mammals and carnivores which may be commonly found in the area include white-tailed deer, mule deer, beaver, red foxes, coyotes, and raccoons. Abundant signs of the above mentioned carnivores, i.e., tracks and scats, were observed in 2005, and CNHP found all three species to be abundant immediately downstream in the City of Wheat Ridge Greenbelt (Anderson and Stevens 2000).

Given the habitat present, it was determined that the study area *may* be used at some stage in their life history by approximately 331 species of fish and wildlife. This number includes 17 species of fish, 7 species of amphibians, 21 species of reptiles, 221 avian species, and 59 species of mammals. Avian species represent the bulk of the vertebrate diversity identified in the study area. During field work, 73 vertebrate wildlife species were either sighted or detected in the study area including two fish species (the fathead minnow and the white sucker), two amphibian species (the bullfrog and Woodhouse's toad), and two reptile species (the fence lizard and the plains garter snake). Fifty-one species of birds and 16 species of mammals were field identified.

### 4.11.2 Environmental Consequences

#### *No-Action Alternative*

There would be no impacts to vegetation or wildlife under the No-Action Alternative. Impacts of other actions in the area, including local agency projects, are discussed in **Section 4.20 Cumulative Impacts**.

#### *Proposed Action*

Impervious area within the study area would increase an estimated 20.54 acres (0.032 square mile) due to the Proposed Action. The Proposed Action would primarily impact very low quality vegetative communities within existing roadway right-of-way and previously developed residential/commercial areas along the I-70 corridor, Youngfield Street, 32<sup>nd</sup> Avenue, and SH 58.

The SH 58/Cabela Drive interchange would permanently impact marginal upland wildlife habitat, which is presently characterized by an abundance of exotic weed forb species. Some non-jurisdictional long narrow wetland areas associated with stormwater drainage ditches on both sides of SH 58 would also be impacted by the interchange. These sites provide minimal benefit to wildlife species. The primary wildlife impacts under the Proposed Action would be temporary construction impacts during construction of the connection to Cabela Drive north of Clear Creek. Temporary impacts would include disturbance of upland and riparian habitat as well as disturbance caused by the noise and activity of construction. After the completion of the project, minimal impacts to wildlife habitat would occur. Permanent disturbance and wildlife access along the Clear Creek riparian movement corridor would be minimized.

### 4.11.3 Mitigation

To minimize the adverse impacts of disturbance to vegetation, the Proposed Action will follow CDOT revegetation practices. Disturbed areas are recommended to be seeded in phases throughout construction with a CDOT-approved native seed mix. Seeding will occur during appropriate seeding seasonal windows. If out of season, slopes will be temporarily protected from erosion with straw crimping, erosion blankets or with mulch and mulch tackifier. Permanent seeding will occur throughout the project, bringing areas to completion as soon as possible. Mitigation for impacts to riparian areas, including 1:1 replacement of trees greater than 2 inches in diameter, replacement of shrubs on an equivalent area (square footage) basis, and implementing BMPs such as performing channel work from above (not in-channel), revegetating disturbed areas, and chemical spill prevention, will be coordinated with CDOW as required by Senate Bill 40 (33-5-101-107 C.R.S. 1973 as amended). Tree and shrub replacement in other areas will be in accordance with the CDOT Region 6 and Jefferson County tree replacement policies, and the use of native species is recommended. Existing trees and shrubs in construction areas that are to remain will be protected with temporary orange mesh fencing. During the design phase, slope stability will be assessed to determine if the slope can be steepened to minimize impacts to existing vegetation.

To minimize animal/vehicle collisions with increased traffic along SH 58 in the vicinity of the new SH 58/Cabela Drive interchange, alternate fencing and landscaping plans will be investigated during final design to deter north-south wildlife movement. Vegetation palatable to wildlife will be avoided in the revegetation of roadway medians and rights-of-way.

#### **4.12 Noxious Weeds**

This section describes noxious weeds within the project area. The information provided in the section is based upon available literature, reports, and site-specific field surveys conducted for the project. The information gathered was used to describe current conditions and identify impacts associated with construction activities which may increase the spread of noxious weeds. Impact assessment and recommended mitigation measures were based on applicable federal and state statutes including Federal Executive Order 13112 Invasive Species, Colorado Noxious Weed Act, and Jefferson County Noxious Weed List. Additional detail and analysis is provided in the *Integrated Weed Management Plan for Noxious Weeds* (FHU and NRSI 2006c).

Noxious weeds are non-native invasive plant species that have been introduced into an environment with few, if any, controls and which are likely to cause economic or environmental harm or harm to human health. Noxious weeds generally have a competitive advantage in dominating and crowding out native plant species and can threaten the integrity of native plant communities. Noxious weeds are aggressive, spread rapidly, reproduce profusely, and resist control and management measures. Because of the adverse environmental effects of weeds, both the federal and state governments have issued regulations regarding noxious weeds. FHWA guidance (August 10, 1999) requires consideration of noxious weed species in the project area. This includes mapping all existing invasive weed populations within on or adjacent to the project site and an analysis of the potential impact of disturbances caused by project construction and the spread of weeds.

##### ***Presidential Executive Order 13112 – Invasive Species***

Executive Order 13112, Invasive Species, was issued on February 3, 1999 to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that result from invasive species. This order directs federal agencies to prevent the introduction of invasive species, control and monitor invasive species, and restore native species and habitats that have been invaded (FHWA 1999).

##### ***Colorado Noxious Weed Act***

The Colorado Noxious Weed Act, §§ 35-5.5-101 through 119, C.R.S. (2003) as amended, states that all landowners must manage noxious weeds that may be damaging to adjacent landowners. Rules pertaining to administration of the Act include three lists of noxious weed species (CDOA 2006). The A List contains 18 species of noxious weeds targeted for eradication within Colorado. If individuals or populations of A List species are found, the local governing body must provide the State Weed Coordinator with mapping that includes information on location and density of the infestation. The B List contains 39 species that the state of Colorado has targeted for control rather than eradication (i.e. containment or



suppression depending on location). The C List contains 14 species for which the State will provide support and funding for local control efforts.

#### *Jefferson County Noxious Weed List*

The *Jefferson County Noxious Weed List* (Jefferson County 2006) contains a local list of noxious weeds which have been identified by Jefferson County for eradication (8 species), control (9 species) or as weed species of special concern (3 species).

#### **4.12.1 Current Conditions**

A noxious weed survey was conducted in the project area between August 30 and September 26, 2005. Noxious weed species were identified; locations were mapped; and weed species densities were recorded at each location. The field survey resulted in the identification of 24 noxious weed species that are listed on the *Colorado Noxious Weed Lists A, B and C* (CDOA 2006) (see **Table 4-18**). Sixteen of these species are listed on the *Jefferson County Weed List* as shown in the table. Ten of the species found in the project area are listed on the *Jefferson County List* as requiring control and three species, cypress spurge, myrtle spurge and salt cedar, are listed by Jefferson County as requiring eradication (Jefferson County 2006).

Table 4-18 Noxious Weed Species Identified in the Project Area

Scientific Name	Common Name	Colorado Weed List A, B or C? <sup>1</sup>	Jefferson County Weed List Requirements <sup>2</sup>	Listed by the City of Wheat Ridge <sup>3</sup>	Listed on the CDOT Maintenance Program Noxious Weed List <sup>4</sup>
<i>Arctium minus</i>	Common burdock	C			
<i>Bromus tectorum</i>	Downy brome (Cheatgrass)	C			
<i>Cardaria draba</i>	Whitetop (Hoary cress)	B	Control Required		Yes
<i>Carduus nutans</i>	Musk thistle	B	Control Required	Yes	Yes
<i>Centaurea (Acosta) diffusa</i>	Diffuse knapweed	B	Control Required	Yes	Yes
<i>Cichorium intybus</i>	Chickory	C			
<i>Cirsium arvense</i>	Canada thistle	B	Control Required	Yes	Yes
<i>Cirsium vulgare</i>	Bull thistle	B		Yes	Yes
<i>Clematis orientalis</i>	Chinese clematis	B	Control Required	Yes	Yes
<i>Conium maculatum</i>	Poison hemlock	C		Yes	
<i>Convolvulus arvensis</i>	Field bindweed	C			Yes
<i>Cynoglossum officinale</i>	Houndstongue	B	Control Required		Yes
<i>Dipsacus fullonum</i>	Common teasel	B	Control Required	Yes	
<i>Dipsacus laciniatus</i>	Cut-leaf teasel	B	Control Required	Yes	
<i>Elaeagnus angustifolia</i>	Russian olive	B		Yes	Yes
<i>Euphorbia cyparissias</i>	Cypress spurge	A	Eradication required		
<i>Euphorbia esula</i>	Leafy spurge	B	Control Required	Yes	Yes
<i>Euphorbia myrsinites</i>	Myrtle spurge	A	Eradication required		Yes
<i>Linaria genistifolia</i>	Dalmatian toadflax	B	Weed of Concern	Yes	Yes
<i>Linaria vulgaris</i>	Yellow toadflax	B	Weed of Concern	Yes	Yes
<i>Onopordum acanthium</i>	Scotch thistle	B	Control Required	Yes	Yes
<i>Saponaria officinalis</i>	Bouncingbet	B			
<i>Tamarix ramosissima</i>	Salt cedar (Tamarisk)	B	Eradication required	Yes	Yes
<i>Verbascum thapsus</i>	Common mullein	C	Weed of concern		

<sup>1</sup> Colorado Department of Agriculture (2006).  
<sup>2</sup> Jefferson County (2006).  
<sup>3</sup> City of Wheat Ridge and ERO Resources Corporation (2002).  
<sup>4</sup> Colorado Department of Transportation (2006)

## 4.12.2 Environmental Consequences

### *No-Action Alternative*

There will be no adverse impacts to or from noxious weeds by the No-Action Alternative.

### *Proposed Action*

Since most of the construction for the Proposed Action would occur in upland vegetative communities that consist mostly of noxious weed/exotic grass associations, the project could spread local noxious weed populations by creating disturbed ground that is conducive to the spread of many of the noxious species. Seeds and vegetative fragments of weed species could also be spread to new areas by equipment during the construction phase. If replanting disturbed areas and right-of-way with native grasses, forbs, shrubs and trees is included in mitigation and erosion control requirements after construction is completed, a net improvement of existing vegetative communities could be realized through the reduction of local weed populations in those areas. The long term consequences of implementing the Proposed Action for vegetative communities within the project area should, therefore, be minimal to positive.

## 4.12.3 Mitigation

In compliance with Executive Order 13112 and the Colorado Noxious Weed Act, the *Integrated Weed Management Plan for Noxious Weeds* will be implemented for the Proposed Action. The *Integrated Weed Management Plan for Noxious Weeds* includes a variety of control methods depending on species found, size of the populations, and the surrounding landscape. Some of these control methods will include mechanical methods, such as cutting or pulling and removing noxious weeds, mowing, and discing; or chemical methods using carefully selected and applied herbicides that are targeted for particular species and growth stages if possible.

The *Integrated Weed Management Plan for Noxious Weeds* includes the following actions to control noxious weeds in the project area:

- ▶ All construction vehicles will be cleaned of all soil and plant parts before entering the construction site to avoid the spread of noxious weeds
- ▶ Disturbance to existing vegetation will be limited as much as practicable
- ▶ Weeds-infested areas targeted for disturbance will be treated with herbicide prior to ground disturbance or the topsoil be hauled off-site or used as roadway fill
- ▶ Topsoil salvaged from the project area for reuse will be from areas free of noxious weeds or treated for pre- and post-emergent weeds prior to disturbance. Areas free of weeds will be identified prior to beginning construction
- ▶ Temporary fences will be installed to limit construction traffic in weed-infested areas in an effort to reduce erosion and the spread of weeds
- ▶ Any imported topsoil will first be treated with pre- and post-emergent herbicides before being used on the project site

- ▶ Keep on site all topsoil which is collected from the site and which is to be reapplied after construction during the landscaping phase to prevent dispersal of weed seeds and cuttings. If topsoil remains stockpiled for more than one month, the stockpile will be seeded oats (*Avena sativa*) or mulch and mulch tackifier or soil binder will be applied to the stockpile. Toes of slopes on stockpiles will be protected with sediment control BMPs
- ▶ Only certified weed-free mulch will be used. The mulch will be certified under the Colorado Department of Agriculture Weed Free Forage Certification Program and inspected, as regulated by the Weed Free Forage Act, Title 35, Article 27.5, C.R.S

### 4.13 Special Status Species

Threatened, endangered, and special status wildlife and plant species that are addressed in this section are defined as follows:

#### *Federal Threatened or Endangered Species*

These are species that are federally listed as threatened or endangered and those that are proposed or are candidates for listing under the Endangered Species Act of 1973 as amended (16 U.S.C. 1531 *et seq.*). The Endangered Species Act provides protection to designated species and includes protection of critical habitat necessary for a species' persistence. Critical habitat is defined as "areas of a listed species' habitat that are designated as essential for the conservation of that species and which may require special management considerations or protection" [16 USC § 1532(5A)]. A government action that "may affect" a threatened or endangered species or its critical habitat requires consultation with the USFWS pursuant to Section 7 of the Endangered Species Act. Federally listed threatened or endangered species are defined as follows:

- ▶ **Federal Endangered** species are species which are in danger of extinction throughout all or significant portions of their range [16 USC § 1532(6)].
- ▶ **Federal Threatened** species are species which are likely to become an endangered species within the foreseeable future throughout all or a significant portion of their range [16 USC § 1532(20)].
- ▶ **Federal Proposed** species are those for which the USFWS has received adequate information for listing as either threatened or endangered and for which a proposed rule has been published in the Federal Register.
- ▶ **Federal Candidate** species for listing are species for which the USFWS has on file sufficient information on biological vulnerability or threats to support a proposal to list as endangered or threatened, but for which development of a proposed listing regulation is precluded by other higher priority listing activities (USFWS 1983).



*State Threatened, Endangered or Species of Special Concern*

State listed species are listed by the CDOW as threatened, endangered, or as species of special concern pursuant to the Colorado Wildlife Commission Regulations, Chapter 10. The State of Colorado designates threatened and endangered animal species under the authority of CRS 33-2-105 and Colorado Wildlife Commission Regulations Chapter 10, Article IIA. The List is compiled by CDOW biologists and automatically includes species listed under the Endangered Species Act. Colorado listed species are defined as follows:

- ▶ **State Endangered** species or subspecies are those whose prospects for survival or recruitment within the state are in jeopardy.
- ▶ **State Threatened** species or subspecies are those not in immediate jeopardy of extinction but which are vulnerable because there are small numbers, restricted ranges, low recruitment, or low survival.
- ▶ **State Species of Concern** are species that have been removed from state listing within the last five years, are proposed for federal listing or as candidates, or have experienced a decline in distribution or density.

*Colorado Natural Heritage Program (CNHP) Ranked Species*

CNHP has developed its own ranking system with global imperilment ranks that are based on the range-wide status of a species and state imperilment ranks based on the status of a species within the state of Colorado. CNHP global/state imperilment ranks are listed as follows:

- ▶ **G1/S1** – Critically imperiled globally/statewide because of rarity (5 or fewer occurrences in the world/state; or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction.
- ▶ **G2/S2** – Imperiled globally/statewide because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range.
- ▶ **G3/S3** – Vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences).
- ▶ **G4/S4** – Apparently secure globally/statewide, though it might be quite rare in parts of its range, especially at the periphery.
- ▶ **G5/S5** – Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Impact assessment and recommended mitigation measures for these species are based upon applicable federal statutes, treaties and conventions, state statutes, and interstate Memoranda of Agreement. In addition to the Endangered Species Act and state statutes, these include:

- ▶ **Migratory Bird Treaties and Conventions:** The U.S. Government has signed several treaties with its neighbors for the conservation of migratory birds. In 1916, the Secretary of State negotiated the Convention for the Protection of Migratory Birds with Great Britain on behalf of Canada that provided protection to birds migrating between Canada and the United States [39 Statutes at large (stat.) 17002, Treaty Series (T.S.) No 628]. . The Canadian Convention was supplemented in 1936 by the Convention for the Protection of Migratory Birds and Game Mammals-Mexico (50 Stat. 1311, T.S. No 912). The Convention for the Protection of Birds in Danger of Extinction and Their Environment was implemented with Japan in 1972 [25 United States Treaty (U.S.T) 3329 Treaties and Other International Acts Series (T.I.A.S.) No. 990] and the Convention Concerning the Conservation of Migratory Birds and Their Environment was implemented with the Union of Soviet Socialist Republics in 1976 (19 U.S.T. 4647, T.I.A.S. No. 5604). The treaties are implemented by the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§703-712 [Supp. III 1979]) which makes it unlawful among other things, “to hunt, take, capture, kill, . . . [or] possess” any bird protected by the Convention except as permitted (MBTA, 16 U.S.C. §703). The treaties provide for protecting migratory bird habitat from pollution, conversion and degradation as well as “. . . establish(ing) preserves, refuges, protected areas . . . intended for the conservation of migratory birds and their environments, and to manage such areas so as to preserve and restore the natural ecosystems”. As amended in the 1972 and 1979 treaties with Mexico and the Soviet Union, all of the treaties apply to raptors including bald eagles.
- ▶ **The Bald and Golden Eagle Protection Act:** The Bald and Golden Eagle Protection Act (16 USC 668 et. Seq.) and its associated regulations govern the taking, possession, and transportation of eagles. (§ 668c defines “take” to include “...or molest or disturb...”).
- ▶ **Northern States Bald Eagle Recovery Plan:** This plan, established in 1983 defines the actions the federal government will take to facilitate the recovery of the Bald Eagle in the northern states (Grier et al. 1983).
- ▶ **South Platte River Basin Program:** In 1994, the Department of the Interior entered into a Memorandum of Agreement with Colorado, Nebraska, and Wyoming to establish the Platte River Basin Program (Sidle and Faanes 1997). Its primary focus is to address the needs of federally-listed species along the central Platte River. However, another goal is to protect and improve habitats of non-listed species of concern to try to prevent the possibility of future listings (Sidle and Faanes 1997).

#### 4.13.1 Current Conditions

An assessment of special status and sensitive plant and wildlife species identified by federal and state agencies as potentially found in Jefferson County was conducted in the study area. A list of threatened, endangered, and special concern species that might be found in the study area was prepared based on interviews with USFWS, CDOW, and CNHP officials and a review of the existing literature. Information related to special status wildlife and plant species occurrence and potential habitat was provided by CDOW (CDOW 2003, Nesler 2005, and Winkle 2005), USFWS (USFWS 2002), and CNHP (CNHP 2004, CNHP 2005).

A number of sensitive species surveys and biological assessments have been completed within or adjacent to the study area since 1998. These have included several presence/absence surveys for the Preble's meadow jumping mouse and the Ute ladies'-tresses orchid as well as

several general surveys for sensitive wildlife and plant species. These surveys were reviewed and cited as necessary.

#### 4.13.1.1 Critical Habitat

No federally designated critical habitat for any wildlife or plant species exists within the study area or its immediate vicinity.

#### 4.13.1.2 Evaluated Species

Initially considered species included federally listed threatened, endangered and candidate species identified by the USFWS (USFWS 2002), state listed species identified by CDOW (CDOW 2003) and special status species listed by the CNHP (CNHP 2004, CNHP 2005) that potentially may be found in Jefferson County, Colorado or that could be affected by depletions to the Platte River basin. Species that are listed as federally threatened or endangered, but that have been extirpated from Colorado, were not included in the analysis. Several other species, potentially occurring in Jefferson County, were also excluded from consideration as occurring within the study area for reasons provided as follows:

- ▶ The Canada lynx (*Lynx canadensis*) is listed as a federally threatened species with potential to occur in Jefferson County, Colorado. The lynx requires sub-alpine forested areas and is very unlikely to occur in the study area (CDOW 2003).
- ▶ The Mexican spotted owl (*Strix occidentalis lucida*) is a federally listed threatened species with potential to occur in Jefferson County. The species prefers heavily forested mountainous areas and rocky canyons, however, and is very unlikely to occur within the study area (CDOW 2003).
- ▶ The pallid sturgeon (*Scaphirhynchus albus*), is a federally listed endangered species, that could potentially be affected by depletions to the Platte River basin. The pallid sturgeon is found in the larger turbid stream channels of the Missouri/Mississippi River drainage system of which the South Platte River basin is a part (Dryer and Sandvol 1993). The species is highly unlikely to be found in Clear Creek within the study area, however. The pallid sturgeon along with the least tern (*Sterna antillarum*), the piping plover (*Charadrius melodus*), and the whooping crane (*Grus americana*) are provided federal legal protection from water flow depletions to the Platte River basin under the Endangered Species Act.
- ▶ The Pawnee montane skipper (*Hesperia leonardus montana*) is listed as federally threatened (USFWS 1987) and is also listed as a species that is found in Jefferson County (USFWS 2002). The study area is located outside the very restricted habitat (Pikes Peak granite outcroppings) of this butterfly.

Eleven sensitive wildlife and plant species and one sensitive plant community (see **Table 4-19**) were identified as having the potential to occur within the study area (FHU, et al. 2006b). The likelihood of occurrence of each of these species in the study area during the survey period was determined by the presence of suitable habitat, known distribution records, and relative abundance.

Table 4-19 Presence/Absence Status of Evaluated Special Status Species

Common Name	Scientific Name	Status	Occurrence in the Study Area	Comments
<b>BIRDS:</b>				
Bald eagle	<i>Haliaeetus leucocephalus</i>	FT	Occasional	Observed in vicinity
Ferruginous hawk	<i>Buteo regalis</i>	CO-SC G4/S3	Occasional	Observed in vicinity
Least tern	<i>Sterna antillarum</i>	FE	None	Provided federal legal protection from water flow depletions to the Platte River
Piping plover	<i>Charadrius melodus</i>	FT	None	Provided federal legal protection from water flow depletions to the Platte River
Whooping crane	<i>Grus americana</i>	FE	None	Provided federal legal protection from water flow depletions to the Platte River
<b>MAMMALS:</b>				
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	FT	None	Habitat survey completed. Suitable habitat not present.
<b>HERPETOFAUNA:</b>				
Common garter snake	<i>Thamnophis sirtalis</i>	CO-SC	Possible	Suitable habitat present. Verified in the vicinity.
Northern leopard frog	<i>Rana pipiens</i>	CO-SC G5/S3	Possible	Suitable habitat present. Verified in the vicinity.
<b>FISH:</b>				
Pallid sturgeon	<i>Scaphirhynchus albus</i>	FE	None	Provided federal legal protection from water flow depletions to the Platte River
Common shiner	<i>Luxilus cornutus</i>	CO-ST	Stocked	Verified stocked in small pond within the study area since 2000.
Iowa darter	<i>Etheostoma exile</i>	CO-SC	None Known	Verified in Clear Creek but not in the study area.
Northern redbelly dace	<i>Phoxinus eos</i>	CO-SE	Stocked	Verified stocked in small pond within the study area since 2000.
<b>INSECTS:</b>				
Hops feeding azure	<i>Celastrina humulus</i>	CNHP G2/S2	None Known	Potential habitat verified in the study area.



Table 4-19 Presence/Absence Status of Evaluated Special Status Species (Continued)

Common Name	Scientific Name	Status	Occurrence in the Study Area	Comments
<b>PLANTS:</b>				
Colorado butterfly plant	<i>Gaura neomexicana</i> ssp. <i>Coloradensis</i>	FT	None Known	Survey completed in the study area. Potential habitat verified.
Ute ladies'-tresses orchid	<i>Spiranthes diluvialis</i>	FT	None Known	Survey completed in the study area. Potential habitat verified.
Fork-tip three awn	<i>Aristida basiramea</i>	CNHP G5S1	Possible	Survey completed in the study area. Potential habitat verified.
<b>PLANT COMMUNITIES:</b>				
Cottonwood/snowberry	<i>Populus deltoids</i> / <i>Symphoricarpos occidentalis</i>	CNHP G2/G3	Yes	Potential habitat in vicinity.
<b>Status Codes</b>				
FE – Federal Endangered		FT – Federal Threatened		
CO-SE – Colorado State Endangered		CO-ST – Colorado State Threatened		
CO-SC – Colorado Species of Concern				
Source: FHU et. al. 2006b				

- ▶ **Bald eagle** (*Haliaeetus leucocephalus*). Bald eagles are a federally listed threatened species which are opportunistic feeders, fish being the primary diet. Access to food and roosts in large mature trees are critical elements of bald eagle habitat (CDOW 2005). The study area contains large ponds and lakes and a number of large mature trees which provide potential habitat. Eagles have been sporadically sighted in the study area fishing in the ponds in the recent past (Gillihan 2005).
- ▶ **Ferruginous hawk** (*Buteo regalis*). The ferruginous hawk is listed as a Colorado Species of Concern by CDOW. The hawk is an uncommon, locally distributed hawk which utilizes grasslands, sagebrush and desert scrub habitats in the Great Plains and the Great Basin. In Colorado, ferruginous hawks are most often associated with prairie dogs as a food source (Preston and Beane 1996). While the study area is located within the range of the species, no suitable habitat or prairie dog towns were identified at the site in 2005. No raptor nests were observed in the study area during the field surveys in September 2005.
- ▶ **Preble's meadow jumping mouse** (*Zapus hudsonius preblei*). The Preble's meadow jumping mouse is a rare federally threatened subspecies of jumping mouse whose distribution is limited to portions of Colorado and Wyoming. The range of the Preble's meadow jumping mouse includes much of Jefferson County. The study area was determined to lie just outside the Preble's meadow jumping mouse Block Clearance Zone established by the USFWS for the Denver Metropolitan Area (ERO 2003). Several surveys for the Preble's meadow jumping mouse and potential habitat have been conducted within and adjacent to the Study area since 1998 with negative results (Anderson and Stevens 2000; Beane 1998; FHU et. Al. 2005a; FHU et. Al. 2005b; Savage and Savage, Inc. 2004a, USFWS 2005a, Weiland Sugnet, Inc. 2001a). Final ruling on critical habitat for the Preble's

meadow jumping mouse was published in the Federal Register on June 23, 2003 (USFWS 2003).

- ▶ **Common garter snake** (*Thamnophis sirtalis*). The common garter snake is listed by CDOW as a Colorado Species of Concern. The species inhabits many environments including grassland, woodland, farms, city lots, scrub, and chaparral but is most frequently found near wet areas and streams. The common garter snake occurs in northeast Colorado along the South Platte River and its tributaries below 6000 feet and in Yuma County. While the species was not confirmed in the study area, potential habitat exists.
- ▶ **Northern leopard frog** (*Rana pipiens*). This species is a small frog which inhabits permanent water bodies in eastern Colorado. The frog is listed as a Colorado Species of Concern by CDOW and as a U.S. Forest Service sensitive species in Colorado. No individuals were identified in the vicinity of the study area in 2002 (Anderson and Stevens 2000) or during surveys conducted in the study area in 2001 (CH2M HILL 2001b) and in 2005 (FHU et. al. 2006b). Potential habitat was located in the study area.
- ▶ **Common shiner** (*Luxilus cornutus*). The common shiner is a small minnow which prefers shaded streams of moderate gradient with cool, clear water and gravel bottoms. It is listed by CDOW as a Colorado Threatened Species. The species is found from New England and Nova Scotia, south to Virginia and west to Colorado. It is native to the South Platte River drainage in Colorado. Some individuals were stocked by CDOW in a small pond in the study area between 2000 and 2005, but the species has not been identified in Clear Creek (Winkle 2005).
- ▶ **Iowa darter** (*Etheostoma exile*). The Iowa darter is a small perch species which is listed as a Colorado Species of Concern by CDOW. The fish prefers cool, clear, slow moving water over a sand or organic matter substrate. Populations in Colorado are found in lakes and in streams with vegetation along the bank extending into the water. The species range extends from New York westward to Colorado, Wyoming and Montana. The range in Colorado is limited to some plains streams in northeastern Colorado. The Iowa darter has been captured in Clear Creek in the vicinity of the study area (Winkle 2005).
- ▶ **Northern redbelly dace** (*Phoxinus eos*). This small fish species is listed as a Colorado Endangered Species by CDOW. The northern redbelly dace requires cool, clear vegetated ponds or slow moving streams with a sand substrate. The range of the species extends across the northern U.S. and southern Canada to the South Platte River basin in eastern Colorado. The fish was stocked by CDOW in a small isolated pond in the study area between 2000 and 2005 but has not been identified in Clear Creek (Winkle 2005).
- ▶ **Hops feeding azure** (*Celastrina humulus*); **Fork-tip three awn** (*Aristida basiramea*); **Cottonwood/Western snowberry plant association** (*Populus deltoides/Symphoricarpos occidentalis*). These species and plant communities are listed as sensitive by CNHP. The hops feeding azure is a rare butterfly which is found in higher mountain foothill canyons along the Front Range of Colorado and is associated with permanent water and patches of hops. The hops feeding azure is not likely to occur in the study area because they are typically found in steep ravines at the somewhat higher elevations. The fork-tip three awn is uncommon in Colorado but is found throughout eastern North America. It is intolerant of competition from other plants and is unable to survive in areas of dense plant cover or shade. The species has not been identified during searches in the vicinity of the study area (Anderson and Stevens 2000; FHU et. al. 2006b). The cottonwood/western snowberry plant

association is a sensitive vegetative community which is tracked by CNHP. It is typically found in Colorado in low elevation floodplains. Several very small isolated patches of this community were located along drainage ditches within the study area (FHU et. al. 2006b).

- ▶ **Colorado butterfly plant** (*Gaura neomexicana coloradensis*). The Colorado butterfly plant is a federally listed threatened species which occurs in habitat associated with the floodplains of wide stream channels in eastern Colorado and Wyoming and western Nebraska. The study area is located at the southern end of the accepted range. A survey was conducted by NRSI in the study area for the Colorado butterfly plant and, while no plants were identified, potential habitat was found along the channel of Clear Creek (FHU et. al 2005b). The potential Colorado butterfly plant habitat is identified on **Figure 4-24**.
- ▶ **Ute ladies'-tresses orchid** (*Spiranthes diluvialis*). The Ute ladies'-tresses orchid is a federally listed threatened plant that occurs on sub-irrigated soils along streams and in wet meadows in floodplains in Colorado, Idaho, Montana, Nebraska, Utah, Washington, and Wyoming. Populations have been located along Clear Creek to the west and east of the study area (Anderson and Stevens 2000). No plants were identified within the study area during surveys conducted between 2000 and 2005 (CH2MHILL 2001; FHU, et. Al. 2005b; Savage and Savage, Inc. 2004b, Savage and Savage, Inc. 2004c, Weiland Sugnet 2001b), but potential habitat was identified along Clear Creek in 2001 (Weiland Sugnet 2001b) and 2005 (FHU et. al. 2006b). The potential Ute ladies'-tresses orchid habitat is identified on **Figure 4-24**.

#### 4.13.2 Environmental Consequences

##### *No-Action Alternative*

There would be no impacts to threatened or endangered species under the No-Action Alternative.

##### *Proposed Action*

The Proposed Action would primarily impact weedy grassland that has already been severely impacted by mining and industrial uses in the past. Although potential habitat for the Colorado butterfly plant and the Ute ladies'-tresses orchid was identified along Clear Creek, the Proposed Action would not impact any potential habitat for these federally threatened or endangered plant species. The Proposed Action would not impact any active roosting or nesting sites for the Bald Eagle, which utilizes the study area sporadically and opportunistically, although suitable roosting and nesting trees exist in that area. Since no water depletions of Clear Creek and consequently the South Platte River basin would occur under the Proposed Action, there would be no impacts to downstream South Platte River federally threatened or endangered species or critical habitat. Therefore, the Proposed Action would have no effect on any threatened or endangered species.

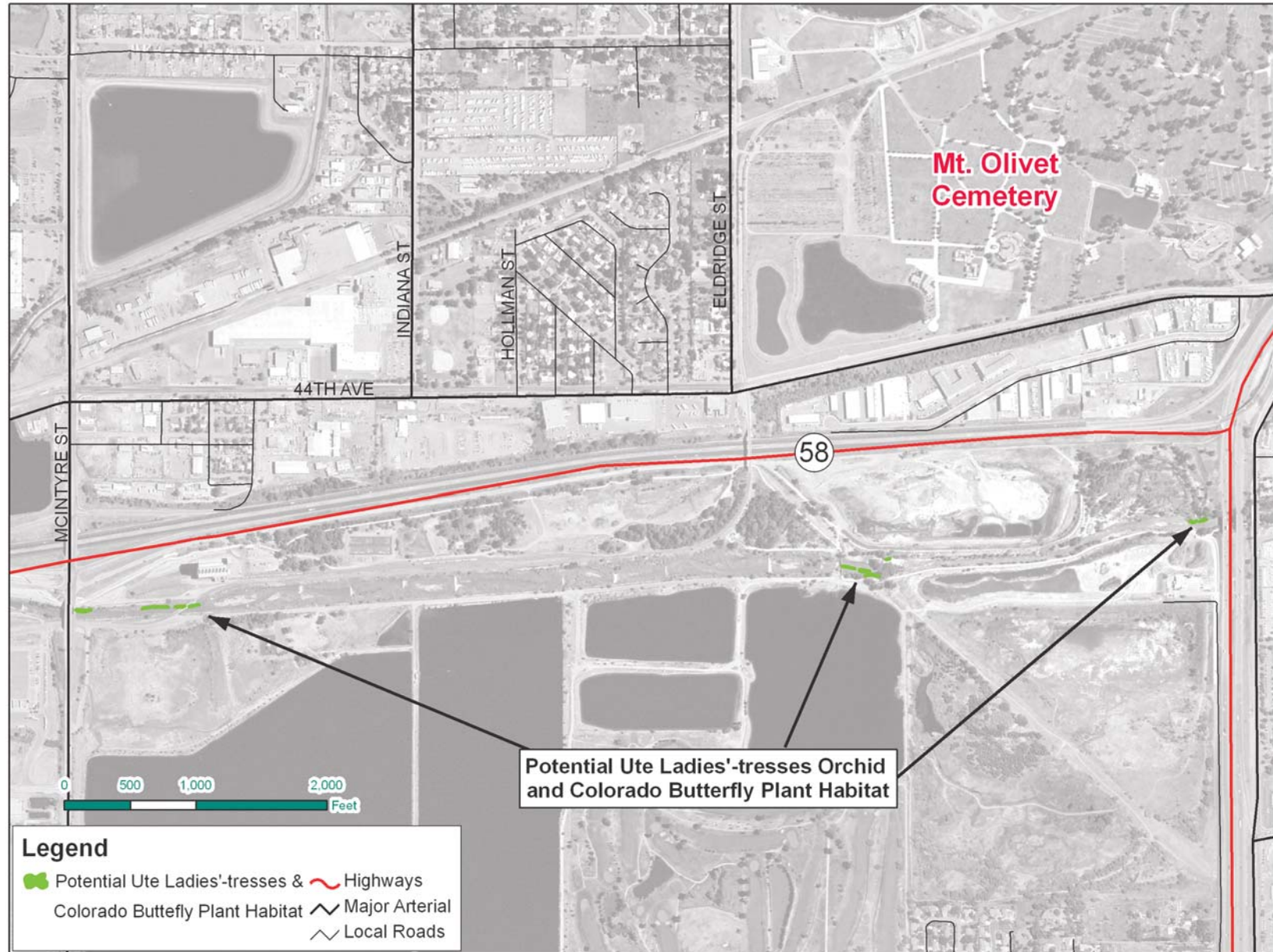


Figure 4-24

**Potential Ute Ladies'-tresses Orchid and Colorado Butterfly Plant Habitat**



North SOURCE: FHU et al 2006b



The most significant impacts to migratory birds would be associated with the loss of several large trees in the vicinity of the proposed SH 58/Cabela Drive interchange, primarily cottonwoods, which may provide roosting, feeding and possibly nesting habitat. Construction could potentially result in a take, or loss of, active migratory bird nests. No permit from the USFWS is required for removal of inactive nests other than eagle nests, and the USFWS generally will not permit removal of an active nest unless justifiable to protect human health and safety.

#### 4.13.3 Mitigation

Some potential conflicts with MBTA requirements may occur during the course of construction of the Proposed Action during the removal of large trees which provide nesting sites for migratory bird species. To avoid violating MBTA “take” requirements, (i.e. damage, destruction, or causing the abandonment of an active nest), a thorough survey of the project area will need to be completed between April 1 (February for raptors) and August 15, prior to the initiation of construction activities to determine whether any active nests are present. If active nests are found to be present, construction will not be allowed to begin near active nests until all nestlings have fledged. If construction is to occur during the breeding season for migratory birds, then all protected birds must be prevented from achieving an active nest prior to and during that breeding season. If occupied nests are observed during construction, no work can occur that would impact the nests. No permit from the USFWS is required for removal of inactive nests, other than eagle nests, and the USFWS will generally not permit the removal of an active nest unless justifiable to protect human health and safety. Habitat disturbing activities, such as tree removal, grading, scraping, grubbing, etc. may be conducted during the non-breeding season (August 15 to March) unless the area has been verified by a qualified biologist that no active nests are present. Some owl species may nest during the late winter months, however.

#### 4.14 Wetlands and Other Waters of the U.S.

Wetland resources are protected under Section 404 of the Clean Water Act (33 U.S.C. 1344) and Executive Order 11990 *Protection of Wetlands* (USEPA 1977). The Clean Water Act requires coordination with the U.S. Army Corps of Engineers (USACE) and resource agencies such as the USEPA and the USFWS when impacts occur to wetlands that are considered Waters of the U.S. The U.S. Department of Transportation Order 5660.1A *Preservation of the Nation’s Wetlands* (USDOT 1978), provides guidance on wetland mitigation assessment. CDOT has incorporated this and other FHWA environmental guidance into its *Environmental Stewardship Guide* (CDOT 2005d), which emphasizes efforts to avoid and minimize wetland impacts.

An onsite assessment of the study area for the presence of jurisdictional and non-jurisdictional wetlands as defined under Section 404 of the Clean Water Act was conducted (FHU and NRSI 2006d). A delineation of the boundaries of all wetlands located within relevant areas of the Study area, using procedures described in the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), was completed during the same period.

Preliminary data collection included:

- ▶ Inspection of copies of NRCS soils maps and local hydric soils lists obtained from the NRCS, Lakewood, Colorado office
- ▶ Inspection of USGS 7.5 minute topographic quadrangle sheets (Golden, CO quad)
- ▶ Inspection of 2004 aerial orthophotography
- ▶ Inspection of USFWS National Wetland Inventory quad maps (USFWS Golden, CO quad)
- ▶ A literature review of documents relating to the past history of the study area

These data were used for reference during the onsite wetland delineation. Routine Onsite Wetland Determination procedures as outlined in the Corps of Engineers *Wetlands Delineation Manual* (Environmental Laboratory 1987) were utilized to delineate the wetland boundaries within the study area. Onsite sampling procedures included:

- ▶ Visual inspection of the soils, hydrology, and flora of the overall project site and specific designated sampling points
- ▶ Completion of a USACE approved data form for Routine Onsite Wetland Determination for each sample point
- ▶ Sample points were selected at representative sites within identified wetlands using procedures described in the 1987 Delineation Manual (Environmental Laboratory 1987) for areas of less than five acres in size

A wetland delineation report was prepared subsequent to the field delineations (FHU and NRSI 2006d). The delineation report presents results in greater detail.

#### **4.14.1 Current Conditions**

Wetlands and riparian areas occur throughout the study area and include a number of vegetative community types. The approximate boundaries for thirty-three wetlands were delineated within the study area. The characteristics of these wetlands are summarized in **Table 4-20**. The delineated portions of the 33 wetlands included a total of approximately 164,000 ft<sup>2</sup> (3.76 acres). As indicated in **Table 4-20**, wetlands in the study area each fall into one of three generally recognized classifications (Cowardin et al. 1979). These are palustrine emergent, palustrine scrub-shrub, and palustrine forested.

The USACE determined that the wetland areas identified in the *I-70/32<sup>nd</sup> Avenue Interchange Environmental Assessment Wetland Delineation Report* (FHU and NRSI 2006) as wetlands B-1, C-1, C-2, C-3, C-4, C-5, C-6, C-7, and N-1 (see **Table 4-20** and **Figures 4-23, 4-24, 4-25, and 4-26**) are jurisdictional (USACE 2006). The hydrology of these wetlands was determined to be directly connected to Clear Creek, a Water of the U.S.

The remaining delineated wetlands, i.e. Wetlands A-2, A-3, A-4, D-1, E-1, E-2, F-1, G-1, H-1, I-1, I-2, I-3, I-4, I-5, J-1, J-2, J-3, J-4, K-1, K-2, K-3, K-4, L-1, and M-1 (see **Table 4-20** and **Figures 4-25, 4-26, 4-27, and 4-28**) are non-jurisdictional (USACE 2006). The hydrology of these wetlands was determined to be either isolated (Wetlands A-2, A-3, A-4, D-1, K-3, and K-4) and covered by the Solid Waste Agency of Northern Cook County (SWANCC) ruling (531 U.S. 159 [2001]) guidance (USEPA and USACE 2003) or associated with water flow into irrigation ditches with no return flow into waters of the U.S. (also covered by the SWANCC guidance). Physical characteristics and estimated jurisdictional status for all delineated wetlands are provided in **Table 4-20**.

**Table 4-20 Physical Characteristics of Wetlands Delineated**

Wetland ID <sup>1</sup>	Wetland Type <sup>2</sup>	Jurisdictional Wetland	Estimated Area in Wetland in sq. ft. [acre (ac)] <sup>3</sup>	Estimated Area of Impacts in sq. ft. (ac) <sup>4</sup>
A-2	PEM	No	950 (0.022)	0 (0.0)
A-3	PEM	No	1,724 (0.040)	0 (0.0)
A-4	PEM	No	16,840 (0.387)	0 (0.0)
B-1	PEM/PSS	Yes	24,110 (0.553)	0 (0.0)
C-1	PEM	Yes	110 (0.003)	0 (0.0)
C-2	PSS	Yes	539 (0.012)	0 (0.0)
C-3	PFO	Yes	4,092 (0.094)	0 (0.0)
C-4	PEM/PSS	Yes	4,027 (0.092)	0 (0.0)
C-5	PSS	Yes	1,621 (0.037)	0 (0.0)
C-6	PEM/PSS	Yes	53 (0.001)	0 (0.0)
C-7	PEM/PSS	Yes	2,013 (0.046)	0 (0.0)
D-1	PSS	No	2,256 (0.052)	1,214 (0.028)
E-1	PSS	No	243 (0.006)	176 (0.004)
E-2	PSS	No	557 (0.013)	442 (0.10)
F-1	PEM/PSS	No	4,280 (0.098)	0 (0.0)
G-1	PEM/PSS	No	3,067 (0.070)	0 (0.0)
H-1	PEM	No	87 (0.002)	0 (0.0)
I-1	PSS	No	598 (0.014)	699 (0.016)
I-2	PEM	No	636 (0.015)	63 (0.001)
I-3	PEM	No	377 (0.009)	217 (0.005)
I-4	PEM	No	96 (0.002)	26 (0.001)
I-5	PEM	No	7,140 (0.164)	4,301 (0.099)
J-1	PEM/PSS/PFO	No	18,220 (0.418)	111 (0.003)
J-2	PEM/PSS/PFO	No	14,180 (0.326)	9,521 (0.219)
J-3	PEM/PSS/PFO	No	9,406 (0.216)	7,864 (0.181)
J-4	PEM/PSS	No	2,244 (0.052)	1,950 (0.045)

Table 4-20 Physical Characteristics of Wetlands Delineated (Continued)

Wetland ID <sup>1</sup>	Wetland Type <sup>2</sup>	Jurisdictional Wetland	Estimated Area in Wetland in sq. ft. [acre (ac)] <sup>3</sup>	Estimated Area of Impacts in sq. ft. (ac) <sup>4</sup>
K-1	PEM	No	762 (0.017)	1,588 (0.036)
K-2	PEM/PSS/PFO	No	34,660 (0.796)	25,071 (0.576)
K-3	PEM/PSS	No	748 (0.017)	906 (0.021)
K-4	PEM/PSS	No	1,470 (0.034)	2,106 (0.048)
L-1	PSS	No	1,315 (0.030)	0.0 (0.00)
M-1	PSS	No	279 (0.006)	0 (0.0)
N-1	PEM	Yes	5,260 (0.121)	28 (0.001)
<b>Total</b>			163,960 (3.764)	56,284 (1.292)

<sup>1</sup> A-1 is omitted since it did not meet the vegetation requirements to qualify as a wetland (Environmental Laboratory 1987).

<sup>2</sup> PEM = Palustrine Emergent; PSS = Palustrine Scrub-Shrub; PFO = Palustrine Forested (Cowardin et al. 1979)

<sup>3</sup> Wetland area is the estimated total delineated area of the wetland.

<sup>4</sup> Estimated area of impacts is the area of a wetland which may be temporarily or permanently impacted by construction of the Proposed Action. **Note: This is an estimate only and will require confirmation prior to permitting.**

No wetlands were identified during the current assessment in the area of the I-70/32<sup>nd</sup> Avenue interchange and the I-70 right-of-way from 27<sup>th</sup> Avenue to Ward Road. The Clear Creek channel beneath I-70 and Youngfield Street was not assessed.

In addition to the delineated wetlands within the study area, Clear Creek is considered a Water of the U.S. under the regulatory jurisdiction of USACE because it is a tributary to the South Platte River, which eventually flows across state lines.



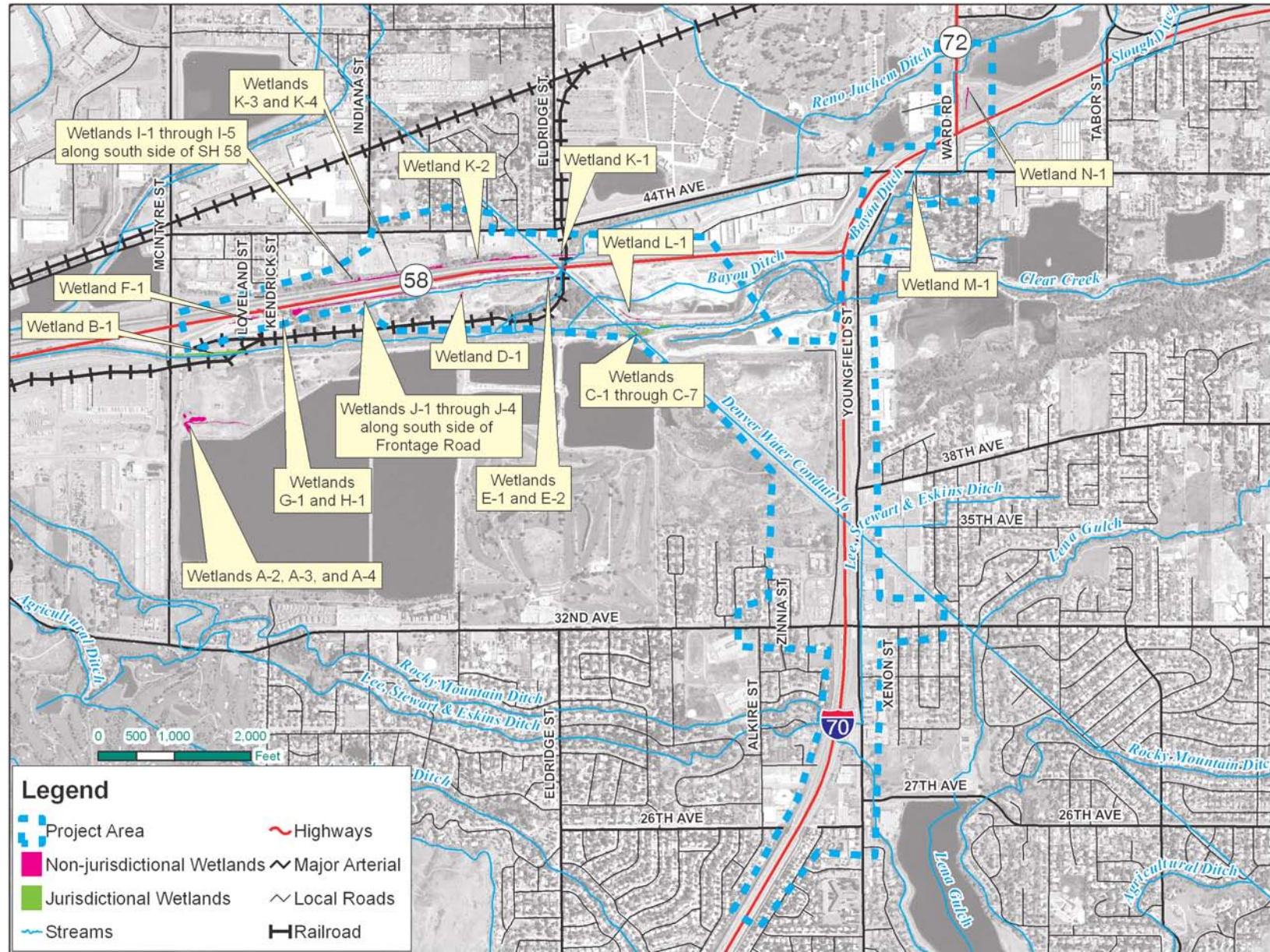


Figure 4-25  
**Overview of Jurisdictional and Non-Jurisdictional  
 Wetlands in the Study Area**



SOURCE: FHU and NRSI 2006c



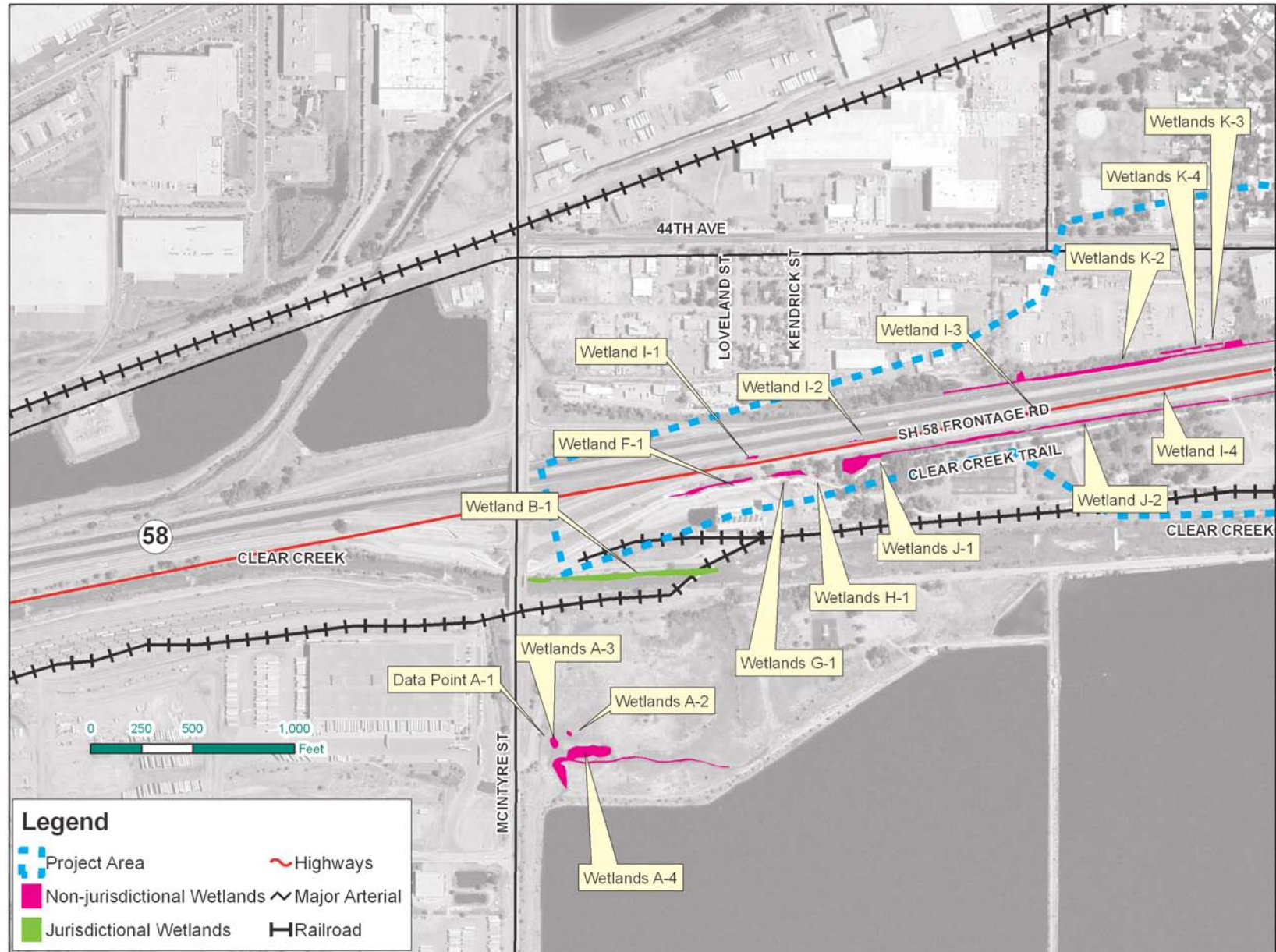


Figure 4-26  
**Jurisdictional and Non-Jurisdictional  
 Wetlands near McIntyre Street**

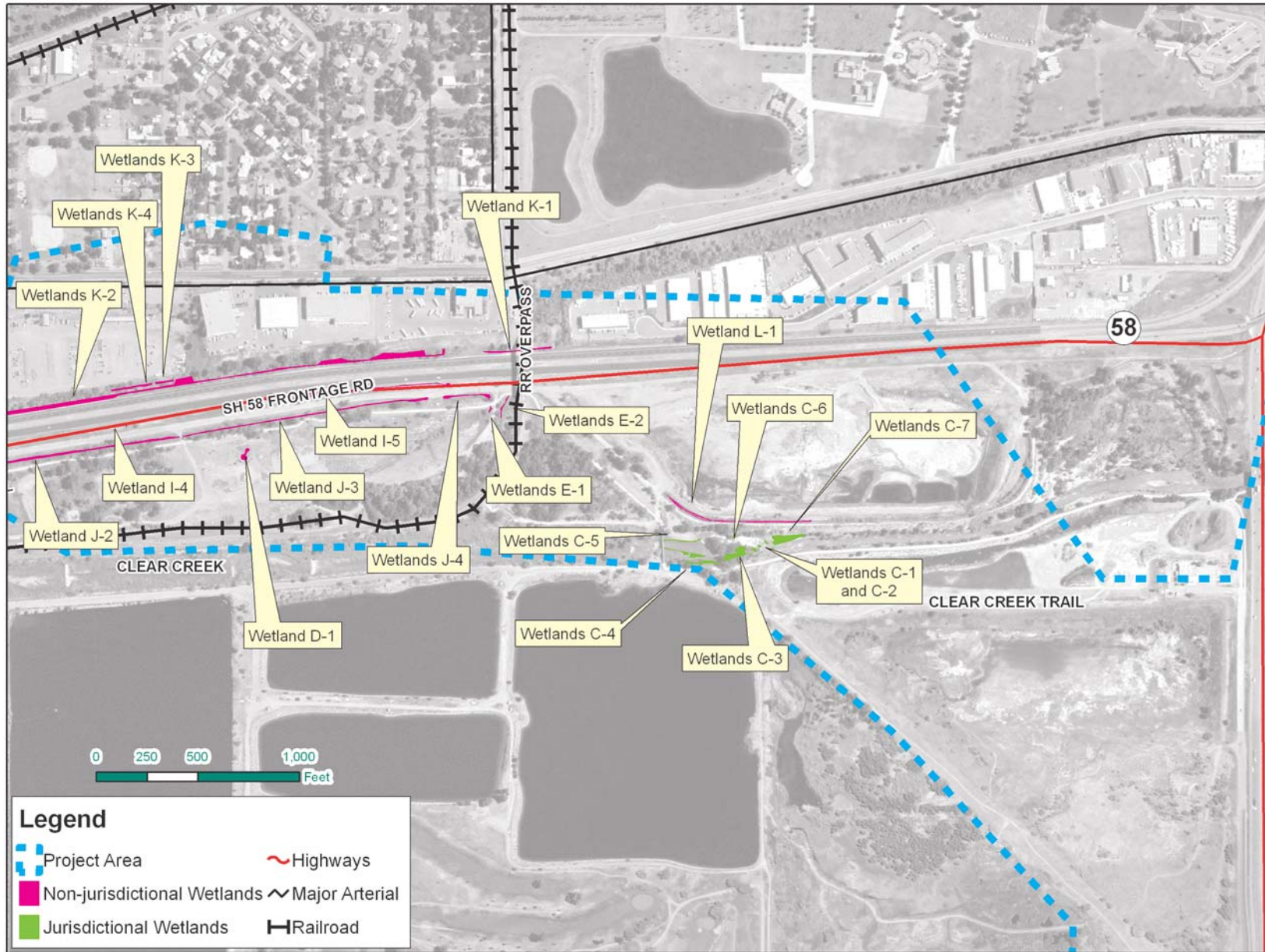


Figure 4-27  
**Jurisdictional and Non-Jurisdictional  
 Wetlands near Eldridge Street**



North SOURCE: FHU and NRSI 2006c



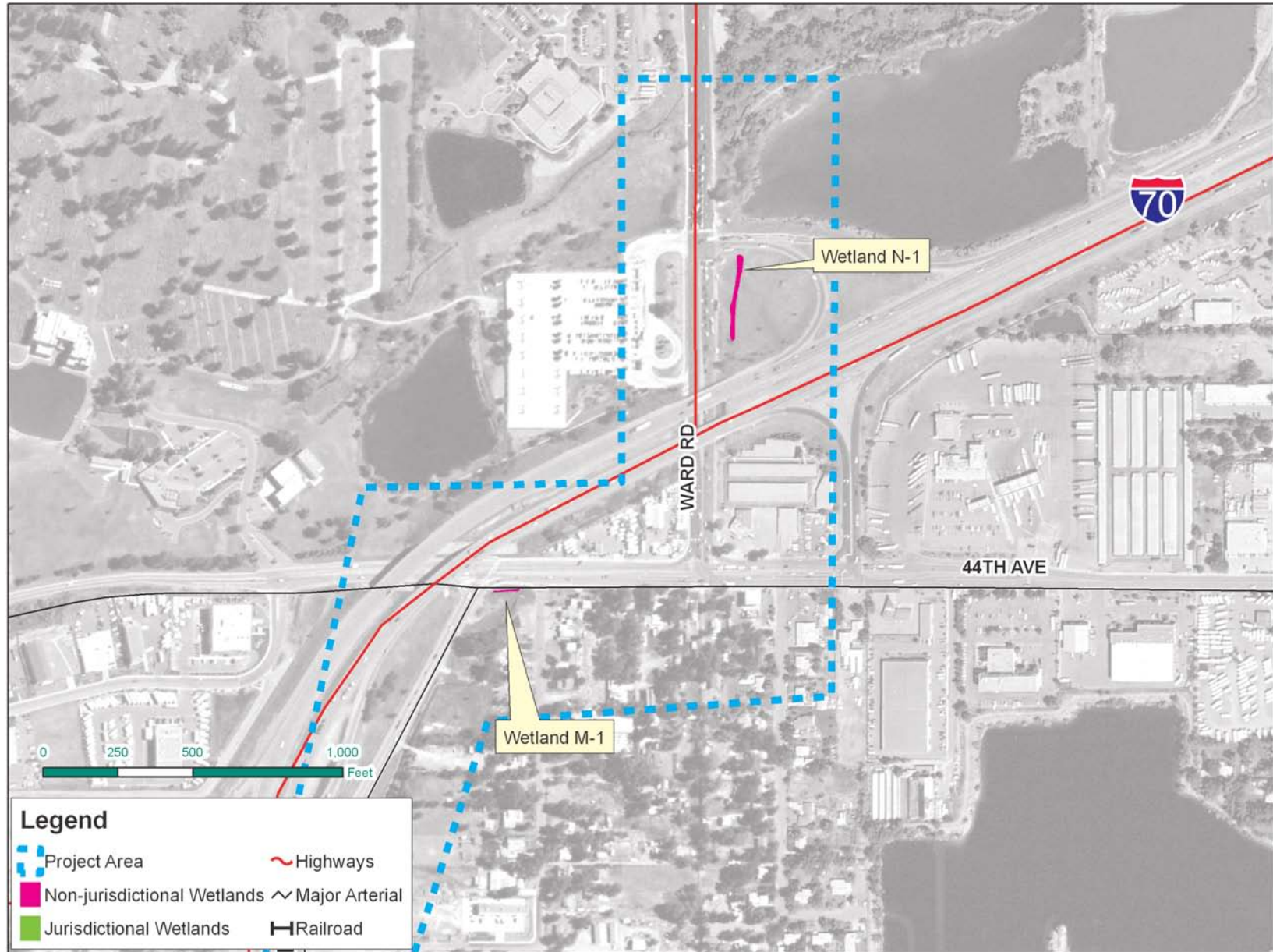


Figure 4-28  
*Jurisdictional and Non-Jurisdictional  
Wetlands near I-70 / Ward Road*



#### 4.14.2 Environmental Consequences

##### *No-Action Alternative*

There would be no impacts to wetlands under the No-Action Alternative. Impacts of other actions in the area, including local agency projects, are discussed in **Section 4.20 Cumulative Impacts**.

##### *Proposed Action*

The Proposed Action would impact wetlands during construction of the SH 58/Cabela Drive interchange. Estimated acreages of potential impacts associated with the Proposed Action were determined by overlaying the conceptual design for the Proposed Action with the delineated wetland map. Approximately 1.291 acre of non-jurisdictional wetlands would be impacted by construction of the SH 58/Cabela Drive interchange included in the Proposed Action, and approximately 0.001 acre of jurisdictional wetlands would be impacted by the widening of the westbound I-70 on-ramp at Ward Road. Most of these impacted wetlands are associated with existing right-of-way drainage ditches along SH 58 and the SH 58 frontage road. Given the level of preliminary design completed to date; however, it is difficult at this stage to differentiate between temporary and permanent impacts. This will be done during final design and permitting.

#### 4.14.3 Mitigation

FHWA and CDOT policy requires compensatory mitigation for permanent impacts to both jurisdictional and non-jurisdictional wetlands. Wetland mitigation is typically done on a 1:1 basis. A Clean Water Act Section 404 permit that is issued by the USACE for jurisdictional impacts may require higher ratios; however, if unique or high quality wetlands are impacted. **Appendix D** presents a Wetland Finding for the Proposed Action, which documents impacts, minimization, and mitigation for wetlands.

During final design, additional efforts will be taken to minimize impacts to wetlands. These efforts may include:

- ▶ “Compacting” the design along the horizontal alignment of the roadway, i.e. no divided section nor open median
- ▶ Minimize slope footprints through the use of guard rails, adjusted vertical alignment, etc.
- ▶ Placement of concrete abutments and riprap so as to minimize encroachment on wetlands
- ▶ Use of “dirty” riprap, i.e. earth interspersed within the riprap
- ▶ Planting of coyote willow cuttings within the riprap to soften the look, aid in bank stabilization, and further minimize wetland impacts
- ▶ Consultation with CDOT environmental will be required to identify possible improvements to riparian habitat near Clear Creek

Wetland banking within the Clear Creek basin is the preferred mitigation method for permanent impacts. Mitigation credits can currently be purchased from a USACE-approved wetlands bank with available credits within the primary service area at a cost of approximately \$70,000.00 per acre.

Temporary and indirect impacts to wetlands will be mitigated through the use of construction BMPs, which would ensure that all work will minimize impacts to the river and wetland areas. These BMPs may include the following:

- ▶ Erosion prevention, including temporary soil stabilization measures (surface roughening, terracing, mulching, and turf reinforcement mats) and structures such as berms or swales, with or without a diversion channel, to prevent and/or slow runoff across temporary and permanently disturbed areas and/or divert runoff to sediment basins. These measures may also include the planting of native shrubs, trees and herbaceous plant species for long term erosion prevention
- ▶ Sediment control measures, including straw bales, silt fences, sediment traps and/or sediment basins
- ▶ Water quality treatment measures to capture and treat runoff and to prevent runoff from entering Clear Creek and associated wetlands (see **Section 4.10** *Water Resources, Floodplains, and Water Quality*)
- ▶ Use of designated areas for vehicle staging to minimize disturbance of wetlands and vegetated areas
- ▶ Revegetation of disturbed areas as quickly as possible with native vegetation throughout construction
- ▶ Installation of temporary fencing to prevent construction access to wetland areas
- ▶ Targeting dewatering activities so as to avoid wetland areas
- ▶ Keeping cranes and other heavy equipment for bridge construction out of the river or stream bank area to the greatest extent possible
- ▶ Construction of a crane pad if cranes or other equipment can not be kept out of the creek

With the mitigation measures described above, the impact of the Proposed Action on wetlands would be appropriately mitigated

#### **4.15 Hazardous Materials**

This section provides an overview of the potential presence of soil and groundwater contamination in the study area. The term hazardous materials is an inclusive term for materials that are regulated as solid waste, hazardous waste, and other wastes contaminated with hazardous substances, radioactive materials, petroleum fuels, toxic substances, and pollutants. It is necessary to identify the properties (sites) that are associated with areas of contaminated soil and groundwater for planning efforts so that these sites can be avoided when reasonably possible or appropriate mitigation measures can be implemented prior to construction. The presence of hazardous materials is a liability concern for any potential right-of-way acquisition (full or partial) and could affect the project in terms of worker health and

safety, cost, schedule, and agency and public relations, particularly if they are not identified prior to construction.

As part of this EA, a Modified Phase I Environmental Site Assessment (MESA) was performed to evaluate whether properties within the project area had potential or recognized soil and groundwater contamination. The MESA was prepared based on the American Society for Testing and Materials (ASTM) E 1527-00, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM 2000), USEPA Standards and Practices for All Appropriate Inquiries [40 Code of Federal Regulations (CFR) Part 312], and CDOT hazardous materials guidance (CDOT EPB 2005). The ASTM E 1527-00 standard "...is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner defense to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)" (FHU 2006g).

Sites associated with the project area that were identified as having known (current and historic) soil and groundwater contamination are distinguished in this report as sites with recognized environmental conditions. Recognized environmental conditions, as defined by ASTM, include sites with *"the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property"*. The term "site with potential environmental condition" has been used to identify properties in the project area where recognized environmental conditions could exist but could not be confirmed without additional inspection or investigation.

The methodology that was used to assess the presence of sites with recognized environmental conditions or potential environmental conditions within the project area included the following steps:

- ▶ Performance of a limited site reconnaissance "windshield survey" to identify site activities with potential soil or groundwater contamination concern
- ▶ Review of readily available documents, such as aerial photographs, that identify historical uses of the sites within the project area
- ▶ Review of readily available local, state, and federal environmental agency databases within the project area from 0.125 mile to 1.0 mile from the Proposed Action as dictated by the ASTM Standard E1527-00
- ▶ Screening of sites identified in the local, state, and federal environmental agency databases by distance and ranking of sites based on known environmental site conditions and groundwater flow
- ▶ Review of previous CDOT investigations, CDPHE records, Colorado Department of Labor and Employment Division of Oil and Public Safety (OPS) records, and other available records from local, state, and federal agency records for sites within the project area
- ▶ Identification of sites requiring additional evaluation or investigation to assist in right-of-way acquisition, project design, and specific-materials management or institutional controls required during construction

Site reconnaissance activities occurred in September 2005 and included a limited visual inspection of sites located adjacent to public right-of-way within the project area. The purpose of the visual inspection was to identify areas with evidence of current uses that would result in soil, groundwater, or surface water contamination such as: above ground storage tanks; solid waste disposal; structures such as pits, ponds, or lagoons; and storage of hazardous materials such as 55-gallon drums and tote containers. The site reconnaissance activities did not include visual inspection of fenced-in areas, interior of buildings, rear lots (alley side portion of each site), or areas not visible from public right-of-way in the project area (FHU 2006g).

A review of historical research documents and historical aerial photographs was performed to “*establish a history of the previous uses of the property and surrounding area, in order to help identify the likelihood of past uses having led to recognized environmental conditions*” (ASTM 2000). The review of aerial photographs offers an opportunity for direct observation of site conditions through a period of time. These observations may include the locations of former tanks, drums, pits, ponds, lagoons, stained/stressed vegetation, or other site development features that can indicate the presence of historical environmental conditions. FHU reviewed historic aerial photographs of the project area in approximately ten-year increments, including the years 1948, 1953, 1959, 1965, 1974, 1979, 1984, 1989, and 1995. General historical information concerning the project area was also collected from the Denver Public Library Western History and Genealogy Department archives and the Jefferson County Library system (FHU 2006g).

Local, state, and federal database records were searched by Environmental Data Resources, Inc. (EDR) for information relating to sites within and extending up to 1.0 mile from the project area (EDR 2005). Approximately 221 sites were identified by EDR within 1.0 mile of the right-of-way of the Proposed Action. These sites were then screened based on distance (up to 1,000 ft) from the Proposed Action. Sites that were located greater than 1,000 ft and downgradient from the Proposed Action were judged relatively unlikely to have impacted the project area, but sites potentially upgradient or cross-gradient of the Proposed Action were reviewed to determine the likelihood of potential environmental conditions. A total of 67 sites were identified as having recognized environment conditions during the initial site screening process (FHU 2006g).

Following the distance screening, the 67 sites were ranked with a high, medium, or low designation based on the known environmental conditions and the potential for the site to have an adverse impact on the Proposed Action. Sites with no to minimal indications of a known release, past release, or material threat of release of any hazardous substances or petroleum products into the ground (soil), groundwater, or surface water received a “low” ranking, including sites with underground storage tanks (UST) and aboveground storage tanks (AST) with no reported releases. Sites received a “medium” ranking if they had moderate indications of a potential existing release, past release, or material threat of a release of any hazardous substances or petroleum products into the ground (soil), groundwater, or surface water, and included Resource Conservation and Recovery Act (RCRA) generators with violations, Emergency Response Notification System (ERNS) sites, and leaking underground storage tank (LUST) sites. Sites with the potential for large-scale contaminant migration or a known existing or past release of a hazardous substance or petroleum product received a “high” ranking. Of the 67 sites identified as having a potential impact on the project area, 40 sites received a low ranking, 22 sites received a medium ranking and 5 sites received a high ranking (FHU 2006g).



To determine which sites required detailed agency file review, an additional distance screening was performed to distinguish sites within 100 ft from the Proposed Action, within 100 ft to 500 ft of the Proposed Action, and within 500 ft to 1,000 ft of the Proposed Action. Thirty-three sites were located within 100 ft of the Proposed Action; seventeen sites were located from 100 to 500 ft of the Proposed Action; seventeen sites were located from 500 to 1000 ft of the Proposed Action (FHU 2006g).

A detailed review was conducted of sites within and adjacent to (within 100 ft of) the Proposed Action with a medium and high ranking, sites from 100 ft to 500 ft of the Proposed Action with a medium and high ranking, and sites from 500 to 1,000 ft with a high ranking. Also, sites identified as having potential and recognized environmental conditions that had a medium ranking and are located downgradient of the Proposed Action were screened out. More detailed information about the site screening and ranking processes is discussed in the MESA (FHU 2006g).

#### **4.15.1 Current Conditions**

The project area has a history of agricultural, commercial, and industrial land uses that have influenced the current conditions. The most predominant historical land use in the project area consisted of agricultural land use. Gardens, farms, nurseries, and orchards were prevalent throughout the area from the late 1800s through the present. General environmental concerns include residual contamination of soils due to past chemical storage, handling, and application of chemicals such as pesticides. As part of this EA process, no evidence of recognized or environmental conditions were identified due to past agricultural land uses; however, soil and groundwater contamination may exist near sites that historically stored or handled agricultural chemicals due to leaking storage tanks, spilled chemicals, or buried storage drums, or the application of chemicals to former cultivated areas (FHU 2006g).

Historical industrial and commercial land uses in the project area have included, but are not limited to, aggregate mining, fueling facilities, vehicle maintenance, petroleum storage, a tannery, and smelting (mineral processing) plants. Aggregate mining within the Clear Creek floodplain has been prevalent throughout the entire project area since the mid-1950s. Former aggregate quarries were historically used for landfills and in combination with remnant methane gas present an environmental concern. Concerns associated with commercial and industrial land uses include potential releases of petroleum and chemical constituents. Due to the project area's history of industrial and commercial land uses, residual soil and groundwater contamination associated with these activities may be present within the project area (FHU 2006g).

The BNSF railroad corridor extends north of the project area, crossing McIntyre Street at West 44<sup>th</sup> Avenue. The tracks were historically routed farther south. As part of this EA process, no evidence of potential or recognized environmental conditions associated with the BNSF were identified; however, impacts to soil and groundwater along the current and historic railroad corridor may exist due to undocumented events and an accumulation of hydrocarbon exhaust, drips, leaks, and spills over time. Also, although there is no evidence of the presence of historic railroad maintenance areas and transfer stations in the area, if such areas did exist within the project area, there is a likelihood of potential soil and groundwater impacts (FHU 2006g).

A total of 46 sites were identified as having potential and recognized environmental conditions throughout the project area. Sites that would potentially impact the Proposed Action are listed and discussed in **Table 4-21**. The location of these sites is shown in **Figure 4-29**.

Several areas of known contaminated soil and groundwater were identified in the project area:

- ▶ Soil and groundwater have been contaminated with chlorinated solvents, including tetrachloroethylene (PCE), trichloroethylene (TCE), trichloroethane (TCA), dechloroethane (DCA), and vinyl chloride north of the SH 58/McIntyre Street interchange
- ▶ Petroleum and volatile organic compounds (VOCs) contaminated soil and groundwater were detected historically in the vicinity of the I-70/32<sup>nd</sup> Avenue
- ▶ Petroleum-contaminated groundwater exists in the vicinity of the I-70/Ward Road interchange westbound on-ramp. In addition, methyl tertiary butyl ether (MTBE) – contaminated soil and groundwater is present in the vicinity of the 44<sup>th</sup> Avenue/Ward Road interchange and the I-70/44<sup>th</sup> Avenue eastbound on-ramp
- ▶ Soil and groundwater have been historically contaminated with petroleum hydrocarbons and VOCs associated with light industrial sites located along 44<sup>th</sup> Avenue, between Youngfield Street and McIntyre Street
- ▶ Several active LUST sites are located throughout the entire project area. Areas of known (current and past) groundwater contamination are identified in **Figure 4-29**

**Table 4-21 Sites with Potential & Recognized Environmental Conditions Associated with the Proposed Action & Recommendations for Additional Assessment**

Type of Condition	Property Name and Address	Acquisition F = Full or P = Partial	Environmental Conditions	Recommendations			
				Initial Site Assessment (ISA)	Site-Specific MESA	Preliminary Site Investigation (PSI)	Materials Management / Health & Safety
Potential	Novacek's Nursery 2635 Youngfield Street	F	Nursery with unknown material handling and disposal practices. Potential pesticide and herbicide use. Soil and groundwater contamination have not been reported at this location.	X			
Recognized	Walgreens/ Diamond Shamrock 12700 W. 32 <sup>nd</sup> Avenue	P	Inactive LUST, UST, FINDS. 4 closed USTs (gasoline). Following removal of 4 USTs in May 1999, petroleum hydrocarbons were detected in trace amounts in soil and groundwater, but did not exceed standards. OPS issued a no further action letter in December 2000.		X		X
Recognized	Applewood Conoco 3210 Youngfield Street	F	FINDS. Inactive LUST, UST. 3 active USTs (gasoline). Upon tank upgrading activities in March 1990, soils were visibly stained with petroleum hydrocarbons; however, analysis revealed that concentrations did not exceed Tier 1 RBSLs. OPS issued a no further action letter in May 1997.		X	X	X
Potential	Colorado Lace Cleaners 12757 W. 32 <sup>nd</sup> Ave.	F	Dry cleaning operations with unknown cleaner and solvent handling and disposal practices. No reported contamination of soil and groundwater associated with this site.		X	X	
Recognized	Absolute Controls Systems/Cumberland Companies Inc. 14452 W. 44 <sup>th</sup> Avenue	P	ERNS, RCRA Small Quantity Generator, FINDS. Contaminated soils uncovered during construction activities in November 1997. BTEX, specifically xylenes detected.	X			X
Recognized	Benders Nu Look Cleaners 2680 Youngfield Street	P	RCRA Small Quantity Generator with violations reported, FINDS, FTTS. Violations concerning unlabeled and unsecured drums containing hazardous materials and an unknown fluid leak near facility cooker.  There is no indication that hazardous materials storage and handling procedures have affected soil or groundwater within the project area.		X		X
Potential	Asphalt Paving Co. 14802 W. 44 <sup>th</sup> Avenue	P	One permanently closed 8,000-gallon UST for an unknown substance. Six 12,000-gallon AST for diesel. One 10,000-gallon AST for gasoline. Four 2,000-gallon AST for lube oil. One 1,000-gallon AST for used oil. No spills or leaks reported.	X			
Potential	Codi Manufacturing 14352 W. 44 <sup>th</sup> Avenue	P	Manufacturing facility with vehicle bays. Unknown material handling and disposal practices.	X			
Potential	Amoco 3190 Youngfield St	P	One 560-gallon UST for waste oil, two 10,000-gallon USTs for gasoline, and one 12,000 gallon UST for gasoline were removed from the site in December 2005. One liquefied petroleum gas AST on-site. No leaks or spills reported.		X		

Source: FHU, 2006f



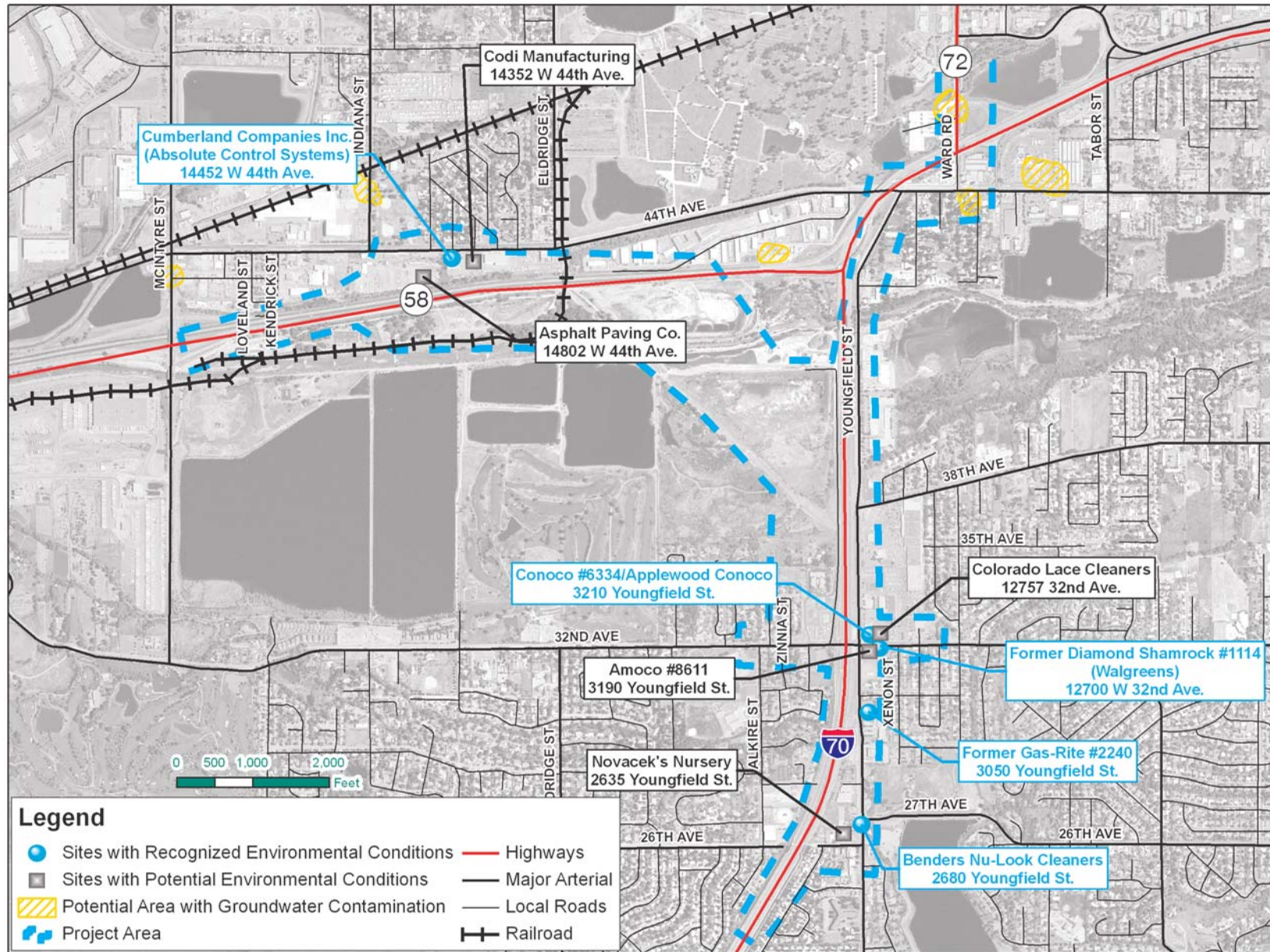


Figure 4-29  
**Sites with Potential and Recognized Environmental Conditions Impacted by the Proposed Action**



#### 4.15.2 Environmental Consequences

##### *No-Action Alternative*

There would be no impacts under No-Action Alternative to or from sites with recognized or potential environmental conditions.

##### *Proposed Action*

Nine sites with potential and recognized environmental conditions could potentially affect the project in terms of either construction-related worker health and safety and materials management or right-of-way acquisitions. The sites are listed in **Table 4-21**.

The proposed improvements in the northern and northwestern portions of the project area that are part of the Proposed Action include the widening of 44<sup>th</sup> Avenue in the vicinity of the proposed new SH 58/Cabela Drive interchange west of Eldridge Street and the construction of the proposed new SH 58/Cabela Drive interchange south of 44<sup>th</sup> Avenue. Soil and groundwater in this portion of the project area has been historically contaminated with petroleum hydrocarbons due to leaking tanks, cyanide due to a leaking AST, and VOCs associated with a CDPHE Voluntary Clean Up site (VCUP) and RCRA Corrective Action (CORRACTS) site. Soil and groundwater have been contaminated with VOCs, including PCE, TCE, TCA, DCA and vinyl chloride in the vicinity of the SH 58/McIntyre Street interchange.

The proposed improvements in the eastern and southeastern portions of the project area include widening of Youngfield Street in the vicinity of the 32<sup>nd</sup> Avenue and the construction of the I-70/32<sup>nd</sup> Avenue interchange eastbound hook ramps at 27<sup>th</sup> Avenue and Youngfield Street. Soil and groundwater in the vicinity of this portion of the project area, particularly near the I-70/32<sup>nd</sup> Avenue interchange has been historically contaminated with petroleum hydrocarbons due to LUSTs and VOCs associated with a former CORRACTS site.

Residual surficial and subsurface soil contamination and groundwater contamination may be present in the vicinity of these sites and potentially downgradient of these sites, and could be encountered during subsurface activities, such as structural excavations from retaining walls or caissons associated with the Proposed Action.

#### 4.15.3 Mitigation

Mitigation measures applicable to the types of impacts that may be encountered in the project area are summarized below.

##### *Right-of-Way Acquisition*

Nine sites with potential or recognized environmental conditions will be acquired for project right-of-way. Dependent on the recognized or potential environmental conditions identified in the corridor-wide MESA, more detailed hazardous materials investigations may be recommended to determine the extent of soil or groundwater contamination.

The process for identifying, evaluating, and mitigating hazardous waste during right-of-way acquisition is identified in Chapter 3 of the *CDOT Right of Way Manual* (CDOT 2005e). Projects requiring right-of-way or easements follow these guidelines in order to avoid, to the greatest extent possible, acquisition of contaminated property. These guidelines also ensure protection for employees, workers, and the community prior to, during, and after construction. The right-of-way acquisition process for sites with potential and recognized environmental conditions is a three step process: Initial Site Assessment (ISA), Preliminary Site Investigation (PSI), and Remedial Investigation/Feasibility Study (RI/FS) (CDOT 2005e).

- ▶ The ISA is similar to a MESA or Phase I Environmental Site Assessment and involves a site reconnaissance, historical land use review, and database search. An ISA is performed on properties that are to be acquired by or dedicated to CDOT.
- ▶ The site-specific modified Phase I Environmental Site Assessment (MESA) is performed on properties that are to be acquired by or dedicated to CDOT and are known or suspected of harboring hazardous waste. The objective of the Site-specific MESA further investigates the level of known or suspected soil and groundwater contamination.
- ▶ The PSI is an investigation that involves a drilling/sampling and analytical program to determine preliminary information regarding environmental conditions on the property. The objective of the PSI is to assist in the decision-making process regarding the potential liability associated with acquiring a property and to provide information regarding health and safety issues for construction workers and the public.
- ▶ The RI/FS is a detailed, comprehensive investigation that further delineates the magnitude of contamination on a property. The RI/FS details the mitigation and clean-up strategies and provides cost estimates for the clean-up and mitigation of a contaminated property.
- ▶ The development of materials management and health and safety plans are required prior to construction and demolition activities in accordance with Section 250, Environmental, Health and Safety Management, of Occupational Health and Safety (OSHA) regulatory details. Basic regulatory requirements are summarized in the following section.

**Table 4-21** summarizes sites with potential and recognized environmental conditions associated with the Proposed Action. It is important to note that a PSI or RI/FS may be recommended based on the findings of an ISA. Sites where a PSI or RI/FS are expected to be required are identified.

#### *Contaminated Soil and Groundwater Contamination*

Several general areas of known contaminated soil and groundwater have been identified in the project area. Prior to construction, additional assessments in accordance with CDOT Right-of-Way acquisition protocols may be conducted to establish the nature and extent of current conditions associated with these sites. In areas of known and potential soil and groundwater contamination, precautionary measures must be used, including a Materials Handling Plan as required by Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005c), and a Health and Safety Plan. Construction specifications must be written to include review of the Materials Handling and Health and Safety Plans by the CDOT Regional Environmental Manager.

Water collected in excavations due to seepage of groundwater or surface water runoff typically requires a dewatering permit regardless of the water quality. Therefore, structural excavation, such as caisson and retaining wall construction, may require the necessary permit, and should be managed according to Section 107.25 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2005c). In the case that residual groundwater contamination is present, mitigation measures such as the operation, maintenance, and monitoring of groundwater treatment systems may be necessary to meet compliance requirements. To avoid or mitigate the impacts to sites with existing groundwater monitoring wells or remedial treatment systems, proper coordination with property owners and applicable regulatory agencies must take place.

### *Regulated Materials Clearance*

Materials may be present in buildings and structures that may require demolition as part of the Proposed Action, such as the full acquisition properties. Prior to demolition of any structures, an asbestos and miscellaneous hazardous materials survey will be conducted at each property. Materials abatement will be conducted, as necessary, according to Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction and relevant Occupational Safety and Health Administration (OSHA) and regulatory requirements. In addition, the residences will be checked for the presence of methamphetamine lab residues prior to acquisition.

Prior to building or structure demolition activities, all regulated materials including PCB-containing ballasts, fluorescent bulbs, mercury containing equipment, electronic equipment, containerized regulated liquids (e.g., paints, solvents, oil, grease, chemicals, pesticides, and herbicides), and CFC-containing equipment must be removed and appropriately recycled or disposed of off-site.

## **4.16 Visual Character**

This section discusses the visual character of the project area and the impacts of the Proposed Action in this context. Field observations identified residential areas and provided information to document dominant existing views. **Figure 4-30** identifies views from the areas proposed for improvements in the northern portion of the project area, and **Figure 4-31** identifies views in the vicinity of the I-70/32<sup>nd</sup> Avenue interchange. Picture number references in the following discussion refer to photograph numbers in **Figures 4-30** and **4-31**.

Desirable and important views have been documented for the project area. These include views of the Front Range Mountains that have been identified by Jefferson County and the City of Wheat Ridge as important elements of higher visual quality to be maintained. The Central Plains Community Plan, North Plains Community Plan, City of Wheat Ridge, and Front Range Mountain Backdrop/Foreground Preservation Plan all support the preservation of the mountain views in the Front Range area (JCPZ 2004; JCPZ 1989; JCPZ 2005). Views were also considered from the standpoint of the primary viewers, i.e., motorists adjacent residential and business properties as well as recreation users.

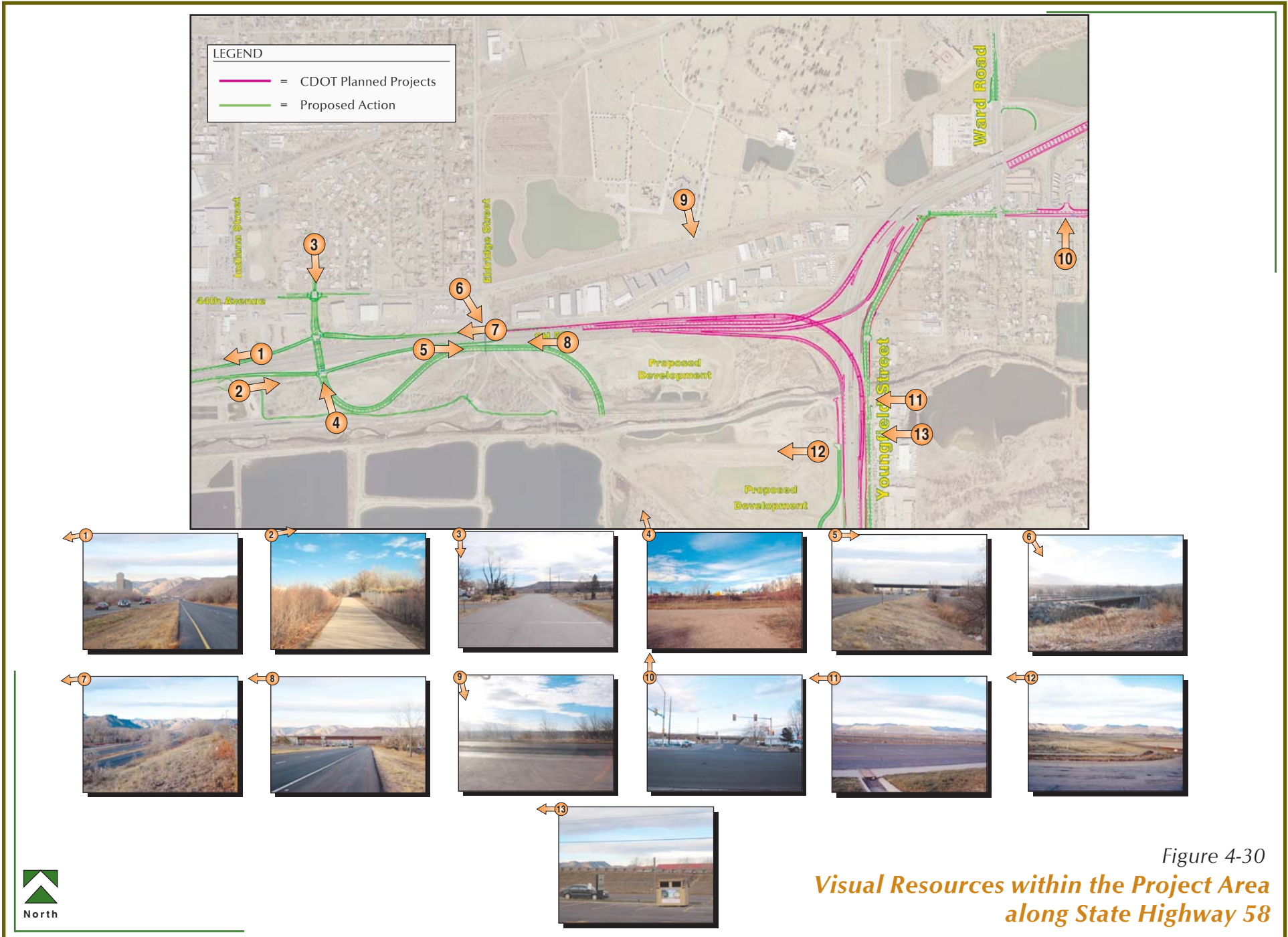


Figure 4-30  
**Visual Resources within the Project Area  
 along State Highway 58**









LEGEND	
	= CDOT Planned Projects
	= Proposed Action



Figure 4-31

Visual Resources within the Project Area Vicinity of the I-70/32nd Ave. Interchange

#### 4.16.1 Current Conditions

- ▶ The project area can be broken down into distinct landscape character units that contain similar elements. The following landscape units are found within the project area and are described below:
- ▶ Existing Road Corridors
- ▶ Undeveloped Land (Open Space, Parks, Recreation Areas and Trails, Cemetery)
- ▶ Geologic Features
- ▶ Commercial, Municipal, and Light Industrial Land Use
- ▶ Residential

##### *Existing Road Corridors*

The project area contains five types of existing road corridors described in detail in this section. Most of the areas adjacent to the roadway corridor have typical transportation elements, such as signing, lighting, signal controls, guardrail, and right-of-way fencing. Road Corridors present within the project area are presented in **Table 4-22**.

**Table 4-22 Road Corridors within the Project Area**

Road Type	Road Name	Road Details	Adjacent Uses	Grade
Interstate Facility	I-70	Enters the study area from the east and turns to the south at I-70/SH 58 Interchange	Commercial, retail, sparse residential and undeveloped land	Northern portion slightly above grade and then elevating to approximately 15 feet above grade toward south end
Urban Freeway Facility	SH 58	Trending west from I-70 into Golden	Commercial and light industrial and open space	At grade
Collector Streets	Youngfield Service Road	Trends north-south terminating to the north at Clear Creek, and becoming Zinnia Street south of 32 <sup>nd</sup> Avenue	Residential, commercial, hotel, and retail	At grade
	27 <sup>th</sup> Avenue	East-west trending	Residential	At grade
Major Arterial	Youngfield Street	North-south trending	Commercial and retail to east and I-70 to west	At grade
Minor Arterial Roads	44 <sup>th</sup> Avenue	East-west street located north of SH 58	Truck stop, retail, commercial and scattered residential	At grade
	32 <sup>nd</sup> Avenue	East-west trending	Residential, retail, and commercial	At grade

The I-70/32<sup>nd</sup> Avenue Interchange is currently a prominent visual feature within the area. Residences and businesses located on the east side of the I-70/32<sup>nd</sup> Avenue Interchange currently view the interchange in the foreground (Photo 14). Residences located on the west side of the highway currently view a church, surrounded by undeveloped land, followed by a masonry noise barrier, and I-70 to the east in the foreground (Photos 15, 17, and 18). There are no single-family residences located adjacent to where the eastbound hook ramps would be constructed within the vicinity of 27<sup>th</sup> Avenue. One multi-family apartment complex is located adjacent to where a portion of the I-70 widening would occur for the off-ramp. The rear of the complex currently faces a noise barrier.

A pedestrian walkway currently connects 26<sup>th</sup> Avenue over I-70 and is planned to be replaced as part of the improvements. The visual quality of the current walkway is somewhat compromised due to graffiti and age (Photo 19).

Two grade-separated crossings are currently present over SH 58, a diamond interchange at McIntyre Street to the west of the improvement, and a railroad crossing to the east of the improvement (Photo 6). The current view for drivers traveling east on SH 58 consists of bridge crossings and hillsides in the foreground and roadway and flat surfaces in the background (Photo 5). Views to the west consist of bridge crossings/interchanges in the foreground and North and South Table Mountain in the background (Photos 1, 7 and 8). Views south from 44<sup>th</sup> Avenue toward the project area are buffered by vegetation in many areas (Photo 9).

#### *Open Space, Parks, Recreational Areas and Trails*

Within and adjacent to the project area are numerous parks and recreational areas including a golf course, and trail opportunities for bicyclists, equestrian riders, and hikers. There is one off-roadway trail corridors with adjacent open space and scenic sight-seeing opportunities along Clear Creek (Jefferson County Open Space Clear Creek trail connects to the City of Wheat Ridge Greenbelt Trail underneath I-70). Views from these recreational resources to transportation facilities are a consideration for the visual assessment, as well as minimizing direct and visual impacts to the recreational amenity. The Clear Creek trail has a pleasing visual quality because of the variety of scenic elements (i.e., mountains, vegetation, topographical variety, drainages, and minimal man-made elements). The City of Wheat Ridge Comprehensive Plan identifies Clear Creek Greenbelt a major unifying element in the community that should be enhanced and preserved (City of Wheat Ridge 1999).

The improvement would relocate the Jefferson County Clear Creek Trail in the vicinity of the new interchange on SH 58. The current trail alignment is at or slightly below grade of SH 58 and is separated by the SH 58 frontage road and/or Clear Creek from SH 58 (Photos 2 and 4). Lush vegetation and trees serve as a visual barrier between the trail and SH 58.

#### *Geologic Features*

The unique geologic history of the Front Range is exposed in a number of geologic features that serve as community landmarks and provide community identity. The midground views to the west within many parts of the project area, include such regionally notable geologic formations as the North and South Table Mountains. The Rocky Mountains are visible to the west in the background views within the project area. These geologic features are visually notable because

of their steep slopes and unique formations. Views that include features such as these are considered a higher scenic quality.

Various municipalities and the public consider the view of the Front Range Mountains, important elements of higher visual quality to be maintained. The Central Plains Community Plan, North Plains Community Plan, City of Wheat Ridge, and Front Range Mountain Backdrop/Foreground Preservation Plan all support the preservation of the mountain views in the Front Range area (JCPZ 2004; JCPZ 1989; JCPZ 2005).

### *Commercial, Municipal and Light Industrial Land Use*

Within the project area, there are a number of land uses with a commercial or municipal character east of Youngfield Street. The land uses within the commercial/municipal character unit contain common elements such as frequent curb cuts, signs, utilities, lighting, parking lots and many vehicles. The architectural styles, building heights, and colors vary. Commercial roadway corridors are characterized by the presence of increased vehicular activity, pedestrian activity, and urban amenities (i.e., places to shop or places to eat). Commercial or municipal land uses often are surrounded by cultivated vegetation and lawns and have landscaped roadways. A higher level of light is typical of a commercial area with light sources originating from businesses, homes, vehicles, and street lights. This landscape character unit would include commercial development at intersections and along highways.

Industrial uses are dominant adjacent to SH 58 and the northern portion of I-70. Many man-made features are visible in these landscapes and include such land uses as railroad; Coors water storage ponds, aggregate operations, gravel and landscape supply businesses, wells, and storage facilities. The Coors Brewing Company grain elevator is located south of SH 58 near South Table Mountain at the end of the project area.

### *Residential*

Residential overlooks are adjacent to I-70 and SH 58 at several locations within the project area. A desire has been expressed by members of the public to retain the view sheds in their current state. Residences in the project corridor are primarily suburban in nature and consist of single-family dwelling units. Sensitive residential receptors were identified north of SH 58 at the intersection of 44<sup>th</sup> Avenue and Holman Street. Currently, residences along Holman Street view South Table Mountain in the background and 44<sup>th</sup> Avenue and the entrance to a light industrial facility in the foreground (Photo 3). Sensitive residential receptors were also identified north of 32<sup>nd</sup> Avenue where the southern portion of Cabela Drive is proposed. These residences overlook the project area to the north from an elevated position (Photo 16).

Residences at 44<sup>th</sup> Avenue, east of Youngfield Street generally face north toward the I-70/Ward Road interchange (Photo 10). Residences along 32<sup>nd</sup> Avenue are situated so that they generally face north or south toward other residential units. Very few residential units were identified along Youngfield Street. Those businesses that were identified along the northern portion of Youngfield Street generally face west toward I-70, with mountain views in the background (Photos 11 and 12). Businesses located further south on Youngfield Street view the elevated portions of I-70 with little or no background view of the mountains (Photo 13). There were no identified residences located along Ward Road or the I-70/Ward Road



interchange within the study area. Views are dominated by existing roadways for residences located within the adjacent portion improvements area.

#### **4.16.2 Environmental Consequences**

##### *No-Action Alternative*

There will be no visual impacts under the No-Action Alternative.

##### *Proposed Action*

A number of key viewpoints have been selected to display the visual effects of the project. Key views also represent the primary viewer groups that would be affected by the project. Key views were selected for each of the three key improvements previously mentioned. Visual impacts for the Proposed Action were identified by comparing existing conditions, as determined by field visits and photographs, with the roadway plan sheets, and typical sections of the Proposed Action (see **Figures 4-30** and **4-31**).

The I-70/32<sup>nd</sup> Avenue Interchange improvements would consist of construction of off-set hook ramps at the I-70/32<sup>nd</sup> Avenue interchange with the westbound hook ramps located north of 32<sup>nd</sup> Avenue and the eastbound hook ramps located at Youngfield Street and 27<sup>th</sup> Avenue, and a new pedestrian bridge. There are no residences located adjacent to where the eastbound hook ramps would be constructed within the vicinity of 27<sup>th</sup> Avenue. Those residents currently located south of the improvements and adjacent to I-70 view a noise wall that would restrict their view of the construction of the hook ramps. Adjacent property uses to the improvements are primarily retail and commercial.

The construction of a new pedestrian bridge over I-70 is expected to create a positive visual impact for adjacent residences on both sides of I-70 at 27<sup>th</sup> Avenue because the existing is aged and has been heavily vandalized. The improvements for the I-70/32<sup>nd</sup> Avenue interchange are expected to have positive visual impacts to surrounding residential areas.

The improvements at SH 58 from McIntyre Street to the I-70/SH 58 Interchange would consist of the construction of a new diamond interchange on SH 58 west of Eldridge Street and east of Indiana Street. This interchange would provide a connection of Cabela Drive with 44<sup>th</sup> Avenue north of the interchange. The improvement would relocate portions of the Jefferson County Clear Creek trail to the south.

The construction of the SH 58 improvements would require a structure for the grade-separated roadway, impacting the continuity of the topography and view of vegetation on the hill. The adjacent roadway and ramps would likely be elevated on fill as they approach the interchange. Cut slopes would change the existing landform immediately adjacent to the roadway and would require revegetation.

The current view for drivers traveling either east or west on SH 58 would remain relatively unchanged with the addition of the bridge crossing. The grade-separated crossing would blend with existing crossings and would not interfere with the background view of the South Table Mountain.

Visual impacts from the construction of the new interchange would be primarily to the residences located on Holman Street north of 44<sup>th</sup> Avenue. The construction of the interchange would be in the foreground viewshed of the residences and would create a change in the scenery to the south. The degree to which the improvement would affect scenic resources for the residences depends on the amount of visual contrast that is created by project components and appurtenances. The signalized intersection at 44<sup>th</sup> Avenue and Cabela Drive would be in the foreground of the background view of South Table Mountain for the residences.

The new Jefferson County Open Space Clear Creek Trail alignment would be at-grade and separated from Cabela Drive. From the trail bridge over Clear Creek, the trail would trend to the west and cross the railroad spur at approximately Eldridge Street with a grade-separated structure. The trail would then continue to the west along the railroad past the new SH 58/Cabela Drive interchange and curve north to meet with the existing trail west of the trail parking lot accessed from the SH 58 frontage road.

Some new right-of-way would be required along portions of 32<sup>nd</sup> Avenue and Youngfield Street. The right-of-way for the improvements would be expanded in several locations from the existing condition but would generally be in the same location. The expanded right-of-way required for the improvements would move the outer limits of the right-of-way closer to several residences and businesses and cause a sidewalk that is set off of the road by a few feet to become adjacent to the curb. The residences are already located adjacent to the streets and roads. The widened and reconstructed roads are not expected to be a new visual influence on the surroundings, but would move closer, in some cases, causing an incremental increase in the visual influence of the improvements on these residences. The change in sidewalk is consistent sidewalk character before and after that segment.

### **4.16.3 Mitigation**

As described above, the replacement of aging transportation structures, including the 26<sup>th</sup> Avenue pedestrian bridge, with new, more visually appealing structures will have a positive aesthetic effect in many areas. During final design, CDOT will identify the appropriate aesthetic design elements and enhancements to ensure compatibility with the surrounding areas and provide a positive visual experience.

The signalized intersection at Cabela Drive, 44<sup>th</sup> Avenue, and Holman Street would introduce a new traffic signal on 44<sup>th</sup> Avenue and affect the visual character of the area for the adjacent residences. During final design, CDOT will investigate landscape design options and/or other design features that will soften the effect of the new signalized intersection and provide an appropriate transition to the residential area (Fairmount neighborhood). CDOT will incorporate landscaping and other design elements within the right-of-way, where space is available, in order to provide a visual transition with the adjacent neighborhood, such as entry treatments, entry signage, sidewalk constrictions, and other traffic calming devices.

Public input will be solicited on aesthetic issues, such as bridge design treatments at grade-separated intersections and retaining walls. These will include facing materials, colors, textures, and aesthetic elements. Input will also be solicited on roadway appurtenances, such as lighting fixtures, signs, and traffic control devices that have visual effects.

## **4.17 Construction Impacts**

Construction activities would be consistent with heavy highway and roadway work and would involve demolition, utility modification or instillation, drainage improvements, earthwork, concrete flatwork, bridge and wall construction, paving, traffic signal, and landscaping construction.

### **4.17.1 Current Conditions**

The study area includes residential, retail, light industrial and vacant land uses, as discussed in **Section 4.1 Land Use, Socio-Economics, and Community**. Each has different sensitivities to construction activities. Residential neighborhoods are impacted most by construction noise, vibrations due to adjacent heavy construction activities, traffic diverted onto local neighborhood streets, congestion, dust, and detouring. Maintenance of access and minimization of traffic congestion is crucial to retail businesses. Access for trucks and customers are typically issues for those light industrial businesses.

### **4.17.2 Environmental Consequences**

The No-Action Alternative involves no additional construction over what is currently programmed, approved, and funded by CDOT, the City of Wheat Ridge and Jefferson County. Therefore the No-Action Alternative would result in no direct or indirect construction impacts.

#### ***Proposed Action***

Construction of the Proposed Action would present the potential for increased dust, noise, runoff, and traffic congestion, restricted access to residences and businesses, and visual intrusions to motorists and residents. It is likely that groundwater and hazardous materials would be encountered during construction activities based on information gathered during this study (see **Section 4.15 Hazardous Materials**).

#### ***Air Quality***

Air quality impacts from construction can be a concern. The overall construction for the Proposed Action has the potential to cause short-term impacts to air quality. Adjoining properties in the study area would be near construction activities while the project is built. Construction emissions differ from regular traffic emissions in several ways:

- ▶ Construction emissions last only for the duration of the construction period
- ▶ Construction activities generally are short-term, and depending on the nature of the construction operations, could last from seconds (e.g., a truck passing) to months (e.g., constructing a bridge)
- ▶ Construction can involve other emission sources, such as fugitive dust from ground disturbance
- ▶ Construction emissions tend to be intermittent and depend on the type of operation, location, and function of the equipment, and the equipment usage cycle; traffic emissions are present in a more continuous fashion after construction activities are completed

Without mitigation, excavation, grading, and fill activities could increase local fugitive dust emissions. Fugitive dust is airborne particulate matter, generally of a relatively large particle size (greater than 100 microns in diameter). Because of the large size, these particles typically settle within 30 feet of their source. Smaller particles could travel as much as several hundred feet depending on wind speed.

#### *Noise*

Construction noise would present the potential for short-term impacts to those receptors located along the corridor and along the designated construction access routes. Adjoining properties in the study area could be exposed to noise from road construction activities when the Proposed Action would be built. Construction noise differs from traffic noise in several ways:

- ▶ Construction noise lasts only for the duration of the construction event, with most construction activities in noise-sensitive areas being conducted during hours that are least disturbing to adjacent and nearby residents
- ▶ Construction activities generally are of a short-term nature, and depending on the nature of the construction operations, could last from seconds (e.g., a truck passing a receiver) to months (e.g., constructing a bridge)
- ▶ Construction noise is intermittent and depends on the type of operation, location, and function of the equipment, and the equipment usage cycle. Traffic noise, on the other hand, is present in a more continuous fashion after construction activities are completed

Demolition and pile driving could be the loudest construction operations. Demolition of buildings near the Youngfield Street/32<sup>nd</sup> Avenue and Youngfield Street/27<sup>th</sup> Avenue intersections would most likely be the source of noise for this project and is likely to occur during the day when noise ordinance restrictions are at their least. Piles could be required at most major bridge installations such as SH 58/Cabela Drive interchange, westbound, I-70 bridge over 32<sup>nd</sup> and the 27<sup>th</sup> Avenue pedestrian bridge. Alternative construction methods could replace pile driving in noise sensitive locations. The majority of noise receptors are located greater than 50 ft from areas where pile driving, or other high-noise activities, are expected. Noise impacts would be expected to occur only in isolated areas along the project corridor.



### *Vibration*

Vibration caused by construction activities would present the potential for short-term impacts in areas where pile driving and compaction equipment are being used. The potential for building damage from pile driving vibration is estimated to exist only within about 50 feet. Vibration from compaction equipment is less severe. Construction activities in close proximity to buildings (i.e., within 50 feet) would be sensitive to vibration damage risks. Details would be developed during subsequent design efforts that would identify if any such conditions exist.

### *Water Quality*

During construction, the project will comply with water quality permits for construction and dewatering because stormwater runoff would present the potential for violations of water quality standards in adjacent waterways and groundwater. Without mitigation measures, stormwater runoff could cause erosion and sedimentation, and transport of spilled fuels or other hazardous materials. This project's watershed drains into Clear Creek. Groundwater could be encountered during relocation of deep utilities, excavation, and construction of bridge foundations. Dewatering and any appropriate treatment would be required where groundwater is present.

### *Traffic Impacts*

Construction detours would be expected to create short-term impacts on local traffic circulation and congestion. Delays to the traveling public and inconvenience to corridor residents would occur. A primary goal of CDOT during construction of the project would be to minimize inconvenience to the public.

### *Visual Impacts*

Short-term construction-related visual impacts would likely occur as a result of this project. These impacts would include the presence of construction equipment and materials, temporary barriers, guardrail, detour pavement and signs, temporary shoring and retaining walls, lighting for night construction, and removal of vegetative cover.

## **4.17.3 Mitigation**

Mitigation for direct impacts will be specified in final design and will include implementation of the following measures during construction:

- ▶ Construction of noise walls (as identified in **Section 4.5 Traffic Noise and Vibration**) as early as possible in the construction period (to be determined during final design)
- ▶ Maintain access to local businesses, residences, and trails
- ▶ Coordinate detour routes (to be provided on existing streets) to avoid overloading local streets
- ▶ Implement BMP's required by the SWMP, including keeping vehicles in good working order to minimize oil/fuel leaks on the project site
- ▶ Minimize construction duration in residential areas
- ▶ Minimize night-time activities in residential areas
- ▶ Minimize construction truck traffic on residential streets, in accordance with the traffic management plan (below)

- ▶ Combine noisy operations to occur in the same period
- ▶ Conduct pile driving and other high-noise activities during day-time construction, when possible. Public notification of high-noise activities will be provided as part of public outreach
- ▶ Develop traffic management plan to include:
  - Maintain traffic flow during peak travel times by minimizing lane closures, if possible
  - Coordinate with emergency service providers to minimize delays and ensure access to properties
  - Use signage, television and radio announcements to inform and advertise timing of road closures
  - During peak travel times, keep as many lanes as possible open by temporarily shifting lanes within the existing framework of the roadway
  - Develop public outreach and public information plan
  - Develop method of handling traffic
  - Estimated work zone delays and mitigation strategies
- ▶ Public information and involvement prior to and during construction. This will include public workshop during construction planning to discuss construction details and mitigation measures. During construction, updates will be provided, as needed
- ▶ Coordinate proposed action construction with local agency construction and local site development activities

To address the temporary elevated air emissions that may be experienced during construction, standard construction mitigation measures will be incorporated into construction contracts. These could include:

- ▶ Engines and exhaust systems on equipment in good working order
- ▶ Equipment maintained on a regular basis, and equipment subject to inspection by the project manager to ensure maintenance
- ▶ Fugitive dust systematically controlled through diligent implementation of a dust control plan
- ▶ No excessive idling of inactive or unnecessary equipment or vehicles
- ▶ Construction equipment and vehicles use higher-grade fuel to reduce pollutant emissions
- ▶ Stationary equipment located as far from neighbors as possible

The Proposed Action may affect environmental resources not regulated at the federal, state, or local level. Such impacts can include the consumption of natural resources such as fossil fuels and raw materials like gravel. The alternative selected may also affect social resources such as landfill capacity. In most cases such impacts cannot be quantified and cannot be avoided. It is recognized that these impacts need to be minimized to the extent practicable. Sustainable practices incorporated into the project planning, construction, and maintenance can minimize impacts, both during and after construction. To this end, CDOT and its contractors are

encouraged and will be allowed the flexibility to incorporate the concepts of sustainability into planning, bidding, contracting, building, and maintaining the Proposed Action.

As part of its environmental ethic and policy, CDOT encourages its staff, consultants, and contractors to identify opportunities and methods to reduce the impact of projects and programs on environmental resources through innovative programs and by providing flexibility in project planning and construction for the use of sustainable processes and materials. This may include such concepts as natural resource conservation, efficient use of recycled and minimally processed items, and preference for locally available resources. CDOT encourages the identification and incorporation of proven materials that are longer lasting, and require less maintenance as long as such materials do not impact CDOT's ability to meet its primary obligations for providing a safe and efficient transportation system.

Finally, CDOT will encourage the application of contractor Environmental Management Systems. Alternative materials and practices must meet the performance goals of CDOT construction specifications and be cost-effective, demonstrate legitimate expenditure of public funds, and comply with all other applicable laws and regulations.

#### **4.18 Utilities**

Public and private utilities are typically located within a roadway corridor within separate utility easements or within the right-of-way. These often include water, sewer, reclaimed water, electrical (distribution and transmission), natural gas, communications, and fiber optic, located either above ground or underground. Since utilities generally parallel or are located within the roadway right-of-way, impacts are a common occurrence with roadway improvements and require coordination early in the process. If impacts to utilities do occur, they need to either be adjusted or relocated. Adjustments and relocations need to be designed and verified with the utility company during the preliminary and final design process.

Several utilities are located within the study area. These include electrical, lighting, telephone and communication (including fiber optic), gas, water and sewer. Utility information was obtained from utility maps, coordination with utility companies and field reconnaissance. A summary describing each of the utilities that exist within the project area is provided below.

##### **4.18.1 Current Conditions**

###### ***Electrical (Distribution)***

Electrical distribution lines can be found in most areas within the project limits. Xcel Energy has overhead electric lines located on both sides of 44<sup>th</sup> Avenue, on the east side of Youngfield Street, on the north side of 32<sup>nd</sup> Avenue and 26<sup>th</sup> Avenue, and on the south side of 27<sup>th</sup> Avenue. In many cases telephone lines are located on overhead electric poles.

*Lighting*

Interstate level lighting is present on I-70 at and near the current interchanges with SH 58, 32<sup>nd</sup> Avenue, and Ward Road. Standard street lighting is present in 32<sup>nd</sup> Avenue, 27<sup>th</sup> Avenue, and 26<sup>th</sup> Avenue. Portions of Youngfield Street within the project area contain lighting although not continuously.

*Natural Gas*

Gas lines are present in Youngfield Street, 44<sup>th</sup> Avenue and 32<sup>nd</sup> Avenue corridor. This line also branches off and crosses under I-70. Another gas line is present in the 32<sup>nd</sup> Avenue corridor.

*Telecommunication/Fiber Optic*

Telecommunication/fiber optic lines are present in the Youngfield Street corridor, as well as in the 32<sup>nd</sup> Avenue corridor. Lines are also located adjacent to the I-70 frontage road.

*Potable Water Lines*

Water lines are present in Youngfield Street, 44<sup>th</sup> Avenue and 32<sup>nd</sup> Avenue. Denver Water owns a major water transmission system including multiple pipes of 48 in, 54 in, and 8 in diameters crossing diagonally from northwest to southeast across SH 58, Cabela Drive, I-70, and Youngfield Street.

*Sanitary Sewer*

Sanitary sewer lines are present in Youngfield Street, in 44<sup>th</sup> Avenue, in the westside frontage road to I-70 north of 32<sup>nd</sup> Avenue, and in 32<sup>nd</sup> Avenue. Multiple sanitation districts operate these facilities including Applewood, Pleasant View, Fruitdale and Metro Wastewater. These sanitary sewer lines cross I-70 and SH 58 at various locations.

**4.18.2 Environmental Consequences**

*No-Action Alternative*

The No-Action Alternative would not impact public or private utility services.

*Proposed Action*

Interchange reconstruction work would likely encounter existing utilities requiring adjustment or relocation of facilities. No major utility impacts would be anticipated with this action. Utility impacts would be anticipated in those locations with major roadway reconstruction/construction including:



- ▶ Eastbound I-70 off ramps at 27<sup>th</sup> Avenue/Youngfield
- ▶ Widening of 32<sup>nd</sup> Avenue
- ▶ Reconstruction of the intersection of 32<sup>nd</sup> Avenue and Youngfield Street
- ▶ Construction of Cabela Drive between 32<sup>nd</sup> Avenue and the new westbound hook ramps
- ▶ Construction of Cabela Drive in and around the Denver Water line
- ▶ Construction of the SH 58/Cabela Drive interchange

### **4.18.3 Mitigation**

In the development of the conceptual design for the Proposed Action, efforts have been made to avoid and minimize utility impacts to the extent feasible. This was done with the horizontal and vertical alignment decisions. Coordination with the known utility companies in the area was conducted to obtain the latest information possible on the number, type and location of each utility within the corridor to assist in avoiding and minimizing impacts to these utilities.

During preliminary and final design, locator services and potholing will be conducted to provide more accurate information on underground utilities. Where relocations are required due to conflict with the Proposed Action, designs to relocate the utility will be developed with the utility company or public utility department. Utility adjustments that are required will be reviewed by each affected company or public utility department. Proper detours and advance notice will be coordinated with service providers to allow delivery of uninterrupted utility service during construction.

As development occurs within the corridor, new utilities will be required to service the developments. Coordination of new facilities with relocation or reconstruction of facilities associated with the proposed action will be of greater importance.

### **4.19 Permits**

Transportation projects must comply with a wide range of federal and state environmental laws and regulations, permits, reviews, notifications, consultations, and other approvals. **Table 4-23** indicates permits, notifications, or concurrences would be required for the Proposed Action and must be obtained prior to construction.

Additional permits may be required with other activities such as:

- ▶ Erosion control/grading
- ▶ Utility access, relocation, or surveying
- ▶ Construction, slope, and utility easements
- ▶ Access and authorizations

Table 4-23 Permits, Notifications, and Concurrences

Agency	Regulated Activity	Permit/Approval
<b>Air Quality</b>		
DRCOG	Regional Air Quality Conformity	Regional Air Conformity Concurrence
CDPHE – APCD	Local Air Quality Conformity	Local Air Conformity Concurrence letter from APCD
<b>Special Status Species</b>		
Colorado Senate Bill 40 Certification	Construction in any stream or its bank or tributaries	Senate Bill 40 Wildlife Certification
<b>Wetlands</b>		
USACE	Impacts to jurisdictional wetlands	Clean Water Act Section 404: Wetland Fill
<b>Water Resources</b>		
CDPHE	Required to assure the quality of stormwater runoff	Clean Water Act Section 402: National Pollutant Discharge Elimination System (NPDES)
CDPHE – WQCD	Construction dewatering	Clean Water Act Section 402 Construction Dewatering Permit or Individual Construction Dewatering Permit, if contaminated groundwater to be encountered
CDPHE	With in the CDPHE Phase I Colorado Discharge Permit System	Follow the requirements of the cities of Lakewood and Wheat Ridge, CDOT, Jefferson County, MS4 discharge permit
<b>Hazardous Materials</b>		
CDPHE – Hazardous Materials and Waste Management Division (HMWMD)	Generation of hazardous waste	Permits for regulated hazardous waste management activity under RCRA
Pipeline and Hazardous Materials Safety Administration	Handling and transport of hazardous materials	Permits for regulated hazardous materials management under the Hazardous Materials Transportation Act
CDPHE – HMWMD	Classification of construction waste material and transportation of solid wastes generated	May require facility approval
CDPHE	Generation of contaminated materials during construction	Coordination and approval for handling such materials and a management plan

## 4.20 Cumulative Impacts

NEPA and its implementing regulations require federal agencies to consider direct, indirect, and cumulative impacts of a proposed federal action. Direct and indirect impacts have been discussed by resource in the preceding sections. This section discusses cumulative impacts that the Proposed Action and the No-Action Alternative may have on key resources in concert with other actions.

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

Cumulative impacts include the total additive impacts to a particular resource that have occurred in the past, are occurring now, and are likely to occur in the future. It is the combination of these effects, and any resulting environmental degradation, that is the focus of the cumulative impact analysis. Cumulative impact analysis is resource-specific and generally performed for environmental resources directly impacted by a federal action under study, such as a transportation project. It is important to note that if a project has no direct or indirect impacts on a particular resource, then it also has no cumulative impacts on the resource. The resources selected for cumulative impact analysis are those resources, ecosystems, and human communities considered in the Proposed Action-specific analysis to be those that could be affected cumulatively.

In addition to providing full disclosure of the impacts of a Proposed Action, the cumulative impact analysis is intended to ensure that decision makers have adequate information to make an informed decision. This includes FHWA, as well as other federal, state, and local decision makers, such that these decision makers are able to understand the potential relationships between separate actions and make appropriate decisions necessary to achieve desirable outcomes.

### 4.20.1 Key Resources, Geographic Area and Timeframe for Analysis

The following key resources have been identified for cumulative impacts consideration based on the direct and indirect impacts of the Proposed Action and the potential for impact of other actions on the resources:

- ▶ Transportation/Traffic
- ▶ Socio-economics and community
- ▶ Air quality
- ▶ Noise
- ▶ Vegetation and wildlife
- ▶ Wetlands

- ▶ Water resources/water quality
- ▶ Construction

A cumulative impacts study area for cumulative impacts analysis has been identified encompassing all of the Proposed Action and extending north to 52<sup>nd</sup> Avenue, west to McIntyre Street, south to 20<sup>th</sup> Avenue and east to Kipling Street. The borders were established by using census tract boundaries and therefore have approximate boundaries that may extend slightly beyond or within the streets mentioned above (see **Figure 4-32**).

The cumulative impacts study area was chosen as a reasonable area for analysis of cumulative impacts because it encompasses nearby areas of current and planned development. The study area is most appropriate for the analysis of socio-economic and community impacts, based on census tract boundaries, but are also useful for other impacts. However, where appropriate, observations are included in the individual resource discussions below regarding cumulative impacts that may fall outside of the study area. For example, air quality impacts have been considered with regard to the Denver metro area and water quality impacts are described in terms of the Clear Creek watershed.

To focus the assessment of cumulative impacts, it is important to establish an appropriate time frame for analysis. The time frame should be neither too short (such that longer-term trends are not recognized) nor too long (such that the analysis lacks focus). For this project, a time frame extending from approximately 1965 to 2030 has been established for analysis.

The time frame for analysis was selected based on the following:

- ▶ The future time frame extending forward approximately to 2030 was selected to complement the time frame for local and transportation planning in the area.
- ▶ The past time frame extending back approximately to 1965 was selected to include actions and events in the past that are shaping current trends in the area. The major events shaping current trends include the construction of I-70 through the area and the construction of SH 58.

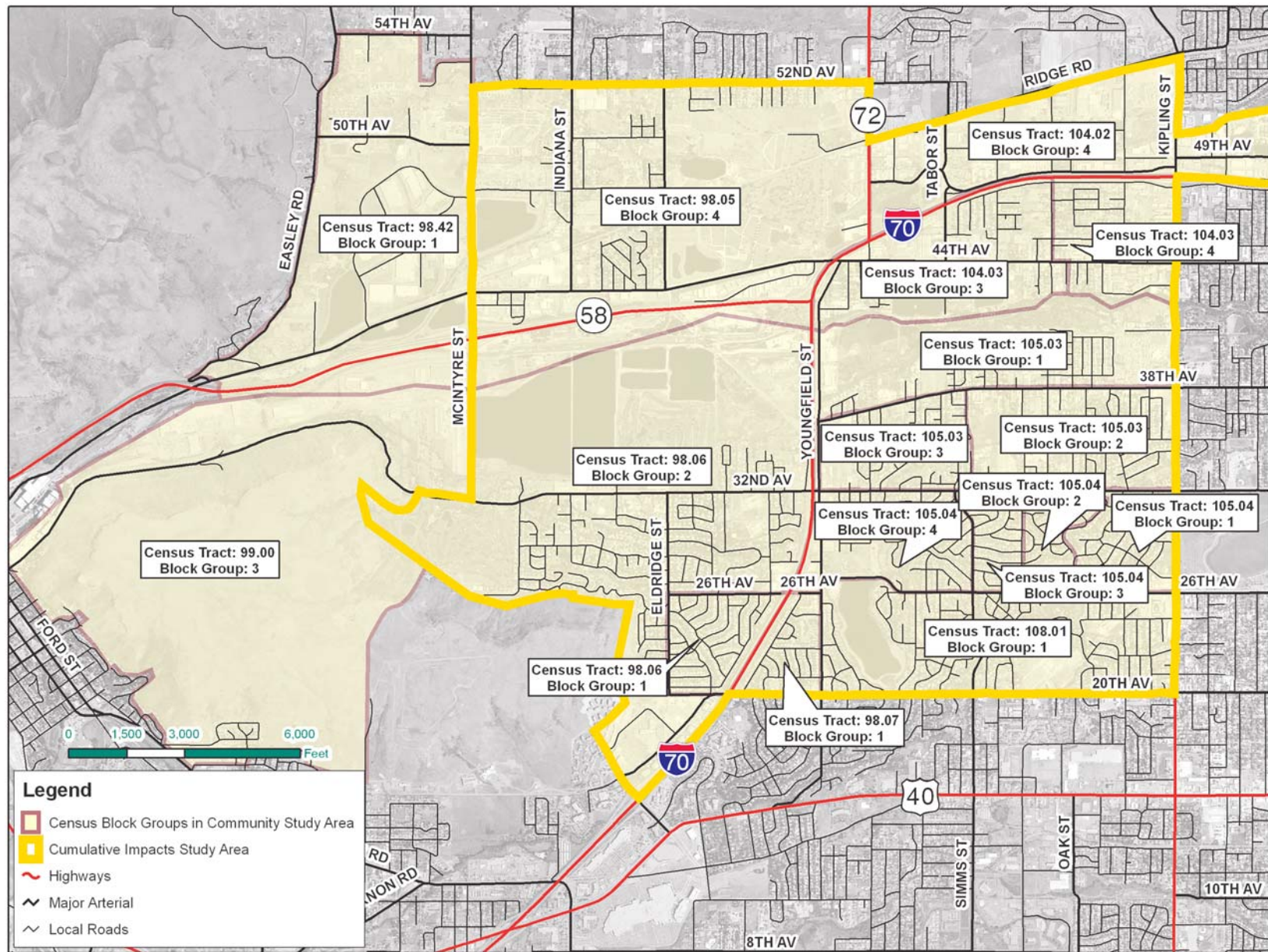
## **4.20.2 Past and Present Development / Land Use Changes**

### *4.20.2.1 Past Development*

Aerial photos of the study area taken in 1955 show the study area as largely undeveloped. The cumulative impact study area appears to be agricultural in use, with scattered farms surrounded by orchards and land used for agricultural purposes. 44<sup>th</sup> Avenue, trending east-west, and Youngfield Street, trending north-south, are present in their current locations. Clear Creek meanders through the area with several oxbows and obvious floodplain areas.

A 1964 aerial depicts greater residential and neighborhood development east of Youngfield Street; however, the area appears to be largely undeveloped and is still primarily farmland. The residential development along 32<sup>nd</sup> Avenue in the 1964 aerial photograph is prior to the construction of I-70. This development indicates that the area was developing without the influence of a major highway.





North SOURCE: U.S. Census 2000

Figure 4-32

Cumulative Impacts Study Area

The 1984 aerial photograph depicts the area as developed and there are few, if any, farm residences present. I-70 and SH 58 appear in the aerial photograph as prominent transportation features in the area. Residential neighborhoods and commercial and retail uses are present along Youngfield Street.

#### *4.20.2.2 Present Development*

The City of Wheat Ridge has identified an area of potential development located southwest of the I-70/SH 58 interchange (City of Wheat Ridge 1999). This area is west of I-70, north of 32<sup>nd</sup> Avenue and south of Clear Creek and is currently being developed for retail use. A retail store, Cabela's, is planned for this location.

### **4.20.3 Future Development**

#### *4.20.3.1 Proposed Business Park*

The City of Wheat Ridge has identified the area along West 44<sup>th</sup> Avenue and south of SH 58 and north of Clear Creek to be developed with a business park (City of Wheat Ridge 1999). The business park is expected to contain a hotel and retail development.

#### *4.20.3.2 Northwest Corridor*

The Northwest Corridor EIS is currently analyzing possible transportation improvements for the northwest portion of the Denver Metro area. The area of analysis includes a portion of the cumulative impact area. The Northwest Corridor EIS includes one alternative (called the "Combined Alternative") that would improve McIntyre Street, south of SH 58. This alternative would improve McIntyre Street from a residential collector to a principle arterial. The purpose of the alternative is to improve the highway system connectivity and improve the flow of traffic. The analysis of this alternative considers DRCOG 2030 traffic projections. No decision has been made regarding this or any of the Northwest Corridor EIS alternatives.

#### *4.20.3.3 I-70 and Kipling Street Ramp Improvements*

Reconstruction of the I-70/Kipling Street interchange is identified in the 2030 RTP. However, the configuration and a schedule for construction has not been identified.

#### *4.20.3.4 Local Agency Projects*

The City of Wheat Ridge submitted an application to FHWA and CDOT for use of interstate right-of-way, which was subsequently approved. This allows for the development and analysis of a series of local agency projects. The local agency projects include:

- ▶ Construction of the 40<sup>th</sup> Avenue underpass of I-70
- ▶ Widening of Youngfield Street from 38<sup>th</sup> Avenue to 44<sup>th</sup> Avenue, with restriping of 44<sup>th</sup> Avenue.

- ▶ Construction of Cabela Drive from 40<sup>th</sup> Avenue to the proposed development just north of Clear Creek

#### *4.20.3.5 CDOT-planned I-70/SH 58 Interchange Project*

The CDOT plans to improve the I-70/SH 58 interchange (CDOT 2002a, FHWA 2004). The I-70/SH 58 interchange improvements include the addition of ramp connections between I-70 west and SH 58 west. The I-70/SH 58 interchange improvements also include the relocation of the I-70/Ward Road east ramps further east along I-70 to increase spacing between the on-ramp from SH 58 and the 44<sup>th</sup> Avenue eastbound off-ramp.

The relocation of the existing I-70 eastbound on-ramp from the Youngfield Street/38<sup>th</sup> Avenue intersection south to the Youngfield Street/35<sup>th</sup> Avenue intersection was also included in the I-70/SH 58 interchange improvements; however, the Proposed Action described in this EA would modify this by relocating the existing I-70 eastbound on-ramp from the Youngfield Street/38<sup>th</sup> Avenue intersection south to the Youngfield Street/27<sup>th</sup> Avenue intersection. The I-70/SH 58 EA for the interchange was completed in June 2002. The project is identified in the 2010 TIP; however, it is not fully funded. The design of the interchange is expected to be completed by June 2006 with a construction start date dependent on funding.

#### *4.20.3.6 RTD Gold Line*

The Gold Line transit facility is currently being planned by the RTD. The Gold Line will extend from Union Station in Downtown Denver to Ward Road north of I-70 (Phase I) and ultimately to the City of Golden (Phase II) (CH2MHILL 2002). Phase I of the Gold Line is part of the metro-wide FasTracks system, which was approved by voters in November 2004. The FasTracks system is planned to be completed between 2013 and 2016. Phase II is unfunded at this time.

#### *4.20.3.7 Kipling Street Improvements*

The Kipling Street improvements would widen the section of Kipling between US 6 and I-70 from four to six lanes. The current schedule and funding of the project is unknown.

#### *4.20.3.8 Wheat Ridge Urban Renewal Authority*

The Wheat Ridge Urban Renewal Authority (URA) has established the West 44<sup>th</sup> Avenue/Ward Road Redevelopment Plan. The urban renewal area is defined by (see **Figure 4-33**) Tabor Street to the east, I-70 to the north, Youngfield Street to the west, and an irregular line to the south of West 44<sup>th</sup> Avenue (City of Wheat Ridge Urban Renewal Authority 2000). The redevelopment plan assumes that the I-70 on/off ramps will be relocated to the east of their current location. The URA proposes the development of a large community commercial center that would enhance the area and create a positive visual impression when entering the city of Wheat Ridge. The proposed plans for the renewal area are consistent with the 2000 Wheat Ridge Comprehensive Plan and future land use plans.



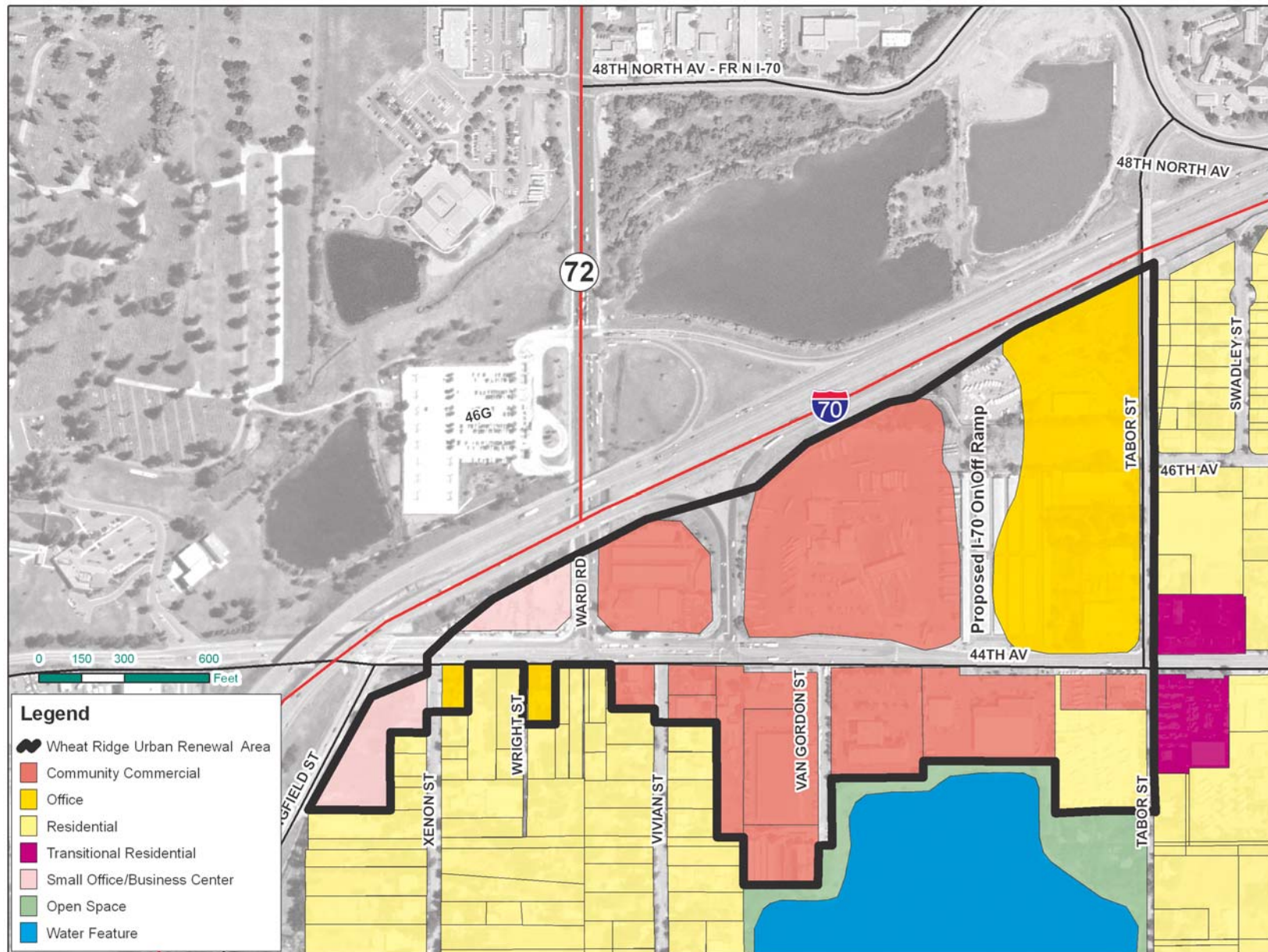


Figure 4-33

SOURCE: City of Wheat Ridge  
Urban Renewal Authority 2000

City of Wheat Ridge Urban Renewal Area



#### *4.20.3.9 Improvements near the I-70/SH 58 Interchange*

An undeveloped area of land is situated southwest of the I-70/SH 58 interchange. A small portion of this land is being considered for the relocation of the Table Mountain Animal Center. Portions of the remaining land in the southwest corner are anticipated to be designated as right-of-way to CDOT from Jefferson County. The remaining areas are under the Jefferson County mining permit and are zoned as agriculture. No changes are currently anticipated to the mining permit area.

#### *4.20.3.10 Wheat Ridge De-Icing Equipment*

New de-icing equipment was purchased for the City of Wheat Ridge that allowed them to decrease the application of sand on icy roads by utilizing a liquid spreader unit and two combination sand/liquid spreader units (DRCOG 2004).

### **4.20.4 Resources Evaluated for Cumulative Impacts**

#### *4.20.4.1 Transportation / Traffic*

Since the 1960s, the transportation system within the cumulative impacts study area has undergone a series of changes in response to the relatively steady growth in population and travel demand within the area and metro Denver.

The improvements to the transportation system over time have generally been outpaced by the growth in transportation demand, resulting in a general increase in congestion. The current and future transportation projects discussed above have been identified through the local and regional transportation planning process as necessary to help address future demand in the area.

The transportation modeling and analysis conducted for the proposed action, as presented in **Chapter 3 Transportation Analysis**, include traffic projections prepared to account for additional traffic that would be generated by major planned redevelopments. Therefore, the cumulative impacts of reasonably foreseeable projects on the operation of I-70, SH 58, and arterial street system have been accounted for and planned for in the Proposed Action.

Each of the transportation projects identified above will play a part in serving future transportation needs in the area. Coordination and implementation of these projects will help to address the traffic impacts of redevelopment and regional growth.

The Proposed Action provides improvements to transportation systems compatible with other planned transportation improvements. The Proposed Action is part of the overall transportation improvement process, contributing a cumulative improvement in the transportation system relative to the future No-Action Alternative.

#### *4.20.4.2 Socio-economics and Community*

Homesteading within the cumulative impacts study area began in the early 1900s, with an increase in residential development within the area beginning in the 1960s. Commercial development within the cumulative impacts area increased with the completion of I-70 in 1968. Residential and commercial development within the area peaked around the mid-1980s and has remained relatively stable since this time.

The multiple projects planned within the cumulative impacts study area may impact aesthetics, neighborhood cohesion, employment, tax base, and access to public facilities. These impacts may be positive or negative, and current and future planning efforts with local agencies and municipalities will assist in reinforcing positive impacts and identifying appropriate mitigation for negative impacts. However, there are many factors that will influence positive outcomes, such as the level of funding available for public projects and the economic conditions as they relate to private developments.

Proposed road improvements, such as the I-70/SH 58 interchange and the local agency projects, are expected to benefit the overall economic condition of the area by allowing new and improved access to existing and proposed commercial and community facilities.

Proposed development projects, such as Cabela's are expected to bring economic growth and increased vitality to the area. The City of Wheat Ridge has proposed the road improvements to assure that the quality of life for new and existing residents is maintained.

Overall, the cumulative effects on socio-economics and community from the Proposed Action along with past, present, and future projects are expected to be positive.

#### *4.20.4.3 Air Quality*

Cumulative impacts to air quality are an issue of concern, particularly considering Denver's historic air quality problem. In general, the Denver metro area has made substantial progress in improving air quality over the past couple of decades and in working toward long-term attainment of air quality criteria. The proposed project is expected to be beneficial for regional transportation. The potential improvements may help to alleviate some traffic congestion, but certainly cannot cure all the congestion in the metropolitan area. Construction of the project may generate additional vehicle trips during construction and require some traffic rerouting, but these should be temporary and not create substantial adverse effects.

DRCOG is responsible for monitoring growth within the metropolitan area, and regularly examines regional impacts by performing regional conformity evaluations. These conformity evaluations are cumulative by their nature because they consider emissions from all sources, not just vehicles, and are updated to reflect recent changes. These evaluations are necessary to demonstrate compliance with the air quality State Implementation Plans. Therefore, there are mechanisms in place to ensure that cumulative changes in air quality do not lead to violations of the NAAQS. The cumulative impacts on air quality from current and future transportation sources are accounted for in the conformity analysis for the RTP. The RTP is the official multi-modal transportation plan that is developed for the Metro Denver area by DRCOG.

Through the RTP, DRCOG demonstrates that the cumulative air quality impacts of all transportation systems in the regions are acceptable. The Proposed Action is in the process of being added to the 2030 RTP, which will demonstrate that the project will not have significant incremental impacts when added to other proposed projects within the cumulative impacts area.

Road improvements of the type being considered may be necessary just to accommodate the future local traffic. Such growth would be expected to result in more vehicle traffic in the area and could lead to more vehicle emissions. These changes would be regional in nature and not really specific to a particular location.

The cumulative effects on regional air quality, relative to future conditions with the proposed project, are difficult to estimate. Whereas more efficiently operating roadways will sustain higher intersection LOS in the area, the proposed improvements could also increase total traffic. CO emissions per mile are expected to decrease in the future because of cleaner vehicles, regardless of the alternative chosen (see **Table 4-24**). On the whole, while traffic and emission sources may increase on a local scale, traffic and overall emissions should improve on the larger regional scale. The net effect on regional air quality with the proposed project is taken into account in the regional conformity analysis performed by the DRCOG that is a cumulative examination of the regional pollutant sources.

**Table 4-24 Maximum Modeled Carbon Monoxide Concentrations**

Intersection	1-Hour CO Result (ppm)			8-Hour CO Result (ppm)		
	2005	No-Action 2030	Proposed Action 2030	2005	No-Action 2030	Proposed Action 2030
Ward Road and I-70 Ramps	10.2	7.3	7.2	5.3	3.9	3.9
SOURCE: FHU 2006d						

#### 4.20.4.4 Noise

The overall ambient noise at a given location depends on the noise from multiple sources. However, noise impacts decrease rapidly with distance so that the closest major sources often predominate. Noise concerns and monitoring have emerged relatively recently; therefore, it is difficult to establish how noise levels may have changed over the last several decades. Traffic has increased on highways and local streets, but vehicles have become quieter over time. In addition, noise from other sources, such as industrial sites, may have decreased over time as site uses have changed.

The noise modeling and analysis, presented in **Section 4.5 Traffic Noise and Vibration**, include the noise impacts of multiple traffic noise sources in the vicinity of the project and thus represent the cumulative impact with regard to traffic noise. As additional transportation projects are considered, the noise impacts will typically be evaluated for these projects in a similar manner. Overall, the Proposed Action is not expected to have a negative impact on noise within the cumulative impacts area. Increases in transportation and development resulting in an increase

in noise would occur within the area regardless of whether or not the Proposed Action is constructed.

#### *4.20.4.5 Vegetation and Wildlife*

Aggregate mining within the Clear Creek floodplain has been prevalent throughout the cumulative impact study area since the mid-1950s. This mining and commercial, residential, and agricultural practices and highway construction (i.e. I-70 and SH 58) have decreased and fragmented wildlife habitat. Conversely, wildlife habitat has been created from features associated with agriculture or water storage ponds.

Roads can be detrimental to wildlife because wildlife have to cross the road to access food and potential mates. Several of the proposed transportation projects within the project area consist of widening already existing roads, to which animals have become accustomed. However, some proposed development projects involve new roads and alignments further decreasing and fragmenting wildlife habitat. New roads and expanded footprints would create larger physical obstacles for wildlife to cross resulting in increased mortality from auto collisions as well as fragmented habitats and populations due to road avoidance.

The riparian streamside corridor associated with Clear Creek still functions as an east-west wildlife movement corridor and provides habitat for a wide range of wildlife species. Of the habitat types identified in the study area, riparian habitat has perhaps the highest wildlife value, (i.e. utilization by the largest number of individual wildlife species). Although affected by past fragmentation and development, it provides a continuous connection between habitats in the foothills and mountains to the west, including North Table Mountain Open Space, South Table Mountain, and the Wheat Ridge Greenbelt immediately to the east.

The Proposed Action would contribute to the already decreasing amount of wildlife habitat within the cumulative impacts area. Short grass prairie wildlife habitat is expected to be reduced by 3.8 acres from the construction of the I-70/SH 58 Interchange (CDOT 2002a). The proposed development, which includes the Cabela's store, will impact approximately 40 acres of an inactive aggregate mine and former agricultural property, which is potentially used by wildlife in the area. Construction of the bridge for Cabela Drive over Clear Creek, which is a local agency project, would have temporary impacts to potential Colorado Butterfly Plant habitat during construction. A survey for this species yielded no individual plants, and a concurrence of no significant impact was issued by the USFWS on November 10, 2005 (USFWS 2005). While not quantifiable, the I-70/32<sup>nd</sup> Avenue construction is likely to contribute to the cumulative reduction of wildlife habitat. However, the wildlife corridor along Clear Creek will be maintained.

Increases in population and commercial development in the study area may indirectly displace wildlife not tolerant of human activity. Overall, incremental and cumulative effects of the Proposed Action combined with past, present, and future projects are likely to occur.



#### *4.20.4.6 Wetlands*

Human activities, including mining and urban development, have resulted in extensive alterations to the wetland and riparian areas within the cumulative impact study area. A review of aerial photos from 1955, 1964 and 1996 indicate that wetlands had a greater presence around Clear Creek in the 1950s and 1960s than they do in the 1996 aerial photograph.

Approximately 1.6 acres of non-jurisdictional wetlands would be impacted with the construction of the SH 58/Cabela Drive interchange which is part of the Proposed Action. The local agency improvements, which include construction of a bridge over Clear Creek, are expected to impact approximately 1.9 acres of jurisdictional and non-jurisdictional wetlands. The I-70/SH 58 Interchange construction is expected to impact 0.01 acres of jurisdictional and non-jurisdictional wetlands. Reclamation of the aggregate pits, Golden Pits, located south of Clear Creek and southwest of the I-70/SH58 interchange did not impact any jurisdictional wetlands (USACE 2004a), although an unknown area of non-jurisdictional wetlands were removed during mine reclamation (Savage and Savage 2004d). Reclamation of the Mt. Olivet aggregate pits, which are located north of Clear Creek and southwest of the I-70/SH 58 interchange, would impact an unknown area of non-jurisdictional wetlands and 0.0036 acres of jurisdictional wetlands (USACE 2004b). These three transportation projects and the proposed development are expected to potentially impact a total of approximately 3.5 acres of jurisdictional and non-jurisdictional wetlands within the cumulative impacts study area.

Under Section 404 of the Clean Water Act, impacted jurisdictional wetlands would be mitigated in accordance with USACE requirements. In addition, impacts to non-jurisdictional wetlands by the Proposed Action and the I-70/SH 58 interchange project would be mitigated on a 1:1 basis in accordance with FHWA and CDOT requirements.

Assuming that the wetland impacts would be mitigated at a minimum ratio of 1:1 by CDOT, then wetland impacts from the I-70/32<sup>nd</sup> Avenue interchange would not contribute to the cumulative loss of wetlands.

#### *4.20.4.7 Water Resources/Water Quality*

The Clear Creek watershed, which contained very little impervious area in the early 1990s, has increased to about five percent impervious surface area. Most of this increase has occurred in the Golden/Wheat Ridge/Arvada areas has resulted in an increased volume and total discharge of runoff from stormwater events into Clear Creek.

The Proposed Action along with current and future projects are expected to increase impervious surfaces by approximately 80 acres (0.120 square miles) or by 0.024 percent within the 500 square mile watershed (see **Table 4-25**). Potential increases in stormwater expected to flow to Clear Creek from runoff from proposed development are expected to be negligible.

Table 4-25 Cumulative Impervious Surfaces

Project	Expected Increase in Impervious Surface (Acres)*
Proposed Action	21.14
CDOT Planned Projects	6.17
Local Agency Improvements	10.05
Cabela's and Proposed Development	40
<b>Total Impervious</b>	<b>77.36</b>

\*Numbers are approximate

Source: **Section 4.10** *Water Resources, Floodplains, and Water Quality*

Consequences that impact water quality from the Proposed Action and other actions within the cumulative impact area would occur where there is erosion during construction and where roadway runoff conveys pollutants into Clear Creek. Work within the cumulative impacts study area will comply with the MS4 permit requirements obtained by CDOT, the cities of Wheat Ridge and Lakewood, and Jefferson County.

Permanent drainage and water quality facilities (permanent BMPs) are expected to be included with the final design for proposed projects in order to mitigate adverse impacts to surface water within the cumulative impacts area. Stormwater runoff from paved surfaces currently passes into streams, channels, and drainages without any treatment. Treatment of developed runoff from areas not previously treated will result in an improvement over existing conditions. The development and implementation of existing management plans increase the likelihood of maintaining and protecting local water quality conditions within the cumulative area.

Overall, the Proposed Action, along with past, present, and future development is not expected to contribute to the cumulative degradation of water quality. Water quality may be improved from the projects as a cumulative whole.

#### 4.20.4.8 Construction

Construction projects can cause disruptions and impacts to both the community and the environment. These may range from very short-term inconveniences to longer-term impacts affecting many people. Some of the primary types of impacts include access, noise, dust, and traffic delays. Construction impacts are limited and regulated by a variety of federal, state, and local controls. The construction impacts of the Proposed Action alternative were discussed in **Section 4.17** *Construction Impacts*.

Other projects may be constructed within the cumulative impacts area at the same time as the Proposed Action. These projects have the potential to cause cumulative impacts within the cumulative impacts area during construction, depending on timing. While the timing of many projects is unknown, cumulative impacts during construction are more likely with major projects which overlap or are in close proximity and are constructed during the same timeframe. These may include but are not limited to:

- ▶ Northwest Corridor
- ▶ Local Agency Projects
- ▶ CDOT-planned I-70/SH 58 Interchange project
- ▶ Proposed development

When several construction projects proceed contemporaneously, the cumulative impact of the projects on residents and the environment may be compounded, requiring additional coordination. This should be undertaken throughout the planning, design, and construction process, with CDOT and the City of Wheat Ridge taking the lead in coordination between projects.

#### **4.21 Summary of Environmental Consequences and Mitigation Measures**

This section summarizes the environmental consequences that would result from the No-Action Alternative and the Proposed Action, based on the detailed discussion presented in earlier sections of this chapter. Measures to mitigate these consequences are also summarized. This section focuses on impacts to and mitigation measures for the social and environmental resources discussed in **Chapter 4 Environmental Consequences**. Transportation improvements and impacts are presented in **Chapter 3 Transportation Analysis**.

##### **4.21.1 Summary of Direct and Indirect Impacts**

**Table 4-26** summarizes the direct and indirect impacts for the No-Action Alternative and the Proposed Action.

Table 4-26 Summary of Direct and Indirect Impacts

No-Action Alternative	Proposed Action
<b>Land Use, Socio-Economics, and Community</b>	
<p>Proposed development with potential office, commercial, and retail land use in the southwest quadrant of the I-70/SH 58 interchange would continue</p> <p>Land use in this area would continue to change from an aggregate mine to retail and commercial use</p> <p>Transportation system not able to function at an operational level of acceptability with proposed development and economic development objectives</p> <p>The substandard, non-ADA compliant pedestrian crossing over I-70 at 26<sup>th</sup> Avenue would remain</p> <p>Emergency access across SH 58 would be limited to McIntyre Street</p>	<p>Change of use of a limited area from industrial, commercial, and residential land use to highway or transportation right-of-way</p> <p>Proposed development in the southwest quadrant of the I-70/SH 58 interchange would continue and change the area from an aggregate mine to retail and commercial use</p> <p>Improve accessibility to proposed development retail and commercial facilities currently located on Youngfield Street and those proposed west of I-70, such as Cabela's</p> <p>Improve accessibility, safety, and access across SH 58 to the proposed development and also to the Jefferson County Open Space Clear Creek Trail</p> <p>Replace the pedestrian crossing over I-70 at 26<sup>th</sup> Avenue with an ADA-compliant structure</p> <p>Construction costs associated with the improvements would have beneficial short-term impacts on the local economy</p> <p>Construction workers for the improvements are expected to be drawn from the existing local workforce or outside contractors, resulting in a positive impact</p> <p>No identified direct adverse impacts to low-income or minority populations</p>
<b>Right-of-Way and Displacements</b>	
<p>No right-of-way impacts</p> <p>No business or residential displacements</p>	<p>Requires acquisition of approximately 597,867 ft<sup>2</sup> (approximately 13.7 acre) of right-of-way</p> <p>Displacement of 2 residences and 7 businesses</p>
<b>Parks and Recreation</b>	
<p>No impacts to parks or recreational resources</p>	<p>Approximately 0.004 acre of the Chester Portsmouth Park would be impacted. Approximately 2,400 ft of the Jefferson County Open Space Clear Creek Trail and approximately 1,100 ft of the 32<sup>nd</sup> Avenue Trail would be relocated</p>
<b>Air Quality</b>	
<p>Deterioration of air quality due to increased traffic congestion</p>	<p>Improved air quality due to improved traffic flow</p> <p>Temporary increase in air emissions during construction</p>



Table 4-26 Summary of Direct and Indirect Impacts (Continued)

No-Action Alternative	Proposed Action
<b>Noise</b>	
51 residences, 2 churches, Clear Creek Trail, and 18 businesses would exceed noise abatement criteria	50 residences, 2 churches, Clear Creek Trail, and 18 businesses would exceed noise abatement criteria
<b>Historic and Archaeological Resources</b>	
No impacts to historic or archeological sites	Widening of Youngfield Street south of the 32 <sup>nd</sup> Avenue intersection would require approximately 0.06 acre of right-of-way from the NRHP-eligible Maple Grove Grange property  No impacts anticipated to archeological sites, but unknown, buried sites could be encountered
<b>Paleontology</b>	
No impacts to paleontological resources	Scientifically important paleontological resources could be encountered during construction excavation
<b>Soils and Geology</b>	
No impacts to soils and geology	Expansive soils and unsuitable fill may be encountered
<b>Farmlands</b>	
No impacts to farmland	No impacts to farmlands
<b>Water Resources, Floodplains, and Water Quality</b>	
No short-term sediment impacts No change in drainage area Continued discharge of stormwater directly to Clear Creek without benefit of water quality ponds or best management practices	Short-term increase in erosion and sedimentation from construction activities  Increase of approximately 20.54 acres of impervious drainage area Improved quality of stormwater discharge due to construction of water quality ponds and best management practices
<b>Vegetation and Wildlife</b>	
No impacts to vegetation  Continued potential for animal vehicle collisions on SH 58	Removal of vegetation during construction  Short-term disturbance of wildlife and aquatic habitat during construction  Permanent impacts to marginal upland habitat near new SH 58/Cabela Drive interchange
<b>Noxious Weeds</b>	
No noxious weeds impacts	Potential spread of noxious weeds into areas disturbed by construction
<b>Special Status Species</b>	
No impacts to special status species	No impacts to federally threatened or endangered animal or plant species would occur
<b>Wetlands</b>	
No impacts to existing wetlands	Approximately 1.291 acre of non-jurisdictional wetlands impacted, and approximately 0.001 acre of jurisdictional wetlands impacted

Table 4-26 Summary of Direct and Indirect Impacts (Continued)

No-Action Alternative	Proposed Action
<b>Hazardous Waste</b>	
No hazardous waste impacts	<p>Three sites with recognized or potential environmental conditions would be acquired as full right-of-way acquisitions. Six sites with recognized or potential environmental conditions would be acquired as partial right-of-way acquisitions</p> <p>Contaminated soil and/or groundwater from existing sources could be encountered during construction</p> <p>Asbestos and/or lead-based paint could be encountered during demolition of structures</p>
<b>Visual</b>	
No visual impacts	<p>Construction of the ADA-compliant pedestrian structure at 27<sup>th</sup> Avenue would provide positive visual benefit to the surrounding neighborhoods</p> <p>A signalized intersection at Cabela Drive and 44<sup>th</sup> Avenue would reduce the quality of the view of South Table Mountain for the residences along Hollman Street</p>
<b>Construction</b>	
No short-term construction-related impacts	<p>Short-term and intermittent fugitive dust emissions during construction</p> <p>Short-term and intermittent construction noise</p> <p>Short-term increase in sediment from construction</p> <p>Short-term traffic delays</p> <p>Short-term visual impacts</p> <p>Short-term utility impacts</p>
<b>Utilities</b>	
No impacts to utilities	Relocation of utilities prior to construction

#### 4.21.2 Summary of Mitigation Measures and Monitoring

Table 4-27 summarizes the mitigation measures for the Proposed Action.

Table 4-27 Summary of Mitigation Measures

Resource	Mitigation Measures
<b>Land Use, Socio-Economics, and Community</b>	<ul style="list-style-type: none"> <li>▶ Access to the Clear Creek trail across SH 58 from 44<sup>th</sup> Avenue via the new SH 58/Cabela Drive interchange</li> <li>▶ Replacement of the bike route access to the Clear Creek trail along the Youngfield Service Road with a 10 ft multi-use sidewalk along Cabela Drive and along 40<sup>th</sup> Avenue</li> <li>▶ School safety improvements along 32<sup>nd</sup> Avenue in the vicinity of The Manning School and Maple Grove Elementary</li> <li>▶ Replacement of the 26<sup>th</sup> Avenue pedestrian bridge (ADA-compliant)</li> <li>▶ Sidewalk improvements along 32<sup>nd</sup> Avenue and Youngfield Street in the vicinity of the I-70/32<sup>nd</sup> Avenue interchange</li> <li>▶ Construct a new sidewalk along the north side of 32<sup>nd</sup> Avenue from Braun Court to Xenon street to improve pedestrian access to The Manning School and Maple Grove Elementary and to replace the sidewalk affected by reconstruction of 32<sup>nd</sup> Avenue</li> <li>▶ Continue public involvement and coordination with local community during design and construction to ensure that final design is compatible with local community and disruption is minimized</li> </ul>
<b>Right-of-Way and Displacements</b>	<ul style="list-style-type: none"> <li>▶ Conform to the requirements set forth in the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970 (as amended) and the Uniform Relocation Act Amendments of 1987 (as amended), each of which contains specific requirements that govern the manner in which a government entity acquires property for public use</li> <li>▶ Prepare a relocation analysis and provide relocation advisory service</li> </ul>
<b>Parks and Recreation</b>	<ul style="list-style-type: none"> <li>▶ Construct a continuous sidewalk from the Chester Portsmouth Park to the 27<sup>th</sup> Avenue/Youngfield intersection and north along Youngfield Street</li> <li>▶ Realign the Jefferson County Open Space Clear Creek trail from the Clear Creek bridge to the west of the new SH 58/Cabela Drive interchange</li> <li>▶ Modify the trail along the south side of 32<sup>nd</sup> Avenue from Alkire Street to Cabela Drive with an attached sidewalk with curb and gutter</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>▶ Maintain construction equipment in good working order</li> <li>▶ Implement a dust control plan</li> <li>▶ Ensure no excessive idling of inactive or unnecessary equipment or vehicles</li> <li>▶ Use higher-grade fuel in construction equipment</li> <li>▶ Locate stationary equipment as far from sensitive receivers as possible</li> </ul>
<b>Noise</b>	<ul style="list-style-type: none"> <li>▶ Rebuild the existing barrier along I-70 near 27th Avenue that must be removed for the proposed eastbound I-70 hook ramps</li> <li>▶ Extend the existing noise wall along the Youngfield Service Road (Cabela Drive) another 140 feet to the north</li> </ul>
<b>Historic and Archaeological Resources</b>	<ul style="list-style-type: none"> <li>▶ Instruct construction personnel to stop work and notify the CDOT Staff Archaeologist who will evaluate the discovery if any suspected archeological finds are encountered</li> </ul>
<b>Paleontology</b>	<ul style="list-style-type: none"> <li>▶ Have the CDOT paleontologist examine project design plans as finalized to determine the extent of impact to the Denver Formation, and the scope, if any, of monitoring work required</li> <li>▶ Instruct construction personnel to stop work and notify the CDOT Staff Paleontologist who will evaluate the discovery if any suspected fossils are encountered</li> </ul>

Table 4-27 Summary of Mitigation Measures (Continued)

Resource	Mitigation Measures
<b>Soils and Geology</b>	<ul style="list-style-type: none"> <li>▶ Perform a detailed geotechnical analysis of the project area during the preliminary/final design process to determine the structural stability and load-bearing capacity of the geologic formation</li> </ul>
<b>Water Resources, Floodplains, and Water Quality</b>	<ul style="list-style-type: none"> <li>▶ Replace any impact to an irrigation facility with an in-kind replacement</li> <li>▶ Not allow stormwater to co-mingle with irrigation waters</li> <li>▶ Notify irrigation companies of any potential impacts to their irrigation system</li> <li>▶ Provide ditch companies the opportunity to review plans that call for impacts to their system</li> <li>▶ Observe irrigation ditch operational requirements and schedules</li> <li>▶ Use erosion control measures at irrigation ditch areas during construction and remove these measures once the site has stabilized</li> <li>▶ Use construction best management practices to reduce temporary impacts</li> <li>▶ Use best management practices to control stormwater runoff</li> <li>▶ Convey stormwater through water quality ponds or use other best management practices to settle sediment and improve water quality flow to Clear Creek</li> <li>▶ Obtain and comply with required permits for temporary dewatering</li> <li>▶ Install adequate riprap at ends of the stormwater outfalls to reduce erosion potential</li> <li>▶ Use temporary sedimentation ponds or filtering apparatus to remove sediment from groundwater prior to discharge during dewatering</li> <li>▶ Construct and use concrete washout basins to protect Clear Creek during construction</li> </ul>
<b>Vegetation and Wildlife</b>	<ul style="list-style-type: none"> <li>▶ Revegetate construction areas in accordance with CDOT revegetation practices</li> <li>▶ Seed during appropriate seeding seasonal windows</li> <li>▶ Temporarily protect slopes from erosion with straw crimping, erosion blankets or with mulch and mulch tackifier, if seeding is conducted out of season</li> <li>▶ Coordinate SB 40 mitigation with CDOW, which will include an appropriate tree replacement ratio and implementation of BMPs</li> <li>▶ Replace trees in other areas in accordance with CDOT Region 6 and Jefferson County tree replacement policies</li> <li>▶ Protect trees and shrubs in construction areas that are to remain with temporary orange mesh fencing</li> <li>▶ Investigate alternative fencing and landscaping plans to deter north-south wildlife movement and minimize animal/vehicle collisions with increased traffic along SH 58 in the vicinity of the new SH 58/Cabela Drive interchange</li> <li>▶ Avoid vegetation palatable to wildlife in the revegetation of roadway medians and rights-of-way</li> </ul>
<b>Noxious Weeds</b>	<ul style="list-style-type: none"> <li>▶ Implement an integrated weed management plan to target noxious weed populations</li> <li>▶ Clean all construction vehicles of all soil and plant parts before entering the construction site to avoid the spread of noxious weeds</li> <li>▶ Limit disturbance to existing vegetation as much as practicable</li> <li>▶ Treat weeds-infested areas targeted for disturbance with herbicide prior to ground disturbance or the topsoil be hauled off-site or used as roadway fill</li> <li>▶ Salvage topsoil from the project area for reuse from areas free of noxious weeds or treat with pre- and post-emergent herbicide prior to disturbance. Areas free of weeds will be identified prior to beginning construction.</li> <li>▶ Install temporary fences to limit construction traffic in an effort to reduce erosion and weed invasion</li> <li>▶ Seed topsoil stockpiles with annual grasses, if topsoil remains stockpiled for more than one month</li> <li>▶ Use only certified weed-free mulch. The mulch will be certified under the Colorado Department of Agriculture Weed Free Forage Certification Program and inspected, as regulated by the Weed Free Forage Act, Title 35, Article 27.5, C.R.S.</li> </ul>



Table 4-27 Summary of Mitigation Measures (Continued)

Resource	Mitigation Measures
<b>Special Status Species</b>	<ul style="list-style-type: none"> <li>▶ Conduct a thorough survey of active nests in the project area between April 1 (February for raptors) and August 15, prior to initiation of construction activities</li> <li>▶ Do not allow construction to begin near active nest areas until all nestlings have fledged, if active nests are found to be present</li> <li>▶ Prevent all protected birds from achieving an active nest, if construction occurs during the breeding season for migratory birds</li> <li>▶ Conduct habitat disturbing activities, such as tree removal, grading, scraping, grubbing, etc., during the non-breeding season unless the area has been verified by a qualified biologist that no active nests are present</li> </ul>
<b>Wetlands</b>	<ul style="list-style-type: none"> <li>▶ Mitigate wetlands on a 1:1 basis through the purchase of mitigation credits from a certified wetland bank in the Clear Creek basin</li> <li>▶ Consult with CDOT Environmental during preliminary/final design to identify possible improvements to riparian habitat near Clear Creek</li> <li>▶ Minimize culvert lengths and use riprap for stormwater outfalls to reduce permanent impacts</li> <li>▶ Prevent erosion, using temporary soil stabilization measures and structures to prevent and/or slow run off across disturbed areas and/or divert runoff to sediment basins</li> <li>▶ Use sediment controls measures, including straw bales, silt fences, sediment traps and/or sediment basins</li> <li>▶ Use water quality treatment measures to capture and treat runoff and to prevent runoff from entering Clear Creek and associated wetlands</li> <li>▶ Use designated areas for vehicle staging to minimize disturbance of wetlands and vegetated areas</li> <li>▶ Revegetate disturbed areas as quickly as possible with native vegetation</li> <li>▶ Install temporary fencing to prevent construction access to wetland areas</li> <li>▶ Target dewatering activities to avoid wetland areas</li> <li>▶ Keep cranes and other heavy equipment for bridge construction out of the river or stream bank area to the greatest extent possible</li> <li>▶ Construct a crane pad if cranes or other equipment can not be kept out of the creek</li> </ul>
<b>Hazardous Materials</b>	<ul style="list-style-type: none"> <li>▶ Conduct Initial Site Assessments (ISA) CDOT Form 881 for partial acquisitions or individual, site-specific Phase I environmental site assessments for full acquisitions</li> <li>▶ Perform Preliminary Site Investigations (PSI) of properties to be acquired for right-of-way, if recommended by the ISA or Phase 1</li> <li>▶ Prepare a materials handling plan and a health and safety plan, as required by Section 250.03 of the <i>CDOT Standard Specifications for Road and Bridge Construction</i></li> <li>▶ Conduct an asbestos and miscellaneous hazardous materials survey of each property prior to demolition</li> <li>▶ Abate asbestos and miscellaneous hazardous materials, as necessary</li> <li>▶ Check properties for the presence of methamphetamine lab residues prior to acquisition</li> <li>▶ Remove and appropriately recycle or dispose of all regulated materials including PCB-containing ballasts, fluorescent bulbs, mercury containing equipment, electronic equipment, containerized regulated liquids (e.g., paints, solvents, oil, grease, chemicals, pesticides, and herbicides), and CFC-containing equipment, prior to building or structure demolition activities</li> </ul>
<b>Visual</b>	<ul style="list-style-type: none"> <li>▶ Incorporate landscaping and other design elements within right-of-way, where space is available to provide a visual transition between the adjacent area and the new signalized intersection at Cabela Drive, 44<sup>th</sup> Avenue, and Holman Street</li> <li>▶ Provide for public involvement on aesthetic issues such as bridge design treatments at grade-separated intersections, and retaining walls</li> </ul>

**Table 4-27 Summary of Mitigation Measures (Continued)**

Resource	Mitigation Measures
<b>Construction</b>	<p>Specify construction mitigation measures in final design, which will include the following to the extent practicable:</p> <ul style="list-style-type: none"> <li>▶ Engines and exhaust systems on equipment in good working order</li> <li>▶ Equipment maintained on a regular basis, and equipment subject to inspection by the project manager to ensure maintenance</li> <li>▶ Fugitive dust systematically controlled through diligent implementation of a dust control plan</li> <li>▶ No excessive idling of inactive or unnecessary equipment or vehicles</li> <li>▶ Construction equipment and vehicles use higher-grade fuel to reduce pollutant emissions</li> <li>▶ Stationary equipment located as far from neighbors as possible</li> <li>▶ Construction of noise walls (determined to be feasible and reasonable during design stages) early in the construction phase, where practicable</li> <li>▶ Maintain access to local businesses, residences, and trails</li> <li>▶ Coordinate detour routes to avoid overloading local streets</li> <li>▶ Minimize construction duration in residential areas</li> <li>▶ Avoid nighttime activities in residential areas, as much as possible</li> <li>▶ Re-route truck traffic away from residential streets, where possible</li> <li>▶ Implement BMPs required by the SWMP including keeping vehicles in good working order to minimize oil/fuel leaks on to the project site.</li> <li>▶ Combine noisy operations to occur in the same period</li> <li>▶ Conduct pile driving and other high-noise activities during daytime construction, when possible. Public notification of high-noise activities will be provided as part of public outreach.</li> <li>▶ Develop traffic management plan to include: <ul style="list-style-type: none"> <li>● Maintain traffic flow during peak travel times by minimizing lane closures, if possible</li> <li>● Coordinate with emergency service providers to minimize delays and ensure access to properties</li> <li>● Use signage, television and radio announcements to inform and advertise timing of road closures</li> <li>● During peak travel times, keep as many lanes as possible open by temporarily shifting lanes within the existing framework of the roadway</li> <li>● Develop public outreach and public information plan</li> <li>● Develop method of handling traffic</li> <li>● Estimate work zone delays and mitigation strategies</li> </ul> </li> <li>▶ Public information and involvement prior to and during construction. This will include an informational meeting to be held prior to construction to discuss construction details and mitigations measures. During construction, updates will be provided, as needed.</li> <li>▶ Coordinate Proposed Action construction with local agency construction and local site development activities</li> </ul>
<b>Utilities</b>	<ul style="list-style-type: none"> <li>▶ Coordinate with utility providers during final design and construction to ensure appropriate relocation and avoid interruption of service</li> <li>▶ Conduct locator services and potholing during preliminary and final design to provide more accurate information on underground utilities</li> <li>▶ Develop designs to relocate the utility with the utility company or public utility department, if relocation is required</li> <li>▶ Provide design of utility adjustments to the affected company or public utility department for review</li> <li>▶ Coordinate proper detours and advance notice with service providers to allow delivery of uninterrupted utility service during construction</li> <li>▶ Coordinate new facilities with relocation or reconstruction of facilities associated with the Proposed Action</li> </ul>