4.0 Environmental Analysis

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This chapter defines the context, or affected environment, for environmental conditions relevant to the project and evaluates the potential impacts of the No Action Alternative and Build Alternatives on the human and natural environment. The environmental analyses presented in this chapter have been performed in accordance with federal and state regulations and guidance. Both the Colorado Department of Transportation (CDOT) National Environmental Policy Act (NEPA) Manual (CDOT 2024a) and Environmental Stewardship Guide (CDOT 2024b) were used, along with applicable resource-specific guidance.

As presented in Table 4-1, this chapter is organized by environmental resource, with information specific to each on relevant regulatory requirements, existing conditions, and impacts. More detailed information is available in resource-specific technical reports, which are provided in Appendix E, *Resource Technical Documentation*.

Table 4-1. Environmental Resources Evaluated in Chapter 4.0

Section	Resource	Section	Resource
4.1	Transportation Impacts (Appendix E1 and Appendix E2)	4.10	Hazardous Materials (Appendix E11)
4.2	Air Quality (Appendix E3)	4.11	Soils and Geologic Resources (Appendix E12)
4.3	Noise (Appendix E4)	4.12	Historic Properties (Appendix E13 and Appendix E14)
4.4	Biological Resources (Appendix E5)	4.13	Paleontological Resources (Appendix E15)
4.5	Wetlands and Aquatic Resources (Appendix E6)	4.14	Recreational and Section 6(f) Resources (Appendix E16)
4.6	Water Quality (Appendix E7)	4.15	Section 4(f) Resources (Appendix E17)
4.7	Floodplains (Appendix E8)	4.16	Visual (Appendix E18)
4.8	Land Use and Right-of-Way (Appendix E9)	4.17	Utilities (Appendix E19)
4.9	Social and Economic Resources (Appendix E10)		

Prime and unique farmlands or other federally regulated farmlands are not present in the project area and are not discussed in this document. Section 4.18 includes information on

short-term uses of the human environment and the maintenance and enhancement of long-term productivity. Section 4.19 includes information on any irreversible and irretrievable commitments of Federal resources which would be involved in the Preferred Alternative, the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative, should it be implemented.

Each resource has a specific study area that is described in the introduction to the associated section. The project limits (Figure 4-1) represent the full extent of Interstate 270 (I-270) from Interstate 25 (I-25)/United States Highway 36 (US 36) to Interstate 70 (I-70) (approximately 6.5 miles), including the interchanges with Interstate 76 (I-76), York Street, Vasquez Boulevard, and Quebec Street. For context, an aerial image of the project limits and surrounding area is provided in Figure 4-2. The project footprint (Figure 4-1) represents the area that would be required to construct, operate, and maintain proposed improvements. It includes 369 acres surrounding the highway and captures the limits of improvements for both Build Alternatives. Some resources, such as utilities, are analyzed within the project footprint; others, such as water quality, have a broader study area to provide necessary context for the resource. Study areas were defined with input from resource agencies.

Reasonably foreseeable impacts are assessed for the No Action Alternative and both Build Alternatives. The analysis is presented separately for each Build Alternative when there are differences in anticipated impacts. In cases where impacts are anticipated to be the same, the analysis is combined under one heading: Build Alternatives. Mitigation identified for the Build Alternatives is summarized for each resource, with specific mitigation commitments for the Preferred Alternative detailed in Chapter 5, *Preferred Alternative Mitigation Commitments*.

Figure 4-1. Project Limits and Project Footprint

Figure 4-2. Project Limits – Aerial Context

4.1 Transportation Impacts

This section provides an overview of the potential impacts to the transportation system that might result from the No Action Alternative and the Build Alternatives (the Three General-Purpose Lanes Alternative and the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative). For more information see Appendix D, *Transit, Bicycle, and Pedestrian Technical Report*, Appendix E1, *Transportation Impacts,* and Appendix E2, *Traffic Technical Report*.

4.1.1 Existing Transportation Facilities

I-270 is a controlled-access interstate highway with two general-purpose lanes in each direction between I-25 and I-70, serving as a critical east-west connection in the Denver metro area. The posted speed limit is 55 miles per hour (mph). The corridor connects major highways including I-70, I-25, US 36, and I-76.

The corridor serves as part of the Primary Highway Freight System, the Strategic Highway Network (STRAHNET), and hazardous materials routes and freight traffic currently comprises 8 to 17 percent of vehicles. The corridor also intersects Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) freight rail lines.

Transit on the corridor is limited to the Regional Transportation District's (RTD) Flatiron Flyer 5 (FF5), a regional bus between Boulder and the Anschutz Medical Campus that travels along but does not stop on I-270. Other transit services include Routes 37 and 88 on Quebec Street/South Sandcreek Drive, Routes 48 and 49 near the Vasquez Boulevard interchange, and the RTD N Line (commuter rail) crossing near the Burlington Ditch.

Bicycle and pedestrian connectivity across the corridor and in the study area is fragmented. There are major regional trails (Sand Creek, Clear Creek, South Platte River) crossing the corridor but with limited connectivity across I-270.

4.1.2 Overview of the Transportation Impacts Analysis Approach

The project team applied regional travel demand modeling from the Denver Regional Council of Governments (DRCOG) to forecast 2050 conditions, microsimulation to capture traffic operations and bottlenecks, safety analysis based on crash diagnostics, and bicycle/pedestrian network evaluation. These methods support side-by-side comparisons of the No Action Alternative and Build Alternatives.

Detailed information on the safety assessment can be found in Appendix A, *Safety Assessment Technical Report*. Detailed information on the travel demand and microsimulation modeling processes and analysis can be found in Appendix E2, *Traffic Technical Report*.

4.1.3 Alternative Compatibility with the Regional Transportation System

The I-270 corridor connects major highways including I-25, I-70, I-76, and US 36, making its performance critical to the regional transportation system. Under the No Action Alternative, the corridor would remain constrained, limiting the effectiveness of new direct connections between I-25, US 36, and I-70 Express Lanes and pushing more traffic onto parallel highways.

Both Build Alternatives improve compatibility by reconstructing the I-76 and Vasquez Boulevard interchanges, replacing the York Street bridge with multimodal facilities, and adding continuous auxiliary lanes. The Three General-Purpose Lanes Alternative adds capacity but does not integrate with the regional Express Lane network, while the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative provides full Express Lane connectivity, improving travel time reliability and supporting regional mobility investment. Express Lanes are lanes where transit vehicles and high-occupancy vehicles (3 or more people) could travel in an Express Lane, free of charge. Other travelers, including

freight trucks, who choose to pay a toll could also use an Express Lane. A tolling and revenue study will be completed in partnership with CTIO prior to opening the Express Lanes and will evaluate and define the toll rate structures.

Both Build Alternatives include bicycle and pedestrian improvements that are consistent with the regional trail network, strengthening connections to the Sand Creek, Clear Creek and South Platte River Trails. These improvements enhance cross-corridor access and better integrate local facilities with the broader regional system.

4.1.4 Reasonably Foreseeable Impacts of the Alternatives

4.1.4.1 No Action Alternative

Under the No Action Alternative, existing deficiencies along I-270 would persist and intensify as regional demand continues to grow through 2050. Transit and commuter traffic could divert onto local roads contributing to localized congestion. Emergency services and responders would remain hindered by congestion and the narrow shoulders. The No Action Alternative would not address the project's stated purpose and need, and transportation efficiency, safety, and reliability throughout the corridor would continue to worsen.

4.1.4.1.1 Traveler Safety on the Corridor

Crash rates would continue to increase as geometric and operational deficiencies remain. The corridor would continue to experience a crash rate of 42.7 per mile each year, which is well above the statewide average. Without upgrades, rear-end and sideswipe collisions are expected to increase as congestion grows.

4.1.4.1.2 Travel Time and Reliability on the Corridor

Traffic volumes and demand would exceed the No Action Alternative's capacity, resulting in longer periods of recurring congestion, queuing at corridor interchanges, and unreliable travel times. I-270 would operate at Level of Service F, with queues spilling onto connecting highways and worsening regional congestion.

4.1.4.1.3 Transit on the Corridor

The FF5 would continue to reroute to I-25 and I-70 to avoid congestion, resulting in longer and less reliable trips.

4.1.4.1.4 Bicycle and Pedestrian Connectivity Across the Corridor

For bicyclists and pedestrians, I-270 remains a barrier under the No Action Alternative. Existing bicycle and pedestrian network gaps would persist with limited connectivity across I-270. Sidewalks are inconsistent, bicycle lanes are limited, and trail underpasses are often unsafe or poorly lit.

4.1.4.1.5 Freight Operations on the Corridor

Oversized and overweight freight vehicles would have no practical alternative to I-270 due to restrictions on other corridors and bridge clearances, forcing these vehicles to continue using I-270 under increasingly congested and unsafe conditions. Freight operations would continue

to suffer under the No Action Alternative, as short ramps, narrow shoulders, and heavy congestion increase delays and costs.

4.1.4.2 Build Alternatives

Both Build Alternatives would improve safety, mobility, and regional reliability on I-270. Emergency services and responders would benefit from added shoulder width and reduced congestion, resulting in faster and safer incident response.

The Three General-Purpose Lanes Alternative would reduce congestion and crashes but offer limited operational flexibility under future traffic growth.

The Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative would provide the greatest travel-time reliability by managing demand through dynamic pricing and allowing high-occupancy vehicles and transit buses to maintain consistent speeds during peak periods. This alternative would also better integrate I-270 into the regional Express Lane network.

Both Build Alternatives would meet the project's purpose and need and provide long-term transportation benefits compared to the No Action Alternative.

4.1.4.2.1 Traveler Safety on the Corridor

Reconstruction of interchanges at Vasquez Boulevard and I-76, continuous auxiliary lanes, and widened shoulders would reduce congestion and crash potential by improving merging operations and roadway geometry.

The Three General-Purpose Lanes Alternative is projected to lower crash rates by about 9 percent compared to the No Action Alternative.

The Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative provides greater benefits by shifting transit, high-occupancy vehicles, and toll-paying vehicles into Express Lanes. This reduces congestion, limits lane changes, and smooths traffic flow. National studies show Express Lanes can reduce crashes by as much as 17 percent.

4.1.4.2.2 Travel Time and Reliability on the Corridor

The Three General-Purpose Lanes Alternative improves a.m. travel times to 7 minutes in both directions, with gains of 8 to 20 minutes over today and No Action. In the p.m., eastbound improves to 8 minutes, but westbound worsens by 3 minutes due to a merge bottleneck near I-25 and US 36.

The Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative performs best, cutting a.m. eastbound trips to 11 minutes in general-purpose lanes and 7 minutes in Express Lanes. In the p.m., both provide 7-minute eastbound trips and westbound improves to 20 minutes in general-purpose lanes and 9 minutes in Express Lanes. By matching exit capacity and separating traffic streams, this option reduces lane changes, improves flow, and delivers the most reliable westbound travel with 34 percent less delay, higher speeds, and 8 percent more peak trips than the Three General-Purpose Lanes Alternative.

4.1.4.2.3 Transit on the Corridor

The Three General-Purpose Lanes Alternative would improve bus travel times by reducing overall congestion but does not include dedicated transit facilities.

The Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative offers the most benefit by providing buses direct access to Express Lanes, allowing them to bypass congestion and maintain reliable schedules.

4.1.4.2.4 Bicycle and Pedestrian Connectivity Across the Corridor

Both Build Alternatives add the same set of improvements that close gaps in the network, reduce conflicts with vehicles, and provide safer and more direct crossings. New bicycle and pedestrian connections at York Street, Vasquez Boulevard, and Quebec Street would close gaps in the regional trail network and enhance multimodal safety.

4.1.4.2.5 Freight Operations on the Corridor

Freight movement would become more efficient through improved ramp design and lane continuity, reducing travel times for freight trucks and limiting diversion to local streets.

The Three General-Purpose Lanes Alternative addresses these problems by adding capacity, wider shoulders, longer merge lanes, and auxiliary lanes in high-conflict areas, which ease truck entry and exit and help maintain steady speeds.

The Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative provides the greatest benefit by combining these upgrades with reduced congestion from shifting vehicles into Express Lanes. It cuts westbound p.m. truck travel times by nearly 45 percent compared to No Action and offers the most reliable option for freight carriers.

4.1.4.2.6 Construction Impacts

Construction will be phased to match funding and minimize disruption, though temporary impacts will affect all users. General traffic will face slower speeds, narrow shoulders, and detours that may delay emergency response and create localized congestion during major events. Transit services such as RTD's FF5 may encounter delays or detours, while trail and bridge work could temporarily close the South Platte and Sand Creek Trails, with CDOT providing detours and staging improvements to preserve connectivity. Freight trucks will experience slower speeds and delays due to work-zone restrictions, and detours may disrupt deliveries and oversize loads. Rail operations could also be affected during bridge replacements. While temporary impacts will affect motorists, freight, transit, bicyclists, pedestrians, and emergency responders, CDOT will maintain corridor functionality and reduce delays wherever possible.

4.1.5 Mitigation

During construction, CDOT will prepare and implement a public information plan, an emergency service provider coordination plan, and traffic control plan to manage lane closures, detours, and temporary access modifications. These plans will be developed in coordination with local agencies, emergency service providers, and the Colorado Motor

Carriers Association to maintain safe and efficient travel for motorists, freight, transit, and non-motorized users. Advanced notice of traveler information will be provided through multiple platforms to minimize disruption and maintain emergency response capabilities.

4.2 Air Quality

The air quality analysis performed for the project was completed as required by:

- Clean Air Act (CAA) (1970, as amended)
- Federal Highway Administration (FHWA) memorandum Updated Interim Guidance on Mobile Source Air Toxic (MSAT) Analysis in NEPA Documents (FHWA 2023a)
- FHWA's Frequently Asked Questions (FAQs): Conducting Quantitative MSAT for FHWA NEPA Documents (FHWA 2023b)
- CDOT's Air Quality Project-Level Analysis Guidance (CDOT 2019b)

The traffic modeling used for the air quality analysis did not assume that the direct connects between I-270 and I-25 or I-270 and I-70 would be in place, providing a more conservative analysis. The analysis is summarized in this section and detailed in Appendix E3.

Air quality at the federal level is regulated under CAA, the purpose of which is to protect and enhance air quality to promote public health, welfare, and the productive capacity of the nation. The CAA regulates six commonly found air pollutants (ozone, carbon monoxide [CO], particulate matter [PM], nitrogen dioxide [NO_2], sulfur dioxide [SO_2], and lead), also known as criteria pollutants, which are harmful to human health and the environment, and for which National Ambient Air Quality Standards (NAAQS) have been set. Ground-level ozone, CO, NO_2, PM less than 10 microns (PM_{10}), and PM less than 2.5 microns ($PM_{2.5}$) are considered transportation-related criteria pollutants. Nitrogen oxide (NO_x) and volatile organic compounds (VOCs) are important transportation-related pollutant precursors.

The CAA also regulates Hazardous Air Pollutants (HAPs), or air toxics. MSATs, a subset of Hazardous Air Pollutants, are compounds emitted from motor vehicles and motorized equipment that are known or suspected of causing cancer or other serious health and environmental effects. The US Environmental Protection Agency (EPA) has identified nine compounds with significant contributions from mobile sources that are among the key drivers of national and regional-scale cancer risk and non-cancer hazards. FHWA has labeled these as priority MSATs for NEPA studies.

Transportation projects in nonattainment and maintenance areas are evaluated for air quality under the CAA through what is known as the Conformity Rule. Nonattainment and maintenance areas are geographic regions in the United States where air pollutant levels persistently exceed NAAQS (nonattainment areas) or were previously designated as nonattainment but later redesignated as attainment (maintenance areas). Nonattainment, maintenance, and attainment areas that were previously in nonattainment and maintenance are subject to special requirements to improve and maintain air quality. The Conformity Rule requires demonstration that pollutant concentrations near the project will meet the NAAQS and be consistent with (conform to) the purpose of a statewide implementation plan (SIP) for air quality, a plan that shows how communities that once violated the federal clean air standards have attained and will continue to maintain those standards. The EPA's

transportation conformity rule (40 Code of Federal Regulations (CFR) 51.390 and 40 CFR Part 93) establishes the criteria and procedures for determining whether transportation activities conform to the SIP.

Transportation conformity applies at both a regional and project level. Regional conformity for a transportation project is satisfied if the project's design concept, scope, and "open-to-traffic" schedule are consistent with those included in a currently conforming, fiscally constrained Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP). Project-level conformity is an additional requirement that applies to criteria pollutant emissions that may cause localized air quality impacts. Project-level conformity requirements only apply to projects of local air quality concern in NAAQS nonattainment or maintenance areas. Hot-spot analysis (an estimation of likely future localized pollutant concentrations) is included within a project-level conformity determination for these projects. However, for projects that are not a local air quality concern in NAAQS nonattainment or maintenance areas, such as this project, hot-spot analysis is not required.

On January 20, 2025, President Trump signed Executive Order (EO) 14148 - Initial Rescissions of Harmful Executive Orders and Actions and EO 14154 – Unleashing American Energy. The EOs revoked EO 13990 – Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis (January 20, 2021) and EO 14008 – Tackling the Climate Crisis at Home and Abroad (January 27, 2021). Subsequently on January 29, 2025, Secretary Duffy signed a Memorandum for Secretarial Offices and Heads of Operating Administrations – Implementation of Executive Orders Addressing Energy, Climate Change, Diversity, and Gender. On February 25, 2025, the Council on Environmental Quality (CEQ) published an Interim Final Rule removing the CEQ's NEPA implementing regulations, effective April 11, 2025 (90 *Federal Register* 10610). As a result of these actions, FHWA will not include greenhouse gas emissions and climate change analyses in the federal environmental review process. Any purported greenhouse gas emissions and climate change impacts will not be considered in the federal decision. Accordingly, no greenhouse gas emissions or climate change analyses are included in this Draft Environmental Impact Statement (EIS).

Air quality at the state level follows Colorado Revised Statutes (CRS) 43-1-128, *Environmental Impacts of Capacity Projects*. Two additional air quality-related reports have been completed to document and comply with the state statute and are available on the I-270 website (https://www.codot.gov/projects/studies/i270study).

4.2.1 Affected Environment

The study area for air quality spans portions of Adams County, Commerce City, and Denver and focuses on the project limits, as well as the other roadways and intersections that are either part of or impacted by the project as shown in Figure 4-3.

The predominant sources of air pollutants within the study area include traffic and industrial activity. Moderate to heavy traffic congestion along major highways and roadways, as well as on I-270 itself, are contributors of traffic-related air pollutants in the study area. There are multiple point sources of air pollutants from industrial sites in the corridor, including refineries.

As of March 2025, all areas in Colorado were in attainment of all NAAQS criteria pollutants except ground-level ozone, a regional air pollutant. Eight counties in the Denver metro area and a portion of one county in the Colorado North Front Range are currently designated as nonattainment for exceeding the 2015 8-hour ozone standard (70 parts per billion [ppb]). Seven counties in the Denver metropolitan area and portions of two counties in the Colorado North Front Range are currently designated as nonattainment for exceeding the 2008 8-hour ozone standard (75 ppb). The Denver metro/Northern Front Range area was originally designated as nonattainment under the 1-hour ozone standard, which was replaced with an 8-hour ozone standard in 2008. Annual fourth-highest daily maximum 8-hour ozone design values have fluctuated above and below the NAAQS since 2008 (Air Pollution Control District [APCD] 2024). Projects that are a part of a region's conforming, fiscally constrained Regional Transportation Plan and Transportation Improvement Program meet the regional conformity requirements through a broad assessment of emissions involving the entire transportation network to ensure they are consistent with the emissions goals contained in the region's State Implementation Plan. This project is included in the region's conforming, fiscally constrained Plan.

Figure 4-3. Air Quality Study Area

The Denver region was previously designated nonattainment for CO and PM_{10}. The region was redesignated to attainment/maintenance status for CO by the EPA on December 14, 2001 (EPA 2001), and for PM_{10} by the EPA on September 16, 2002 (EPA 2002). Denver is in attainment for the 1997, 2006, and 2012 $PM_{2.5}$ standards. EPA has not yet designated nonattainment areas for the 2024 annual $PM_{2.5}$ standard of 9.0 micrograms per cubic meter ($\mu g/m^3$). However, in their January 2025 submittal to EPA, the Colorado Department of Public Health and Environment (CDPHE) recommended all areas of Colorado be designated in attainment for the $PM_{2.5}$ annual standard based on monitoring data between 2021 and 2023.

4.2.2 Reasonably Foreseeable Impacts of the Alternatives

This section documents the NEPA comparative analysis for criteria air pollutants and MSAT pollutants. Emissions were estimated using the Motor Vehicle Emissions Simulator (MOVES), a model designed by the EPA to estimate air pollutant emissions from mobile sources in the US. Emissions were inventoried in the summer (July) and winter (January) to addresses seasonal differences in weather patterns (such as temperature inversions that occur as a result of the complex topography of the region). Modeling was performed in accordance with *MOVES4 Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity* (EPA 2023).

Table 4-2 shows the results of the criteria pollutant emissions inventory during both the summer and winter seasons for existing conditions (2023), the No Action Alternative (2050), the Three General-Purpose Lanes Alternative (2050), and the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative (2050).

Table 4-2. Emissions Inventory in Tons per Day - Criteria Pollutants

Criteria Pollutant	Season	Existing Conditions (2023)	No Action Alternative (2050)	3GPL Alternative[1] (2050)	2GPL + 1EL Alternative[2] (2050)
PM_{10}	Summer	0.275	0.374	0.422	0.397
PM_{10}	Winter	0.327	0.456	0.518	0.488
$PM_{2.5}$	Summer	0.033	0.011	0.011	0.010
$PM_{2.5}$	Winter	0.033	0.011	0.011	0.010
CO	Summer	3.411	0.699	0.777	0.726
CO	Winter	2.945	0.614	0.679	0.634
SO_2	Summer	0.002	0.001	0.001	0.001
SO_2	Winter	0.002	0.001	0.001	0.001
NO_2	Summer	0.061	0.023	0.024	0.022
NO_2	Winter	0.070	0.030	0.031	0.028
NO_x	Summer	0.790	0.122	0.127	0.117
NO_x	Winter	0.906	0.160	0.167	0.153
VOCs	Summer	0.215	0.066	0.075	0.071
VOCs	Winter	0.172	0.061	0.069	0.065

[1] Three General-Purpose Lanes Alternative

[2] Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative

Emissions of most criteria pollutants decrease from existing conditions to the design year for all three alternatives, which is attributed to the implementation of stringent emission standards, improved fuel efficiency, and vehicle fleet turnover. PM_{10} emissions show a slight increase from the existing conditions to the design year, with approximately 65 to 85 percent of total PM_{10} emissions attributed to re-entrained road dust. Both Build Alternatives exhibit slightly higher emissions than the No Action Alternative due to increased traffic volumes in the design year.

The Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative exhibits lower emissions than or the same emissions (SO_2) as the Three General-Purpose Lanes Alternative due to the reduction in congestion.

4.2.2.1 MSATs

The project is identified as a Tier 3 project for MSAT analysis, which means that a quantitative MSAT analysis was conducted for the nine priority MSATs. Table 4-3 shows the results of the quantitative MSAT analysis during both the summer and winter seasons for existing conditions (2023), the No Action Alternative (2050), the Three General-Purpose Lanes Alternative (2050), and the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative (2050).

Table 4-3. Emissions Inventory in Pounds per Day - Priority MSATs

MSAT	Season	Existing Conditions (2023)	No Action Alternative (2050)	3GPL Alternative[1] (2050)	2GPL + 1EL Alternative[2] (2050)
1,3-butadiene	Summer	0.616	0.000	0.000	0.000
1,3-butadiene	Winter	0.549	0.000	0.000	0.000
Acetaldehyde	Summer	3.317	0.358	0.376	0.346
Acetaldehyde	Winter	3.274	0.352	0.369	0.340
Acrolein	Summer	0.445	0.024	0.025	0.023
Acrolein	Winter	0.438	0.022	0.023	0.022
Benzene	Summer	6.662	1.206	1.367	1.285
Benzene	Winter	4.898	0.832	0.939	0.882
Diesel PM	Summer	53.093	0.819	0.876	0.800
Diesel PM	Winter	53.093	0.819	0.876	0.800
Ethylbenzene	Summer	5.331	2.110	2.403	2.258

MSAT	Season	Existing Conditions (2023)	No Action Alternative (2050)	3GPL Alternative[1] (2050)	2GPL + 1EL Alternative[2] (2050)
Ethylbenzene	Winter	5.058	2.037	2.317	2.177
Formaldehyde	Summer	6.107	0.407	0.436	0.404
Formaldehyde	Winter	5.941	0.388	0.414	0.383
Naphthalene	Summer	0.717	0.023	0.026	0.024
Naphthalene	Winter	0.699	0.020	0.022	0.021
Polycyclic organic matter	Summer	0.367	0.010	0.011	0.011
Polycyclic organic matter	Winter	0.360	0.009	0.010	0.009

[1] Three General-Purpose Lanes Alternative
[2] Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative

The modeled MSAT emissions decrease between the 2023 existing conditions and the design year (2050) for all three project alternatives. This is consistent with EPA's national emissions control programs that are projected to reduce annual MSAT emissions by 90 percent from 2010 to 2050 (FHWA 2023a). The much larger decrease in estimated emissions of diesel PM between 2023 and 2050 compared to the other MSATs is most likely a result of Colorado's adoption of the Advanced Clean Trucks rule and the corresponding increase of electric vehicles in the medium- and heavy-duty truck fleets by 2050.

All priority MSATs, with the exception of 1,3-butadiene, are lower under the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative than the Three General-Purpose Lanes Alternative, and 1,3-butadiene is the same across alternatives.

4.2.2.2 Construction

Project construction would result in short-term, temporary emissions of fugitive dust and equipment-related exhaust emissions, such as NO_x, CO, VOCs, and PM (PM_{10} and $PM_{2.5}$), in the study area. Construction of the project is not expected to last longer than 5 years. Therefore, construction emissions do not need to be accounted for in a hot-spot analysis per 40 CFR 93.123(c)(5).

Sources of fugitive dust (PM_{10} and $PM_{2.5}$) during project construction include disturbed surface areas at the construction site and trucks carrying uncovered loads of soil and debris. Fugitive dust emissions would vary from day to day depending on the nature and magnitude of construction activity and local weather conditions. Dust emissions would depend on conditions, such as soil moisture, the silt content of soil, wind speed, and the number of construction vehicles operating.

Exhaust emissions during construction would be generated by fuel combustion in motor vehicles and construction equipment. Construction vehicles and the disruption of normal traffic flow could result in increased motor vehicle emissions in certain areas. These emissions would be temporary and limited to the immediate area surrounding the construction site.

4.2.3 Mitigation

The project will comply with CDOT's *Standard Specifications for Road and Bridge Construction* (CDOT 2023) and the Air Quality Control Commission's Regulations 1 (5 Colorado Code of Regulations [CCR] 1001-3, Emission Control for Particulate Matter, Smoke, Carbon Monoxide, and Sulfur Oxides) and 3 (5 CCR 1001-5, Stationary Source Permitting and Air Pollutant Emission Notice Requirements) to ensure that appropriate control measures are implemented during construction to reduce emissions of most pollutants and control fugitive dust. Examples of emission control measures include limiting unnecessary idling of construction equipment, using heavy construction equipment that has the cleanest available engines or that can be retrofitted with diesel particulate-control technology, and locating staging sites away from residential areas.

The contractor will be required to obtain an Air Pollutant Emissions Notice (APEN) and follow its requirements for the project. APENs are submitted to CDPHE and used to report predicted emissions, apply for a permit, and modify an existing permit. The project may need to obtain a permit if predicted emissions are greater than permit thresholds as defined by CDPHE. Preparation of a fugitive dust control plan will also be required to specify measures to reduce dust emissions during construction. The contractor will also be required to obtain any air quality permits for stationary sources, unless exempt.

4.3 Noise

The traffic noise analysis performed for the project was completed as required by:

- FHWA noise regulations (23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise)
- CDOT's *Noise Analysis and Abatement Guidelines* (NAAG) (CDOT 2020a)
- FHWA's *Highway Traffic Noise Analysis and Abatement Guidance* (FHWA 2011)

The analysis is summarized in this section and detailed in Appendix E4.

Noise is commonly defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with communication, sleep disturbance, and in extreme circumstances, hearing impairment. The unit of measurement used to describe a noise level is the decibel (dB). Noise levels range from 0 dB (threshold of human hearing) to 140 dB (where sound causes pain). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the A-weighted noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dBA (A-weighted decibels). Noise levels of 40 dBA to 50 dBA are typical of a quiet neighborhood, while 70 dBA to 80 dBA might be heard adjacent to a busy urban street or highway. Average noise levels over a period of minutes or hours are

usually expressed as dBA equivalent noise level (Leq) for that period of time, usually one hour, Leq(h).

CDOT and FHWA have established noise levels at which mitigation measures, generally referred to as noise abatement, must be considered. As presented in Table 4-4, the noise abatement criteria (NAC) vary according to the land use activity category.

Existing (2023) and future (2050) noise levels were modeled in the project area using FHWA Traffic Noise Model (TNM) version 2.5. TNM modeling points (receivers) were assigned to individual receptors (locations where noise impacts are assessed, such as residences and recreational areas) or a group of receptors. For existing conditions and the No Action scenario, the model included 111 receivers, representing 119 receptors (93 receivers representing 93 NAC Activity B receptors, 17 receivers representing 21 NAC Activity C receptors, and 1 receiver representing 5 NAC Activity E receptors). The model for the Build Alternatives is the same except it includes two new proposed receptors at a trail underpass that will only be constructed as part of the project. Therefore, for the Build Alternative scenarios, the model included 113 receivers, representing 121 receptors.

Table 4-4. CDOT Noise Abatement Criteria

Activity Category	Activity Leq (dBA) [1, 2]	Evaluation Location	Activity Description
A	56.0	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	66.0	Exterior	Residential
C[3]	66.0	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	51.0	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	71.0	Exterior	Hotels, motels, time-share resorts[4], offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	Not Applicable	Not Applicable	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), warehousing, malls[5], stores[5], shops[5], and Government managed land.[4,6]
G	Not Applicable	Not Applicable	Undeveloped lands that are not permitted.

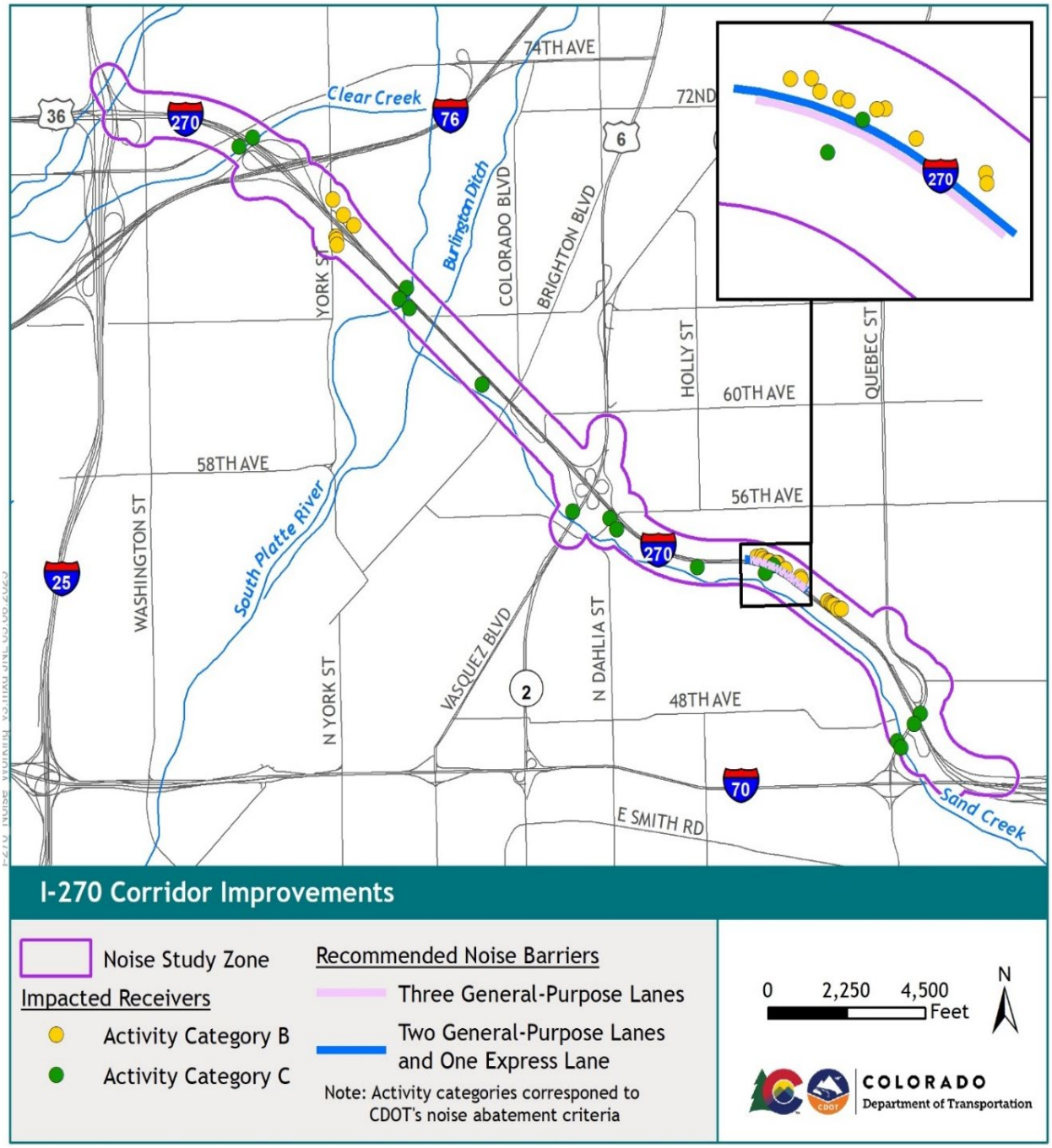
[1] Table 1 of 23 CFR 772 allows state highways agencies to use either Leq(h) or L10(h) on a project, but not both. CDOT uses Leq(h), which is an Hourly A-weighted sound level in dBA.
[2] NACs are for impact determination only. They are not design standards for noise abatement measures.
[3] Includes undeveloped lands permitted for this activity category.
[4] This activity description is not listed in Table 1 of 23 CFR 772.
[5] This activity description is not listed in Table 1 of 23 CFR 772 but is in FHWA's FAQ D7.
[6] Areas of frequent human use within the Government (Federal, State, and County) managed land will be treated as the appropriate land use (e.g., a campground would be Activity Category C, as described in Section 3.5.4 of the CDOT NAAG).

4.3.1 Affected Environment

The study area for the noise analysis, the Noise Study Zone, extends 500 feet in all directions from the proposed edge of travel lanes of freeways or expressways and 300 feet for other types of roads, as shown in Figure 4-4. Traffic on I-270 is the primary source of noise in the study area. One existing noise wall is present within the study area, along I-270 in the eastbound direction west of York Street and north of 68th Avenue, adjacent to a residential development.

Existing (2023) modeled noise levels range from 51.2 dBA to 76.7 dBA. Existing noise levels equal or exceed NAC at 29 receivers—representing 15 residences and 14 locations along Clear Creek Trail, South Platte River Trail, and Sand Creek Greenway Trail.

Figure 4-4. Noise Study Zone, Noise Impacted Receivers, and Recommended Noise Barriers



4.3.2 Reasonably Foreseeable Impacts of the Alternatives

Per CDOT noise guidance, noise impacts can occur in two ways: (1) the predicted design-year traffic noise level meets or exceeds the NAC; or (2) the predicted design-year traffic noise level substantially exceeds the existing condition highway traffic noise level at any receptor. "Substantial" is defined as a noise increase of 10 dBA or more over existing conditions. If a

Build Alternative impacts three or more noise-sensitive receptors that could be protected by noise abatement (e.g., a noise wall), abatement is evaluated using federal law and state guidelines.

4.3.2.1 No Action Alternative

Design year (2050) modeled noise levels for the No Action Alternative range from 51.0 dBA to 77.4 dBA. Noise levels equal or exceed the NAC at 31 receivers—representing 16 residences and 15 locations along the Clear Creek Trail, South Platte River Trail, and Sand Creek Greenway Trail. None of the receptors would experience a substantial noise increase of 10 dBA or more over the existing condition.

The No Action Alternative is not described as having noise impacts. If the project is not constructed, CDOT would not be responsible to mitigate noise via an abatement measure, regardless of if No Action Alternative noise levels exceed the NAC.

4.3.2.2 Build Alternatives

Design year (2050) modeled noise levels for the Build Alternatives range from 52.1 dBA to 77.3 dBA. Noise levels equal or exceed NAC at 38 receivers (Figure 4-4)—representing 22 residences (NAC Activity B) and 16 locations along the Clear Creek Trail, South Platte River Trail, and Sand Creek Greenway Trail (NAC Activity C). None of the receptors would experience a substantial noise increase of 10 dBA or more over the existing condition.

Temporary, intermittent increases in noise would occur during construction affecting receptors located along I-270 and along construction access routes. Noise levels would vary and depend on the type of activity and equipment being operated. The primary source of construction noise would likely be diesel-powered equipment, such as trucks and earth-moving equipment. Pile driving and demolition are expected to be the loudest construction operations. Piles would be required at most major bridge installations. Bridge and road demolition would also be required at many locations.

Nighttime construction activities are anticipated with this project to minimize traffic disruption.

4.3.3 Mitigation

Noise walls were considered in three locations along the I-270 corridor: Along the south side of the eastbound York Street on-ramp; north of I-270 and south of North Sandcreek Drive; and north of I-270 and south of East 52nd Place. A noise wall must be both feasible and reasonable if it is to be constructed with a highway project. A wall is feasible if it can provide, at a height of 20 feet or less, a noise reduction of at least 5 dBA and if it can be constructed without major engineering or safety issues. Reasonableness deals with whether the wall can be designed to achieve a noise reduction of at least 7 dBA, constructed in a cost-efficient manner, and if the community wants the wall (determined through a Benefited Receptor Preference Survey). All three of these criteria must be met for a wall to be considered reasonable to build.

A noise wall was determined to be feasible and reasonable in one location with 12 impacted receptors—north of I-270 and south of North Sandcreek Drive in the South Rose Hill neighborhood (Figure 5-4). The noise model determined that 11 of these receptors would benefit (experience at least a 5 dB(A) reduction in noise levels) from the noise wall in this location. For the Three General-Purpose Lanes Alternative, the wall would be 13 feet high by 1,682 feet long. For the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative, the wall would be 14 feet high by 2,029 feet long. A Benefited Receptor Preference Survey would be conducted during final design and more than 50 percent of the responding owners and residents must support the noise wall for it to be constructed.

To minimize construction noise levels, best management practices will be incorporated into construction contracts, plans, and specifications, where it is appropriate to do so. Public outreach will also be considered, including contact with residents and business owners about the planned construction activities, advanced notification of when construction noise may occur, and a mechanism for complaints, such as a project hotline or other mechanism.

The study area includes unpermitted and undeveloped land (Activity Category G). If development were to occur on these parcels in the future, local officials should consider noise effects on future zoning and land use approvals. Distances may vary somewhat over the corridor due to topography and changing road alignments. In general, land within 425 feet from the proposed new edge of the nearest travel lane is predicted to exceed 66 dBA during peak traffic hours. Land within 200 feet from the proposed new edge of the nearest travel lane is predicted to exceed 71 dBA during peak traffic hours. Properties developed in these areas would not be compatible with Activity Category B or C (66 dBA) or Activity Category E (71 dBA) uses, respectively.

Construction noise is subject to state and local construction noise requirements. Commerce City and Denver have noise ordinances and the State of Colorado has a noise statute (CRS 25-12-103) that restrict the hours in which construction can occur. Coordination would be required and variances may be needed prior to the commencement of any construction activities outside of allowable hours.

4.4 Biological Resources

Biological resources refer to vegetation and noxious weeds, general wildlife and avian species, Colorado special status species, and federally listed threatened and endangered species. Biological resources analysis is summarized in this section and is detailed in Appendix E5. Biological resources are protected by the following federal and state laws and regulations:

- Endangered Species Act (1973)
- Migratory Bird Treaty Act (1918)
- Bald and Golden Eagle Protection Act (1940)
- Colorado Nongame, Endangered, or Threatened Species Conservation Act (1985)
- Colorado Senate Bill (SB) 40 (1973)
- The Colorado Noxious Weeds Act (2003)
- CDOT's Impacted Black-tailed Prairie Dog Policy (2009)

- Shortgrass Prairie Initiative (SGPI) (2003) - The SGPI is a programmatic agreement between FHWA, the US Fish and Wildlife Service (USFWS), Colorado Parks and Wildlife (CPW), CDOT, and The Nature Conservancy to mitigate impacts to the shortgrass prairie ecosystem in eastern Colorado

4.4.1 Affected Environment

The study area for biological resources is the project footprint (Figure 4-1). Field surveys were performed within the study area in July 2020, October 2020, and May 2024.

4.4.1.1 Vegetation and Noxious Weeds

The predominant land cover types within the study area are prairie, grassland, and natural ground cover (47 percent); impervious surfaces or structures (37 percent); and barren land (13 percent). There is limited tree canopy (1 percent), turf and irrigated land (1 percent), or water (1 percent).

Nineteen state-designated noxious weeds were identified in the study area. Of these, 11 are classified by the state as medium-priority for treatment and control (List B), five are classified as low-priority (List C), and three are classified as weeds that should be tracked and reported (Watch List). No high-priority (List A) species were observed. The Colorado Noxious Weeds Act requires eradication of List A weeds, treatment and control of List B weeds, and control and education of List C weeds. Watch List weeds are weeds that should be tracked and reported, but control is not required (Colorado Department of Agriculture 2020).

Canada thistle (*Cirsium arvense*) (List B species), common teasel (*Dipsacus fullonum*) (List B species), downy brome (*Bromus tectorum*) (List C species), and field bindweed (*Convolvulus arvensis*) (List C species) were observed in high density throughout the study area. Canada thistle and common teasel were mainly found near wetland and riparian areas, while downy brome and field bindweed were abundant in upland or drier locations.

Exotic species were also present within the study area during survey—most notably, Russian thistle (*Salsola sp.*) and kochia (*Bassia scoparia*). Although exotic species do not require management under the Colorado Noxious Weed Act, they can spread into naturalized areas that are disturbed by construction activities and degrade natural environments.

4.4.1.2 Fish and Wildlife - General Wildlife

Wildlife species potentially found within the study area include mammals and birds that are common and fairly widespread in urban and suburban environments, including raccoons (*Procyon lotor*), red foxes (*Vulpes vulpes*), coyotes (*Canis latrans*), striped skunks (*Mephitis mephitis*), eastern cottontail rabbits (*Sylvilagus floridanus*), deer mice (*Peromyscus maniculatus*), voles (*Microtus* spp.), and fox squirrels (*Sciurus niger*); black-billed magpies (*Pica hudsonia*), American robins (*Turdus migratorius*), house finches (*Haemorphus mexicanus*), European starlings (*Sturnus vulgaris*), and rock pigeons (*Columba livia*); and several species of bats (*Microchiropteran spp*).

Common herptiles potentially occurring in the study area include American bullfrogs (*Lithobates catesbeianus*) and Woodhouse's toad (*Anaxyrus woodhousii*); bull (or gopher)

snakes (*Pituophis catenifer*), North American racers (*Coluber constrictor*), and garter snakes (*Thamnopis spp.*); and six-lined racerunners (*Aspidoscelis sexlineatus*).

The study area is within the overall range for mule deer (*Odocoileus hemionus*) and white-tailed deer (*Odocoileus virginianus*). Both species are considered uncommon within the study area and, when present, are likely confined to the Clear Creek, South Platte River, and Sand Creek corridors.

Clear Creek, Sand Creek, and the South Platte River have riparian corridors that provide important habitat for birds and wildlife, including reptiles and amphibians. Fish (known to occur in these streams) include fathead minnows (*Pimephales promela*s), sand shiners (*Notropis stramineus*), white suckers (*Catostomus commersoni*), longnose dace (*Rhinichthys cataractae*), western mosquitofish (*Gambusia affinis*), and common carp (*Cyprinus carpio*).

4.4.1.3 Fish and Wildlife - Migratory Birds

Habitat for migratory birds is present within the study area, primarily along the waterways in the wetland and riparian areas. Based on a review of CPW's raptor nest database, there are no raptor nests within 0.5 miles of the study area. However, trees are scattered throughout the study area, mainly along riparian corridors. These trees may provide suitable nesting and perching surfaces for raptors, including owls. A cursory nesting survey was conducted during the field survey, and numerous cliff and barn swallow (*Petrochelidon pyrrhonota* and *Hirundo rustica*, respectively) nests were observed on various bridges in the study area. One inactive raptor nest was inside a tree along Sand Creek, immediately adjacent to the study area in the southeastern portion of the project. This nest was likely used by either red-tailed hawks (*Buteo jamaicensis*) or Swainson's hawks (*Buteo swainsoni*), both of which are relatively common in the region. Although the raptor nest was inactive at the time of the field survey, inactive nests can be used again in subsequent nesting seasons.

4.4.1.4 Fish and Wildlife - Colorado Special Status Species

The study area contains potentially suitable habitats for six Colorado Special Status Species:

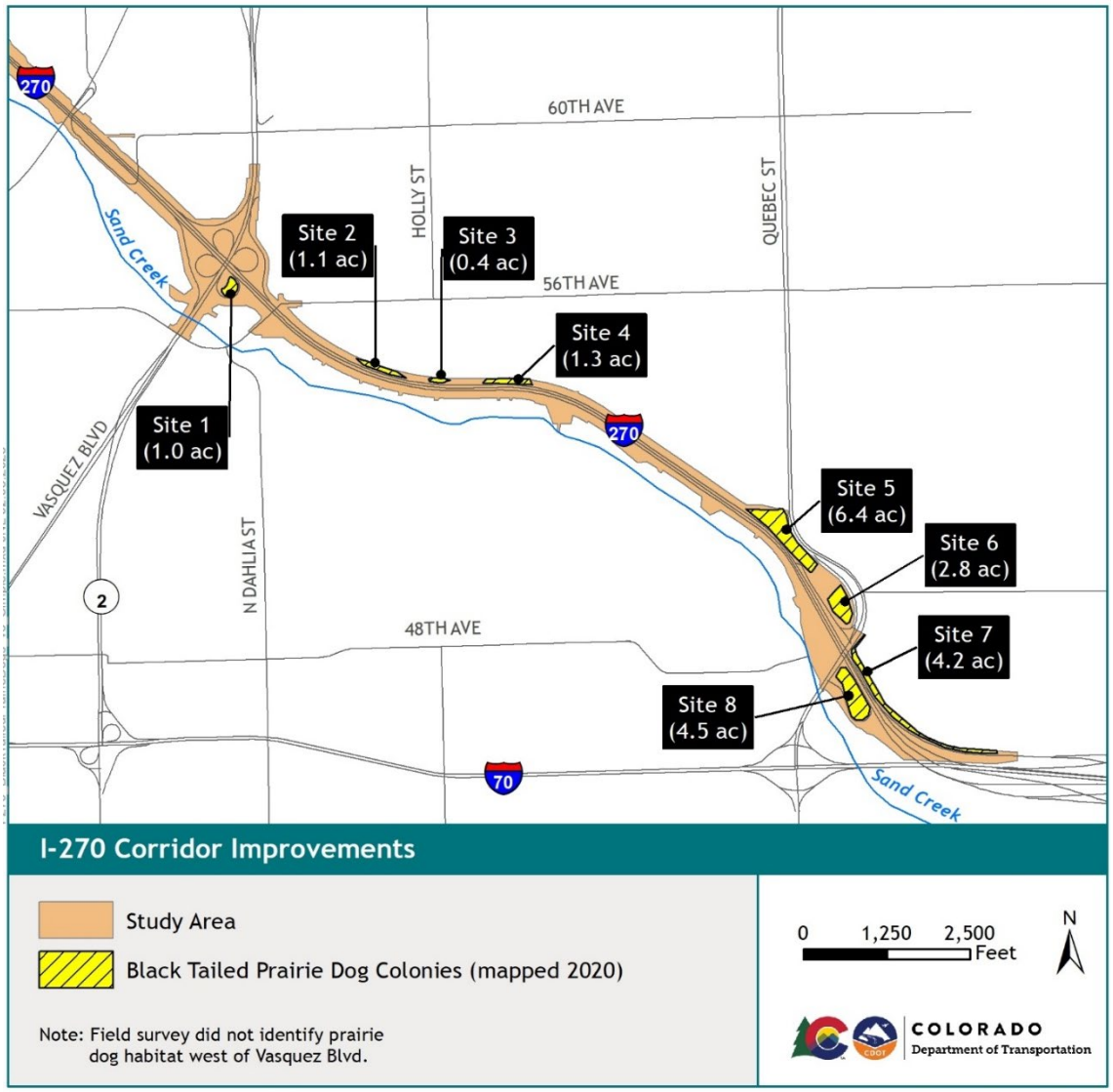
- Northern leopard frog (*Lithobates pipiens*) - State Special Concern
- Bald eagle (*Haliaeetus leucocephalus*) - State Special Concern
- Black-tailed prairie dog (*Cynomys ludovicianus*) - State Special Concern
- Western burrowing owl (*Athene cunicularia*) - State Threatened
- Common garter snake (*Thamnophis sirtalis*) - State Special Concern
- Iowa darter (*Etheostoma exile*) - State Special Concern

The highly urbanized nature of the corridor and associated degradation of aquatic habitats, make it unlikely that most of these species would be present. The northern leopard frog and common garter snake could be present in aquatic and riparian areas throughout the study area. While there are documented occurrences of Iowa darter within one mile of the project, characteristic habitat (cool, clear water with a sand or organic matter substrate and vegetated stream banks) for this species is lacking within the study area.

The study area is within the mapped range for black-tailed prairie dogs (CPW 2018). A total of 21.7 acres of active colonies were mapped during field surveys in the southeastern portion of

the project (Figure 4-5). Because burrowing owls can occupy black-tailed prairie dog burrows, there is also potential for the presence of burrowing owls within the study area.

Figure 4-5. Black-Tailed Prairie Dog Colonies



No bald eagle nests were observed during the field survey, and roosting habitats have not been identified along waterways in the study area. Occurrences within the study area are uncommon and associated with foraging or flight between more desirable habitats.

4.4.1.5 Threatened and Endangered Species

The USFWS's Information Planning and Conservation Tool (IPaC) online service identified the following federally listed threatened and endangered species with potential to occur within or downstream of the study area:

- Piping Plover (*Charadrius melodus*) – Threatened*

- Whooping Crane (*Grus americana*) – Endangered*
- Pallid Sturgeon (*Scaphirhynchus albus*) – Endangered*
- Ute-ladies'-tresses orchid (*Spiranthes diluvialis*) – Threatened
- Western prairie fringed orchid (*Platanthera praeclara*) – Threatened*
- Monarch butterfly (*Danaus plexippus*) - Proposed Threatened

The four species indicated with an asterisk occur downstream of the study area and could be impacted by projects that would result in water-related activities in the South Platte River and its tributaries. Effects to these species are addressed through the Programmatic Biological Assessment prepared by FHWA as part of the South Platte Water Related Activities Program (FHWA 2012, extended through 2032). Any water usage will be reported to the USFWS once the project is complete.

Preble's meadow jumping mouse is not included because the study area is within the block clearance for the Denver metro area within which coordination with the USFWS is not required.

Based on field observations made in July and September 2020, Ute-ladies'-tresses orchid (ULTO) habitat characteristics are not present within the study area. The monarch butterfly lay their eggs on its obligate milkweed host plant. Common places where milkweed occurs include short and tall grass prairies, livestock pastures, agricultural margins, roadsides, wetland and riparian areas, sandy areas, and gardens, in addition to deserts, open forests, and woodlands. FHWA initiated a programmatic, formal consultation with the USFWS on July 18, 2022, regarding the monarch butterfly to determine the impact FHWA/CDOT actions may have on the butterfly. The conference opinion (issued December 28, 2022) concluded that these actions are not expected to jeopardize the monarch butterfly.

4.4.1.6 SB40 Resources

Senate Bill (SB) 40 (CRS 1973a) requires any agency of the state to coordinate with CPW when construction in any stream or its bank or tributaries is planned. Although SB40 emphasizes the protection of fishing waters, it acknowledges the need to protect and preserve all fish and wildlife resources associated with streams in Colorado. Clear Creek, the South Platte River, and Sand Creek, as well as their adjoining wetlands and riparian areas within the study area fall under the jurisdiction of SB40. Impacts to these resources would require SB40 Wildlife Certification, which may include mitigation measures designed to improve fish and wildlife habitat, as well as tree replacements within riparian areas where tree loss is proposed.

4.4.1.7 Shortgrass Prairie Initiative

The study area includes 174.35 acres of SGPI lands. The following seven species identified for conservation in the SGPI have the potential to occur in the study area:

- Bald eagle (Haliaeetus leucocephalus)
- Black-tailed prairie dog (Cynomys ludovicianus)
- Burrowing owl (Athene cunicularia)
- Lark bunting (Calamospiza melanocorys)
- Monarch butterfly (Danaus plexippus)

- Western bumblebee (Bombus occidentalis)
- Northern leopard frog (Lithobates pipiens)

4.4.2 Reasonably Foreseeable Impacts of the Alternatives

4.4.2.1 No Action Alternative

Small areas of vegetation, wildlife habitat, SB40 areas, and habitat within SGPI areas would likely be disturbed by the activities included in the No Action Alternative. Although impacts cannot be quantified at this time, they would be minimal and are not expected to result in any appreciable changes to existing conditions within the study area.

4.4.2.2 Build Alternatives

4.4.2.2.1 Vegetation and Noxious Weeds

Permanently converting vegetation to impervious surfaces would reduce the number of general habitats present along I-270. Most impacts to vegetation would occur within CDOT right of way (ROW) along a heavily trafficked transportation corridor. A breakdown of permanent and temporary impacts by land cover type are presented in Table 4-5.

Table 4-5. Summary of Impacts by Land Cover in the Study Area

Land Cover	Permanent Impacts (Acres)	Temporary Impacts (Acres)
Barren Land	34.93	14.36
Prairie, Grassland, and Natural Ground Cover	127.81	46.55
Impervious Surface	117.68	19.73
Structures	0.04	0.15
Tree Canopy	3.09	0.95
Turf and Irrigated Land	1.56	1.18
Water	0.19	1.16
Total	285.30	84.08

Soil disturbance from construction equipment would create favorable conditions for introduction, establishment, and further spread of noxious weeds.

4.4.2.2.2 Fish and Wildlife - Migratory Birds

Because construction is expected to span several years, disturbances or displacement-related impacts to migratory bird nesting and/or migration near construction areas may occur. The Migratory Bird Treaty Act protects migratory birds, their nests, and their eggs (except for pigeons, European starlings, and certain other species). In Colorado, most nesting and rearing activities occur between April 1 and August 31, but some raptors may nest as early as January or February. Given the urban nature of the corridor, neither Build Alternative is likely to result in extensive habitat loss. Most construction activities will occur in areas where nesting

and foraging are unlikely. Vehicle-bird collisions would likely rise as the wider highway would increase traffic volumes and speeds.

Impacts to bridges could result in temporary impacts to species that may use the underside of the structures, including roosting bats and migratory birds. Individual birds could also be disturbed by noise and light associated with construction.

4.4.2.2.3 Fish and Wildlife - Colorado Special Status Species

The Build Alternatives would result in 1.90 acres of impacts to northern leopard frog habitat (0.37 acres of permanent impact and 1.53 acres of temporary impact). Impacts are likely to decrease with riparian and wetland mitigation as the design progresses and is refined.

Disturbance to wetlands and riparian areas would primarily occur to drainage swales and other low-functioning areas that do not generally provide a suitable habitat for common garter snakes. Impacts to preferred habitat, such as natural floodplain depressions and streambank/riparian wetlands, would be minimal. Therefore, impacts to the common garter snake may occur but are considered unlikely and isolated.

Disturbance to open water would be limited to locations at the I-270 bridge over the South Platte River and Sand Creek at Vasquez Boulevard. In-stream habitat at these locations has been altered by past transportation projects, and preferred habitat features for the Iowa darter, such as undercut banks, are lacking. Based on the low potential for Iowa darters to occur and the low-quality habitat available, potential for impacts to the species are considered unlikely and would be isolated.

Permanent and temporary impacts to black-tailed prairie dogs are likely to occur from removing habitat and from disturbing active colonies located within the construction footprint. Impacts would result from grading, paving, and other disturbances associated with construction. Based on the conceptual design, approximately 21.7 acres of active prairie dog colonies would be impacted by the Build Alternatives (Figure 4-5). As project design progresses, impacts to black-tailed prairie dog colonies will be avoided and minimized, as outlined by CDOT policy (CDOT 2009). Impacts to black-tailed prairie dog burrows have potential to directly impact western burrowing owls. Ground disturbance within and adjacent to suitable habitat would likely disrupt the species behavior and could lead to abandonment and reduce the habitat availability post-construction.

No direct impacts to bald eagles or their habitat are anticipated. No suitable nesting or roosting trees (for example, mature trees along waterways) would be removed. Following construction, habitat characteristics are expected to be similar to existing conditions, and it is unlikely the project would impact bald eagle usage, which is considered low.

4.4.2.2.4 Threatened and Endangered Species

ULTO habitat characteristics are not present within the study area. Therefore, potential impacts to ULTO are not anticipated. The Build Alternatives would not jeopardize the continued existence of the monarch butterfly. In addition, a Biological Assessment was completed in 2023 to update the list of species covered under the SGPI. The monarch butterfly was added in this update and on December 29, 2023, the USFWS responded with a

letter concurring with the request and extended the use of the SGPI with continued annual reporting by CDOT.

4.4.2.2.5 SB40 Resources

The Build Alternatives would impact 3.16 acres of riparian vegetation (2.47 acres of permanent impacts and 0.69 acres of temporary impacts), 4.30 acres of wetlands (2.67 acres of permanent impacts and 1.63 acres of temporary impacts), and 2.67 acres of non-wetland waters (0.26 acres of permanent impacts and 2.41 acres of temporary impacts). For more information regarding wetland and non-wetland waters, refer to Section 4.4.

4.4.2.2.6 SGPI

The Build Alternatives would impact 159.52 acres within SGPI areas (125.53 acres of permanent impacts and 33.99 acres of temporary impacts). Permanent impacts would include replacing vegetation with impervious surfaces and other transportation features. Temporary impacts are associated with construction access and disturbance.

4.4.3 Mitigation

Mitigation to address impacts to biological resources has been developed in compliance with relevant laws and state policy, including SB40 Wildlife Certification Guidelines, Migratory Bird Treaty Act, CDOT Standard Specifications – Section 240 (pertaining to migratory birds), CDOT Impacted Black-Tailed Prairie Dog Policy, and Section 10 of the Biological Assessment, Conference Report, and Conservation Strategy for Colorado's Shortgrass Prairie Initiative (Grunau, Venner, et al. 2023).

CDOT will coordinate with CPW's Aquatic Biologist, and a Programmatic or Formal SB40 Wildlife Certification will be required prior to construction. A revegetation plan will also be developed for the project. The plan will identify appropriate native plants and seed mixes that blend the vegetation with existing vegetation, are consistent with vegetation types, growth habits, and soil types, use native species, mimic surrounding native plant densities, and minimize the spread of noxious and invasive weeds.

4.5 Wetlands and Aquatic Resources

Wetlands are defined for regulatory purposes as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR Part 328.3(a)(c)(1)). Wetlands are important ecological resources that perform many functions including groundwater recharge, flood control, erosion control, and water quality improvement. They also provide habitat for many plants and animals, including threatened or endangered species (Section 4.3).

The primary vehicle for the protection and regulation of wetlands is Section 404 of the Clean Water Act (CWA) (1972) which regulates the discharge of dredged and fill material into waters of the U.S. (WOTUS), including open waters and wetlands that are under the authority of the USACE. Any dredge or fill activity proposing to impact WOTUS must request a permit from the USACE. Open waters and wetlands not under the jurisdiction of the USACE are regulated by

the CDPHE - Water Quality Control Division (WQCD). It is CDOT policy to mitigate for all wetland impacts regardless of their jurisdictional status. Wetlands and aquatic resource analysis is summarized in this section and detailed in Appendix E6.

4.5.1 Affected Environment

The study area for aquatic resources is the project footprint (Figure 4-1). Field surveys and delineations to define the boundaries of wetlands and other waters were performed in July 2020, October 2020, and May 2024.

Aquatic resources delineations were completed in accordance with the Corps of Engineers Wetland Delineation Manual (USACE 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) (USACE 2010). Wetland functions were assessed using the Functional Assessment of Colorado Wetlands (FACWet) method, a rapid assessment methodology that rates wetland conditions by evaluating ecological stressors and their effects on nine state variables that drive wetland function. Stressors are used as indicators of functional impairment.

The results of the delineation are presented in Table 4-6. A total of 11.04 acres of wetlands and 6.46 acres of non-wetland waters (non-vegetated channels and ponds) were delineated in the study area. All wetlands were classified as either lower functioning wetlands that fall into the "functioning impaired" category or functioning wetlands.

Table 4-6. Summary of Wetlands and Non-Wetland Waters in the Study Area

Associated Surface Water	Wetlands (acres) [1]	Non-Wetland Waters (acres) [1]	Federal Jurisdictional Status
Clear Creek	2.85	1.38	Jurisdictional
Sand Creek	4.05	3.42	Jurisdictional
South Platte River	0.12	1.07	Jurisdictional
Burlington Ditch/O'Brien Canal	0.00	0.49	Jurisdictional
Gravel Pit	0.00	0.10	Jurisdictional
Stormwater[2]	4.02	0.00	Non-Jurisdictional
Total Jurisdictional	7.02	6.46	
Total Non-Jurisdictional	4.02	0.00	
Total	11.04	6.46	

[1] Wetland acreages reported in the *Wetland and Aquatic Resources Technical Report* have been rounded for the Draft EIS.
[2] Stormwater wetlands include stormwater-related wetland features, such as roadside ditches and water quality facilities.

Figure 4-6 and Figure 4-7 show the locations of the delineated wetlands and open waters, and other WOTUS in the study area.

Figure 4-6. Aquatic Resources – West Section

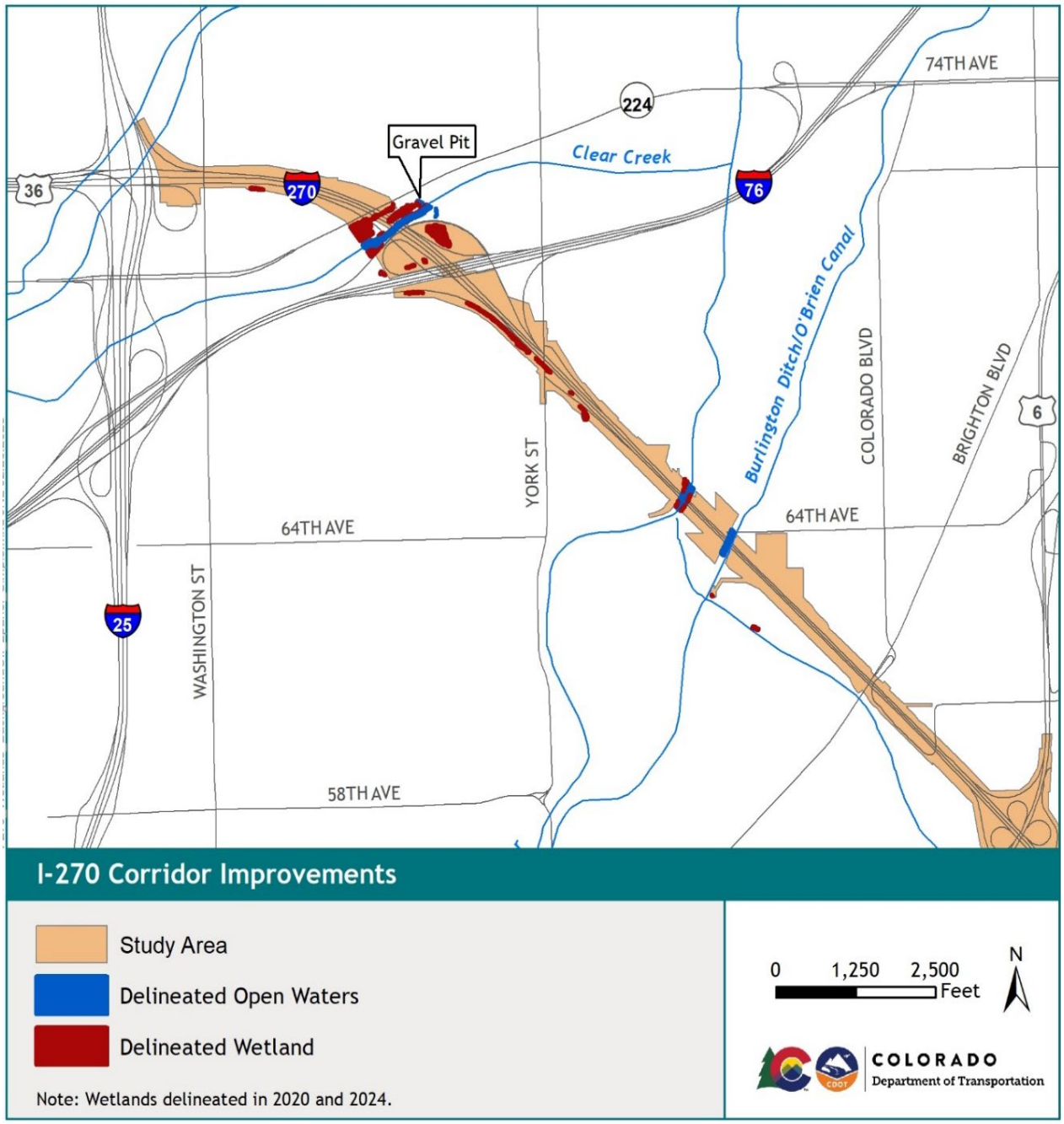
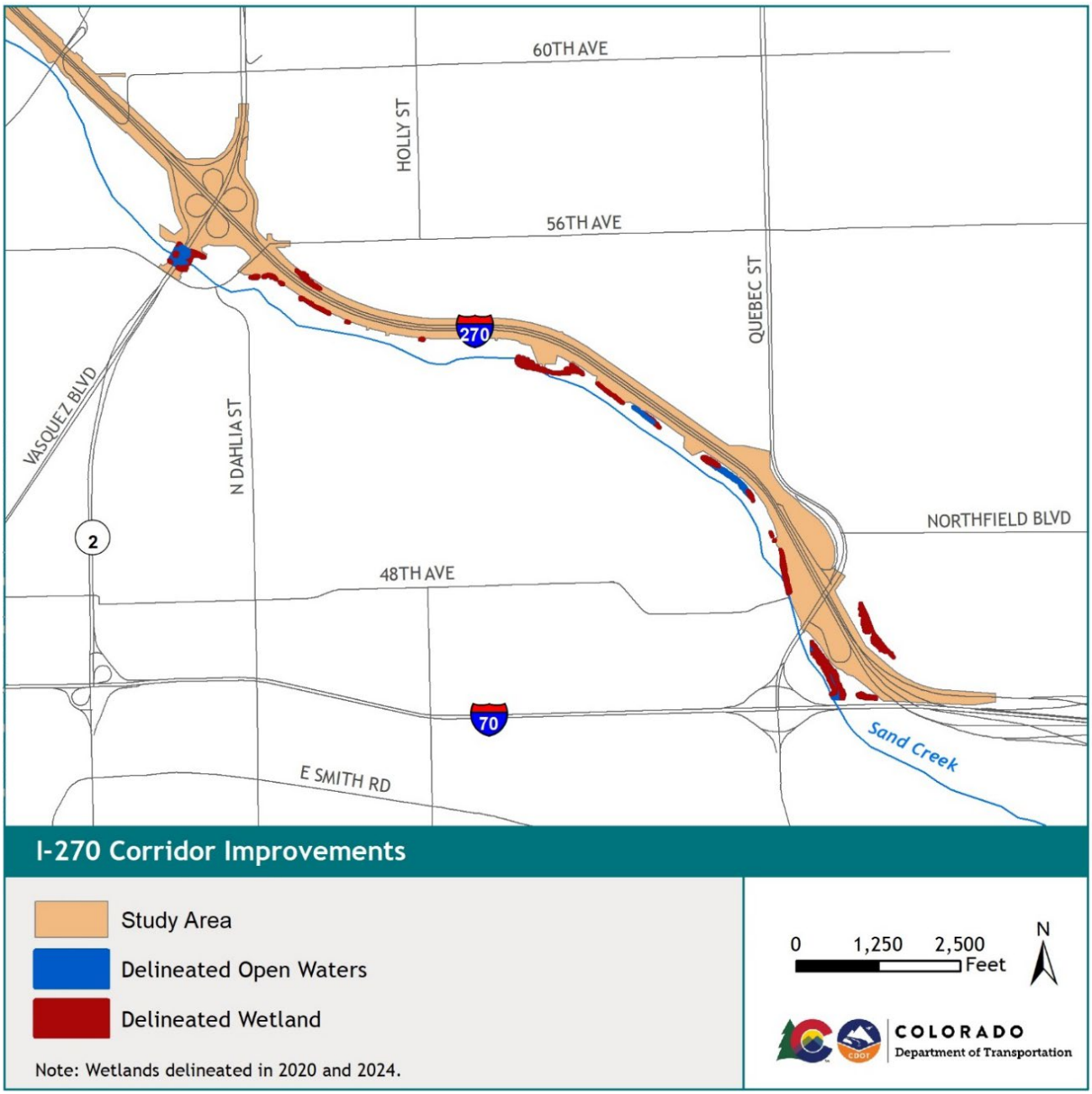


Figure 4-7. Aquatic Resources – East Section



The study area is within the Middle South Platte–Cherry Creek Watershed (hydrologic unit code 10190003). Wetlands are generally associated with the major waterways that cross through the study area—Clear Creek, Sand Creek, and the South Platte River, as well as permanent stormwater facilities or highway drainage features that run parallel to and along I-270.

CDOT initiated coordination with the USACE (Denver Regulatory Office) on May 5, 2023, and an initial meeting to discuss the project was held on May 15, 2023. CDOT submitted

jurisdictional determination requests to the USACE for assumed jurisdictional and non-jurisdictional aquatic resources on August 22, 2024. The purpose of the jurisdictional determination request is to obtain regulatory certainty for the purpose of identifying impacts to Section 404 aquatic resources and eventually to aid in the permitting process prior to construction. Approved and Preliminary jurisdictional determinations were received from the USACE on November 1, 2024.

4.5.2 Reasonably Foreseeable Impacts of the Alternatives

4.5.2.1 No Action Alternative

Maintenance or repair of structures within riparian areas could impact aquatic resources. Although impacts cannot be quantified at this time, given the location of surface waters throughout the study area and the type of work anticipated, these activities would likely be minimal and are not expected to result in any appreciable changes to existing conditions within the study area.

4.5.2.2 Build Alternatives

As presented in Table 4-7, the Build Alternatives are expected to result in 2.67 acres of permanent impacts to wetlands and 0.26 acres of permanent impacts to non-wetland waters.

Table 4-7. Permanent Impacts to Wetlands and Non-Wetland Waters in the Study Area

Associated Surface Water	Permanent Wetland Impacts (acres)[1]	Permanent Non-Wetland Waters Impacts (acres)[1]	Federal Jurisdictional Status
Clear Creek	0.00	0.00	Jurisdictional
Sand Creek	0.26	0.19	Jurisdictional
South Platte River	0.10	0.07	Jurisdictional
Burlington Ditch/O'Brien Canal	0.00	0.00	Jurisdictional
Stormwater[2]	2.30	0.00	Non-Jurisdictional
Total Jurisdictional	0.36	0.26	
Total Non-Jurisdictional	2.30	0.000	
Total	2.66	0.26	

[1] Wetland impact acreages reported in the *Wetland and Aquatic Resources Technical Report* have been rounded for the Draft EIS.
[2] Stormwater wetlands include stormwater-related wetland features, such as roadside ditches and water quality facilities.

Of the total permanent impacts, 13 percent occur in functioning wetlands and 87 percent occur in low-functioning wetlands. No single water crossing (bridges) would incur permanent impacts to presumed jurisdictional WOTUS greater than 0.5 acre, and there would be no permanent impacts to Clear Creek or the Burlington Ditch/O'Brien Canal (I-270 mainline bridges).

As presented in Table 4-8, the Build Alternatives are expected to result in 1.63 acres of temporary impacts to wetlands and 2.41 acres of temporary impacts to non-wetland waters.

Table 4-8. Temporary Impacts to Wetlands and Non-Wetland Waters in the Study Area

Associated Surface Water	Temporary Wetland Impacts (acres)[1]	Temporary Non-Wetland Waters Impacts (acres)[1]	Federal Jurisdictional Status
Clear Creek	0.55	0.22	Jurisdictional
Sand Creek	0.97	1.03	Jurisdictional
South Platte River	0.02	0.77	Jurisdictional
Burlington Ditch/O'Brien Canal	0.00	0.39	Jurisdictional
Stormwater[2]	0.09	0.00	Non-Jurisdictional
Total Jurisdictional	1.54	2.41	
Total Non-Jurisdictional	0.09	0.000	
Total	1.63	2.41	

[1] Wetland impact acreages reported in the *Wetland and Aquatic Resources Technical Report* have been rounded for the Draft EIS.
[2] Stormwater wetlands include stormwater-related wetland features, such as roadside ditches and water quality facilities.

Of the total temporary impacts, 84 percent occur in functioning wetlands and 16 percent occur in lower functioning wetlands that fall into the "functioning impaired" category. Temporarily impacted wetlands are expected to recover following construction and after revegetation and restoration measures.

4.5.3 Mitigation

Federal and state laws require that impacts to wetlands must be avoided, minimized to the extent practicable, and compensated for when impacts are unavoidable. Mitigation for impacts to jurisdictional wetlands will be subject to compliance with Section 404 permit conditions and standards. Mitigation for non-jurisdictional wetlands will be held to similar standards and monitoring protocol but may support roadside water quality as a primary function and purpose.

The study area was evaluated for the potential for on-site mitigation for permanent impacts to wetlands. Several preliminary wetland mitigation concepts have been developed to mitigate unavoidable wetland loss. Wetland mitigation may combine one or more of the on-site wetland mitigation concepts but may also involve the purchase of wetland bank credits.

4.6 Water Quality

Water quality refers to the physical, chemical, and biological characteristics of aquatic systems. It is important to protect water quality for the intended uses of a water body that may include support of aquatic habitats, domestic water supply, contact recreation (such as swimming or other water sports), or agricultural irrigation. Water quality analysis is summarized in this section and detailed in Appendix E7.

Federal and state regulations applicable to water-related resources include:

- CWA (Sections 303(d), 401, 402, and 404) (1972)

- Safe Drinking Water Act (1974)
- National Wild and Scenic Rivers Act (1968)
- Erosion and Sediment Control on Highway Construction Projects (25 Code of Federal Regulations 650 Subpart B)
- EPA's Municipal Separate Storm Sewer System (MS4) Program
- Colorado Water Quality Control Act (CRS 1973b)
- Colorado Regulation 93 - Colorado Section 303(d) List of Impaired Waters
- Colorado Regulation 61 – Colorado Discharge Permit System (CDPS)

Outside of CDOT ROW, local jurisdictions (Denver, Adams County, and Commerce City) regulate water quality through their MS4 programs.

4.6.1 Affected Environment

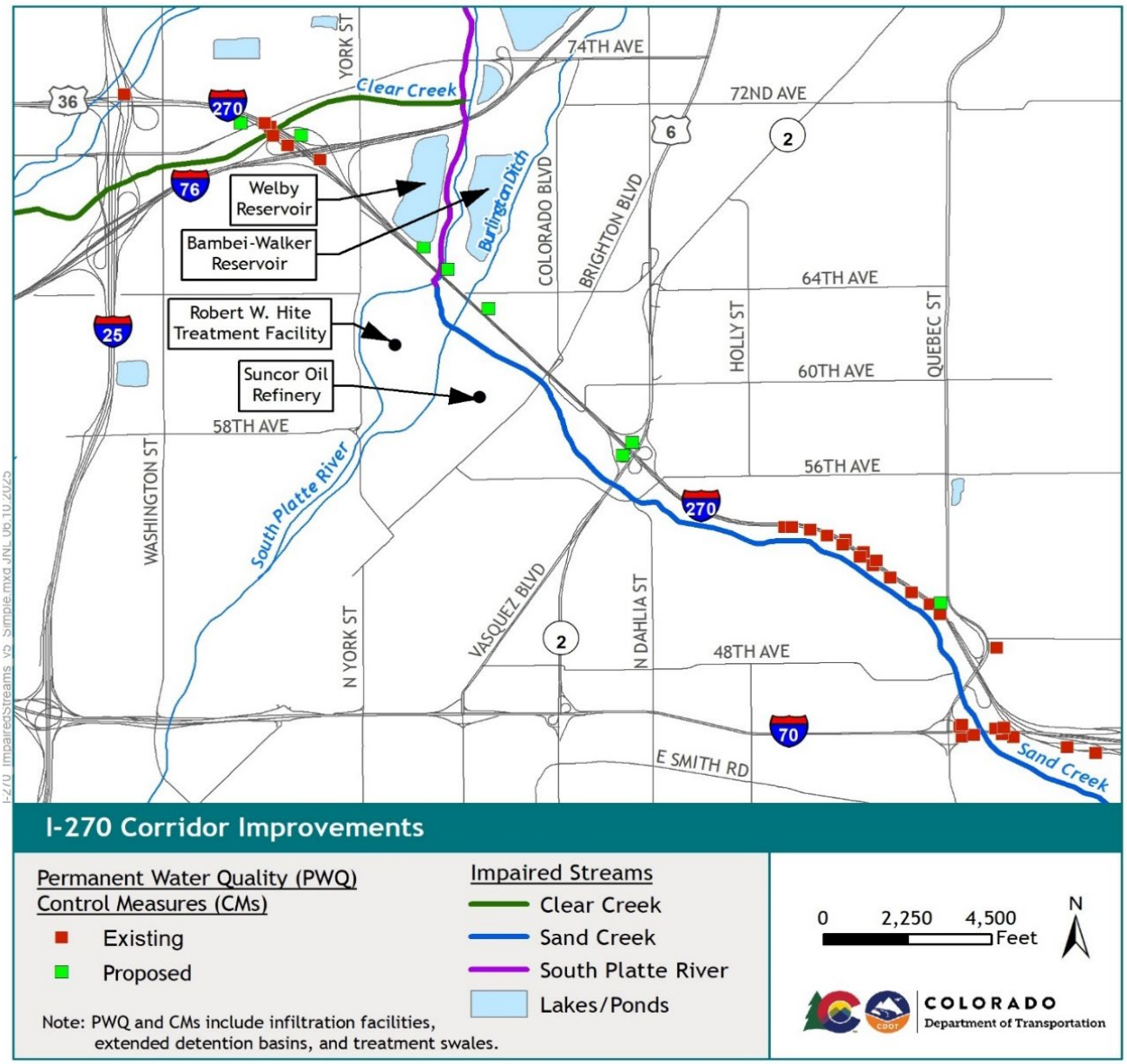
The study area for water quality is the South Platte Watershed (Figure 4-8). The South Platte River is the primary drainage in the study area. Smaller creeks and drainages within the study area include Clear Creek and Sand Creek. Although not visible in Figure 4-7, Sand Creek parallels much of the I-270 corridor. The South Platte River, Burlington Ditch/O'Brien Canal, and Clear Creek cross I-270 near the north end of the corridor.

No waterways within the study area are designated as Wild and Scenic Rivers. Based on Colorado Regulation 93, the CDPHE-WQCD has identified three stream segments within the project footprint as impaired (Figure 4-9). Clear Creek is listed as impaired for ammonia, temperature, *Escherichia coli* (*E. coli*), arsenic, manganese, and organic sediment; South Platte is listed as impaired for temperature, cadmium-D, and *E. coli*; and Sand Creek is listed as impaired for *E. coli* and selenium. Both the South Platte River and Clear Creek have limits established for the maximum amount of pollutants allowed to enter the waterbody in order to meet water quality standards (also called total maximum daily loads [TMDLs]).

CDOT's Online Transportation Information System (OTIS) database identifies existing permanent water quality (PWQ) control measures (CMs) (infiltration facilities such as detention ponds and water quality vaults) along I-270 and adjacent roadways (Figure 5-9). The existing drainage system consists of small and often undersized infiltration facilities concentrated between the I-270/Vasquez Boulevard and I-270/Quebec Street interchanges and at the I-270/I-76 interchange. In general, the infiltration facilities are not well connected to each other and discharged individually to Sand Creek. Existing water quality ponds are not to current water quality standards and are present only at the limits of the project at the I-270/I-25 and I-270/I-70 interchanges.

Figure 4-8. South Platte Watershed

Figure 4-9. Impaired Streams and Existing and Proposed Permanent Water Quality Control Measures



The depth to groundwater is highly variable throughout the project limits. Samples taken during the hazardous materials investigation identified hydrocarbon and metal contamination in the groundwater. Adjacent heavy industrial land uses and landfills have contributed to regionally impacted groundwater, which may discharge to surface water bodies in the areas upstream, and downstream of the project area. Refer to Section 4.10 and Appendix E11 for additional information regarding groundwater conditions in the study area.

Water currently drains from I-270 into ditches, where it is conveyed to pipes and ultimately discharged into adjacent water bodies. The ultimate source of the pollutants identified in

adjacent streams is not isolated to one cause and may include upstream discharges to surface water from agriculture; residential, commercial, and industrial uses; wastewater treatment plants; the highway and other transportation infrastructure; and groundwater discharges from various areas. Pollutants can enter and impair water bodies from natural and man-made causes, including sedimentation from soil erosion, roadway runoff, the application of deicers, and vehicular traffic. Surface water impairments include roadway pollutants of concern, such as cadmium and manganese.

No drinking water supply wells or wellhead protection areas are located within the project footprint. A number of groundwater monitoring wells are located along I-270 to monitor groundwater impacts from the surrounding industrial developments.

The Robert W. Hite Treatment Facility is adjacent to the Suncor Energy USA (Suncor) Oil Refinery and the South Platte River crossing of I-270. Metro Wastewater Recovery (formerly the Metro Wastewater Reclamation District) owns and maintains the facility. As the largest wastewater facility in the Rocky Mountain region, this facility provides wastewater treatment for approximately 2 million residents across the Denver metropolitan area and surrounding communities. The facility's discharge point to the South Platte River is immediately upstream of its confluence with Sand Creek.

4.6.2 Reasonably Foreseeable Impacts of the Alternatives

4.6.2.1 No Action Alternative

The No Action Alternative would maintain existing drainage patterns and PWQ features. Untreated roadway runoff would continue to enter adjacent streams, negatively impacting water quality in the study area.

4.6.2.2 Build Alternatives

The Three General-Purpose Lanes Alternative would result in 128 acres of new impervious surface while the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative would result in 133 acres of new impervious surface. The additional 5 acres of new impervious surface over the Three General-Purpose Lanes Alternative is a result of the 8-foot buffer for the Express Lanes. All other impacts described in this section would be the same under either Build Alternative.

The Build Alternatives would improve water quality conditions in the study area through modernization of the corridor's drainage infrastructure. PWQ CMs will be required in accordance with CDOT's PWQ program requirements. The addition of PWQ CMs and improvements to existing PWQ CMs would improve water quality in the study area. The existing, undersized, and disconnected PWQ CMs would be replaced and outfalls to adjacent surface waters would be consolidated in some areas to reduce the number of PWQ CMs and reduce future maintenance needs.

The addition of new impervious surface will increase runoff from storm events. Plans for PWQ CM locations (water quality ponds) have been developed to address treatment of additional impervious surfaces and to meet CDOT's MS4 permit capture and treatment volume requirements. The modernized drainage design, additional PWQ CMs, and modernization of

existing PWQ CMs are anticipated to improve water quality conditions in the long term when compared to the No Action Alternative.

Temporary impacts are primarily associated with construction—namely, sediment sourced from clearing and grubbing, stream channel work, and roadway construction. Import of soils and earthmoving activities may further increase the risk of erosion and transportation of sediment.

Groundwater may be encountered during drilling activities necessary for pier installation and excavation activities, which would necessitate dewatering during construction and the potential for increased erosion and transportation of pollutants.

4.6.3 Mitigation

Mitigation will address erosion, stormwater runoff, and water quality degradation during construction and operation. In addition to the design of PWQ CMs to treat stormwater runoff from impervious surfaces, the following plans will be developed for the project: a permanent soil stabilization plan; drainage plan; spill prevention, control, and countermeasure plan (to address the potential for spills of regulated materials during construction); and Stormwater Management Plan (SWMP). Stormwater and construction dewatering permits will be obtained from applicable agencies including Adams County, CDOT, CDPHE, Denver, and Commerce City.

4.7 Floodplains

The US Department of Transportation (USDOT) defines floodplains as the lowland areas adjoining inland and coastal waters which are periodically inundated by flood waters, including flood-prone areas of offshore islands (USDOT 5650.2). The floodplains analysis is summarized in this section and detailed in Appendix E8. Federal laws, orders, and guidance applicable to floodplains include:

- National Flood Insurance Act (1968)
- Flood Disaster Protection Act (1973)
- 23 CFR 650 Subpart A, Location and Hydraulic Design of Encroachments on Floodplains
- 44 CFR Chapter I Subchapter B, Insurance and Hazard Mitigation
- DOT Order 5650.2 Floodplain Management and Protection (1979)
- Rules and Regulations for Regulatory Floodplains in Colorado, Colorado Water Conservation Board: 2 Colorado Code of Regulations (CCR) 408-1

The National Flood Insurance Program (NFIP) was established following the passage of the National Flood Insurance Act (1968) and the Flood Disaster Protection Act (1973) to encourage sound floodplain management programs at state and local levels. The Federal Emergency Management Agency (FEMA) maps floodplains and regulates them through the NFIP. To provide a national standard, FEMA has adopted the 100-year flood as the area with a 1 percent chance of flooding in a given year. Federal regulations (23 CFR Part 650 Subpart A) prescribe the policy and procedure for the location and hydraulic design of highway encroachments on floodplains.

In Colorado, the Colorado Water Conservation Board coordinates the NFIP, in cooperation with county and municipal agencies. Adams County, Commerce City, and Denver all participate in the NFIP. Each NFIP-participating community has a designated floodplain administrator who is responsible for overseeing the management of and development within the community's floodplains. The Mile High Flood District (MHFD) and these local floodplain administrators oversee floodplain regulations in the project area.

4.7.1 Affected Environment

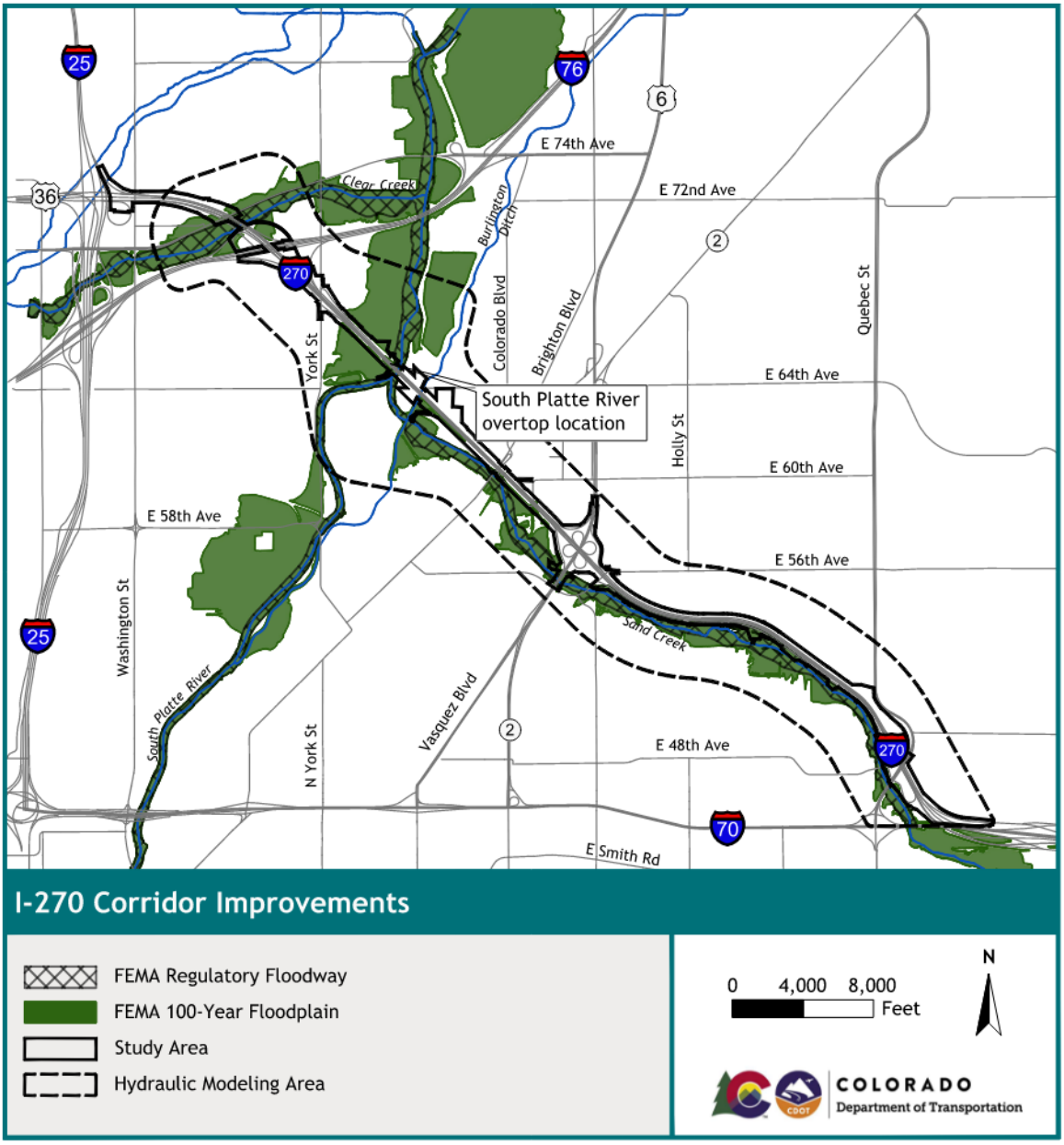
The study area for floodplains is the project footprint (Figure 4-10). Regulated floodways and areas designated as 100-year and 500-year floodplains are present in the study area. These areas are associated with the major water features within the study area: the South Platte River, Sand Creek, and Clear Creek. The project is within the FEMA NFIP areas of the City and County of Denver, Commerce City, and Adams County. The effective Flood Insurance Rate Maps (FIRMs) encompassing the project study area are listed below (Table 4-9) along with the effective dates. An effective FIRM is one that has been through public review and has been adopted as a regulatory FIRM. The study area is covered in the Flood Insurance Study (FIS) for Adams County, with an effective revision date of December 2, 2021. This includes Clear Creek, South Platte River, and Sand Creek. Review of the FEMA maps indicates that portions of the project are within the base floodplain. The effective FIRMs show the 100-year flood to inundate I-270 at the I-76 interchange and where the South Platte River crosses I-270.In addition, the regulatory floodway is shown to inundate South Sandcreek Drive for nearly its entire length and an approximate 300-foot stretch of the eastbound I-270 lanes west of Quebec Street in the eastern project limits.

Table 4-9. Effective FIRMs Encompassing Study Area

Jurisdiction	FIS Number	FIRM Panel(s)	Panel Effective Date
Unincorporated Adams County	80881CV001D	08001C0604H	3/5/2007
City of Commerce City	80881CV001D	08001C0604H 08001C0612H 08001C0616H	3/5/2007
City and County of Denver	080046V001E	0800460092H	11/20/2013

Source: FEMA Map Service Center

Figure 4-10. Regulated 100-Year Floodplains and Floodways within Study Area



Early in project development, concerns with the extents of the floodways and floodplains of Sand Creek, Clear Creek, and the South Platte River were identified. No overtopping of I-270 is noted in descriptions of major flood events along Sand Creek in flood insurance studies produced by FEMA.

Hydraulic modeling of existing conditions completed for this project used the U.S. Bureau of Reclamation's Sedimentation and River Hydraulics – Two Dimension (SRH-2D) model and supplemental topographic channel surveys. This model generally reproduces the floodplain provided by FEMA in their FIS. The 2D model has more resolution in the depiction of local

ground elevations, and thus some differences are expected when comparing results to the FEMA study that was done with a one-dimension model. This model indicates that the 100-year event would not inundate I-270 nor South Sandcreek Drive because an existing retaining wall on the northern side of the floodway contains flood flows. Hydraulic modeling of existing conditions completed for the South Platte River shows one overtopping location on I-270, west of the South Platte River, during the 100-year flood event; however, this condition is based on a conservative assumption of simultaneous 100-year flows on both the South Platte River and Sand Creek. The peak flow analysis and low overtopping probability (less than 1 in 10,000) indicate a combined 100-year event is not likely. Floodplain levels are below the I-270 pavement elevation for scenarios where the 100-year-flow is assigned to one river and the 50-year-flow is assigned to the other.

4.7.2 Reasonably Foreseeable Impacts of the Alternatives

Although hydraulic modeling performed for this project indicates the Sand Creek floodplain and floodway shown on the effective FIRM panels is inaccurate, FHWA procedures dictate "Where NFIP maps are available, their use is mandatory in determining whether a highway location alternative will include an encroachment on the base floodplain" (23 CFR 650, Subpart A). As a result, effective FEMA floodplain data was used in the analysis for the purposes of determining potential floodplain impacts, resulting from the No Action and Build Alternatives.

4.7.2.1 No Action Alternative

No measurable changes to floodplains in the study area are anticipated to occur under the No Action Alternative. I-270 would continue to be at risk of inundation (overtopping the roadway) at the I-76 interchange, where the South Platte River crosses I-270, and along the majority of South Sandcreek Drive. Discrepancies in outdated FIRMs would need to be updated through formal processes, which are described above. Without updating effective FIRMs, the data will continue to reflect inaccurate floodway and floodplain boundaries.

4.7.2.2 Probable Incompatible Floodplain Development for Build Alternatives

Both Build Alternatives, the Three General-Purpose Lanes Alternative and the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative, result in the same impacts to the South Platte River, Clear Creek and Sand Creek floodplains. The current alignment of I-270 and the two Build Alternatives are recommended to continue to operate on the current longitudinal alignment and will result in several encroachments.

Twelve of the nineteen bridges within the I-270 corridor are reaching the end of their useful life and will be replaced as part of this project in both Build Alternatives. These bridges, specifically the bridge over the South Platte River, will require new piers within the floodway and a widened bridge crossing the river. Other bridges will be replaced similarly.

Per the FEMA FIRMs, the two Build Alternatives will have minimal and significant longitudinal encroachment on the floodplain due to a widened section of I-270.

4.7.2.2.1 Clear Creek

Only minimal encroachments to the Clear Creek floodplain are proposed with the project. Two water quality ponds are being proposed, one on the northeast side of I-270, and one on the southwest side, along with associated storm sewer pipes located within the base floodplain for Clear Creek. Additionally, upgrades to guardrail are proposed within the base floodplain; however, no modifications to the existing pavement or ground surface elevations are anticipated in those locations.

4.7.2.2.2 South Platte River

Only minor encroachments to the South Platte River base floodplain are anticipated. The eastbound and westbound on- and off- ramps for York Street west of the river will have small areas of encroachment, as well as the toes of slope, storm pipes, roadside ditches, a water quality pond, and a relocated access road northwest of the South Platte River and I-270 crossing. Because I-270 is an evacuation route the new I-270 bridges over the South Platte River will have a significant encroachment. The new bridge piers will impact the floodway, and the new abutments, realigned trail under the bridge, and new revetment for the riverbanks and scour protection will have impacts to the floodway of the South Platte River. The existing and proposed bridge deck is significantly higher than the effective base flood elevations of the river, providing adequate freeboard.

4.7.2.2.3 Sand Creek

Significant encroachments to the effective floodplain and floodway have been identified along Sand Creek due to the widened section of both Build Alternatives.

At the Burlington Ditch crossing of Sand Creek, the banks of the ditch act as a levee for larger storm events within Sand Creek. Because of this, the floodplain extends to the toe of slope of the existing eastbound I-270 as well as reaching the existing abutment of the I-270 eastbound bridge over the Burlington Ditch. The eastern abutment and retaining wall of the proposed new bridge over Burlington Ditch will encroach into the floodplain. The proposed roadside ditch, toe of slope, and a portion of the eastbound shoulder will also fill in the floodplain east of the bridge. These encroachments will be minimal as they won't affect the base flood elevations of Sand Creek.

Although the effective floodplain extends beneath a portion of the new bridge at the Brighton Boulevard and East 60th Avenue crossing of I-270, only minimal encroachments are anticipated. These encroachments include the piers and retaining walls for the new I-270 bridges over Brighton Boulevard, sidewalk improvements along Brighton Boulevard, a storm sewer outfall, as well as a connection to the Sand Creek Trail. All of these improvements will not change the base flood elevations of Sand Creek.

Improvements at the Vasquez Boulevard interchange will affect the Sand Creek floodplain. The Vasquez Boulevard bridge over Sand Creek will be widened to include shared-use paths and span the floodplain with new piers, revetment for the creek, and scour protection at the piers and abutments, as well as a new Sand Creek Trail alignment located within the base floodplain and floodway. Additional minor encroachments will result from improvements to

the Sand Creek Trail and construction of approximately 200 feet of retaining wall along the eastbound off-ramp to Vasquez Boulevard.

East of the Vasquez Boulevard interchange, improvements include new sidewalks connecting to the Dahlia Trailhead, reconstruction of portions of the Sand Creek Trail, and several storm sewer outfalls from the trailhead to East 49th Avenue.

The widened section of I-270 east of Vasquez will also result in a significant longitudinal encroachment as the effective mapping shows the current floodplain limits extending into the eastbound lanes of I-270 for about 300 feet. The proposed improvements push the edge of the roadway to the south, in turn encroaching further into the floodplain.

South Sandcreek Drive and associated retaining walls, pavement, guardrail, and storm sewer improvements will be reconstructed as a part of the project. This will constitute a significant longitudinal encroachment to the floodplain and floodway of Sand Creek per the FEMA FIRMs.

A bicycle and pedestrian overpass is also planned between Vasquez Boulevard and Quebec Street to connect the Sand Creek Trail to northeast of I-270. The new bridge structure, retaining walls, and associated trail improvements will constitute a significant encroachment of the Sand Creek floodplain.

At Quebec Street, the toe of slope for the widened roadway of South Sandcreek Drive from East 49th Avenue to East 47th Avenue Drive will have minimal encroachment into the edges of the Sand Creek floodplain. Two storm sewer outfalls will also be constructed in this location within the floodplain limits. Additional minimal encroachments to Sand Creek floodplain will result from intersection improvements at South Sandcreek Drive with East 49th Avenue and East 47th Avenue Drive, along with new sidewalks and retaining walls east of the intersections.

4.7.2.3 Risks Associated with Implementation

The main risk associated with the project is the reduced available volume within the floodplain and a change to the base floodplain elevations and boundaries. However, as noted above, the best available FIRM maps are not accurate.

CDOT anticipates the first phase of construction will replace eight of the twelve bridges located at the South Platte River, Burlington Ditch, Brighton Boulevard, and East 60th Avenue. CDOT plans to obtain floodplain development permits through Commerce City, Adams County, and City and County of Denver to complete this work. Letters of no rise, certified by a licensed engineer, will be completed to obtain these permits prior to construction. This process will be separate from the Letter of Map Revision (LOMR) process CDOT will complete for the existing conditions of Sand Creek for the remainder of the I-270 corridor prior to finalizing preliminary and final design. A LOMR will officially change the FIRM and FIS for Sand Creek, and the changes to the floodplain will be documented through FEMA with this process. After revising the floodplain through this process, floodway and floodplain boundaries are anticipated to be contained within channel banks during the 100-year event. Therefore, after the LOMR process, the Build Alternatives would have a reduced encroachment into the floodplain and no new encroachment into the floodway associated

with Clear Creek, the South Platte River, and Sand Creek. Where there are still encroachments, CDOT will follow local, state and federal requirements to ensure base flood elevations are maintained.

4.7.2.4 Impacts on Natural and Beneficial Floodplain Values

At the I-270 bridge crossing of the South Platte River and the Vasquez Boulevard bridge over Sand Creek, natural and beneficial values will be temporarily impacted during construction. Anticipated impacts include disturbances to the stream, aquatic habitat, and short-term alterations to flow patterns in the streams during construction. No long-term impacts to the natural and beneficial floodplain values or floodplain storage are anticipated.

At the Clear Creek bridge, only minimal encroachments would occur outside the main channel of the stream. Therefore, there would be no impacts on the floodplain values and minimal impacts to floodplain storage.

4.7.3 Mitigation

During construction, construction materials will not be stored in the floodplain, and construction activities (including trail detours) will be limited within the floodplain, as feasible, to reduce the potential temporary or permanent impacts to the floodplain. A floodplain development permit will be obtained from Denver, Adams County, and Commerce City, if determined necessary.

As noted in the above sections, the two Build Alternatives will have significant longitudinal encroachment on the floodplain due to a widened section of I-270, per the FEMA FIRMS. Improvements that support the widened section, such as fill, storm sewer and retaining walls, will result in impacts within the current floodplain footprints. There are no practicable alternatives to reduce these significant impacts because widening I-270 is necessary to meet the project purpose and need by improving operations for vehicles, transit, and freight, enhance bicycle and pedestrian connectivity, and increase safety for all users. The Build Alternatives rely on the existing longitudinal alignment to maintain this designated evacuation route and minimize overall environmental and community impacts. Relocating I-270 outside of mapped floodplains would require new right-of-way, substantial additional impacts to developed property, utilities, and other resources.

CDOT will coordinate with the MHFD and the local floodplain administrators for Commerce City, Adams County, and City and County of Denver to ensure the project conforms to applicable State and local floodplain protection standards.

Initially, CDOT will obtain all necessary floodplain development permits and provide engineer-certified “no-rise” letters, as required, prior to construction to advance design and construction of the bridges at the South Platte River, Burlington Ditch, Brighton Boulevard, and East 60th Avenue/BNSF Railway. CDOT will also complete a LOMR for the remainder of the I-270 corridor prior to finalizing design. Based on this projects analysis, the LOMR process is anticipated to demonstrate that the Build Alternatives would reduce encroachment into the floodplain and no new encroachment into the floodway associated with, the South Platte River, and Sand Creek. The LOMR will document the revised limits and once the LOMR is

approved and made effective, it is anticipated that only simple floodplain development permits and no-rise certifications will be required to complete the project.

4.8 Land Use and Right-of-Way

Land use is a broad term encompassing all the different ways that humans use or develop land for economic, residential, recreational, and governmental purposes. Local jurisdictions have the authority to regulate land use and planning within their jurisdiction. For lands adjacent to the I-270 corridor, these jurisdictions include Adams County, Commerce City, and Denver. Each prepares comprehensive plans to communicate their community's goals and objectives, provide a blueprint for future land use, and serve as the basis for zoning, subdivision, land use codes, and decision making. Key plans that guide development within the I-270 corridor include:

- Advancing Adams Comprehensive Plan (Adams County 2022a)
- Commerce City 2045 Comprehensive Plan (Commerce City 2023)
- City and County of Denver Comprehensive Plan 2040 (Denver 2019a)
- Blueprint Denver (Denver 2019b)
- South Platte River Corridor Heritage Plan (Adams County 1997)
- Sand Creek Regional Greenway Trail Denver Segment Master Plan (Denver 2016)
- Adams County Clear Creek Corridor Master Plan (Adams County 2017)
- Walk.Bike.Fit – A Multimodal Active Transportation Plan (Commerce City 2012)
- Game Plan for a Healthy City (Denver 2019c)

Relevant goals and policies identified in these plans include maintaining existing industrial land uses; ensuring strong industry, high quality infrastructure, and growth in employment over time; improving access, safety, bicycle and pedestrian infrastructure, and transit; growing a connected system of multi-use trails and open space; and better connecting areas north and south of I-270. Commerce City has also identified goals related to improving the overall image of the city for residents and business.

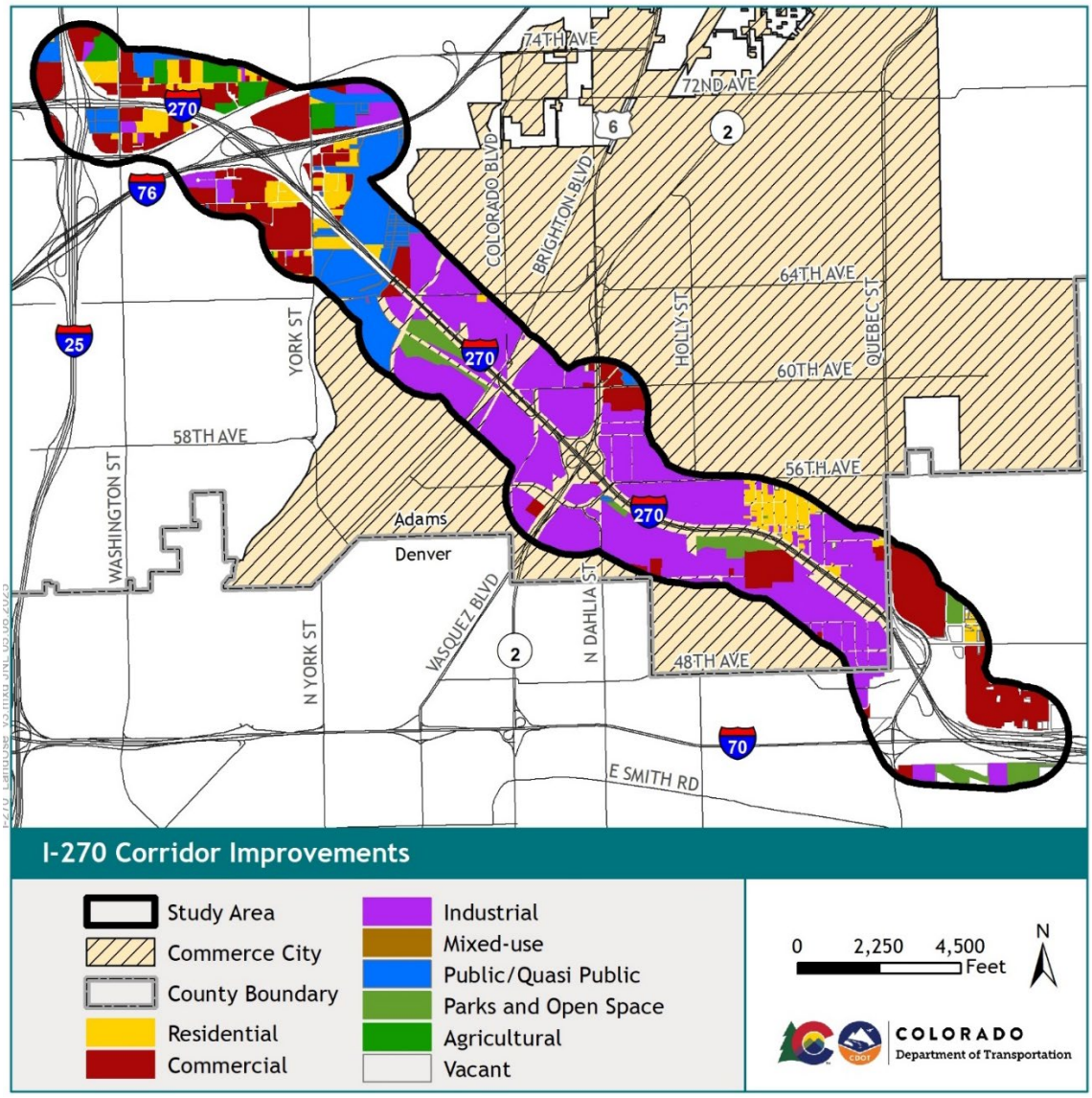
ROW refers to the real property rights, which CDOT must possess to construct or operate transportation facilities utilizing federal funds. The *CDOT Right of Way Manual* (CDOT 2020b) provides guidance in all phases of acquiring real property and ensuring compliance with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970. Land use and ROW information is summarized in this section and detailed in Appendix E9.

4.8.1 Affected Environment

The study area for the land use analysis is a one-quarter mile buffer of the project footprint (Figure 4-11). This area includes the land on which improvements are proposed, as well as adjacent development and recreational facilities that have the potential to be affected by the project.

Existing I-270 ROW within the study area ranges from approximately 300 feet along portions of the mainline and up to 0.25 mile near major intersections. Properties adjacent to I-270 are in both public and private ownership.

Figure 4-11. Existing Land Use in the Study Area



4.8.1.1 Existing Land Use and Zoning

I-270 is a critical east-west interstate that provides entry into Commerce City at its southern end while connecting residents and the business community with the region. It is surrounded by heavy industrial land uses that include processing plants, manufacturing and commercial uses, sand or gravel operations, and freight and truck yards.

Throughout the study area, industrial uses are interspersed with residences and businesses. Small residential areas within the study area are located north of I-270 and east of I-25 along 73rd Avenue, along 71st Avenue between I-270 and I-76 east of I-25, and along the southern side of I-76 between I-270 and Welby Reservoir along Clayton Street. A few residences are also north of I-270 in this area, primarily on either side of 68th Place and Elizabeth Street.

Larger residential areas are associated with well-established neighborhoods that intersect the study area as shown in Figure 4-12. They include Denver's Central Park neighborhood (east of Quebec Street and mostly outside of the study area), Denver's Northeast Park Hill neighborhood (west of Central Park and north of I-70 with only the industrial northeastern limit within the study area), and the South Rose Hill neighborhood (adjacent to I-270 south of 56th Avenue). The South Rose Hill neighborhood, one of Commerce City's original neighborhoods, is surrounded by industrial land uses and has experienced encroachment of industrial development and truck activity in recent years (Commerce City 2023).

Two reservoirs (Welby Reservoir and Bambei-Walker Reservoir) are located west of the South Platte River between I-270 and I-76 just north of the study area. Both are part of Denver Water's Downstream Reservoir Water Storage Program and comprise its South Reservoir Complex (Denver Water 2025). Limited agricultural uses are present in the study area. Most of these are small scale operations that integrate with adjacent uses, such as the approximately 5-acre parcel in Adams County north of I-270 and east of I-25 in the northern project limits.

Natural and recreational areas within the study area include the South Platte River and South Platte River Trail (which travel north-south between the two reservoirs), Clear Creek and the adjacent Clear Creek Trail (between I-76 and CO 224), and Sand Creek and the Sand Creek Regional Greenway Trail (roughly parallel to and south of I-270 throughout most of the study area). These uses provide recreational amenities, wildlife habitat, and an overall break from the industrial setting. Recreational resources are covered in detail in Section 5.13 of this document. Existing land use in the study area is shown in Figure 4-11 and presented in Table 4-10.

The majority of the study area is zoned for industrial uses with only small pockets of land in the northwest portion of the study area zoned for residential uses. Commercial zoning is focused on the area north of I-270 and east of Quebec Street, along 60th Avenue and Dahlia Street, and near the I-25/I-270 interchange. The area south of the CO 2 and I-270 interchange is zoned for planned unit developments (PUDs). This zoning classification allows for flexibility in development in areas within which uses would otherwise not be permitted because of the strict application of zoning district or general development standards.

4.8.1.2 Future Land Use

The Commerce City 2045 Comprehensive Plan organizes the city into character areas. Those that govern land use, growth, and development along the I-270 corridor include the 270 Industrial District, South Platte District, and Fusion District (South Rose Hill). Each district identifies priorities related to land use within the district, such as the protection of historic residential communities in South Rose Hill, the consolidation of industrial uses in the 270 Industrial District, and leveraging the natural areas within the South Platte District.

In the Adams County portion of the study area, future land use is anticipated to be predominantly industrial with some areas of residential and commercial around I-25. Future land use will likely emphasize retaining industrial areas and land for future jobs, supporting existing neighborhoods, and improving transportation connectivity.

Figure 4-12. Neighborhoods with Larger Residential Areas

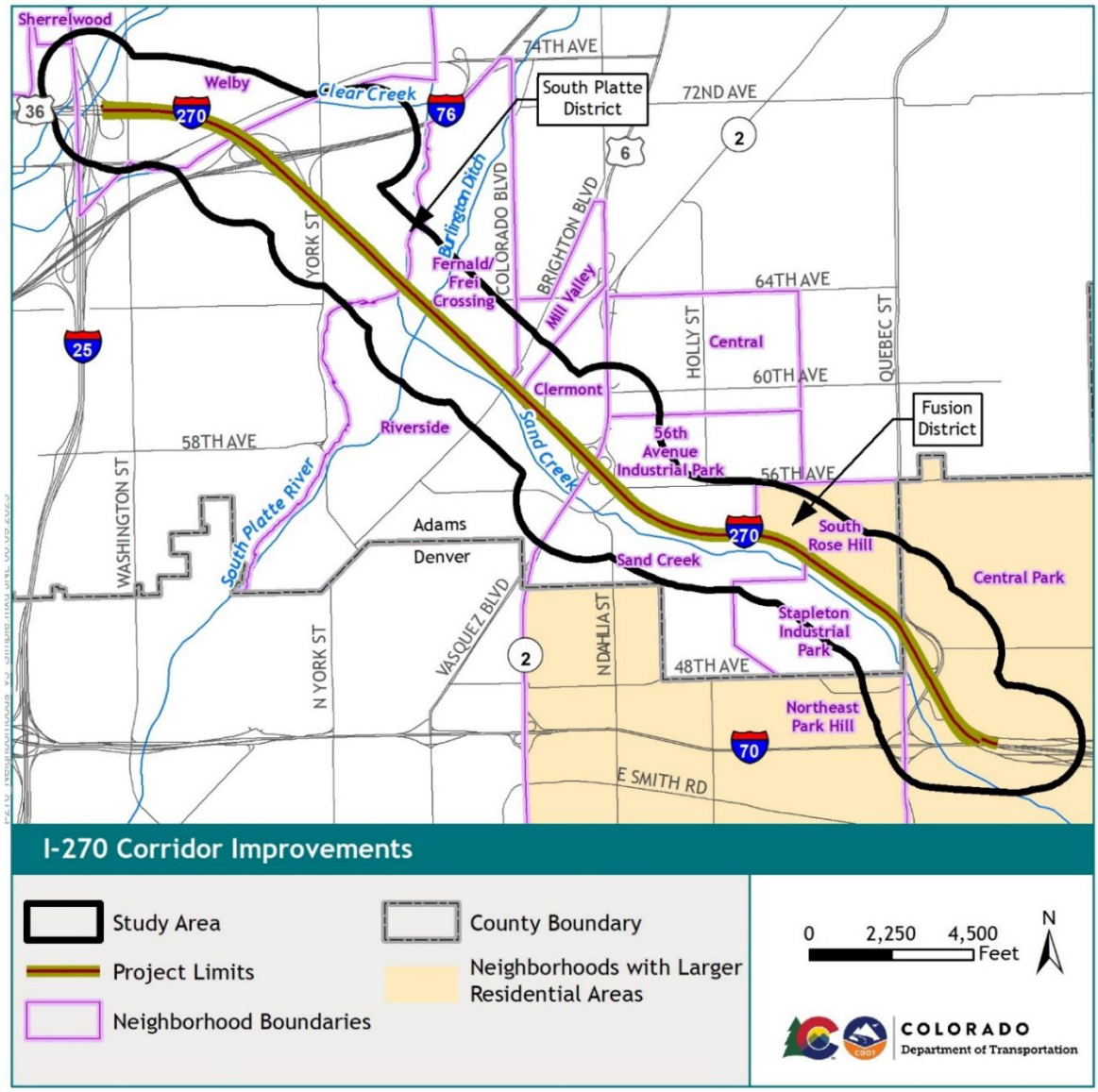


Table 4-10. Existing Land Use in the Study Area

Land Use	Acres	% of Study Area
Agricultural	52.18	1.83
Residential	140.59	4.93
Commercial[1]	459.23	16.10
Industrial	917.85	32.19
Mixed Use	9.50	0.33
Parks and Open Space	114.77	4.02
Public/Quasi Public	274.32	9.62

Land Use	Acres	% of Study Area
Vacant[2]	87.33	3.06
CDOT ROW/Public and Private Utilities	795.97	27.92

[1] Commercial includes office uses.
[2] Vacant includes properties that are not currently in use, with no occupants or personal property.

In the Fusion District of Commerce City, existing residential areas in Rose Hill and South Rose Hill will likely be protected from encroachment by industrial development, in alignment with the priorities for the district. Expansion of transit-oriented development, commercial, and manufacturing is expected within the Central Park neighborhood north of I-70, around the I-70/I-270 interchange in Denver. Riparian restoration and greenway development are expected to continue along Sand Creek and South Platte River. Portions of Vasquez Boulevard and York Street are also identified for improvements in transportation plans.

Transportation Master Plans adopted by Adams County (Adams County 2022b), Denver (Denver 2019b), and Commerce City (Commerce City 2010) recognize I-270 as one of the most heavily traveled corridors in the region and a critical freight corridor that needs improvements.

4.8.2 Reasonably Foreseeable Impacts of the Alternatives

4.8.2.1 No Action Alternative

The No Action Alternative would not result in the acquisition of additional ROW within the study area, and no existing land uses would be directly converted to transportation uses. As a result, aside from what is planned and implemented by local jurisdictions, there would be no changes in land use from existing conditions.

Under the No Action Alternative, I-270 would continue to operate under current conditions and serve existing land uses. This is consistent with goals outlined in the Commerce City 2045 Comprehensive Plan related to maintaining existing industrial land uses. However, this alternative does not address transportation needs on I-270 relating to travel reliability, safety, existing infrastructure, and freight efficiency. While industrial areas would continue as under existing conditions, they would not be supported by a more modern and efficient transportation system. As such, the No Action Alternative would not be consistent with goals to ensure strong industry, high quality infrastructure, and growth in employment over time. The No Action Alternative would also conflict with transportation master plans that recognize the need for improvements to I-270 as one of the most heavily traveled corridors in the region.

Goals identified throughout Commerce City, the Fusion District, the South Platte District, and Denver call for improved access, safety, bicycle and pedestrian infrastructure, and transit. This alternative would not address these goals, grow Commerce City's connected system of multi-use trails and open space, or better connect areas north and south of I-270.

The No Action Alternative is not expected to induce growth. The study area is highly developed, and no changes in highway capacity or new access would occur. However, increasing congestion on I-270 could lead to changes in land use patterns, as more travelers choose to use alternative routes through adjacent areas to avoid the highway.

4.8.2.2 Build Alternatives

Both Build Alternatives would acquire 10.57 acres of land. Of this, 6.50 acres are industrial, 2.10 acres are residential, 1.94 acres are parks/open space, 0.02 acres is public, and 0.01 acre is vacant. In addition to permanent ROW acquisition, the project would require 3.21 acres of permanent easements and 33.71 acres of temporary easements. Land use would not permanently change as a result of these easements—most are required for access and construction staging. Neither Build Alternative would result in the displacement of any residences or businesses.

The Build Alternatives would be consistent with goals related to maintaining existing industrial land uses identified in local plans as well as Colorado's 2045 Statewide Transportation Plan (CDOT 2020c). The corridor would remain predominantly focused on industrial land use and transportation. By addressing transportation needs on I-270 relating to travel reliability, safety, existing infrastructure, and freight efficiency, the project would support industrial land uses with a more modern and efficient transportation system. As such, the Build Alternatives would be consistent with goals to ensure strong industry, high quality infrastructure, and growth in employment over time. The Express Lane may offer some additional benefits for transit-related goals because transit vehicles and high-occupancy vehicles (three or more people) could travel in the Express Lane, free of charge, which would contribute to transit reliability. Freight vehicles and other travelers who choose to pay a toll could also use the Express Lane when a more reliable trip is needed, further contributing to community goals related to high quality infrastructure, improved access, and efficiency.

The Build Alternatives include numerous improvements that are consistent with other goals identified throughout Commerce City and Denver, including the construction of new multi-use paths throughout the study area, safety improvements around intersections, new bicycle and pedestrian connections, improved connectivity to recreational amenities (the Sand Creek Trail and the South Platte River Trail crossing), and new RTD bus stops at Quebec Street and South Sandcreek Drive. Both Build Alternatives would address issues related to a lack of bicycle/pedestrian connectivity and limited connections across I-270. Refer to Appendix D for additional information.

When compared to the No Action Alternative, the Build Alternatives would improve safety and reduce travel times for all drivers, which would support goals related to maintaining a balanced mix of land uses, retaining industrial land uses, and improving access and connectivity.

The Build Alternatives would increase capacity, reduce travel delays, and improve existing access, supporting existing and planned development in the study area. Neither Build Alternative is expected to increase access to undeveloped lands or alter existing development patterns.

4.8.3 Mitigation

No mitigation measures are required for land use and zoning. With regard to the project's ROW requirements, property acquisition will occur in accordance with the Uniform Relocation Assistance and Real Property Acquisition Act. Coordination will continue to occur with Adams

County, Commerce City, and Denver throughout the project development, final design, and construction processes.

4.9 Social and Economic Resources

Socioeconomic analyses are concerned with the interaction between social and economic characteristics of populations and transportation infrastructure. CDOT evaluates social and economic resources to involve communities that will be affected by transportation projects (whether positively or negatively). This section summarizes social and economic resource analysis and it is detailed in Appendix E10. Federal and state guidance applicable to socioeconomic analysis includes:

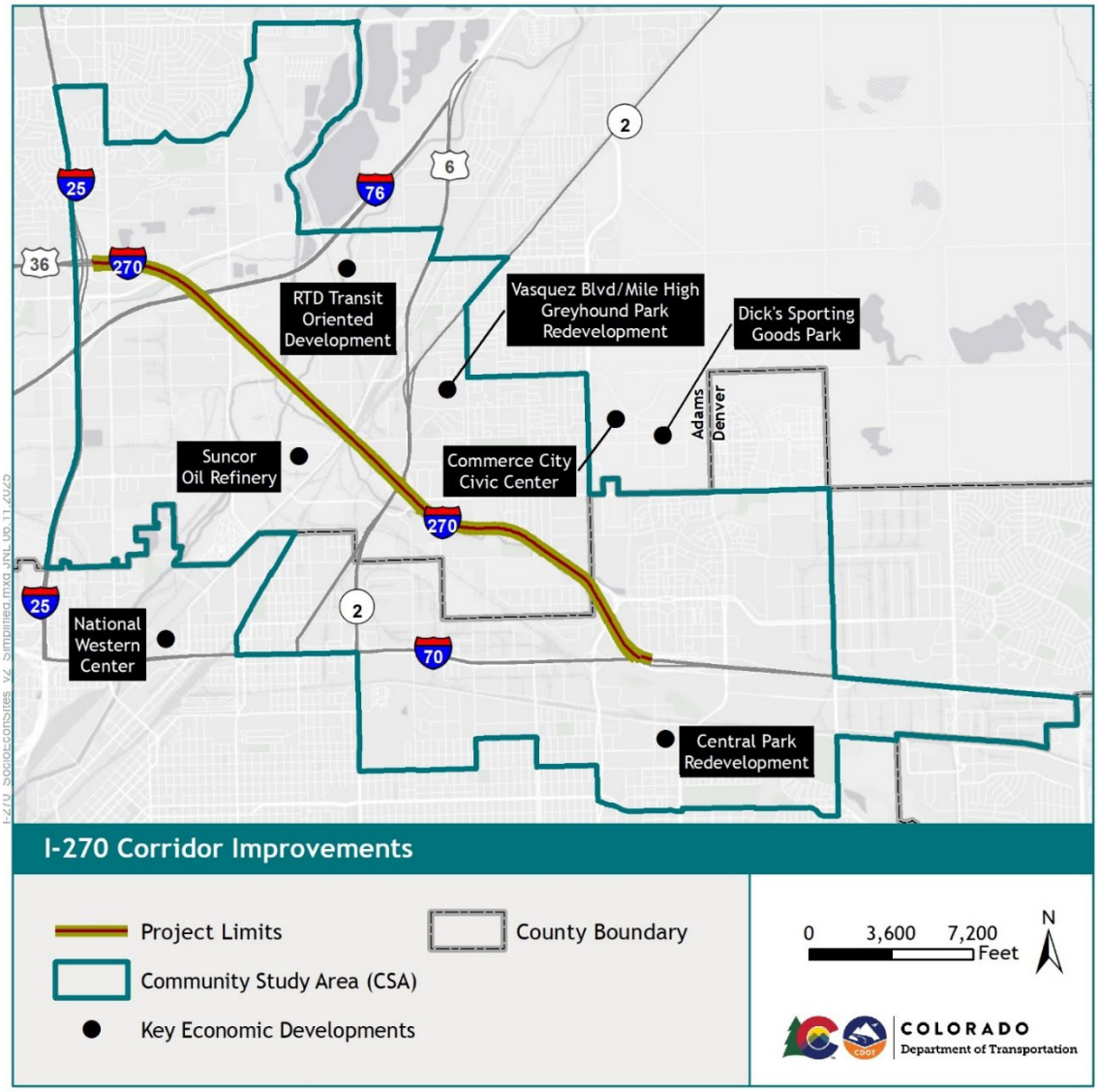
- CDOT's NEPA Manual (CDOT 2024a)
- CDOT's Environmental Stewardship Guide (CDOT 2024b)
- Guidance for Preparing and Processing Environmental and Section 4(f) Documents (FHWA 1987)
- 23 United States Code (USC), Section 109(h) - Federal Aid Highways
- CRS 43-1-128, *Environmental Impacts of Capacity Projects*

Socioeconomics at the state level follows CRS 43-1-128, *Environmental Impacts of Capacity Projects*. A separate Community Analysis Technical Report has been completed to satisfy state level requirements and is available on the I-270 website (https://www.codot.gov/projects/studies/i270study).

4.9.1 Affected Environment

The study area for social and economic resources (the community study area [CSA]) includes all communities within and adjacent to I-270 that may be affected by the project (Figure 4-13). The CSA was defined with input from stakeholders and the public. Because I-270 is a regional facility that provides connections to locations within and throughout the Denver metropolitan area, the analysis incorporates a broader consideration of population, housing, development, business, employment, and freight characteristics and trends.

Figure 4-13. Community Study Area and Key Economic Developments Near I-270



4.9.1.1 Population, Employment, and Economic Development

Data from the Colorado Department of Local Affairs (DOLA) indicates that Adams County's population is projected to increase by 47.9 percent between 2022 and 2050 (from 527,501 in 2022 to 780,081 in 2050). This is substantially higher than what is expected in Colorado (28.3 percent) and Denver (18.9 percent) during the same period. Although population projections are not available at the city level, Commerce City comprises about a tenth of Adams County's population and is likely to reflect growth trends reported for the county.

Although residential development is limited near the project limits, there are several long-standing and historic neighborhoods (e.g., South Rose Hill) with supportive infrastructure such as schools, parks and recreational amenities, and churches interspersed with existing

commercial and industrial development. Other residential areas include small pockets of residences along the corridor and the larger, master-planned neighborhood of Central Park in the eastern project limits as described and shown graphically in Section 4.8.

Commerce City is home to more than 1,400 companies that employ more than 32,000 people. The transportation, warehousing, and utilities sectors are the largest employment sectors in Commerce City. The Commerce City 2045 Comprehensive Plan identifies the city's strong industrial and manufacturing base as one of its great strengths and unique attributes with proximity to I-270, as well as other major transportation infrastructure, one of its biggest competitive advantages in economic development (Commerce City 2023). Economic growth within Adams County and Commerce City is projected to grow steadily by about eight percent annually. I-270 is a critical connection for planned developments and economic generators, such as the Mile High Greyhound Park redevelopment, transit-oriented development near the Colorado Boulevard/72nd Avenue RTD Station, Central Park redevelopment, the area surrounding Vasquez Boulevard, and the National Western Center (Figure 4-13).

Suncor operates the Commerce City Refinery adjacent to the corridor—employing approximately 500 people—and is a major economic contributor in Commerce City, Adams County, and the greater Denver metropolitan region. As Colorado's only major petroleum refinery, it processes approximately 98,000 barrels of crude oil per day. Nearly all (95 percent) products produced by the refinery are used within the state, including 30 percent of all gasoline and 50 percent of all diesel fuel sold in Colorado and about one-third of jet fuel used at Denver International Airport. Suncor reports that annually it pays approximately $11 million to Adams County in property taxes and $4 million to Commerce City in sales and use taxes.

4.9.1.2 Freight Considerations

I-270 is a critical part of Colorado's freight network (primarily truck transportation), carrying a large portion of freight truck traffic and playing a substantial role in connecting the main east-west (I-76/I-70) and north-south (I-25) freight corridors in the state. It also directly serves numerous freight companies and rail terminals in Commerce City, and it is one of the only designated nuclear and hazardous materials routes through the Denver metropolitan area (CDOT 2024c).

Freight operators provided feedback at public meetings and stakeholder workshops about issues along the corridor that supports the need to reduce congestion and improve travel times, reliability, and entrance and exit movements at the interchanges within the corridor. For instance, carriers located on East 56th Avenue, such as United Parcel Service and Old Dominion, often use local streets, rather than the Vasquez Boulevard interchange (which is closer), to access the Quebec Street interchange because of difficulty maneuvering through the interchange. Freight carriers also noted that interchange and ramp designs, such as the intersection at East 56th Avenue and Eudora Street, are challenging to navigate, poorly signed, and confusing. Adding lane capacity, lengthening and reducing curves for on-ramps and off-ramps, and exploring alternate routes for freight travel, particularly freight carrying hazardous materials, in the Denver metropolitan area to reduce reliance on I-270 for through-freight movement, are ideas that have been recommended by freight users and advocates.

4.9.1.3 Emergency Service and Response

Colorado State Patrol as well as Adams County and Denver police, sheriff, and fire rescue provide emergency services and incident response on I-270 and adjacent areas. There are limited medical facilities and no hospitals along I-270; emergency responders transport patients to Denver or Aurora for emergency and acute care.

Emergency service providers have been engaged throughout project development at public open houses, stakeholder workshops, and in one-on-one discussions and ride-alongs. They note that the infrastructure—narrow and inconsistent shoulder widths, limited turnaround locations, and poor pavement conditions—hampers their operations and creates safety concerns for responders. They recommended essential infrastructure upgrades, emergency turnarounds, more lanes, safer ramps, and wider shoulders to enhance safety and efficiency. Users of I-270 observe and recognize the challenges of emergency response, and improving emergency response operations has been consistently identified as one of the critical needs for the project.

4.9.2 Reasonably Foreseeable Impacts of the Alternatives

4.9.2.1 No Action Alternative

In the absence of improvements, underlying infrastructure deficiencies and problems throughout the corridor would persist. Population would likely continue to increase as forecasted, placing additional demand on the already deficient infrastructure. Congestion would make it more difficult for employees, customers, and freight carriers to reach their destinations. Major employment centers north of I-270 could experience adverse impacts related to growth if travel on I-270 continues to degrade. Hampered economic growth could also impede positive investments in surrounding communities.

The transportation, warehousing, and utility sectors, which are the largest employment sectors in Commerce City, would be particularly affected by congestion due to their reliance on the efficient movement of materials along I-270 to adjacent interstates. Freight use of local streets to avoid congestion and difficulty navigating interchanges would continue and could become exacerbated by truckers venturing further onto local roads not designed to handle such vehicles. This situation would be aggravated as companies in the area grow, or new companies are located in the area that require more freight activity and/or deliveries.

Incidents on I-270 would likely increase along with the increase in traffic, additionally straining emergency services.

4.9.2.2 Build Alternatives

The Build Alternatives include capacity, interchange, and safety improvements that would improve transportation conditions in the corridor. The following beneficial outcomes are anticipated under both Build Alternatives:

- Investments in critical infrastructure would support the anticipated growth in Commerce City and Adams County.

- Safety improvements would respond to critical needs identified by emergency response providers, including widening shoulders, increasing acceleration/deceleration lanes, redesigning the Vasquez Boulevard interchange, improving signage, and adding emergency turnaround areas. With better roadway and traffic conditions, emergency responders would be able to respond to incidents more safely and efficiently.
- Improved safety, travel time, and reliability would improve access to employment and support operations as well as reduce delays in reaching local businesses and delivering products.
- Improvements would support the area's strong industrial and manufacturing base by retaining its strategic position and competitive advantage in the region.
- Infrastructure would better accommodate planned development of the area near Vasquez Boulevard and I-270 and Mile High Greyhound Park.

Both Build Alternatives would acquire 10.57 acres of land. The conversion of this land to transportation uses is not expected to have a notable impact on community tax base. Land use within the CSA is established and property values are not expected to change because of the project. Neither Build Alternative would result in the displacement of any residences or businesses. The highway widening would occur within an existing transportation corridor in a highly developed urban area, where land use patterns and neighborhood boundaries are well established. The project does not involve the displacement of residents, division of neighborhoods, or removal of community gathering spaces. Therefore, the project is not anticipated to adversely affect community cohesion.

Both Build Alternatives would improve travel time and reliability on I-270. The primary difference between the two Build Alternatives is how the additional lane would operate (as a general-purpose lane versus an Express Lane). Express Lanes provide drivers with the choice of a more reliable trip by paying a toll, carpooling, or using transit. With an Express Lane, there will always be one lane that is free-flowing and reliable. With either Build Alternative, freight benefits from improved interchanges, improved merging, and more efficient, intra-corridor pickups and deliveries—with auxiliary lanes connecting the most frequently accessed areas along the corridor (i.e., I-76 and Vasquez Boulevard). Additional information regarding operational differences between the Build Alternatives is included in Appendix E2.

Some adverse impacts would be expected during construction, where lane closures, lower speed limits, and temporary reduction in lane and shoulder widths, lane shifts, changes in access, or other construction phasing and staging needs could affect the travel on the corridor. Although I-270 will remain open, emergency response, employees, and business operations would be adversely affected by detours and traffic delays during construction. Businesses would be more difficult to reach, which could result in employment and other economic losses (e.g., delays in receiving and distributing products, decrease in patronage).

4.9.3 Mitigation

CDOT will develop and implement a public information plan, an emergency service provider coordination plan, and traffic control plan to address social and economic impacts associated with lane closures and traffic delays during the construction period. These plans include coordination with local agencies, public information officers, businesses, emergency service

providers, residents, and the Colorado Motor Carriers Association. CDOT will provide construction updates on the project website.

4.10 Hazardous Materials

Hazardous materials refer to materials that are regulated as solid waste, hazardous waste, and other materials contaminated with hazardous substances, radioactive materials, petroleum products, toxic substances, and pollutants. Because of their quantity, concentration, or physical or chemical characteristics, hazardous materials may pose an existing or potential hazard to human health and safety or to the environment if released. This section summarizes the hazardous materials analysis and it is detailed in Appendix E11.

Federal laws pertaining to hazardous materials include:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (1980)
- Resource Conservation and Recovery Act (RCRA) (1976)
- Toxic Substances Control Act (TSCA) (1976)

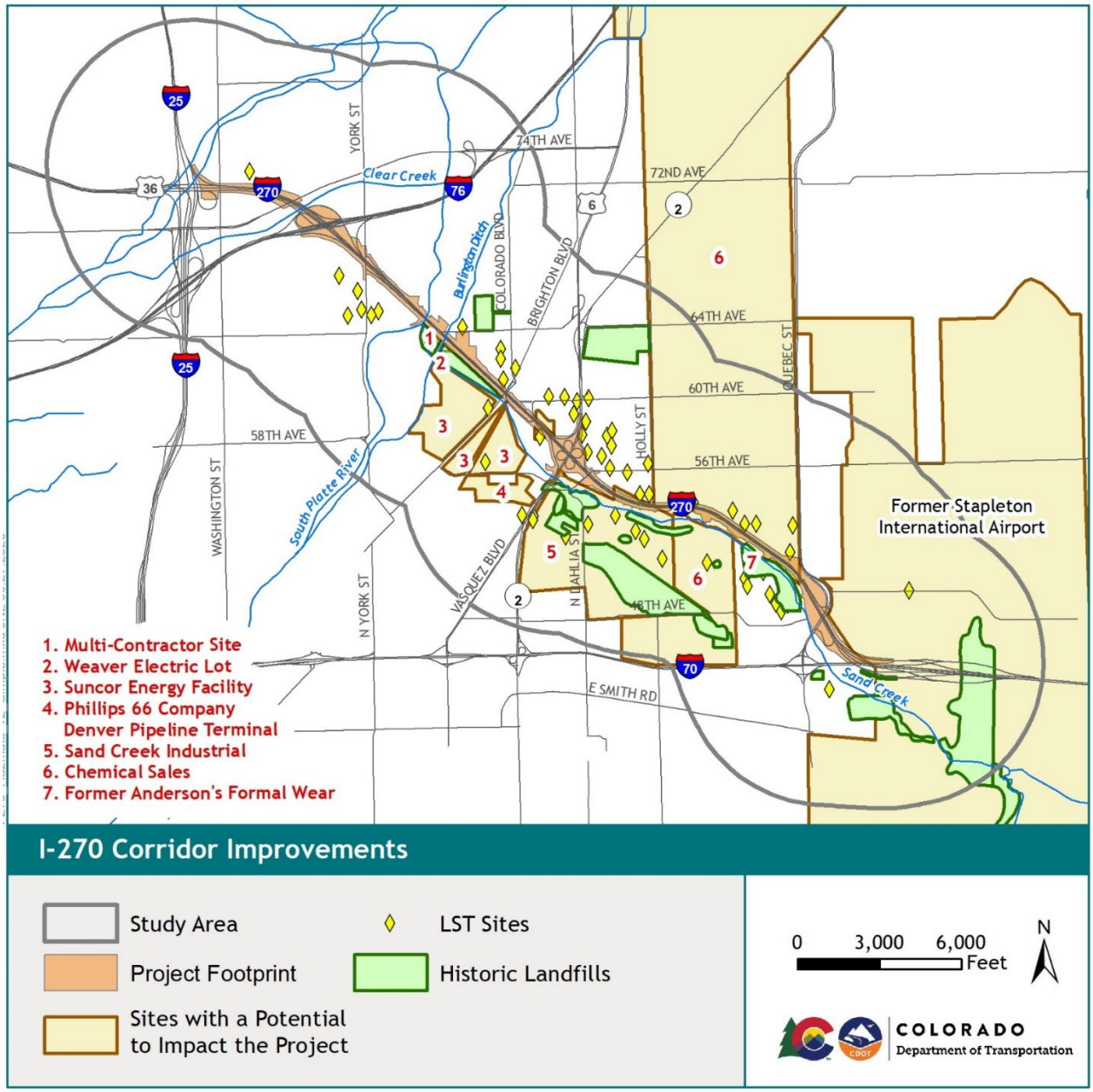
Additionally, the EPA, Colorado Department of Labor and Employment (CDLE), and CDPHE have established regulations relating to the identification, discharge, clean up and transport of hazardous materials.

CDOT methods for hazardous materials assessment include an Initial Assessment, Modified Environmental Site Assessment (MESA), and the American Society for Testing and Materials (ASTM) International Phase 1 and Phase 2 Environmental Site Assessments (ESAs). The MESA method is an adapted version of the Phase I assessment process that is modified to allow a hazardous materials assessment to be conducted on a corridor or project-wide scale, like I-270. A MESA was prepared for the project using methodology based on CDOT's Hazardous Materials Guidance Manual (CDOT 2025), EPA Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), and ASTM International Designation E 1527-21, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (ASTM International 2021).

4.10.1 Affected Environment

The study area for hazardous materials is up to a one-mile buffer of the project footprint, which corresponds to regulatory database search requirements dictated by ASTM International Standard E1527-21 (Figure 4-14). Sites with the potential to impact the project were identified through an Environmental Risk Information Services (ERIS) database search, review of readily available historic materials (aerial photography, topographic maps), and limited site reconnaissance (windshield survey).

Figure 4-14. Sites with a Potential to Be Impacted by the Project



Review and reconciliation of the ERIS database search identified 377 regulated facilities within the study area. Additional facilities and observations were identified through the windshield survey or review of historic materials. For the purpose of evaluating project liability (i.e., property acquisition and encountering regulated materials during ground disturbance activities), facilities within or adjacent to the potential limits of construction were categorized as having a low, medium, or high potential to impact the project area. In addition to the individual high potential sites, other corridor-wide issues of concern, including numerous leaking storage tank (LST) sites and historic landfill facilities, were identified. The

sites with a potential to be impacted by the project are shown in Figure 4-14 and summarized in Table 4-11.

Table 4-11. Summary of Findings

Map ID	Facility Name	Distance/Direction from Project	Risk Classification
1	Multi-Contractor Site (3200 East 64th Avenue)	Within the project area and adjacent to the south; upgradient	High. This property was formerly used as a landfill, dump, and contractor's yard. Elevated levels of semi-volatile organic compounds (SVOCs), total petroleum hydrocarbons, RCRA metals, and naphthalene have been reported in soils.
2	Weaver Electric Lot #1 and #2 (3200 East 64th Avenue)	Within the project area and adjacent to the south; upgradient	High. Operations from a former landfill and partially paved former storage yard have resulted in elevated levels of polychlorinated biphenyls (PCBs), SVOCs, toluene, pesticides, and heavy metals in soils and shallow groundwater.
3	Suncor (5800 Brighton Boulevard)	Adjacent to the south of the project area; cross gradient	High. This facility has operated as a refinery since at least the 1930s. Although impacts to soil and groundwater are not currently being mapped onto the project area, it is possible that residual impacts to soil and groundwater are present.
4	Phillips 66 Company/Denver Pipeline Terminal (3960 East 56th Avenue)	570 feet to the south of the project area; cross gradient	Medium. Operating bulk terminal and pipeline. The site had previous releases, which resulted in petroleum-contaminated soil and groundwater beneath the site. Residual VOCs contamination may be present.
5	Sand Creek Industrial (33rd Avenue and Dahlia Street)	Within the project area and adjacent to the south; upgradient	High. This is a delisted National Priorities List (NPL) superfund site. Operations from a former landfill, a former pesticide manufacturer, a closed acid storage impoundment, and a former oil refinery have impacted groundwater in the project area.
6	Chemical Sales/CSC (4661 Monaco Street)	Adjacent to the south of the project area; upgradient	High. Industrial uses. This is an active NPL superfund site. Plumes of contaminated groundwater and subsurface soils have affected groundwater beneath the project area.
7	Former Anderson's Formal Wear (4661 Monaco Street)	150 feet to the south of the project area; upgradient	High. This property was formerly a dry cleaner. Groundwater impacted with tetrachloroethene at levels above Colorado groundwater standards remain onsite.
NA	Closed Leaking Storage Tank (LST) Facilities	Throughout the project area	High. Forty-nine LST facilities are mapped within one-eighth mile of the project. Although all but three of these facilities are closed, residual impacts to soil, groundwater, and/or soil vapor may remain and may have impacted the project area.

Map ID	Facility Name	Distance/Direction from Project	Risk Classification
NA	Former Solid Waste Landfill Facilities	Throughout the project area	High. Thirty-nine former landfill facilities mapped within 1,500 feet of the project area were identified with medium or high potential to impact the project area. Fill from these facilities may be encountered during construction activities and could also impact geotechnical efforts and design. In addition, these facilities may have impacted soil, soil vapor, and/or groundwater in the project area. The potential presence of flammable methane gas and other landfill gases present a potential explosion hazard and worker health and safety concern.
NA	Historical and Current Industrial Uses	Throughout the project area	Medium. Industrial and commercial facilities using and storing hazardous materials and railroads have been located adjacent to and in the vicinity of the project area since at least the 1930s. These facilities may have impacted soil, soil vapor, and/or groundwater in the project area.
NA	Bulk Terminal, Storage and Pipelines	Adjacent to project area	Medium. Above ground storage tanks and pipelines were observed at the following industrial facilities: the Suncor refinery facilities at 5800 Brighton Boulevard; Blue Knight Energy Partners/BKEP asphalt terminals at 4308/4310 East 60th Avenue; United Asphalts storage yard at 4304 East 60th Avenue; and the Phillips 66 Denver Terminal at 3960 East 56th Avenue. Residual petroleum contamination at these facilities may have impacted soil and groundwater in the project area.
NA	Wells	Throughout the project area	Medium. Drinking water and groundwater monitoring wells are located throughout the project area. However, there are no drinking water or groundwater wells within the project footprint.
NA	Surficial Debris	Throughout the project area	Medium. Debris was observed throughout the project area, generally located within or immediately adjacent to roadway ROW areas. In some areas, debris consisted of abandoned mechanical and automotive equipment and general household refuse (i.e., wood, metal, concrete, and trash).
NA	Structures (Bridges) and Utilities	Throughout the project area	Medium. Structures were present within and adjacent to the project area from at least the 1930s, until I-270 was constructed in the 1960s and 1970s. Debris that potentially exists from the demolition of these former structures may

Map ID	Facility Name	Distance/Direction from Project	Risk Classification
			be present in the subsurface and could contain lead based paint (LBP), asbestos containing materials (ACMs), or other regulated materials. Additionally, current structures could contain LBP or ACMs.
NA	Surficial Staining	Throughout the project area	Low. Surficial staining was observed throughout the project area, generally located within or immediately adjacent to roadway ROW areas.

4.10.2 Reasonably Foreseeable Impacts of the Alternatives

4.10.2.1 No Action Alternative

The No Action Alternative would have no impact on existing areas of contamination, including sites identified as low, medium, and high potential. If structures or infrastructure are disturbed during maintenance activities, they would need to be tested for LBP and ACMs for worker protection and disposal purposes.

4.10.2.2 Build Alternatives

To the extent that contaminated soils and groundwater are treated onsite or removed for safe treatment or disposal, the Build Alternatives would result in a permanent reduction of contaminated material in the study area.

Construction of the Build Alternatives would require excavation and subsurface drilling. Grading activities could range from 2 feet to 4 feet in depth, while drilling activities could extend to depths of up to 60 feet to 80 feet. Groundwater may be encountered during bridge construction or in areas where deep foundations may be necessary (e.g., deep retaining wall and/or pedestrian bridge foundations). Existing areas of residual soil and groundwater contamination or landfill gases at or adjacent to the listed facilities of medium or high potential to impact the study area are anticipated.

Locations where contaminated materials are most likely to be encountered during construction include the York Street bridge over I-270; I-270 bridge over the South Platte River, Burlington Ditch, Brighton Boulevard, East 60th Avenue, Vasquez Boulevard and East 56th Avenue; Vasquez Boulevard bridge over Sand Creek; and Quebec Street bridge over I-270. The Build Alternatives would have approximately 5 acres of impacts within former landfill sites and areas with prior contamination near the Burlington Ditch, including impacts to the Multi-Contractor and Weaver Electric sites. Construction of the I-270 ramps to I-76 would impact approximately four acres within a historic landfill. Improvements to the Sand Creek Regional Greenway at Vasquez Boulevard and East 56th Avenue would also impact historic landfills, where soil contamination and soil vapors would likely be encountered. East of East 56th Avenue, deep excavation may encounter fill material from river channelization.

The Build Alternatives are likely to encounter impacted soil and soil vapor (methane, for example) on I-270 near Brighton Boulevard, where previous geotechnical and environmental

investigations indicate differential settlement beneath the highway, adjacent historic landfills, and landfill material extending beneath the project area.

The proposed pedestrian bridge over I-270 west of Quebec Street is located within the groundwater contamination plume of the Chemical Sales Superfund site. Deep excavation activities in this location have a high potential to encounter contaminated groundwater and require dewatering.

Stormwater discharge and water quality facilities would be needed for the project and are proposed in locations with historic landfills and impacted soils. Additional investigation may be necessary to confirm proposed locations.

Dewatering activities would likely be necessary during the installation of deep foundation systems for new bridge structures, retaining walls, or other features. Results of 2022 Phase II ESA sampling in various locations of the I-270 study area indicate that various contaminants have impacted regional groundwater to levels that exceed surface water and groundwater standards. Therefore, water would require either treatment to meet those standards prior to discharge to state waters or would require off-site disposal.

ACMs and LBP could be encountered with buried utilities, historic landfills, structures, or infrastructure. Additional testing and investigation would be required.

4.10.3 Mitigation

Any contamination encountered during the construction of the project will be managed in compliance with applicable state and federal regulations. A project-specific Materials Management Plan (MMP) and Health and Safety Plan (HASP) will be developed and implemented to guide the management and handling of contaminated soil, debris, impacted groundwater, and landfill gases that may be encountered during construction. Construction activities within areas with known environmental use restrictions will follow appropriate site-specific MMPs. Phase I ESA(s) will be completed, as needed, for properties with potential hazardous material concerns that have been identified for acquisition. Additional subsurface investigation will be conducted if recommended by the Phase 1 ESA or MMP.

Real-time monitoring during construction for VOCs, methane, and ACMs are recommended. Existing structures anticipated for demolition will be tested for LBP and ACMs. Impacted wells will be abandoned, plugged, and replaced if necessary, per Colorado Division of Water Resources regulations and in coordination with property owners.

Per- and Polyfluoroalkyl Substances (PFAS) groundwater contamination was identified as a potential corridor-wide concern. It is recommended that the project team monitor future developments in PFAS regulations and review mapped areas of PFAS contaminated groundwater prior to construction. Coordination with the CDPHE Hazardous Materials and Waste Management Division and WQCD will be required for permitting and compliance prior to construction.

4.11 Soils and Geologic Resources

Geologic features include outcrops, unique rock formations, and potential mining and energy resources. Formations that are unstable or erode easily, extreme topography, areas of former or active underground mining, and faults or areas of seismic activity are considerations for project development and implementation. Soil characteristics and potential hazards include slope stability, expansive soils, differential settlement, erosion, bedrock presence, hazardous materials, and flooding. Knowledge of these conditions is necessary for designing the project and avoiding potential hazard areas. Details related to soils and geologic resources are included in Appendix E12.

4.11.1 Affected Environment

The study area for soils and geologic resources is the project footprint (Figure 4-1). Surface soils within the study area consist of 12 different soil units with varying amounts and sizes of sand, clay, silt, and gravel.

The bedrock underlying the study area is classified as the Denver and Arapahoe Formations of the Upper Cretaceous Age (Lindvall 1980). The study area is heavily urban and previously disturbed from prior construction efforts, with appropriate landscaping on slopes. Therefore, exposed bedrock is not common throughout the study area. The project is underlain by seven geological units, or layers: Artificial Fill, Holocene Piney Creek and Post-Piney Creek Alluvium, the Holocene and Pleistocene Unnamed Eolian Sand Unit, Pleistocene Broadway Alluvium, Pleistocene Louviers Alluvium, Pleistocene Slocum Alluvium, and the Paleocene and Upper Cretaceous Denver and Arapahoe Formations.

Topography for most of the study area slopes slightly to the northwest towards the South Platte River. Near the I-25/US 36/I-270 interchange the topography slopes down to the east-southeast towards Clear Creek and the South Platte River. Depth to groundwater is assumed to be between 5 feet and 20 feet below ground surface (bgs). Groundwater flow is generally north but may be locally to the northeast or northwest. Colorado is in a region that has minimal earthquake activity. FEMA has determined the risk of earthquakes in the study area as relatively low risk.

Numerous areas along the corridor were identified as historic landfill/solid waste disposal areas. Maintenance activities and previous geotechnical and environmental investigations indicate differential settlement of I-270 adjacent to historic landfills west of Brighton Boulevard within the project footprint. These artificial fill areas may impact the geotechnical aspect of the project through differential settling or other geotechnically compromised subgrade materials.

Additional information regarding historic landfills is available in Section 4.10 and in Appendix E11.

4.11.2 Reasonably Foreseeable Impacts of the Alternatives

4.11.2.1 No Action Alternative

The No Action Alternative includes ongoing highway and bridge maintenance and isolated pavement reconstruction of I-270. Structurally and operationally deficient bridges on I-270 would not be replaced, and differential settling would continue to occur.

4.11.2.2 Build Alternatives

Additional disturbance in areas where historic landfills and associated issues have occurred may further exacerbate differential settling on I-270.

Construction would require excavation and subsurface drilling for potential bridge/overpass construction, noise walls, signs, and lighting. Grading activities could range from 2 feet to 4 feet deep, while drilling activities could extend up to 60 feet to 80 feet deep. Groundwater and bedrock will likely be encountered during construction or in areas where deep foundations may be necessary (e.g., deep retaining wall and/or pedestrian bridge foundations).

4.11.3 Mitigation

CDOT and the contractor will develop a mitigation plan to address existing differential settling to reduce the potential for it to occur in the future. In locations where groundwater/infiltration water is generated, dewatering is required. A Construction Dewatering Permit will be obtained from CDPHE-WQCD.

4.12 Historic Properties

Historic properties (including archaeological sites) include buildings, sites, structures, objects, and districts that are listed in, or are eligible for listing in, the National Register of Historic Places (National Register). Historic properties are protected by the following federal and state laws:

- National Historic Preservation Act (1966)
- Colorado State Register of Historic Properties Act (1975)
- United States Department of Transportation Act (1966)

The primary vehicle for the preservation and regulation of historic properties is Section 106 of the National Historic Preservation Act. This law requires federal agencies to evaluate the effects of planned undertakings, or projects, on historic properties. To meet the requirements of Section 106, the federal agency must consult with the State Historic Preservation Office (SHPO), Tribes, and other consulting parties, as applicable, to identify historic properties in the area where the undertaking could have effects, assess the effects of the undertaking on historic properties, and explore alternatives to avoid, minimize, or mitigate adverse effects. Compliance with the federal Section 106 process typically implies compliance with the Colorado State Register Act.

Details related to the Section 106 process for the project are included in Appendix E13 and Appendix E14.

4.12.1 Affected Environment

4.12.1.1 Historic Built Environment Resources

The study area for historic resources, or Area of Potential Effects (APE), is shown in Figure 4-15. It covers the project limits and adjacent properties built in 1980 or earlier that may be subject to direct or indirect effects caused by proposed transportation improvements, including linear features that intersect I-270, such as roadways, railroads, and ditches.

The Section 106 evaluation identified 78 potentially historic properties within the APE. Of these 78 resources, 67 were determined not eligible for listing in the National Register, and 11 were determined eligible or treated as eligible (assumed eligible). They include eight linear resources, one architectural property, one railroad junction, and one industrial complex. Table 4-12 provides a summary of the 11 eligible properties in the APE, which are also shown in Figure 4-16. It should be noted that Suncor was not surveyed due to its expansive size and was treated as eligible for Section 106 review purposes.

4.12.1.2 Archaeological Resources

The APE for archaeological resources is the project footprint (Figure 4-1). Extensive prior disturbance has been documented within the APE. A file search of the Office of Archaeology and Historic Preservation (OAHP) records, literature review of information on previously conducted archaeological surveys and previously recorded archaeological sites, and an archaeological survey and assessment of the I-270 corridor identified nine previous archaeological surveys. No previously documented archaeological sites were identified in the APE through the literature review and records search, or during pedestrian inventory and exploratory testing conducted in 2020.

Figure 4-15. Area of Potential Effects

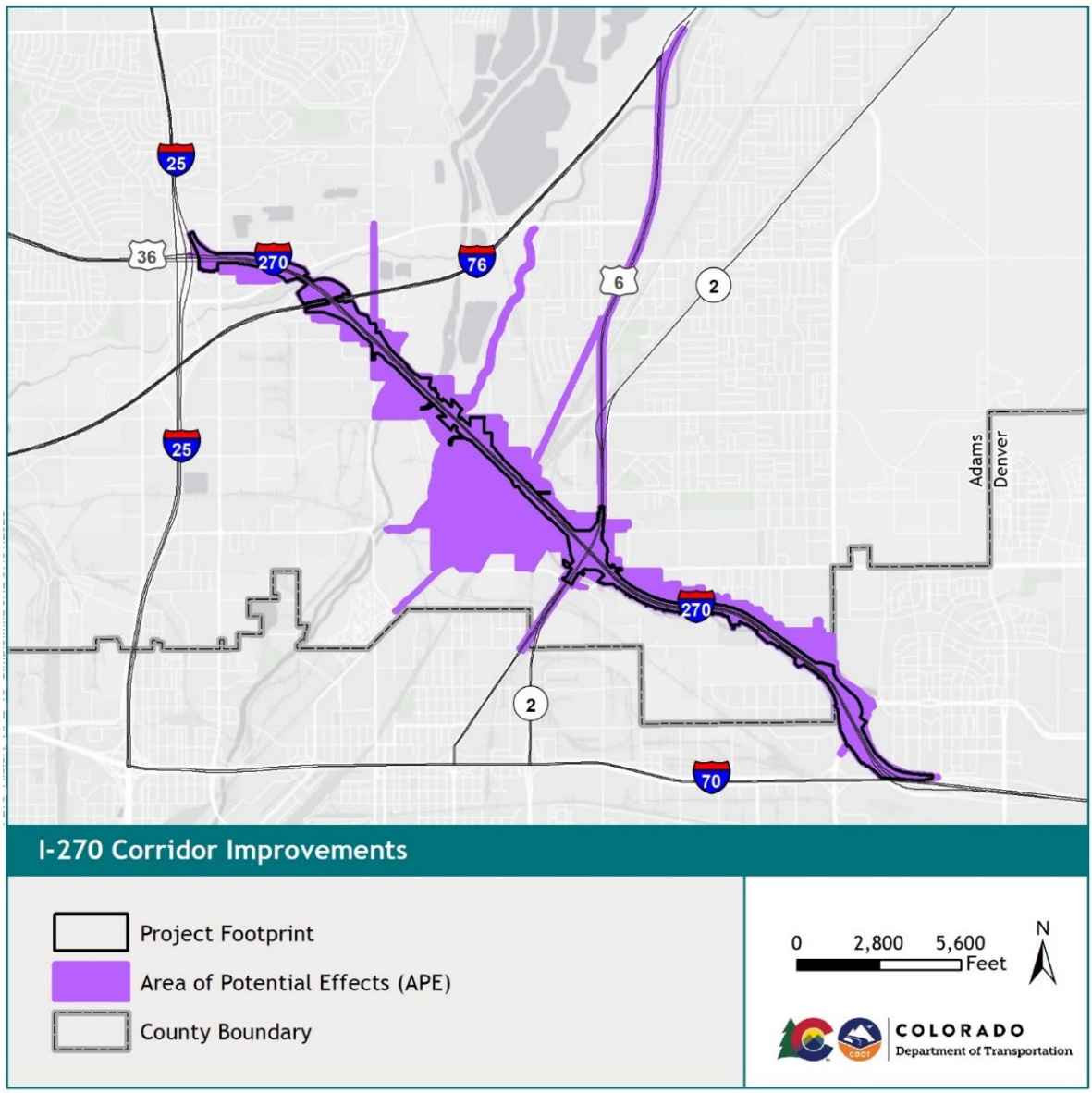
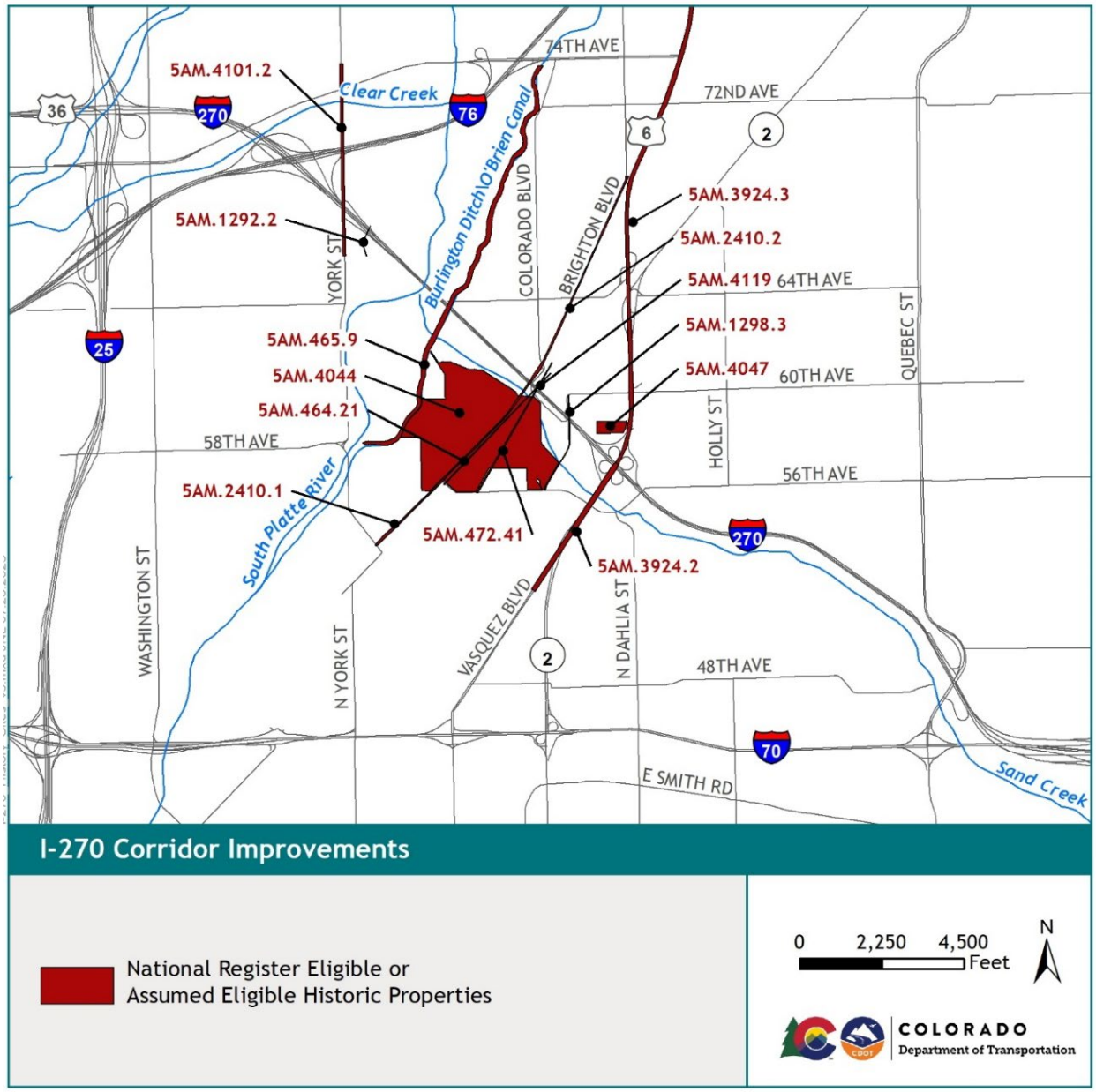


Table 4-12. National Register Eligible Properties or Treated as Eligible (Assumed Eligible) Properties within the Area of Potential Effects

Name	Site Number	Eligibility	Property Type
Plastics, Inc.	5AM.4047	Eligible	Architectural
Suncor	5AM.4044	Treat as Eligible	Industrial Complex
Sand Creek (Railroad) Junction	5AM.4119	Eligible	Linear resource
Chicago, Burlington & Quincy, Brush Railroad Line	5AM.464.21	Eligible (Assumed)	Supporting of longer overall eligible linear resource 5AM.464
Burlington Ditch	5AM.465.9	Eligible (Assumed)	Supporting of longer overall eligible linear resource 5AM.465
Denver Pacific Railroad, Greeley Line	5AM.472.41	Eligible (Assumed)	Supporting of longer overall eligible linear resource 5AM.472
Chicago, Burlington & Quincy, Market Street Line	5AM.1298.3	Eligible (Assumed)	Supporting of longer overall eligible linear resource 5AM.1298
Brighton Boulevard	5AM.2410.1, 5AM.2410.2	Eligible (Assumed)	Supporting of longer overall eligible linear resource 5AM.2410
Gardener's Ditch	5AM.1292.2	Eligible (Assumed)	Non-supporting of longer overall eligible linear resource 5AM.1292
York Street	5AM.4101.2	Eligible (Assumed)	Non-supporting of longer overall eligible linear resource 5AM.4101
Vasquez Boulevard	5AM.3924.2, 5AM.3924.3	Eligible (Assumed)	Non-supporting of longer overall eligible linear resource 5AM.3924

Figure 4-16. National Register Eligible or Treated as Eligible (Assumed Eligible) Properties within the Area of Potential Effects



4.12.2 Section 106 Consultation

4.12.2.1 Historic Built Environment Resources

CDOT initially coordinated its Section 106 eligibility and effect findings with the SHPO and two identified Section 106 consulting parties—Commerce City and Adams County—in February 2021. The SHPO concurred with CDOT's Section 106 eligibility and effect findings on March 5, 2021. No response was received from the two consulting parties.

In November 2024 after completing its assessment of the Build Alternatives under evaluation, CDOT submitted an updated Section 106 submittal to the SHPO and the two Section 106 consulting parties. The SHPO concurred with CDOT's eligibility and effect findings on December 5, 2024. No response was received from the two consulting parties.

4.12.2.2 Archaeological Resources

Because there are no National Register listed or eligible archaeological properties in the APE, CDOT submitted a finding of "no historic properties affected" to the SHPO in June 2021 and the SHPO concurred in July 2021 (Appendix E14). In 2024, the CDOT Archaeologist reviewed the findings in the context of the alternatives under consideration and confirmed this finding. The SHPO concurred on December 5, 2024. No additional SHPO consultation is necessary for archaeological resources.

Tribal consultation was initiated in July 2023 to solicit participation from Tribes with a historical or cultural interest in the project area. A total of 11 tribes were contacted, and no response was received from 9 of the tribes. The Northern Cheyenne Tribe and Pawnee Nation responded and accepted the invitation to be Section 106 consulting parties and Participating Agencies.

4.12.3 Reasonably Foreseeable Impacts of the Alternatives

4.12.3.1 No Action Alternative

The No Action Alternative results in No Adverse Effect to the 11 National Register eligible properties. The ongoing highway and bridge maintenance and isolated pavement reconstruction included in the No Action Alternative would have no effect on the 11 National Register eligible properties. This includes two privately owned historic industrial complexes located adjacent to (and not intersecting) I-270: 5AM.4047, Plastics, Inc., and 5AM.4044, Suncor. Because this alternative does not change conditions or replace bridges at/over the nine historically significant ditches, roads, and railroads, the No Action Alternative also has little to no potential to affect the remaining nine linear resources and one railroad junction that intersect the existing I-270 ROW.

4.12.3.2 Build Alternatives

4.12.3.2.1 Historic Built Environment Resources

All 78 potentially historic properties were assessed for effects under the Section 106 process. The 67 properties within the APE determined to be not eligible for listing in the National Register lack significance and/or historic integrity and are not considered historic properties. Therefore, CDOT has made a determination of "no historic properties affected" for these properties.

For the 11 properties within the APE determined to be eligible for listing in the National Register, CDOT has made a determination of "no adverse effect." A brief summary of effects of both Build Alternatives is provided in Table 4-13. CDOT's consultation with the SHPO evaluated the effects of each of the two Build Alternatives (Three General-Purpose Lanes and Two General-Purpose Lanes and One Express Lane that Accommodates Transit) separately.

Table 4-13. Section 106 Effect Determinations

Name	Site Number	Effect Determination
Plastics, Inc.	5AM.4047	No Adverse Effect. Ramp improvements at Vasquez Boulevard are proximal to Plastics, Inc., but introduce little change to the setting of this industrial property and do not require ROW or easements.
Suncor	5AM.4044	No Adverse Effect. A small temporary easement is required from a vacant, previously disturbed area of this property - a vast industrial complex on the south side of I-270 that is being treated as National Register eligible for purposes of this Section 106 review.
Sand Creek (Railroad) Junction	5AM.4119	No Adverse Effect. Affected by the replacement of a pair of I-270 bridges that span over this resource. All new bridge piers are located outside of the historic boundaries of this resource. Temporary easements would be needed to implement bridge replacements. No permanent effects to the railroad alignment, ballast, or track are anticipated.
Chicago, Burlington & Quincy, Brush Railroad Line	5AM.464	No Adverse Effect. A supporting segment of the Chicago Burlington & Quincy Brush Railroad Line, 5AM.464.21, would be affected by the replacement of a pair of I-270 bridges that span over this resource. All new bridge piers are located outside of the historic boundaries of this resource. Temporary easements would be needed to implement bridge replacements. No permanent effects to the railroad alignment, ballast, or track are anticipated.
Burlington Ditch	5AM.465	No Adverse Effect. Replacement of the I-270 bridge pair over a supporting segment of the Burlington Ditch/O'Brien Canal, 5AM.465.9, will require temporary easements within the historic boundary of the Canal. The two new bridges would be wider than the current bridge pair but will be single-span, instead of three-span as they are currently. All permanent vertical improvements, such as bridge piers, would be located outside of the canal's historically defined boundary. No permanent change to the ditch's alignment, earthen materials, or ditch rider roads are anticipated.
Denver Pacific Railroad, Greeley Line	5AM.472	No Adverse Effect. A supporting segment of the Denver Pacific Railroad Greeley Line, 5AM.472.41, would be affected by the replacement of a pair of I-270 bridges that span over this resource. All new bridge piers are located outside of the historic boundaries of this resource. Temporary easements would be needed to implement bridge replacements. No permanent effects to the railroad alignment, ballast, or track are anticipated.
Chicago, Burlington & Quincy, Market Street Line	5AM.1298	No Adverse Effect. Replacement of the bridge pair spanning over the Chicago Burlington & Quincy Market Street Line supporting segment, 5AM.1298.3, would result in a wider bridge over the rail line, but all new bridge piers are located at least 14 feet from (outside of) the historic rail line boundary. While a temporary easement will be needed to

Name	Site Number	Effect Determination
		implement the bridge replacements, no permanent effects to railroad alignments, ballast, or track are anticipated.
Brighton Boulevard	5AM.2410	No Adverse Effect. Replacement of the bridge pair carrying I-270 over two supporting segments of Brighton Boulevard/CO 265, 5AM.2410.1 and 5AM.2410.2, will affect approximately 1.5 acres of the historic roadway. These effects consist largely of rebuilding the curb and gutter on either side of the roadway under the new bridges, with no widening or other improvements on Brighton Boulevard anticipated. New bridge piers would be located outside of the historically defined boundary of Brighton Boulevard, although the new bridges crossing over Brighton Boulevard would be wider than the prior bridge pair.
Gardener's Ditch	5AM.1292	No Adverse Effect. A non-supporting segment of the abandoned Gardener's Ditch, 5AM.1292.2, already crosses under I-270. Proposed improvements at I-270 and York Street will trigger additional temporary and permanent effects to another 0.01 acres of this already heavily disturbed section of ditch on both the north and south sides of I-270.
York Street	5AM.4101	No Adverse Effect. Minor reconfiguration of the I-270 and York Street interchange and replacement of the York Street underpass at I-270 would require approximately 2.4 acres of new transportation use of a non-supporting segment of York Street, 5AM.4101.2. These effects largely consist of replacing one modern interstate highway underpass, with another wider modern underpass at York Street and adding sidewalk and curb and gutter for an approximately 0.24-mile length.
Vasquez Boulevard	5AM.3924	No Adverse Effect. Two non-supporting segments of Vasquez Boulevard/US 6, 5AM.3924.2 and 5AM.3924.3, would be affected by interchange reconstruction at I-270 and Vasquez Boulevard, including conversion of the roadway from a full cloverleaf to partial cloverleaf, on-ramp and off-ramp reconstruction, addition of a new auxiliary lane on I-270 over Vasquez Boulevard, and replacement of a non-historic bridge on Vasquez Boulevard over Sand Creek. The improvements would permanently affect nearly 9 acres of Vasquez Boulevard; however, the areas where improvements are anticipated already lack historic integrity due to prior interstate construction and other recent widening and bridge replacement improvements.

4.12.3.2.2 Archaeological Resources

There are no known or anticipated archaeological historic properties within the APE. Effects to archaeological resources are not anticipated under either of the Build Alternatives.

4.12.4 Mitigation

Given that the project would result in "no adverse effect" to historic properties under the Section 106 process, CDOT has not identified any mitigation for historic resources.

However, if there is an archaeological discovery during construction, the CDOT Senior Archaeologist should be contacted to evaluate the discovery. In addition, CDOT will need to reassess individual project designs as they move forward to ensure that the effects to these historic properties have not increased, and that these designs are not causing new effects to historic properties.

4.13 Paleontological Resources

Paleontological resources are fossilized remains or traces of plant and animal life, or other organisms, which offer insight into understanding the history of life on Earth. Paleontological resources can include physical remains—such as bones, teeth, shells, and leaves—and trace remains—such as footprints.

Fossils are considered a nonrenewable resource and are therefore broadly protected under general federal environmental protection rules. Colorado's Historical, Prehistorical, and Archaeological Resources Act (1973) reserves ownership of fossils on state land as well as land administered by counties, cities, and other subdivisions to the State of Colorado. Permits issued by the SHPO are required to collect, destroy, or otherwise remove fossil localities covered by this law, and a requirement to avoid damage to fossil localities without such a permit is implied. Details related to paleontological resources are provided in Appendix E15.

4.13.1 Affected Environment

The study area for paleontological resources is the project footprint (Figure 4-1). Geologic maps of the study area were reviewed to determine paleontological sensitivity of underlying rock units. As noted in Section 4.10, the project is underlain by seven geological units, or layers: Artificial Fill, Holocene Piney Creek and Post-Piney Creek Alluvium, the Holocene and Pleistocene Unnamed Eolian Sand Unit, Pleistocene Broadway Alluvium, Pleistocene Louviers Alluvium, Pleistocene Slocum Alluvium, and the Paleocene and Upper Cretaceous Denver and Arapahoe Formations. The Upper Cretaceous Denver Formation is a paleontologically-sensitive geologic unit whose regular production of scientifically important leaf fossils and more sporadic production of scientifically important vertebrate fossils has resulted in establishing a general policy of construction monitoring, wherever substantial construction impacts to the unit are proposed.

Scientific literature and museum records were reviewed for known fossil localities in the study area. Two previously recorded localities are known from the immediate project area. One locality is known from the Pleistocene Louviers Alluvium and a second from the Cretaceous portion of the Denver Formation. At least seven additional localities are known from nearby portions of Adams County, including Cretaceous dinosaur fossils and Pleistocene mammal fossils.

The study area is heavily urbanized and previously disturbed from prior construction efforts, with appropriate landscaping on slopes. Therefore, no exposed bedrock currently exists that warrants detailed on-the-ground survey prior to project construction.

4.13.2 Reasonably Foreseeable Impacts of the Alternatives

4.13.2.1 No Action Alternative

Given the limited scope of activities in the No Action Alternative and minimal ground disturbance anticipated, impacts to any known or unknown fossil locations are not anticipated. Currently buried locations are also unlikely to be discovered.

4.13.2.2 Build Alternatives

Ground disturbance extending below the current disturbed ground level is highly likely to impact potentially fossil-bearing units, including Pleistocene units and Cretaceous bedrock. Two known locations are likely to be impacted, and an unknown number of additional locations may be uncovered during construction. It is also possible that fossil resources may be impacted if not recognized in time.

The Build Alternatives would not result in temporary impacts to paleontological resources.

4.13.3 Mitigation

With appropriate mitigation, potential impacts to paleontological resources can be minimized. Paleontological monitoring is recommended to address potential damage to fossils within the Pleistocene alluvial units and Denver or Arapahoe Formations. Testing and an excavation permit will be required for any paleontological monitoring or removal of fossils from the Denver or Arapahoe Formations.

4.14 Recreational and Section 6(f) Resources

Parks and recreational resources include community parks, school playgrounds, sports complexes, regional bicycle/pedestrian trails or greenways, golf courses, open space corridors, and recreation centers. These resources provide opportunities to be physically active, provide space for social interactions, and have numerous environmental benefits.

Resources evaluated in this section are protected by the Land and Water Conservation Fund (LWCF) Act of 1965. Section 6(f) refers to a section of the LWCF Act. State and local governments often obtain grants through the LWCF to develop or make improvements to parks and outdoor recreation areas. These LWCF grant boundaries delineate areas that are subject to Section 6(f). Section 6(f) of the LWCF prohibits the conversion of property acquired or developed with these grants (referred to as LWCF property) to a non-recreational purpose without the approval of the National Park Service (NPS) and identification of replacement land. Section 6(f) applies to all transportation projects involving possible conversions of LWCF property, whether or not federal funding is being utilized for the project.

Details regarding each resource, impacts, maps, and Section 6(f) analysis and coordination are provided in Appendix E16.

4.14.1 Affected Environment

The study area for recreational resources is a one-quarter mile buffer of the project limits (Figure 4-17). This area captures recreational facilities that have the potential to be affected by the project.

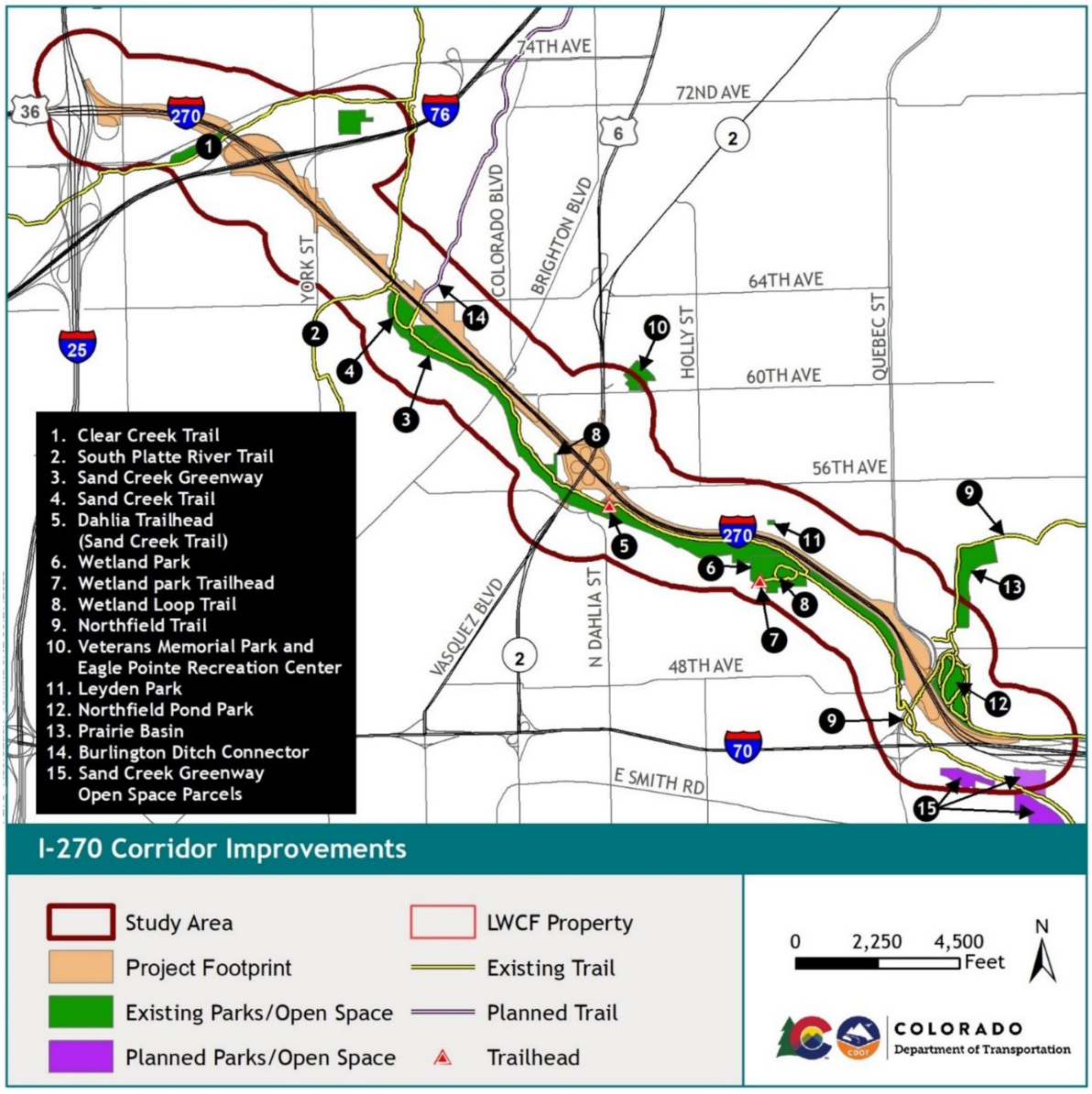
Existing and planned recreational resources are presented in Table 4-14 and shown in Figure 4-17.

Table 4-14. Existing and Planned Recreational Resources in the Study Area

Name	Map ID	Category	LWCF Property?
Existing Resource - Clear Creek Trail	1	Trail	Yes
Existing Resource - South Platte River Trail	2	Trail	Yes – Portions[1]
Existing Resource - Sand Creek Greenway	3	Open Space	No
Existing Resource - Sand Creek Trail	4	Trail	No
Existing Resource - Dahlia Trailhead (for the Sand Creek Trail)	5	Trailhead	No
Existing Resource - Wetland Park	6	Open Space	No
Existing Resource - Wetland Park Trailhead (for Wetland Park)	7	Trailhead	No
Existing Resource - Wetland Park Loop Trail	8	Trail	No
Existing Resource Northfield Trail	9	Off-Street Bikeway	No
Existing Resource Veterans Memorial Park and Eagle Pointe Recreation Center	10	Park/Recreation Center	Yes – Portions[1]
Existing Resource Leyden Park	11	Park	No
Existing Resource Northfield Pond Park	12	Park	No
Existing Resource Prairie Basin	13	Open Space	No
Planned Resource Burlington Ditch Connector	14	Trail	No
Planned Resource Sand Creek Greenway Open Space Parcels	15	Open Space	No

[1] The LWCF Property boundary differs from or does not encompass the legal boundary of the entire recreational resource. Additional detail and mapping regarding these properties is available in Appendix E16.

Figure 4-17. Existing and Planned Recreational Resources in the Study Area



4.14.2 Reasonably Foreseeable Impacts of the Alternatives

4.14.2.1 No Action Alternative

The No Action Alternative would not result in impacts to recreational resources or LWCF properties.

4.14.2.2 Build Alternatives

The following resources are outside the footprint, or would not be impacted by the project with protective measures:

- Clear Creek Trail
- Wetland Park and Trailhead
- Veteran's Memorial Park and Eagle Pointe Recreation Center
- Leyden Park
- Northfield Pond Park
- Prairie Basin
- Burlington Ditch Connector (planned)
- Sand Creek Greenway Open Space Parcels (planned)

The following resources would be permanently and/or temporarily impacted by the Build Alternatives:

- South Platte River Trail
- Sand Creek Greenway
- Sand Creek Trail
- Dahlia Trailhead
- Northfield Trail

Impacts include permanent and temporary easements, detours, closures, construction of supportive infrastructure (e.g., drainage and pipe outfalls, sidewalks), and construction access and staging.

There would be no impacts to LWCF properties under either Build Alternative. Impacts to recreational resources are summarized in Table 4-15.

Table 4-15. Summary of Impacts to Existing and Planned Recreational Resources in the Study Area

Name	Impacts?	LWCF Property Impact?
Existing Resource Clear Creek Trail	No. The potential for falling debris during overhead construction activities would be avoided with the incorporation of protective measures (see Chapter 5.0).	No. With protective measures, no impacts would occur.
Existing Resource South Platte River Trail	Yes. Temporary closure of 500-foot-long segment of trail under I-270; trail realignment to bring up to current design standards and address existing substandard vertical clearances, grades, and curves; temporary trail would be required and would be affected by several overnight closures.	No. All proposed construction activities would occur on a portion of the trail that is not Section 6(f) protected. [1]
Existing Resource Sand Creek Greenway	Yes. Temporary easements for construction activities and staging (totaling 4.42 acres); permanent easements (totaling 1.26 acres) for future access and maintenance; and reconstruction of sidewalk tie-ins.	No

Name	Impacts?	LWCF Property Impact?
Existing Resource Sand Creek Trail	Yes. Multiple segments would be impacted by temporary closures (spur at Brighton Boulevard/East 60th Avenue, 470 feet at Vasquez Boulevard, 400 feet near the Dahlia Trailhead, and 800 feet at East 53rd Way); permanent and temporary easements; construction of temporary trails would be required and would be affected by overnight closures.	No
Existing Resource Dahlia Trailhead (for the Sand Creek Trail)	Yes. Temporary and permanent easements; new sidewalk connections; construction staging and access in a portion of the parking lot.	No
Existing Resource Wetland Park	No	No
Existing Resource Wetland Park Trailhead (for Wetland Park)	No	No
Existing Resource Wetland Loop Trail	No	No
Existing Resource Northfield Trail	Yes. Temporary disturbance during construction of new curb and gutter at the I-270 eastbound off-ramp to Quebec Street; closures not anticipated.	No
Existing Resource Veterans Memorial Park and Eagle Pointe Recreation Center	No	No
Existing Resource Leyden Park	No	No
Existing Resource Northfield Pond Park	No	No
Existing Resource Prairie Basin	No	No
Planned Resource Burlington Ditch Connector	No	No
Planned Resource Sand Creek Greenway Open Space Parcels	No	No

[1]Coordination between CDOT and CPW confirmed there would not be a Section 6(f) use of the South Platte River Trail (see Appendix E16 for additional information).

The Build Alternatives include many improvements to recreational resources throughout the corridor and address existing problems associated with vertical clearance, sight distances, curves, and connectivity. The Build Alternatives would provide new or improved lighting on the I-270 grade separated crossings at York Street, South Platte River Trail, Burlington Ditch, Brighton Boulevard, Vasquez Boulevard, East 56th Avenue, and Quebec Street and at the Vasquez Boulevard over Sand Creek Regional Greenway. Additionally, new or improved bicycle and pedestrian connections designed to current standards would be provided at York Street, Vasquez Boulevard, East 56th Avenue, and between Vasquez Boulevard and Quebec

Street to eliminate bicycle connectivity gaps across I-270, including a grade separated multi-use path over I-270 between Vasquez Boulevard and Quebec Street.

4.14.3 Mitigation

Mitigation to address impacts to recreational resources include measures for the contractor to implement that will protect users of trails; continued coordination with Adams County, Commerce City, and SCRGP over affected properties; communication with the public regarding construction activities, timelines, closures, and detours; and the installation of temporary trails to address closures. Necessary closures of temporary trails will occur outside established operating hours of 5 a.m. to 11 p.m. to maintain access. Adams County and Commerce City trail specifications will be incorporated into the design. All disturbed areas will be restored following construction.

4.15 Section 4(f) Resources

Section 4(f) of the Department of Transportation Act (1966) includes a provision that stipulates FHWA cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites (referred to as Section 4(f) properties), unless there is no feasible and prudent avoidance alternative to the use of land, and the action includes all possible planning to minimize harm to the property resulting from such use; or FHWA determines the use of the property will have a *de minimis* impact on the property. A *de minimis* impact is a use that is so minor that it does not adversely affect the features, attributes, or activities that qualify a property for protection under Section 4(f). Additionally, there are exceptions to Section 4(f), as listed under CFR 774.13, with specific criteria that must be met in order to use the exception.

Properties qualify as Section 4(f) historic properties when they are listed in, or are eligible for listing in, the National Register. A recreational Section 4(f) property is defined as a publicly owned park, recreation area, or wildlife and waterfowl refuge that is open to the public, has recreation or conservation (in the case of a wildlife and waterfowl refuge) as its primary purpose, and is determined to be significant as a park or recreation area by the agency with jurisdiction. There are no wildlife and waterfowl refuges in the study area.

The Section 4(f) analysis conducted for the project is summarized in this section. Additional details are documented in Appendix E17.

4.15.1 Affected Environment

The study area for Section 4(f) resources is the same as the study area for historic resources (the APE, shown in Figure 4-15) and recreational resources (a one-quarter mile buffer of the project limits, shown in Figure 4-17).

4.15.1.1 Historic Resources

Section 4(f) historic properties in the project area include eight linear resources, one architectural property, one railroad junction, and one industrial complex (see Table 4-12 and Figure 4-16).

4.15.1.2 Recreational Resources

Recreational Section 4(f) properties include the Clear Creek Trail, South Platte River Trail, Sand Creek Trail, Dahlia Trailhead (for the Sand Creek Trail), Wetland Park Trailhead (for Wetland Park), Wetland Park Loop Trail, Veterans Memorial Park and Eagle Pointe Recreation Center, Leyden Park, and Northfield Pond Park (see Table 4-14 and Figure 4-17). Although the Sand Creek Greenway and Wetland Park do not have a primary purpose of recreation and are therefore not subject to Section 4(f), their associated trails and amenities (e.g. seating areas along Sand Creek Trail and picnic shelters within Wetland Park) are.

4.15.2 Section 4(f) Consultation

CDOT received a signed Section 4(f) *de minimis* finding from FHWA regarding historic properties described above on August 20, 2025.

Coordination with the Officials with Jurisdiction (OWJ) regarding impacts to Section 4(f) properties is required; the OWJ is generally the entity with ownership of the resource for recreational and non-historic 4(f) properties. On November 22, 2024, Adams County Parks, Open Space & Cultural Arts, the OWJ over the South Platte River Trail, concurred that the project meets the requirements for a Section 4(f) temporary occupancy exception.

Commerce City and the Sand Creek Regional Greenway Partnership (SCRGP), the OWJs for Sand Creek Trail and Dahlia Trailhead, have been informed of FHWA's intent to make a *de minimis* impact finding for impacts to these properties. Public review and comment will be solicited through the EIS public comment and public hearing process. Following the comment period, comments will be considered and the intent to make a *de minimis* impact finding will be reassessed. If it is still the intent, written concurrence agreeing with the *de minimis* impact finding will be requested from the OWJs. Following this process, FHWA may make a final determination on the *de minimis* impact finding.

4.15.3 Reasonably Foreseeable Impacts of the Alternatives

4.15.3.1 No Action Alternative

The No Action Alternative does not require any new transportation use of historic properties, and as such, no Section 4(f) approvals by FHWA are required under this alternative.

4.15.3.2 Build Alternatives

4.15.3.2.1 Historic Resources

The Build Alternatives require new permanent and/or temporary easements from 10 of the 11 National Register eligible properties. The only eligible property within the APE that does not require a new transportation use is 5AM.4047, Plastics, Inc.

4.15.3.2.2 Recreational Resources

The following Section 4(f) recreational resources are outside the footprint or would not be impacted by the project with protective measures: Clear Creek Trail, Wetland Park Trailhead, Wetland Park Loop Trail, Veteran's Memorial Park and Eagle Pointe Recreation Center,

Leyden Park, and Northfield Pond Park. The following Section 4(f) recreational resources would be permanently and/or temporarily impacted by the Build Alternatives: South Platte River Trail, Sand Creek Greenway, Sand Creek Trail, and Dahlia Trailhead.

Impacts to the South Platte River meet the requirements for Temporary Occupancy exception, 23 CFR 774.13(d). Impacts to the amenities associated with the Sand Creek Greenway, Sand Creek Trail, and Dahlia Trailhead would result in a *de minimis* use of these resources.

4.15.4 Mitigation

Mitigation is required for recreational Section 4(f) historic resources that includes things such as coordinating with the OWJs ahead of impacts and putting fall protection on bridges over trails into place prior to beginning construction activities in that location.

4.16 Visual Resources

Visual resources include features of both the built and natural environments that together comprise the visual landscape. Examples of visual resources include water features, mountain peaks, parks, urban skylines, infrastructure, signage, lighting, fencing, or other components of the landscape. Cultural resources, such as historic landmarks and historic districts, can also be visual resources. The importance of visual resources is subjective, based on the viewer's perspective, but can be understood through state policy, public input, and local community planning documents and regulations.

CDOT provides guidance for the assessment and documentation of visual resources through its Visual Impact Assessment (VIA) Guidelines (CDOT 2020d). The guidelines address NEPA requirements and FHWA programs and initiatives related to visual resources, aid in transportation decision making for projects, and reinforce CDOT's Context Sensitive Solutions Principles. A VIA memo was completed for this project and is summarized in this section. Additional details are documented in Appendix E18.

4.16.1 Affected Environment

The study area for visual resources, referred to as the Area of Visual Effect (AVE), is shown in Figure 4-18. Per CDOT guidelines (CDOT 2020d), it includes areas that are visible from within three to five miles of I-270. The analysis considers views in the foreground (up to 0.25 miles to 0.5 miles), middle ground (extending 3 miles to 5 miles), and background (extending to infinity). Photos representing the visual elements described in this section are presented in Figure 4-19.

I-270 travels through predominantly industrial and transportation land uses, which characterize the AVE into a single mostly homogeneous landscape. I-270 is a noticeable visual element with associated transportation features prevalent (paved travel lanes, interchanges, guardrails, light fixtures, jersey barriers, and prominent overhead signage). A large volume of traffic, often at a standstill during rush hours, carries a high number of large freight vehicles and automobiles. Two railroads cross under I-270 just south of Brighton Boulevard, contributing additional transportation features to the landscape. Highway lights, lights from motor vehicles, as well as other adjacent industrial and commercial facilities impact the night

sky. Warehouses, parking lots occupied by freight vehicles, and construction cranes are typical visual components within the AVE.

Figure 4-18. Area of Visual Effect

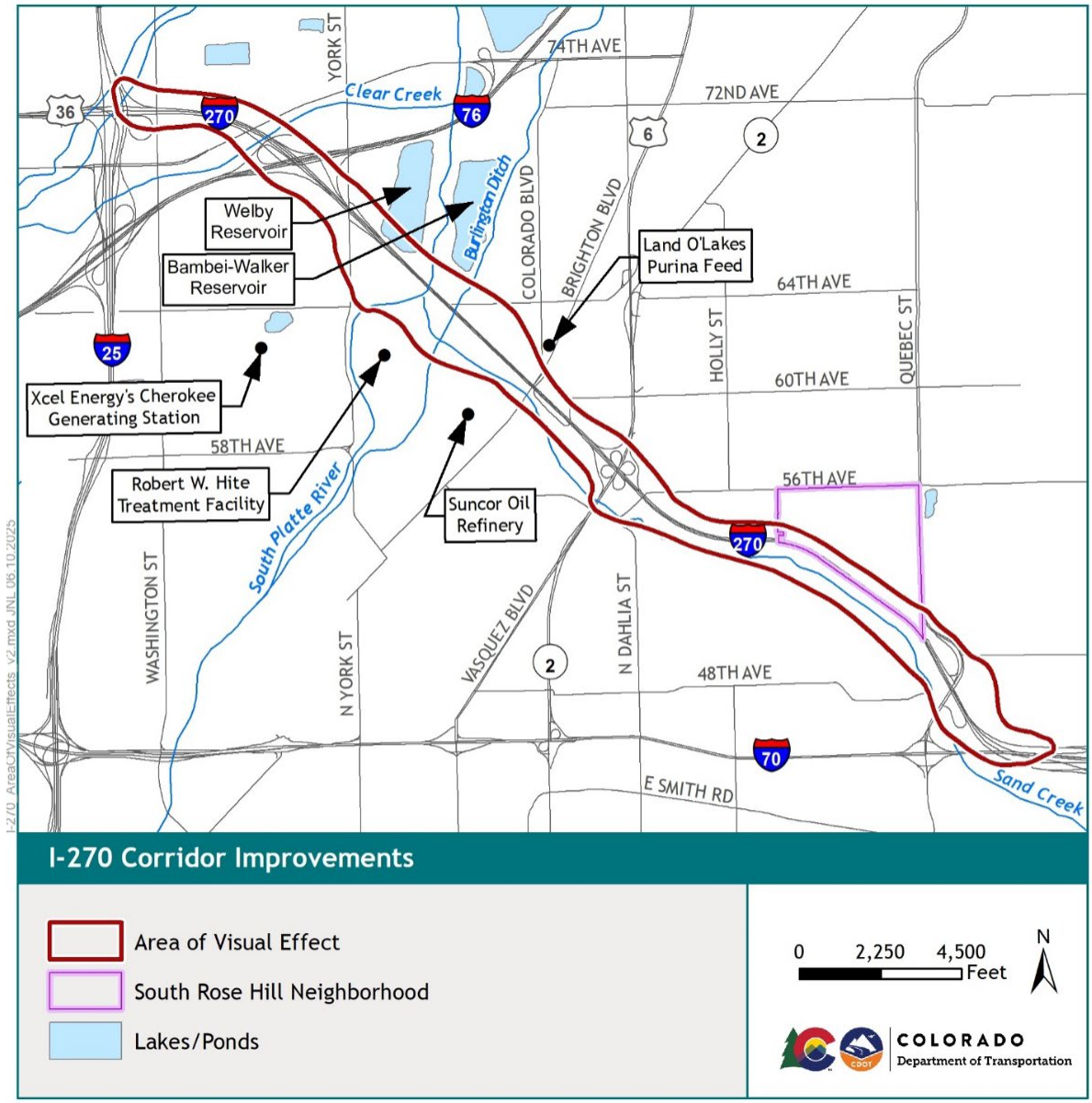


Figure 4-19. Representative Photos

I-270 crossing over the BNSF and UPRR railroads and Brighton Boulevard. Sand Creek and the Sand Creek Greenway trail run along the south side of I-270. Industrial development surrounds the highway. Facing northwest.

I-270 crossing over the Burlington Ditch and Sand Creek Regional Greenway trail. The RTD N Line crosses over I-270 and vacant and industrial development surrounds the corridor. Facing south.

I-270 crossing the South Platte River. Pedestrian bridge for the Sand Creek Greenway trail and industrial development in the background. Facing southwest.

I-270 crossing over a railroad spur and 60th Avenue with industrial development surrounding the highway. Facing northwest.

I-270 and Vasquez Boulevard interchange with industrial and commercial development surrounding the interchange. Facing north.

Typical signage on I-270. Facing northwest.

Industrial uses crowd the interstate, particularly south of Brighton Boulevard. The Suncor refinery, south of I-270 and east of Brighton Boulevard, is a notable industrial feature because of its widespread footprint and conspicuous vertical features, which remain prominent at night because of extensive lighting. Other prominent industrial features include the Robert W. Hite Treatment Facility, Xcel Energy's Cherokee Generating Station, and Land O'Lakes Purina

Feed. All of these elements occupy foreground views on large parcels west of I-270 between Franklin Street and Brighton Boulevard, where views from the highway are more open, giving these facilities heightened visual prominence. The Commerce City 2045 Comprehensive Plan calls for a continuation of industrial uses along the I-270 area and includes goals to retain the existing general industrial use, particularly south of I-270 (Commerce City 2023). Therefore, these development patterns are likely to continue into the future. The plan also includes directives to improve visual quality, the appearance of I-270, and the overall image of the area seen from the highway.

Minor exceptions to the industrial and transportation setting interject slight variations into the landscape but are insufficient to change its overall industrial nature. These include the South Platte River, which I-270 crosses, and Sand Creek, which roughly parallels the south side of I-270 from the river to I-70. I-270 crosses over Clear Creek, which is not readily visible from the highway. A narrow riparian area of deciduous trees borders Sand Creek and is most visible where it is closest to I-270, generally south of 56th Avenue. In this area, the I-270 profile elevates above the creek, and the creek is seldom visible from the highway. Users of the Sand Creek Greenway typically move through the landscape at a slower pace than drivers. Because I-270 is mostly above the creek, the highway's visibility varies along the greenway.

Other elements of the landscape include Welby Reservoir and Bambei-Walker Reservoir, north of the highway on opposite sides of the South Platte River. A handful of residences are north of Welby Reservoir, but most are screened from highway views. An existing noise wall helps obscure views of I-270 for residents on the west side of the highway. The South Rose Hill residential area is north of I-270, generally between Newport Street and Krameria Street. Few of these residences have views of I-270, with some views blocked by existing fences. However, I-270 is within 125 feet of those viewers closest to the highway, who have a level line of sight to it. View duration for residents (considered to be sensitive viewers) is high.

The AVE is within a regional context identified in CDOT's Guidelines as Front Range Urban; Front Range panoramas are defined in CDOT Guidelines as "visually prominent features" that are "visible from the project area but separated by great distance." Panoramas of the Front Range Mountains are visible in the background distance to the west and north but are faint and low on the horizon for westbound travelers, and the downtown Denver skyline is occasionally visible in the middle ground for eastbound travelers, particularly from elevated interchanges. Views of downtown Denver for eastbound travelers are infrequent and typically of low quality because of distance and obstruction by industrial features. These views are also to the south and out of the direct line of sight for drivers, who would be looking southeast. Therefore, views of downtown Denver are limited primarily to vehicle passengers.

Although I-270 follows the contours of Sand Creek south of the South Platte River, the highway is not a unified element of the landscape, as the form, line, color, texture, and scale of the roadway elements overpower the presence of the creek, which is already an anomaly in the industrial setting. I-270 does not blend into the landscape, which generally lacks landforms, vegetation, or visually coherent development patterns that the highway could reflect. The discordant setting displays no integrity of composition and therefore, is not intact or unified. For these reasons, the landscape is inharmonious, and vividness is moderately low, resulting in low overall visual quality.

4.16.2 Reasonably Foreseeable Impacts of the Alternatives

4.16.2.1 No Action Alternative

No noticeable visual change would occur in the study area under the No Action Alternative. Existing visual elements would remain. As congestion continues, slow-moving traffic would occupy views both from and toward the highway, further degrading the area's image, and no actions would be implemented to improve the area. Temporary visual intrusions would occur in the form of ongoing and periodic highway maintenance activities.

4.16.2.2 Three General-Purpose Lanes Alternative

Long-term visual changes would result primarily from widening I-270 to accommodate new travel and auxiliary lanes, widening bridges and shoulders, reconfiguring existing interchanges, and, to a lesser extent, flattening some curves. Changes would be most noticeable to travelers driving on I-270. Although the highway would occupy a wider footprint and introduce some new highway features, changes would be compatible with the visual character of the landscape, as they would have similar lines, colors, and textures, and repeat transportation elements already in the landscape. Visual contrast between the existing landscape and the project would be weak for the same reasons. A rendering of the configuration of the Three General-Purpose Lanes Alternative is depicted in Figure 5-20.

Horizontally extending the visual impact of I-270 would be most noticeable to travelers driving on I-270 and residents closest to I-270 within the South Rose Hill neighborhood resulting in slight adverse impact to these viewers. Although a new lane, extended ramps, and auxiliary lanes would widen the extent of vehicle lights at night, this change would be negligible compared to existing conditions and the surrounding industrial environment.

As discussed in Section 4.3.3, a noise wall would be constructed north of I-270 in the South Rose Hill neighborhood if more than 50 percent of the benefited receptors indicate support for the wall during the Benefited Receptor Preference Survey. The wall would introduce a new visual impact to adjacent residents. However, this impact would likely be beneficial as it would screen residents from both the existing and project-related visual impacts associated with I-270.

Reconfiguring the Vasquez Boulevard interchange would be noticeable, but the ramp alignment would not exceed a 5 percent grade, and other vertical slopes would not exceed a 3:1 grade. Therefore, views toward the mountains would likely remain unhindered. In addition, the interchange design would reduce the visual impact of this transportation feature. Installing new traffic signals as a result of the reconfiguration would not noticeably impact views and landscape character. Overall, impacts at Vasquez Boulevard would be both adverse and beneficial but negligible.

Figure 4-20. Rendering of the Three General-Purpose Lanes Alternative Looking Northwest

All proposed retaining walls would be west of Vasquez Boulevard and would primarily affect views for I-270 travelers; adverse impacts would vary based on wall height which would range from 5 feet to 30 feet. Retaining walls may visually impact views for up to three residences on either side of the highway, in the vicinity of York Street but could also screen views of the highway. New areas of cut and fill would remain within the I-270 ROW but would be visible at the open areas between the South Platte River and the Burlington Ditch/O'Brien Canal. New drainage structures and permanent water quality ponds may introduce some natural elements (water) to the landscape with slight beneficial effects. ITS improvements (i.e., variable message signs) and the new pedestrian overpass as shown in Figure 4-21 would add new vertical features that could potentially block distant views, particularly of mountains for westbound travelers.

Trees may be removed from the greenways to accommodate highway expansion, removing natural elements that are uncommon in the area and resulting in a potential adverse impact to trail users. Any impacts to trees would be subject to the tree mitigation plan developed for this project. Minimal changes may be made to the South Platte River Trail and Sand Creek Greenway, the latter of which would remain below the highway's grade, thereby precluding highway views for trail users. The new pedestrian path at Vasquez Boulevard would offer more views of the new I-270 highway infrastructure. Landscaping within the Vasquez Boulevard interchange would introduce some natural elements to the industrial setting, providing a break in the intensity of the development in this area.

Overall, the study area would retain its industrial and transportation visual character, and visual quality would remain low.

Figure 4-21. Rendering of the New Pedestrian Overpass - Facing Northwest Toward the Front Range

Note that this is a rendering of a potential design style for the overpass. The ultimate design of the overpass will be determined in final design with stakeholder input.

Temporary visual impacts would result from views of staging areas used to store construction materials. Temporary visual impacts would also result from views of large, slow-moving, and stationary construction vehicles, as well as construction personnel and temporary construction mitigation measures, such as concrete barriers, orange fencing, construction lighting, temporary earthwork storage, silt fences, and erosion logs.

4.16.2.3 Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative

The Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative results in similar impacts to the Three General-Purpose Lanes Alternative. The additional elements included in this alternative (such as overhead signage, toll cameras, and a slightly wider footprint) are needed to operate the Express Lane and would introduce additional infrastructure into the existing setting. A rendering that highlights these features is presented in Figure 4-22.

Figure 4-22. Rendering of the Two General-Purpose Lanes and One Express Lane that Accommodates Transit Alternative

4.16.3 Mitigation

Throughout the development of the project, the project team met with the public as well as representatives from several organizations, including the SCRGP and Cultivando, a community nonprofit organization that helped convene a community focus group. Input received through this outreach identified areas of low visual quality and informed the development of the design (e.g., landscaping treatments) and mitigation measures.

Proactive measures will be taken to locate variable message signs to minimize obstructions of distant mountain and Denver skyline views. I-270 Corridor Aesthetic Design Guidelines will be prepared for this project which will identify specific areas along the corridor to implement mitigation strategies. The design guidelines provide opportunities to both minimize and compensate for adverse visual impacts. These project-specific guidelines will be developed in coordination with the existing I-70 and I-25 Design Guidelines, with reference to the Central Park Design Guidelines, US 36 Guidelines, and I-76 Guidelines, to help ensure a cohesive highway design within the larger geographic area.

4.17 Utilities

A utility is a privately, publicly, or cooperatively owned line, facility, or system that produces, transmits, or distributes various commodities that directly or indirectly serves the public (23 CFR §645.105).

4.17.1 Affected Environment

The study area for utilities includes the project footprint (Figure 4-1).

Utilities in the study area include water, sanitary sewer, storm sewer, petroleum, natural gas, electric, and communications:

- Water lines provide filtered potable water to homes and businesses. At least 10 water lines were identified within the study area.
- Sanitary sewers carry sewage from homes and businesses to wastewater treatment plants through a system of underground pipes. At least 12 sewer lines were identified within the study area.
- A storm sewer system can consist of curbs, gutters, drains, inlets, pipes, and open ditches that convey rainfall and other drainage (other than sewage) to streams, lakes, or other surface water bodies. At least four storm sewer lines were identified within the study area.
- Petroleum and natural gas pipelines are used to bring energy to commercial, industrial, public, and residential users. At least 13 gas or petroleum lines were identified within the study area.
- Electric power facilities are used to provide power to commercial, industrial, public, and residential users. Electric lines can either be buried underground or installed on overhead structures. At least 13 transmission lines were identified within the study area.
- Fiber optic lines are used as a medium for telecommunications and computer networking using pulses of light to carry data along strands of glass or plastic. At least 35 fiber optic lines cross or run parallel to I-270 in the study area.

See Appendix E19 which shows the preliminary list of utilities present within the study area, owner, location, and size (if known).

4.17.2 Reasonably Foreseeable Impacts of the Alternatives

4.17.2.1 No Action Alternative

The No Action Alternative would not result in impacts to utilities.

4.17.2.2 Build Alternatives

The Build Alternatives would impact utilities during construction resulting in relocation (required when a utility needs to be moved horizontally and/or vertically to provide adequate clearance and avoid conflict) or adjustment (required when a utility would be affected by the proposed improvement but would not require relocation). Adjustments to utilities might include extending pipes or culverts, extending or adding protective casings, and modifying the elevation of manholes or valves. Utility conflicts are anticipated in the following circumstances:

- Utilities that cross a roadway or ramp would likely result in an adjustment of the utility, at a minimum.
- Utilities attached to bridge supports would require either an adjustment or relocation. This would be determined in a future phase when more detailed designs for the structures are prepared.
- Utilities running parallel to I-270 would likely require adjustment or relocation due to shifting and/or widening of the highway.

Relocating or readjusting utilities during construction would result in temporary interruptions in service.

4.17.3 Mitigation

Wherever possible, impacts to utilities will be avoided through close coordination with municipalities and utility companies during design and construction. In all cases, coordination with jurisdictions, utility companies, and other utility owners is an important component of any highway construction project. Proper coordination, planning, and design will reduce delays and improve cost efficiency.

During construction, the affected utilities will be protected, temporarily interrupted, and/or relocated, as necessary. At completion of construction, all remaining impacted utilities will be returned to condition that is in compliance with current codes and standards with renewed serviceability life. This work will result in an overall improvement to the community's permanent utility infrastructure.

4.18 Irreversible and Irretrievable Commitment of Resources

The phrase "irreversible commitment of resources" describes those resources that are used or expended during project implementation and will never return. Examples of irreversibly committed resources include the use of fuel, mineral resources, labor, and expense. The "irretrievable commitment of resources" is one in which the resource or its use is lost for a period of time. An example of an irretrievably committed resource is land used during construction.

4.18.1 Affected Environment

The irreversible and irretrievable commitment of resources is determined for all project-related actions regardless of geography. Analysis is not limited to the study area because project-related actions may require an irreversible or irretrievable commitment of resources from areas far removed from the study area boundaries, such as extracting, refining, and delivering construction materials; deriving, refining, and transporting required fuels; and obtaining, transporting, processing, and converting resources (primarily coal) into energy.

The process used to determine the irreversible and irretrievable commitment of resources examines all environmental resources documented in this chapter. For each affected environment and environmental consequence reported, potential irreversible and irretrievable commitments are researched and documented.

4.18.2 Reasonably Foreseeable Impacts of the Alternatives

4.18.2.1 No Action Alternative

The No Action Alternative will require some commitment of resources in ways that are irreversible and irretrievable due to the ongoing maintenance of the bridges and pavement needed. Those construction materials used will be irretrievably committed to the project and the fossil fuels consumed during these activities will be irreversibly expended since their use cannot be reversed or resources replenished.

4.18.2.2 Build Alternatives

The Build Alternatives will require a substantial commitment of resources in ways that are irreversible and irretrievable. For example, construction requires vast commitments of construction materials, fuel, energy, land, funding, and labor, all of which are used in a manner that is irreversible and/or irretrievable.

Construction materials used to build any of the alternatives—such as aggregate, steel, and petroleum—will be irretrievably committed to the project. These materials cannot be retrieved until they are removed, recycled, and used elsewhere. In addition, water used directly in concrete mixtures or through dust abatement will effectively be an irreversible expenditure. Although concrete can be retrieved through recycling and reuse, the water used to make it is irreversibly locked in solid form.

Fossil fuels consumed during construction activities, such as through electricity and vehicle use, will be irreversibly expended since their use cannot be reversed or resources replenished.

Similarly, the alternatives will create additional noise, resulting in quiet lost through the duration of the project life. Quiet, or noise at an acceptable level, could conceivably be restored if the project is removed.

Irretrievable losses of vegetation and habitat will result from constructing the roadway and associated infrastructure over or on top of these resources. The lost vegetation and habitat could only be retrieved and restored if the project is removed. Wetlands also will be irretrievably lost through placement of fill to construct the project. While these impacts will be mitigated to ensure no net loss, the function and value of impacted wetlands may be irretrievably lost.

Water quality also may be degraded through increased impervious surface, which can result in increased runoff into adjacent water bodies. This degradation will constitute an irretrievable commitment of water resources because water quality improvements could conceivably be retrieved if the alternative is removed and restoration strategies are implemented.

Lastly, manpower and funding used to construct any alternative will result in irreversible fiscal resource commitments. When time and money are dedicated to the project and used, these expenditures cannot be restored or dedicated to another project, even if an alternative is removed one day.

The Build Alternatives provide substantial long-term benefits that are not offered by the No Action Alternative. These long-term benefits, such as improved bicycle and pedestrian facilities, outweigh the up-front irreversible and irretrievable commitment of resources associated with the Build Alternatives. The most substantial benefit of the Build Alternatives is greater mobility, which means less congestion and, in turn, less fuel is irreversibly lost to engine idling. Less congestion also benefits the drivers who irretrievably lose their time sitting in congested traffic.

4.18.3 Mitigation

No mitigation specific to the irreversible and irretrievable commitment of resources is required for the Build Alternatives. However, the irreversible and irretrievable commitment of resources is minimized through the mitigation provided for other environmental consequences, as identified in this chapter.

4.19 Short-term Uses versus Long-term Productivity

The relationship between local, short-term uses of the environment and the maintenance and enhancement of long-term productivity of resources serves as a benchmark for decision makers, who must determine if the benefits to long-term productivity outweigh negative impacts from the short-term uses of the environment.

4.19.1 Affected Environment

The study area for short-term uses and long-term productivity is consistent with the study area for each resource. To determine impacts of short-term uses on long-term productivity, "short-term" and "long-term" timeframes are defined. "Short-term" describes impacts that occur while a project alternative is being constructed and otherwise implemented. "Long-term" impacts are those that persist over an extended period of time after an alternative is fully implemented. With time frames defined, subjective evaluations of short-term impacts versus long-term benefits can be made.

4.19.2 Reasonably Foreseeable Impacts of the Alternatives

4.19.2.1 No Action Alternative

The No Action Alternative will have some short-term use impacts from the maintenance activities necessary—such as noise, energy use, and cost—required for maintenance. These short-term uses are offset by the benefits to long-term productivity to keep the bridges and pavement functional.

4.19.2.2 Build Alternatives

Short-term uses for the Build Alternatives will include things—such as noise, fugitive dust, energy use, easements, and cost—required for construction. These short-term use impacts are offset by the benefits to long-term productivity generated by the Build Alternatives, which add travel capacity as well as pedestrian and bicycle infrastructure required by growing demand, and are called for in long-range, regional, and local plans.

The Build Alternatives provide the long-term benefits of improved mobility, accessibility, and safety. Due to improved mobility and accessibility, the time spent in congestion will decrease compared to the No Action Alternative.

The ratio of short-term use versus long-term productivity favors the Build Alternatives, which deliver substantial long-term benefits—unlike the No Action Alternative, which will require short-term uses but not produce the long-term benefits of the Build Alternatives.

4.19.3 Mitigation

Short-term impacts will be minimized through the sum of all mitigation measures described in Chapter 5.