

# **EAST COLFAX AVENUE BUS RAPID TRANSIT (BRT) PROJECT TECHNICAL MEMORANDUM**

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**For Biological Resources**

**Prepared for:**

**City and County of Denver and Regional Transportation District**

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Appendix A - Species Known, Expected, or with the Potential to Occur in the Biological Resources Study Area

## Acronyms

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BGEPA	Bald and Golden Eagle Protection Act
BRT	Bus Rapid Transit
CCD	City and County of Denver
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CDA	Colorado Department of Agriculture
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
CWA	Clean Water Act
ESA	Endangered Species Act
DOTI	Denver Department of Transportation and Infrastructure
DRCOG	Denver Regional Council of Governments
DUS	Denver Union Station
EPA	Environmental Protection Agency
FC	Federal Candidate
FE	Federal Endangered
FEMA	Federal Emergency Management Agency
FT	Federal Threatened
FTA	Federal Transit Administration
I	Interstate
LRT	Light Rail Transit
MBTA	Migratory Bird Treaty Act
MS4	Municipal Separate Storm Sewer System
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
ROW	Right-of-way
RTD	Regional Transportation District
SDDTC	Storm Drainage Design and Technical Criteria
SFHAs	Special Flood Hazard Areas
TSP	Transit Signal Priority
US	United States
US DOT	US Department of Transportation

USFWS	US Fish and Wildlife Service
USGS	US Geological Survey
WQ	Water quality
WQCD	Water Quality Control Division

## 1. Project Description

The Federal Transit Administration (FTA) in coordination with the City and County of Denver (CCD) and the Regional Transportation District (RTD) are performing a National Environmental Policy Act (NEPA) evaluation for a Bus Rapid Transit (BRT) system that would serve East Colfax Avenue between downtown Denver and the RTD R Line light rail transit (LRT) Colfax Station at Interstate 225 (I-225) in Aurora (Project). The Project qualifies as a Categorical Exclusion (CE) per the FTA, which is the lead federal agency for this undertaking. The City of Aurora (COA), Colorado Department of Transportation (CDOT) and the Denver Regional Council of Governments (DRCOG) are active Project participants along with numerous public and private stakeholders. The CCD and the RTD implemented a robust stakeholder involvement program as a part of the Project and will continue to work with the stakeholders as design advances, funding is obtained, and construction is initiated.

The Project has completed preliminary design for BRT operations, including the identification of routing and station locations. The East Colfax Avenue BRT would run on existing, heavily traveled bus routes and would serve downtown Denver at the western end of the corridor, communities and businesses along East Colfax Avenue, and the Anschutz Medical Campus at I-225 and East Colfax Avenue in the east. Specifically, the 9.9-mile-long Project would include:

- Reliable BRT service (combined Route 15/15L) operating 24 hours per day, 7 days per week. This would include three service patterns all serving Denver Union Station (DUS) and three patterns that diverge at the eastern project terminus in the COA (including bus turnarounds at the RTD R Line LRT Colfax Station, Tower Road, and the R Line Aurora Metro Center Station). Two patterns would occur with 15-minute headways and one pattern with a 10-minute headway to provide a composite 4.3-minute BRT headway from DUS to the RTD R Line LRT Colfax Station. Connection between Civic Center Station and the Decatur/Federal Station is also provided via Route 16 (Figure 1).

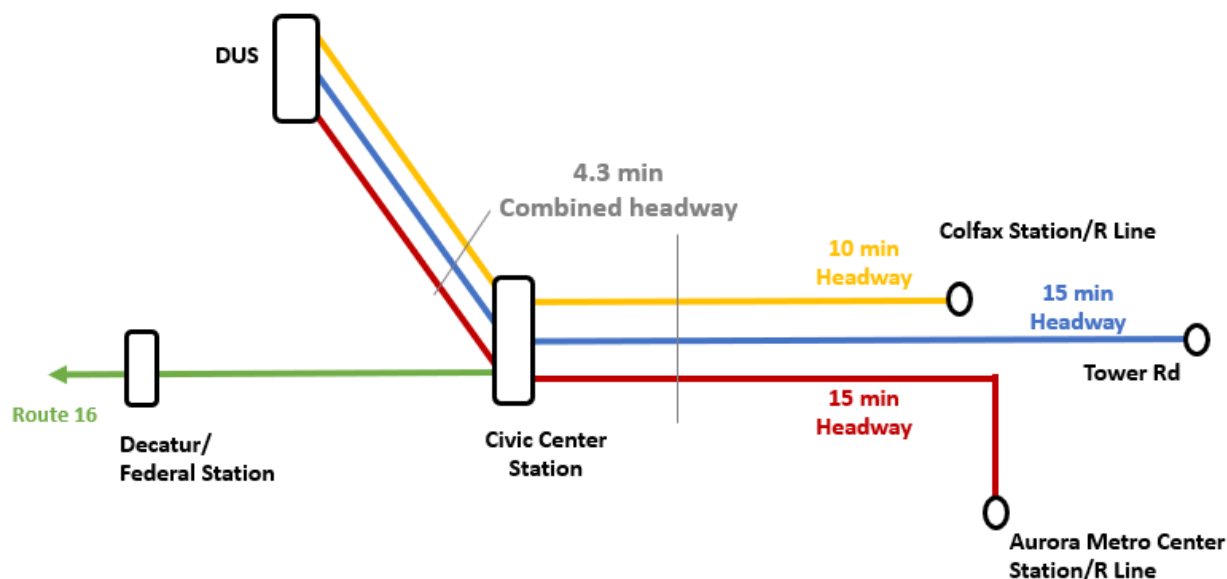


Figure 1. BRT Service Routing and Travel Headways

- Curbside-running alignment in existing 15<sup>th</sup> Street and 17<sup>th</sup> Street on-street bus lanes between DUS and Civic Center (East Colfax Avenue / Broadway) – 1.4 miles.
- Center-running alignment in dedicated bus-only lanes between Civic Center (East Colfax Avenue/Broadway) and East Colfax Avenue/Yosemite Street – 5.5 miles.
- Curbside-running alignment in mixed-flow traffic through COA between East Colfax Avenue/Yosemite Street and the existing RTD R Line LRT Colfax Station at I-225 – 3.0 miles.
- Upgraded signals to provide Transit Signal Priority (TSP) throughout the center-running section.
- Branded service, stations, and vehicles.
- Thirty-five (35) station locations with an average spacing of 0.32 miles.
- Enhanced station amenities including level boarding platforms, high-quality shelters, off-board fare collection, lighting, security features, real-time system traveler information, protection from traffic and weather, and public art opportunities.
- The COA has contributed funding for upgraded station improvements at certain locations between Yosemite Street and I-225 along East Colfax Avenue. At East Colfax Avenue and Havana Street, a station design similar to those planned in the center-running alignment section in Denver, but with a curbside alignment, would be located at the corner of East Colfax Avenue and Havana Street. In addition, level boarding platforms are planned at the intersections of East Colfax Avenue and Peoria Street, Moline Street, and the R Line Colfax Station. The level boarding platforms would be constructed where the existing 15L shelters are currently located at these three locations, and the 15L shelters would be attached on top of each new platform.
- Dual northbound left-turn lanes on Colorado Boulevard at the intersections of East 13<sup>th</sup> Avenue and East 17<sup>th</sup> Avenue to improve traffic operations and travel times within the project area. An approximate 5-foot southbound travel lane shift would be required for the turn lane improvements. These improvements consist of widening of the roadway at the intersection by 10 feet. The added lane width would be accomplished by removal of the existing 5-foot median and shifting the existing curb line 5 feet to the west at both intersections.

Station locations and proposed features are highlighted in Table 1 and Figure 2 below.

**Table 1. Proposed Station Features**

Station	Stop Location	Full Signature BRT Station	Level Boarding Platforms	Existing Enhanced 15L Shelter to Remain	New Relocated Enhanced 15L Shelter	Branding and BRT Amenities
Denver Union Station (DUS)	Curbside					✓
Lawrence /16 <sup>th</sup>	Curbside					✓
California/15 <sup>th</sup>	Curbside					✓
Tremont/15 <sup>th</sup>	Curbside					✓
Lawrence /17 <sup>th</sup>	Curbside					✓

Station	Stop Location	Full Signature BRT Station	Level Boarding Platforms	Existing Enhanced 15L Shelter to Remain	New Relocated Enhanced 15L Shelter	Branding and BRT Amenities
Champa/17 <sup>th</sup>	Curbside					✓
Welton/17 <sup>th</sup>	Curbside					✓
Civic Center Station/Broadway	Curbside			✓		✓
Pennsylvania	Center	✓	✓			✓
Downing	Center	✓	✓			✓
Franklin/Park	Center	✓	✓			✓
Josephine/York	Center	✓	✓			✓
Fillmore	Center	✓	✓			✓
Madison	Center	✓	✓			✓
Colorado	Center	✓	✓			✓
Cherry	Center	✓	✓			✓
Elm	Center	✓	✓			✓
Hudson	Center	✓	✓			✓
Krameria	Center	✓	✓			✓
Monaco	Center	✓	✓			✓
Quebec	Center	✓	✓			✓
Syracuse	Center	✓	✓			✓
Uinta	Center	✓	✓			✓
Yosemite	Curbside			✓		✓
Chester	Curbside				✓	✓
Dayton	Curbside			✓		✓
Florence	Curbside				✓	✓
Havana	Curbside	✓	✓			✓
Kingston	Curbside				✓	✓
Moline	Curbside		✓	✓		✓
Peoria	Curbside		✓	✓		✓
Scranton	Curbside			✓	✓	✓
Children's Way	Curbside			✓		✓
Wheeling / Fitzsimons (VA)	Curbside				✓	✓
R Line LRT Colfax Station	Curbside		✓		✓	✓

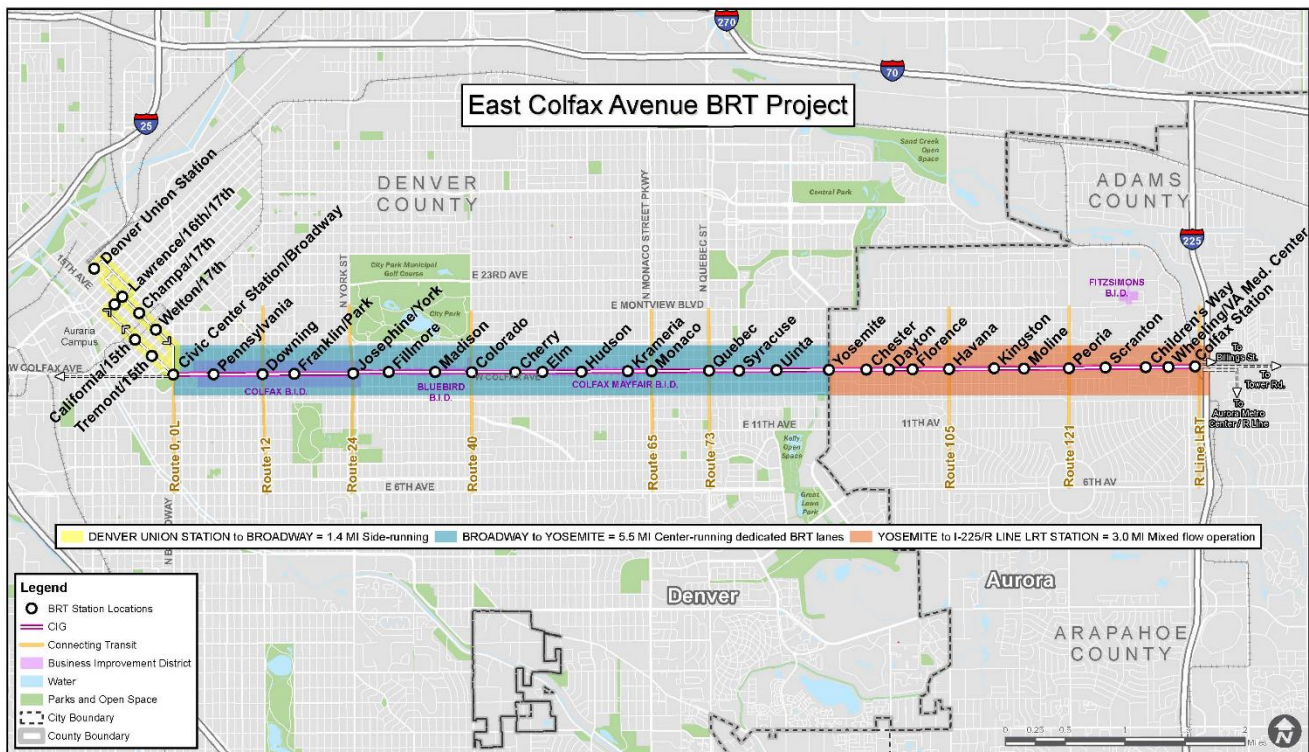


Figure 2. Project Area and Station Locations

## 1.2 PURPOSE OF THE PROJECT

The purpose of the Project is to provide additional person-trip capacity to meet growing travel demand with a high-quality, high-capacity, cost-effective, reliable, and safe transit solution serving the East Colfax Avenue corridor. This new service would provide a faster, more reliable, and more comfortable passenger experience compared with existing bus service, and thereby attract additional transit ridership. The Project would improve local and regional accessibility, mobility, safety, transit travel times and reliability, and passenger facilities in the most heavily used transit corridor in the Denver region.

## 1.2 NEED FOR THE PROJECT

The need for the Project is demonstrated by increasing transit travel demand in the corridor. The Project would aid the growth of transit ridership in the corridor by providing a comfortable, more frequent, and more reliable service for transit patrons, to a variety of destinations along the corridor. The Project also supports Denver’s Vision Zero initiative, making travel safer for pedestrians, cyclists, motorists, and transit riders. The Project would also support future investment along the East Colfax Avenue corridor, while continuing to provide an affordable travel option to help reduce household transportation costs. Seven needs have been identified and outlined for the Project:

- Serve the Growing Travel Demand
- Provide Improved Mobility



- Provide Equity and Affordability
- Improve Safety
- Provide Improved Access to Major Destinations
- Align Mobility Improvements with Land Use, Neighborhood and Economic Plans
- Improve Placemaking

## 2. Introduction to Analysis

This technical memorandum discusses the regulatory setting and affected environment associated with the biological resources (vegetation, noxious weeds, wildlife, fisheries, and special status species (threatened, endangered, and other sensitive species) within the resource-specific study area. In addition, the memorandum documents impacts to identified biological resources resulting from the physical and operational improvements associated with the Project.

### 2.1 SUMMARY OF RESULTS

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The biological resources study area is located within an urbanized transportation corridor and does not contain suitable habitat for threatened and endangered species or special status species and their habitats. Two waterways, Westerly Creek and Toll Gate Creek, cross the biological resources study area. Westerly Creek is diverted underground just north of East Colfax Avenue and daylighted outside of the biological resources study area. Therefore, no impacts would occur to Westerly Creek. Toll Gate Creek is located adjacent to I-225 in Aurora and includes wetland and riverine habitat within the biological resources study area; however, work would take place within the existing right-of-way, and would not impact Tollgate Creek and associated habitat. Direct impacts to a total of 19 trees are anticipated as part the Project.

### 2.2 REGULATORY ENVIRONMENT

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#### Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et. seq) is administered by the U.S. Fish and Wildlife Service (USFWS), whose responsibility includes determining if species are eligible to be listed as threatened or endangered species. Federally listed species also include proposed, or candidate listed species. The ESA provides protection to designated species, including protection of critical habitat necessary for a species' persistence. Critical habitat is defined as "areas of a listed species' habitat that are designated as essential for the conservation of that species and which may require special management considerations or protection."

A Federal government action that "may affect" a threatened or endangered species or its "critical habitat" or an action that may result in the incidental or indirect taking of endangered species through habitat modification requires consultation with the USFWS pursuant to Section 7 of the ESA. Additionally, if the Federal government action is permitted, funded, carried out, or conducted by the Federal government, consultation is required.

### **Migratory Bird Treaty Act**

Under the Migratory Bird Treaty Act (MBTA), it is unlawful to “take” (including killing, capturing, selling, trading, and transporting) any migratory bird, nest, or egg of any migratory bird except as permitted by regulations. This act applies to endangered bird species and waterfowl as well as some common birds (e.g., robins and sparrows). Federal agencies that take actions likely to have a measurable negative impact on migratory bird populations are required by Executive Order to adopt a Memorandum of Understanding with the USFWS to promote the conservation of migratory birds.

### **The Bald and Golden Eagle Protection Act**

The Bald and Golden Eagle Protection Act (BGEPA) and its associated regulations govern the taking, possession, and transportation of eagles. Take is defined to include molest or disturb.

### **Section 404 of the Clean Water Act**

Section 404 of the Clean Water Act (CWA) regulates waters of the U.S. (WOTUS), which include non-wetland waters and wetlands. Impacts to these features require permitting through the U.S. Army Corps of Engineers (USACE).

### **The Colorado Non-game, Endangered, and Threatened Species Conservation Act (33-2-101-108)**

The Colorado Non-game, Endangered, and Threatened Species Conservation Act provides some protection within the state for listed species and establishes the State's intent to protect endangered and threatened species. Colorado Parks and Wildlife (CPW) is responsible for listing state species.

### **Colorado Noxious Weed Act of 2003 (35-5.5-101)**

The Colorado Department of Agriculture (CDA) Noxious Weed Act of 2003 (Colorado Revised Statute (CRS) 35-5-101; CRS 35-5.5-101; Executive Order D-006-99), defines and prioritizes management objectives for state-designated noxious weeds.

## **3. Affected Environment**

### **3.1 METHODOLOGY**

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A desktop analysis was completed to assess the biological resources study area and evaluate environmental conditions; no site visits were conducted. A review of existing literature and mapping was used to identify threatened and endangered species and potential riparian and wetland areas within the biological resources study area (the biological resources study area includes East Colfax Avenue and its associated right of way [ROW] as well as the adjacent sidewalks). Resources consulted included:

- USFWS Information for Planning and Consultation (IPaC) System (USFWS, 2023)
- CPW Species Activity Data (CPW, 2021a)
- CPW species list and profiles (CPW, 2021b)
- Colorado Natural Heritage Program (CNHP) Tracking List by County (CNHP, 2018)
- USFWS National Wetlands Inventory online mapper (USFWS, 2021)

- U.S. Geological Survey (USGS) Englewood and Fitzsimons 7.5-minute topographic maps (USGS, 1994a and b, respectively)
- Google Earth Pro aerial and ground-based photography (Google Earth Pro, 2021)

## 3.2 EXISTING CONDITIONS

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### Vegetation and Habitats

The biological resources study area is located within an urbanized transportation corridor and consists primarily of commercial land uses, as well as a few residential areas and several parks, which include Civic Center Park, Lincoln Memorial Park, and a portion of City Park. Two waterways cross the biological resources study area, Westerly Creek and Toll Gate Creek. No wetlands or riparian habitat are associated with Westerly Creek within the biological resources study area because Westerly Creek is diverted under East Colfax Avenue just north of East Colfax Avenue and does not daylight again until East 13<sup>th</sup> Avenue and Xenia Park, located south of the biological resources study area (USFWS, 2021). Toll Gate Creek, located adjacent to I-255 in Aurora includes wetland and riverine habitat within the biological resources study area (USFWS, 2021). Grasslands, wetlands, riparian woodland, marsh, and aquatic habitats are not present elsewhere in the biological resources study area. Trees identified with greater than 4 inches diameter at breast height (dbh) were noted within the biological resources study area. Such larger trees may provide habitat for roosting or nesting birds.

### Commercial Land Uses

Commercial land uses include buildings, pavement, vegetated medians, sidewalks with tree planters, bare ground, and disturbed areas dominated by weedy vegetation. Large portions of this habitat are unvegetated or sparsely vegetated. Disturbed areas are typically occupied by weedy and pioneer species such as kochia (*Kochia scoparia*), cheatgrass (*Bromus tectorum*), field bindweed (*Convolvulus arvensis*), and Russian thistle (*Salsola collina* and *S. tragus*). Woody species, including Siberian elm (*Ulmus pumila*) and rubber rabbitbrush (*Chrysothamnus nauseosus*), are present in some areas.

### Residential and Park Land Uses

Residential and park land uses include buildings, pavement, and irrigated, landscaped vegetation. Common plant species include Kentucky bluegrass (*Poa pratensis*), dandelion (*Taraxacum officinale*), white clover (*Trifolium repens*), and green ash (*Fraxinus pensylvanica*).

### Wildlife and Fish

The animal species that occur or have the potential to occur in the biological resources study area primarily include those adapted to urban and disturbed environments, and that are adapted to a wide range of habitats. Mammals include, but are not limited to, raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), cottontail rabbit (*Sylvilagus* sp.), fox squirrel (*Sciurus niger*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), little brown bat (*Myotis lucifugus*), and big brown bat (*Eptesicus fuscus*). Fish species in Toll Gate Creek include crappie (*Pomoxis centrarchidae*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*) and common carp (*Cyprinus carpio*). Bird species include, but are not limited to, house sparrow (*Passer domesticus*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), mourning dove (*Zenaidura macroura*), northern flicker (*Colaptes auratus*), American crow (*Corvus brachyrhynchus*), black-billed magpie

(*Pica pica*), cliff swallow (*Petrochelidon pyrrhonata*), barn swallow (*Hirundo rustica*), American robin (*Turdus migratorius*), common grackle (*Quisculus quiscula*), house finch (*Carpodacus mexicanus*), and Canada goose (*Branta canadensis*). There is a low chance for reptiles to occur.

A list of the mammal, reptile, and bird species that are known or expected to occur regularly in the study area, along with the primary habitats of each of these species, are listed in Appendix A. There are typically no fish or amphibians common in the biological resources study area.

### **Sensitive Habitats and Wildlife Corridors**

Due to the urban environment of the biological resources study area, sensitive habitats and wildlife corridors are not expected. Therefore, these resources were eliminated from further study.

### **Noxious Weeds**

Noxious weeds are present within the biological resources study area and include cheatgrass and field bindweed. Other species common to Front Range roadsides and developed areas may be present. The type of noxious weeds in the biological resources study area are similar to surrounding land uses described above.

### **Federally Listed Special Status Species**

Federally listed threatened or endangered species are protected under the ESA. A list of federally listed endangered, threatened, proposed and candidate species was obtained from the USFWS online IPaC System on August 17, 2023 (USFWS, 2023). Based on a review of the USFWS online IPaC System, there are seven federally listed species with the potential to occur in, or be impacted by, a project in this location (USFWS, 2023).

The pallid sturgeon (*Scaphirhynchus albus*; federally listed as endangered [FE]) and Piping Plover (*Charadrius melodus*; federally listed as threatened [FT]) are included because they occur downstream of the biological resources study area and could be impacted by projects that result in water depletions to the South Platte River or its tributaries. To address the effects depletions may have on federally listed species that depend on the river for their survival, agencies, and organizations in Colorado, including public water suppliers, participate in the South Platte Water Related Activities Program (SPWRAP). If water for this project is sourced from a public water source within the South Platte River basin, potential effects to downstream species would presumably be addressed through SPWRAP via the water provider; therefore, these two species are not discussed further. Additionally, the western prairie fringed orchid (*Platanthera praeclara*; FT), and Whooping Crane (*Grus americana*; FE) are included as these species have traditionally been included as downstream species like the pallid sturgeon and Piping Plover but are currently included as “wherever found.” As these species could occur downstream of the study area, they have been addressed under the SPWRAP and are not discussed further.

The habitat and distribution of the remaining three species were reviewed and the potential for occurrence for each species was assigned based on the conditions in the biological resources study area. Based on the habitat review, two of the remaining listed species, gray wolf (*Canis lupis*; FE) and Ute ladies'-tresses orchid (*Spiranthes diluvialis*; FT), have no potential to occur in, or be affected by, the Project (Table 2, Threatened and Endangered Species). The biological resources study area is located within an urbanized transportation corridor and review of aerial imagery indicates the biological resources study area does not contain suitable habitat for these two species. The third species, the monarch butterfly (*Danaus plexippus*; federally listed

candidate [FC]) has the potential to migrate through the study area (Table 2, Threatened and Endangered Species). The monarch butterfly is a candidate species and is not yet listed or proposed for listing under the ESA. There are generally no Section 7 consultation requirements for candidate species.

**Table 2. Threatened and Endangered Species (Non SPWRAP Participants)**

Common Name	Scientific Name	Status <sup>1</sup>	Habitat <sup>2</sup>	Potential for Occurrence
<b>Mammals</b>				
Gray Wolf	<i>Canis lupus</i>	FE	Lone, dispersing gray wolves may be present throughout the state of Colorado, but is only known to occur in northwest Colorado in areas of low human occupancy.	<b>None.</b> Suitable habitat does not occur in the biological resources study area. Additionally, the gray wolf only needs to be considered if the activity includes a predator management program. This activity does not include a predator management program. Further, there are no established wolf packs in or near the study area.
<b>Plants</b>				
Ute Ladies'-tresses Orchid	<i>Spiranthes diluvialis</i>	FT	Sub-irrigated alluvial soils along streams; open meadows on floodplains, including riparian areas. The species generally occurs at elevations below 6,500 feet.	<b>None.</b> Suitable habitat does not occur in the biological resources study area. No impacts occurring to the riparian area of Cherry Creek; Westerly Creek diverted under East Colfax Avenue in the study area.
<b>Insects</b>				
Monarch Butterfly	<i>Danaus plexippus</i>	FC	A variety of habitats that feature their obligate larval host plant, milkweed ( <i>Asclepias</i> spp.)	<b>Low.</b> Milkweed has the potential to occur in the biological resources study area; therefore, monarch butterflies have the potential to migrate through the study area.

Notes:

1. FT = Federal threatened; FE = Federal endangered; FC = Federal candidate (USFWS, 2023)

Based on a review of habitat descriptions from NatureServe Explorer online (NatureServe, 2023) and Colorado Parks and Wildlife Species Activity Mapping (CPW, 2021a).

### State-listed or Special Concern Species

State-listed species and Special Concern Species are protected under Colorado state law. Based on a review of CPW Species Activity Mapping data and the CNHP Tracking List, numerous State Endangered (SE), State Threatened (ST), and Special Concern (SC) species have the potential to be impacted by work occurring in Denver County (CPW, 2021; CNHP, 2018). However, the biological resources study area is located within an urbanized transportation corridor and review of aerial and ground-based photography indicates that the biological resources study area does not contain suitable habitat for these species. Other special status species include “species of greatest conservation need” in CPW’s *State Wildlife Action Plan*, species

considered rare or vulnerable by the CNHP, and USFWS Birds of Conservation Concern (CPW, 2015; CNHP, 2018; USFWS, 2021a). However, no special status animals, plants, or habitats are likely to occur in the biological resources study area because the biological resources study area is an urban transportation corridor characterized by disturbed and non-native habitats.

## 4. Impact Analysis

### 4.1 METHODOLOGY

Biological resources and potential impacts from the Project were assessed based on where ground disturbance is anticipated to occur. Any proposed mitigation is based on project-specific impacts, standard methods used by agencies to mitigate impacts and actions recommended by wildlife management agencies and organizations.

### 4.2 IMPACTS

Direct impacts to trees identified within the biological resources study area are anticipated as part of project activities. A total of 19 larger upland trees located within the biological resources study area may be impacted (Table 3; Figure 3) due to the expectation of ground disturbance where they are planted.

**Table 3. Impacted Upland Trees within the Biological Resources Study Area (dbh of 4” or greater)**

Tree Removal Identification #	Location
1	East Colfax Avenue center median, east of Lincoln Street
2	East Colfax Avenue center median, east of Lincoln Street
3	East Colfax Avenue center median, east of Lincoln Street
4	Sidewalk south of East Colfax Avenue, west of Downing Street
5	Sidewalk south of East Colfax Avenue, west of Downing Street
6	Sidewalk south of East Colfax Avenue, west of Downing Street
7	Sidewalk south of East Colfax Avenue, west of Downing Street
8	Sidewalk south of East Colfax Avenue, east of Josephine Street
9	Sidewalk north of East Colfax Avenue, east of Fillmore Street
10	Sidewalk north of East Colfax Avenue, east of Madison Street
11	Sidewalk north of East Colfax Avenue, west of Monroe Street
12	Sidewalk north of East Colfax Avenue east of Krameria Street
13	Sidewalk south of East Colfax Avenue, west of Monaco Parkway
14	Center median of Colorado Boulevard, south of East 17 <sup>th</sup> Avenue
15	Sidewalk west Colorado Boulevard, south of East 17 <sup>th</sup> Avenue
16	Sidewalk west of Colorado Boulevard, south of East 17 <sup>th</sup> Avenue



Tree Removal Identification #	Location
17	Sidewalk north of East Colfax Avenue, east of Havana Street
18	Sidewalk north of East Colfax Avenue, west of Moline Street
19	Sidewalk north of East Colfax Avenue, west of Peoria Street



**Figure 3. Impacted Upland Trees within the Biological Resources Study Area**

No direct impacts are anticipated to Westery Creek, as it is diverted underground just north of East Colfax Avenue and daylights outside of the biological resources study area. No direct impacts are anticipated to Toll Gate Creek and associated riverine habitat, as the improvements are all within the project right-of-way.

No direct impacts are anticipated to threatened and endangered species or special status species and their habitats. Based on habitat conditions in the biological study area, no federally listed species have the potential to occur in or be affected by project-related activities. Therefore, this project would have **no effect** on federally listed species. There is a potential for monarch butterflies to occur within the study area. The monarch butterfly is a candidate species and is not yet listed or proposed for listing under the Endangered Species Act. There are generally no Section 7 consultation requirements for candidate species.

## 5. Mitigation

Tree retention, protection, removal, and replacement will be performed in accordance with the CCD and the COA Tree Policies. To the extent practicable, impacted trees will be replaced in-kind. CCD intends to plant over a hundred trees in soil cells throughout the corridor as part of the project related to green infrastructure and streetscape improvements. The CCD and/or the COA Forestry Department also allows for replanting of trees in other City-owned areas or payment of a fee, depending on the exact situation. The appropriate mitigation type will be coordinated after the biological resources study area is re-surveyed to confirm the type and location of trees that would need to be removed.

Vehicles and equipment shall be free of soil and debris capable of transporting noxious weed seeds or invasive species onto the site. Additional equipment required for construction shall also be certified prior to being brought onto the project site.

Potential habitat for nesting birds was identified in and within a 0.5-mile buffer of the biological resources study area. The nesting season for most birds generally occurs from April through August, although raptors may nest as early as February. If construction activities occur during the nesting season, the contractor shall perform work in compliance with the MBTA, including nest surveys, timing restrictions, and avoidance buffers.

If an active nest containing eggs or young birds is found, the tree or shrub containing the active nest shall remain undisturbed and protected until the nest becomes inactive. The nest shall be protected by placing fence (plastic) a minimum distance of 50 feet from each nest to be undisturbed. This buffer dimension may be changed if determined appropriate and approved by CPW.

No mitigation is necessary for sensitive habitats (including wetlands and riparian areas) or threatened and endangered and sensitive species and their habitats.



## 6. References

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## APPENDIX A - Species Known, Expected, or with the Potential to Occur in the Biological Resources Study Area

Common Name	Scientific Name	Habitat
<b>Mammal</b>		
Big Brown Bat	<i>Eptesicus fuscus</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Cottontail Rabbit	<i>Sylvilagus sp.</i>	Associated with open grassy areas with abundant grasses and herbs, with adequate shrub cover. Utilize human environments including urban and suburban areas.
Coyote	<i>Canis latrans</i>	Associated with grasslands but are opportunistic and have been encroaching on human environments, including urban and suburban areas.
Fox Squirrel	<i>Sciurus niger</i>	Associated with open forest stands but utilize human environments including urban and suburban areas.
House Mouse	<i>Mus musculus</i>	Habitat generalist, commonly associated with humans and human habitats (i.e., houses, barns, sheds, etc.).
Little Brown Bat	<i>Myotis lucifugus</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Norway Rat	<i>Rattus norvegicus</i>	Habitat generalist, commonly associated with humans and human habitats (i.e., buildings, sewers, etc.).
Raccoon	<i>Procyon lotor</i>	Prefer moist woodland areas but utilize human environments including urban and suburban areas.
Red Fox	<i>Vulpes vulpes</i>	Habitat generalist, utilize human environments including urban and suburban areas.
<b>Bird</b>		
American Crow	<i>Corvus brachyrhynchus</i>	Habitat generalist, utilize human environments including urban and suburban areas.
American Goldfinch	<i>Spinus tristis</i>	Habitat generalist, utilize human environments including urban and suburban areas.
American Robin	<i>Turdus migratorius</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Barn Swallow	<i>Hirundo rustica</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Black-billed Magpie	<i>Pica pica</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Black-capped Chickadee	<i>Poecile atricapillus</i>	Associated with forest edges and are commonly attracted to feeders in urban and suburban areas.
Blue Jay	<i>Cyanocitta cristata</i>	Associated with forest edges and are commonly attracted to feeders in urban and suburban areas.
Canada Goose	<i>Branta canadensis</i>	Prefer riverine areas, but are associated with urban and suburban areas, especially parks.
Chipping Sparrow	<i>Spizella passerina</i>	Associated with open forests and are commonly attracted to feeders in urban and suburban areas.
Cliff Swallow	<i>Petrochelidon pyrrhonata</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Common Grackle	<i>Quisculus quiscula</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Common Raven	<i>Corvus corax</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Downy Woodpecker	<i>Picoides pubescens</i>	Associated with forests and are commonly attracted to feeders in urban and suburban areas.
Eurasian Collared dove	<i>Streptopelia decaocto</i>	Habitat generalist, utilize human environments including urban and suburban areas.
European Starling	<i>Sturnus vulgaris</i>	Habitat generalist, utilize human environments including urban and suburban areas.

Common Name	Scientific Name	Habitat
Great Horned Owl	<i>Bubo virginianus</i>	Habitat generalist, may utilize human environments including urban and suburban areas.
House Finch	<i>Carpodacus mexicanus</i>	Habitat generalist, utilize human environments including urban and suburban areas.
House Sparrow	<i>Passer domesticus</i>	Habitat generalist, utilize human environments including urban and suburban areas.
House Wren	<i>Troglodytes aedon</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Killdeer	<i>Charadrius vociferus</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Mourning Dove	<i>Zenaida macroura</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Northern Flicker	<i>Colaptes auratus</i>	Associated with forests and are commonly attracted to feeders in urban and suburban areas.
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Habitat generalist may utilize human environments including urban and suburban areas.
Ring-billed Gull	<i>Larus delawarensis</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Rock Dove/Rock Pigeon	<i>Columba livia</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Song Sparrow	<i>Melospiza melodia</i>	Habitat generalist, utilize human environments including urban and suburban areas.
Turkey Vulture	<i>Cathartes aura</i>	Habitat generalist may utilize human environments including urban and suburban areas.
<b>Amphibian</b>		
None		
<b>Reptile</b>		
Western Terrestrial Garter Snake	<i>Thamnophis elegans</i>	Habitat generalist may utilize human environments including urban and suburban areas.
<b>Fish</b>		
None		

Source: iNaturalist, 2021

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