



120TH AVENUE CORRIDOR STUDY: EXISTING CONDITIONS

April 2024

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Introduction

Providing the north Metro Area with safe and effective transportation options is vital for the region’s growth and prosperity. This study focuses on one of the most important roadways in the area, 120th Avenue, and one of its most critical segments which is between Highway 85 and Tower Road. This segment, or the “corridor” as it is referred to in the Study, is a highly traveled commuter corridor that provides vital links to nearby communities. Map 1 shows the limits of the project area and its relationship to Adams County, Brighton, and Commerce City.

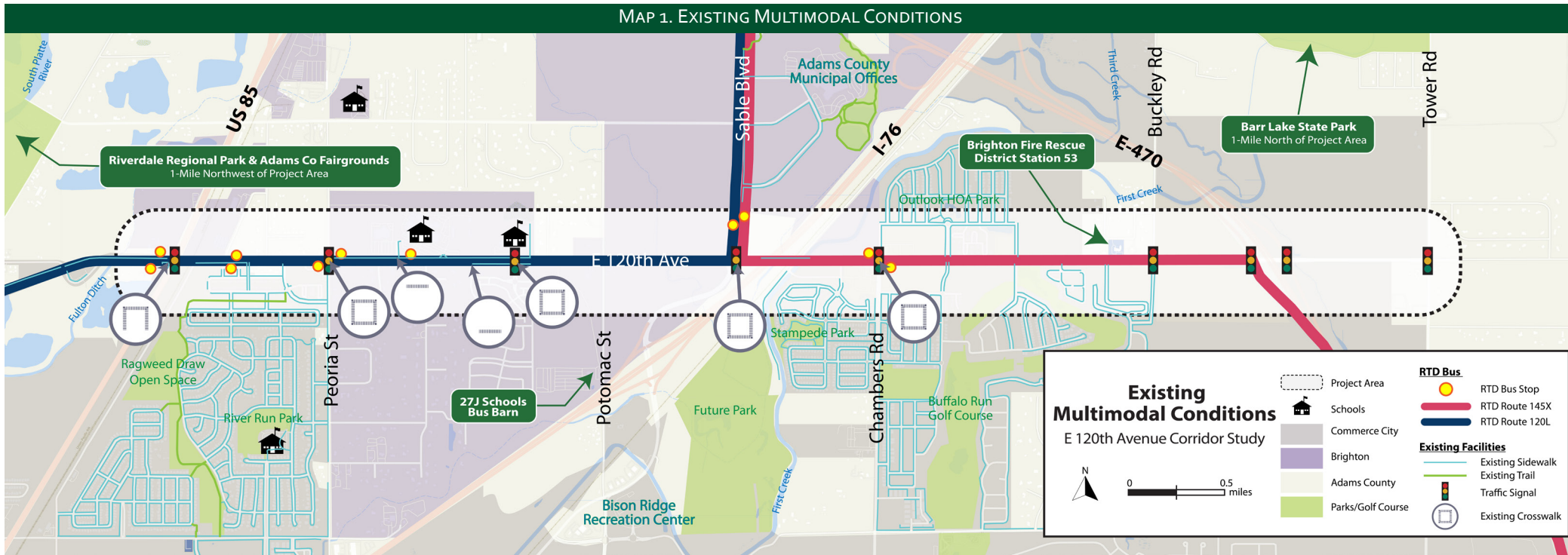
As substantial development occurs in the project area in the years ahead, it is critical that transportation safety and multimodal travel options are considered. The goal of the 120th Avenue Safety and Multimodal Study is to create a cohesive vision for a corridor that is safe, equitable, accessible, and sustainable. Evaluating the existing conditions of the corridor is the first

step in addressing safety and mobility. A thorough understanding of current conditions will be the foundation to development of design alternatives for the corridor. Throughout the process we will engage stakeholders and community members so that their thoughts, concerns, and input inform the corridor, the design alternatives, and ultimately, identification of a preferred alternative.

Multimodal Conditions System

The purpose of this memo is to document the location and extents of transportation facilities in the project area that are primarily used for walking, bicycling, and transit. Potential improvements to these facility types will be an important factor in the development and evaluation of project alternatives. It is important to note that references to walking and bicycling throughout this document are not intended to exclude other forms of non-motorized or non-vehicular transportation. It is anticipated that improvements made for walking and bicycling will also improve the conditions of these other forms of

MAP 1. EXISTING MULTIMODAL CONDITIONS



transportation (e.g. scooting, skateboarding).

Sidewalks

A majority of the E 120th Avenue corridor between Highway 85 and Tower Road does not have paved sidewalks. For the most part, pedestrians must use the shoulder to walk along the corridor and, in many cases, these areas have not been improved (with sidewalks) and are not compliant with the Americans with Disabilities Act (ADA). The project area stretches a total of 4.6-miles from Highway 85 to Tower Road. If sidewalks were continuous on both sides of 120th Avenue, that would equate to approximately 9-miles of sidewalk. However, there is currently only 1.33-miles of sidewalk, which equates to just 15% of the corridor. The segments of E 120th Avenue that do have sidewalks are those where newer development has occurred within the last 10 years. All existing sidewalks are six to ten feet wide and are generally in good condition.

Map 1 shows the limited extents of sidewalk on the project corridor. As shown, there are just a few segments of sidewalk that currently exist. The first is a section on the north side of 120th Avenue, just west of Highway 85, and it is a ten-foot concrete sidewalk in good condition. Only a small portion of this sidewalk segment is located within the project corridor, but as seen on the map, the sidewalk does continue west. There is also a short segment of sidewalk on the south side of 120th Avenue, just east of Havana Street, which extends to Moline Street. This sidewalk segment is a six-foot wide, ADA compliant sidewalk, buffered by a ten-foot landscaping strip. The longest sidewalk segment along the corridor is on the north side of 120th Avenue between Peoria Street and Prairie View Middle School. It starts as a ten-foot asphalt sidewalk at Peoria Street and continues

as a combination of detached and attached sidewalk before ending just to the east of the Prairie View Middle School parking lot. This sidewalk is also in good condition and is buffered with a four-foot landscaping strip. The next segment is a short sidewalk segment on the south side of 120th Avenue, which starts at Foley Road and ends just a short way past the Prairie View Middle School intersection. This sidewalk is a newer ten-foot wide sidewalk, in good condition, and is buffered by a large landscaping strip. The last sidewalk segment on the corridor is located on the north side of 120th Avenue where the road passes over I-76. This sidewalk is difficult to access because of the road guardrail on both ends of the segment. The guardrail prevents pedestrians from being able to access the sidewalk without climbing over it (see Figure 1). Both ends of the sidewalk segment are also overrun with weeds and lack connections to

a continuous sidewalk or path. Overall, the sidewalk concrete is in good condition, but it clearly has barriers to be able to comfortably access it.

Although not yet built, there are plans to construct a new interchange that would elevate US 85 to pass over 120th Avenue. This project will include multimodal access improvements

to make it easier for bicyclists and pedestrians to travel east-west through the interchange. However, those improvements would be limited to the interchange (project) area and accounting for current conditions, new sidewalks, paths, or bike facilities would have limited existing facility to tie into on 120th east of US 85.

Intersection Curb Ramps

Throughout the corridor, the condition and completeness of intersection curb ramps significantly varies. For the majority of intersections, there are no

FIGURE 1. SIDEWALK OVER I-76 RESTRICTED BY GUARDRAILS AND LACKING CONNECTIVITY AT BOTH ENDS



sidewalks or intersection curb ramps (see Figure 2). At other intersections, there are ramps that are partially but not fully compliant with ADA requirements. There are also curb ramps that are ADA compliant, but do not connect to an adjacent crosswalk or sidewalk (see Figure 3). In other locations, such as those in front of the Prairie View Middle School, curb ramps are fully ADA compliant and connect to ADA accessible sidewalks (see Figure 4).

Crosswalks

There are several marked crosswalks along the corridor, most of which are at signalized intersections. Map 1 shows the location of these crosswalks along the corridor, as well as which sides of the intersection have the crosswalk. Typically, the signalized intersections have crosswalks on all four legs, but not always. Below is a list of signalized intersections along the corridor and a brief description of the crosswalks where they exist.

1. **Highway 85/120th:** Crosswalks on the west, north, and east sides of the intersection. No crosswalk along the south side.
2. **Peoria/120th:** Crosswalks along all four sides of the intersection. Faded crosswalk paint near the southwest corner.
3. **Southgate/120th:** Crosswalks along all four sides of the intersection.
4. **Sable/120th:** Crosswalks along all four sides of the intersection. Heavily faded crosswalk paint on the south side and minor fading on west and east sides.
5. **Chambers/120th:** Crosswalks along all four sides of the intersection.
6. **Buckley/120th:** No crosswalks.
7. **Westside E-470 On-ramp/Off-ramp:** No crosswalks.
8. **Eastside E-470 On-ramp/Off-ramp:** No crosswalks.
9. **Tower/120th:** No crosswalks.

There are only two non-signalized crosswalks along the corridor, and both are parallel to vehicle travel on 120th Avenue. One crosses Foley Road, just south of Prairie View High School, and the other crosses the driveway for Orchard Church and the High School along the north side of 120th Avenue.

FIGURE 2. POTOMAC/120TH - EXAMPLE OF WHAT IS MOST TYPICALLY SEEN ALONG THE CORRIDOR WITH NO CURB RAMPS OR CONNECTIONS TO SIDEWALKS OR CROSSWALKS.



FIGURE 3. MOLINE/120TH – INCOMPLETE CURB RAMP WITH ADA COMPLIANCE ON ONE SIDE BUT NO CONNECTION TO SIDEWALK ON ADJACENT SIDE.



FIGURE 4. SOUTHGATE INTERSECTION - COMPLETE AND ADA COMPLIANT CURB RAMPS.



Traffic Signals

There are a total of nine traffic signals on 120th Avenue between Highway 85 and Tower Road. The locations of these are shown in Figure 1, above. Five of the nine signalized intersections on the corridor have pedestrian signal heads (crossing lights). At these five intersections, pedestrian push buttons are present, however, the location of several do not comply with the Manual of Uniform Traffic Control Devices (MUTCD), ADA Standards for Accessible Design, or Public Rights of Way Accessibility Guidelines (PROWAG).

Six of the nine signalized intersections are missing signal heads for motorized vehicles. The observed missing signal heads are considered supplemental and are typically mounted to the side of the signal pole to provide added visibility for approaching traffic that is traveling behind large vehicles or when traveling into the sunlight.

Intersections with 120th Avenue that have deficient equipment include:

- US 85 – Missing signal heads / push button access
- Peoria Street – Missing signal heads / push button access
- Southgate Boulevard – Missing signal heads / push button access
- Sable Boulevard – Push button access
- Chambers Road – Missing signal heads / push button access
- Buckley Road – Missing signal heads
- Tower Road – Missing signal heads

As alternatives are developed and evaluated in the next phase of the study, these locations will be more closely examined. Recommendations will be considered for repositioning existing equipment and installation of new equipment to make the signals and pedestrian crosswalks fully compliant.

Bicycle Facilities

While bicyclists are permitted to travel along any portion of the corridor, there are currently no designated on-street bike facilities, such as a bike lane. Bicyclists can use the identified sidewalks but must otherwise share the travel lanes with motorists or use the aforementioned, unimproved shoulder areas.

Off-Street or Attached Trails

Just over a mile to the west of the Highway 85 & 120th Avenue intersection,

at Riverdale Regional Park, there is a direct connection to the Platte River Trail. Between the Highway 85 & 120th Avenue intersection and the trail connection, there is a 10-ft separated sidewalk that runs along the north side of 120th Avenue. The portion of this connection within the project area is shown in Figure 1, above. The Platte River Trail is a popular multi-use trail that spans 30.3-miles from Henderson to Englewood, providing access to many destinations within the Denver metro area.

Transit

RTD operates two bus lines that travel along 120th Avenue within the project area. These two bus routes are Routes 120L and 145X, which combined have a total of seven stops along 120th Avenue between Highway 85 and Tower Road. The service routes and stop locations are shown on Map 1. Route 120L has a total of two eastbound stops and three westbound stops on 120th Avenue. This route continues westbound beyond the project area and travels northbound at Sable Boulevard. This route provides connections to important destinations such as US 36 & Broomfield Station Park-n-Ride and the US 85 & Bridge Street Park-n-Ride in Brighton. Route 145X provides service along 120th Avenue between Sable Boulevard and E-470 and has one eastbound and one westbound stop on 120th Avenue. This route continues north of 120th Avenue on Sable Boulevard where it ultimately ends in Historic Downtown Brighton, near the US 85 & Bridge Street Park-n-Ride. It continues southbound along E-470, transitions to the east on Peña Boulevard and ultimately loops through Denver International Airport.

There are two bus routes that intersect 120th Avenue within the project area.

FIGURE 5. EXISTING BUS STOP ON 120TH AVENUE JUST WEST OF CHAMBERS ROAD.



These two routes are Route RX and AB1. Route RX provides northbound and southbound travel along Highway 85, intersecting the west end of the project area. Route AB1 provides travel along E-470 and intersects the project area at the E-470 on and off-ramp intersections.

Ridership numbers for Routes 120L and 145X are currently low but are expected to increase as development continues along and near the corridor. Currently, bus stops for the 120L and 145X lines lack facilities such as benches and waiting enclosures. In addition, most of the stops that are not ADA compliant are located on a dirt shoulder next to the road, do not have sidewalk connections to the stops, and have limited separation from passing vehicles. An example of an existing stop is shown in Figure 5. The lack of facilities and accessibility are likely key reasons for the low ridership.

Lighting

The adequacy of lighting can have a notable effect on the potential for crashes

both at intersections and on connecting segments of roadway. Generally, appropriate lighting that increases visibility in low light or after dark conditions can reduce the potential for crashes and can also reduce the severity of crashes.

The existing roadway lighting on 120th Avenue between US 85 and Tower Road is minimal and inconsistent. The current lighting system lacks lighting at decision points, such as entries and exits to the side roads of 120th Avenue. Without sufficient illumination at these decision points the safety and visibility for motorists and pedestrians is decreased. The current lighting layout also lacks uniformity, as some sections of 120th Avenue have ample lighting, while other sections have none. The overall lighting design goal should be to provide continuous uniform illumination along 120th Avenue in compliance with local and state lighting design requirements.

Map 2 shows the location of existing lighting fixtures and demonstrates this inconsistency.

MAP 2. DISTRIBUTION OF EXISTING STREET LIGHTS



Crash Summary

Overview

The reported crash data from 120th Avenue was analyzed to identify locations with a history of severe crashes and/or high crash density (hot spots). The crash analysis utilized the most recent five (5) years of crash data (January 2017 to December 2021). On average, roughly 106 collisions occur each year. Only crashes on 120th Avenue and those that are intersection-related crashes along 120th Avenue were evaluated for a refined approach to this safety and mobility study.

Crash Severity and Distribution

A total of 528 crashes were reported over the 5-year period. The severity of crashes was assessed in order to determine the proportion of severe crashes (defined as fatal and injury) to property damage only (PDO) crashes on the network. As shown in Figure 6, of the 528 crashes recorded along 120th Avenue, 3 were fatal, 11 resulted in incapacitating injury, 29 resulted in evident but non-incapacitating injury, 100 crashes were possible injuries which includes 1 pedestrian crash, and 385 crashes were property damage only, of which 2 involved pedestrians.

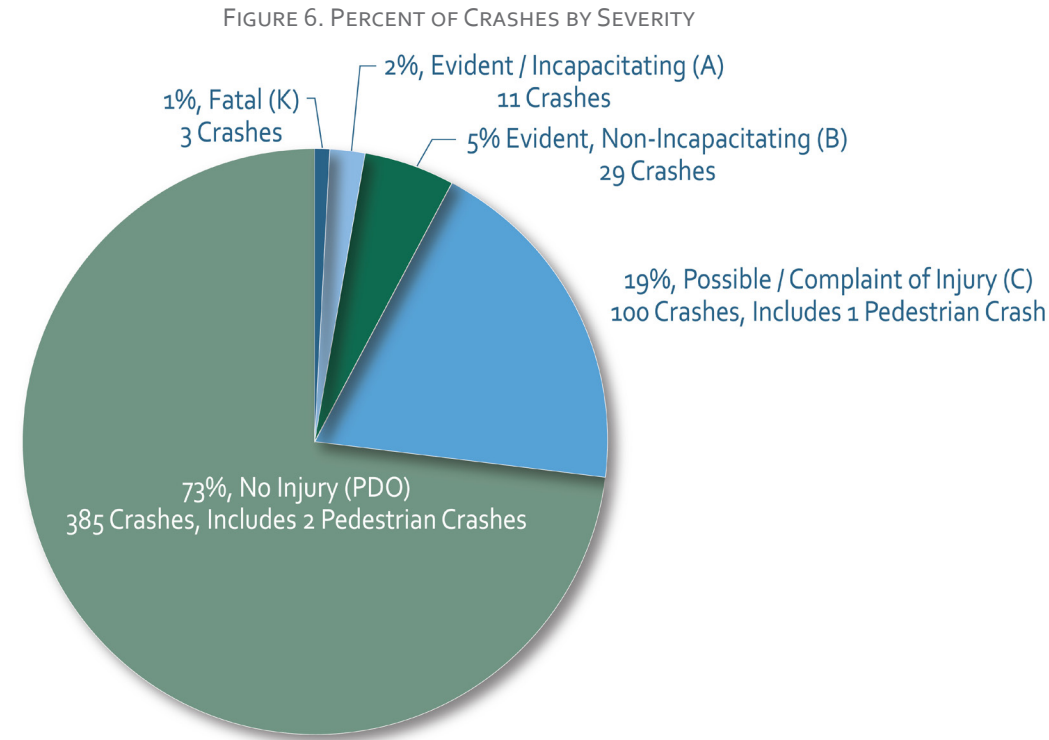
Map 3, seen on the next page, shows where each of the fatal and injury crashes occurred along the corridor. While more crashes occurred at the intersection with Highway 85 than any other location along the corridor, the overall percentage of severe crashes (Fatal crashes and Type A and Type B injury crashes) by location were higher at Sable Boulevard and E-470. As shown in the figure, three fatal crashes occurred on the corridor during the study period. Those crashes are described in more detail below.

120th Avenue/Highway 85: This fatal crash involved a southbound vehicle aggressively weaving in and out of traffic, driving at a high rate of speed. A second vehicle was waiting in the southbound left turn lane and was hit in the rear when the aggressive driver drove into the turn lane to pass traffic in the through lanes. The crash occurred at 8:30pm on August 17, 2019 in dry conditions at a dark but lighted intersection.

120th Avenue/Sable Boulevard: This fatal crash involved a southbound left turning vehicle that hit a northbound through motorcycle at 4:36AM on July 3, 2017. The roadway condition was dry and the intersection was dark but

lighted.

120th Avenue/East of Chambers Road: This fatal crash involved a single vehicle whose occupant was identified as being under the influence of alcohol when they drove off the right side of the road and collided with numerous large rocks. The vehicle spun and rolled one complete time during which the driver was ejected from the vehicle. The crash occurred on a windy evening around 9:30pm on March 4, 2018.



MAP 3. DISTRIBUTION OF FATAL AND INJURY CRASHES

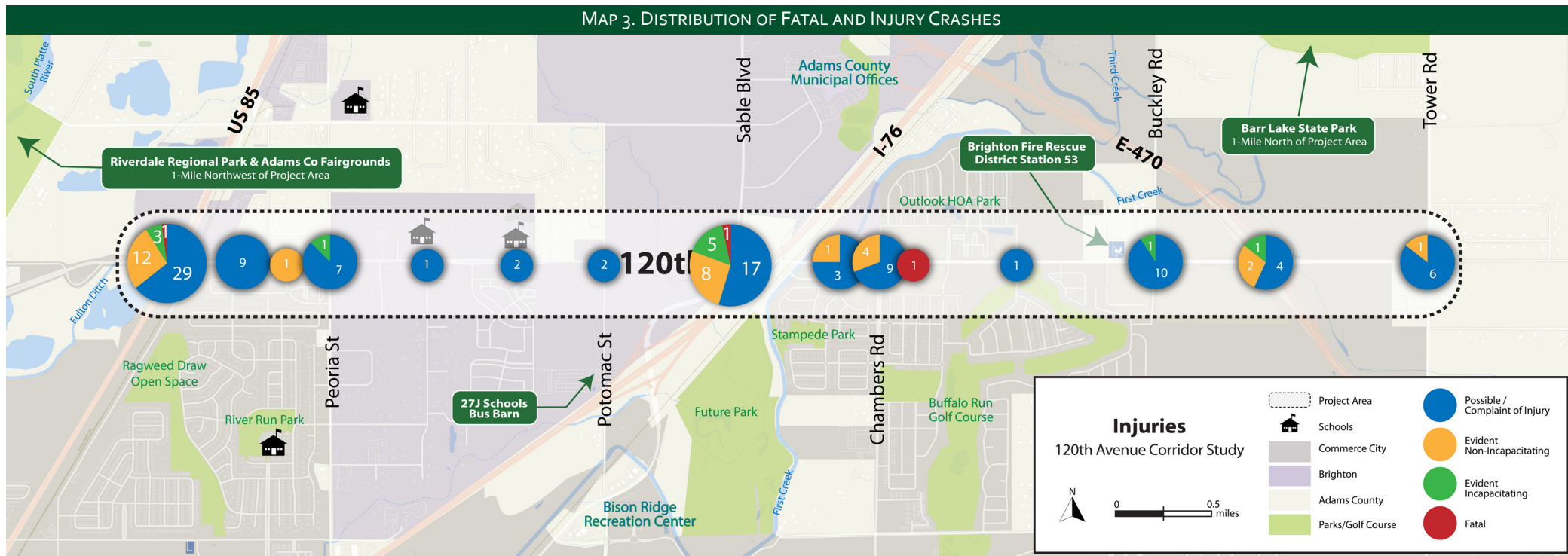
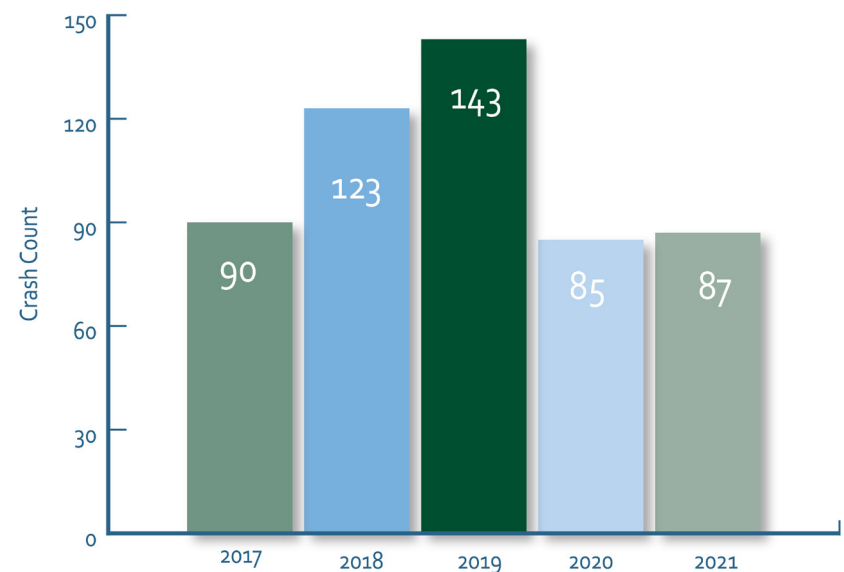
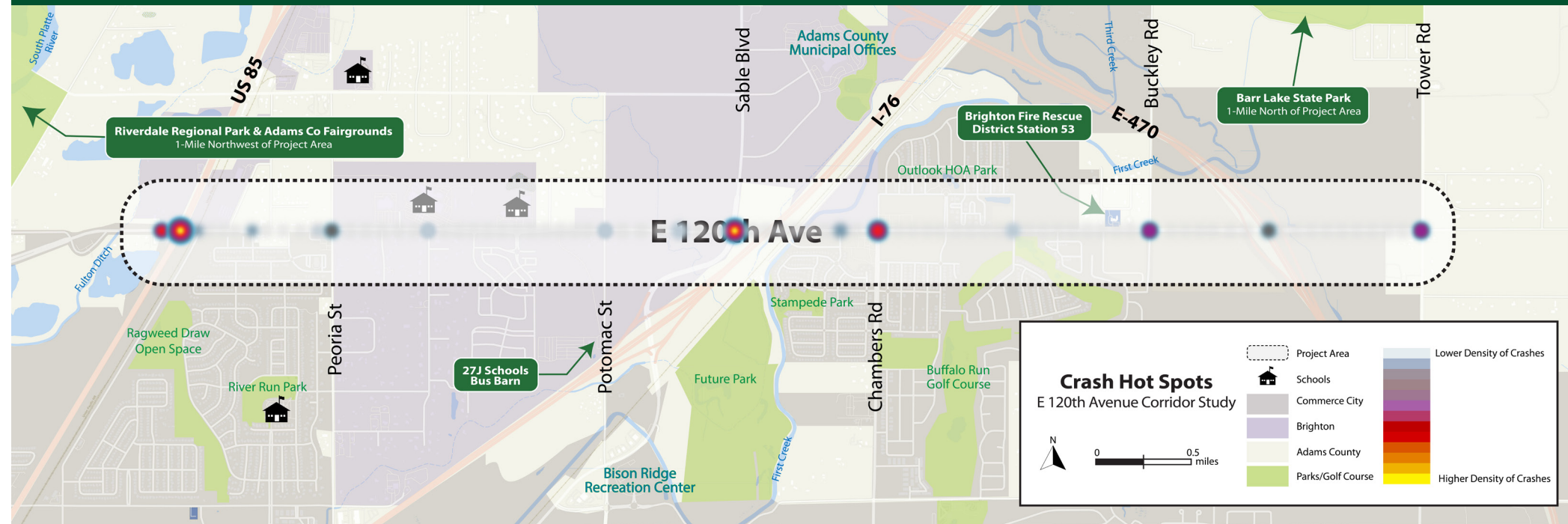


FIGURE 7. ALL CRASHES BY YEAR



Looking for trends in the data, all crashes on 120th Avenue were distributed over the five-year study period (Figure 7). The yearly progression is as follows: in 2017, there were 90 reported crashes; 2018 witnessed a notable increase with 123 crashes; 2019 experienced a further surge, reaching 143 crashes; a dip occurred in 2020 with 85 recorded crashes; and in 2021, the incidence rose slightly to 87 crashes. Calculating the average number of crashes per year from 2017 to 2021 yields an illustrative figure of 106 crashes annually on 120th Avenue. There was a significant 36% increase in total crashes from 2017 to 2018, and a further 16% increase from 2018 to 2019 indicating a notable rise in vehicular incidents between 2017 and 2019. However, the number of crashes dipped by 40% from 143 total crashes in 2019 to 85 crashes in 2020. The decline in crashes in 2020 can be attributed, at least in part, to a reduction in regionwide traffic volumes following the onset of the COVID-19 pandemic, among other contributing factors.

MAP 4. CRASH HEAT MAP ON 120TH AVENUE (2017-2021)



Map 4 shows a Heat Map with crash hot spots identified. Incidents were observed at various key intersections along 120th Avenue, stretching from Highway 85 to Tower Road. Specifically, the intersections at 120th Avenue & Sable Boulevard and 120th Avenue & Highway 85 demonstrated the highest crash densities, closely trailed by the intersection at 120th Avenue & Chambers Road. The intersections at Peoria Street, Buckley Road and Tower Road exhibit a moderate crash density.

Crash Location

Illustrated in Figure 8 is the distribution of crashes based on their location, as identified in the crash report. The majority (59%) of crashes occurred either at an intersection, or were intersection related. A total of 186 crashes occurred outside of intersections or were not directly related to access points or intersections. Additionally, two (2) crashes were documented at ramps, and driveway access points experienced 29 crashes.

FIGURE 8. CRASH COUNT BY ACCIDENT LOCATION

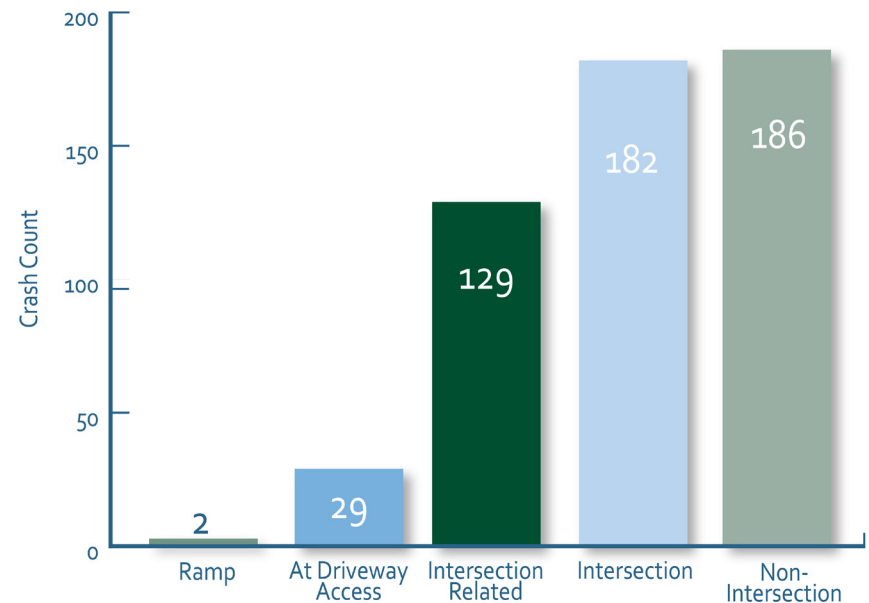
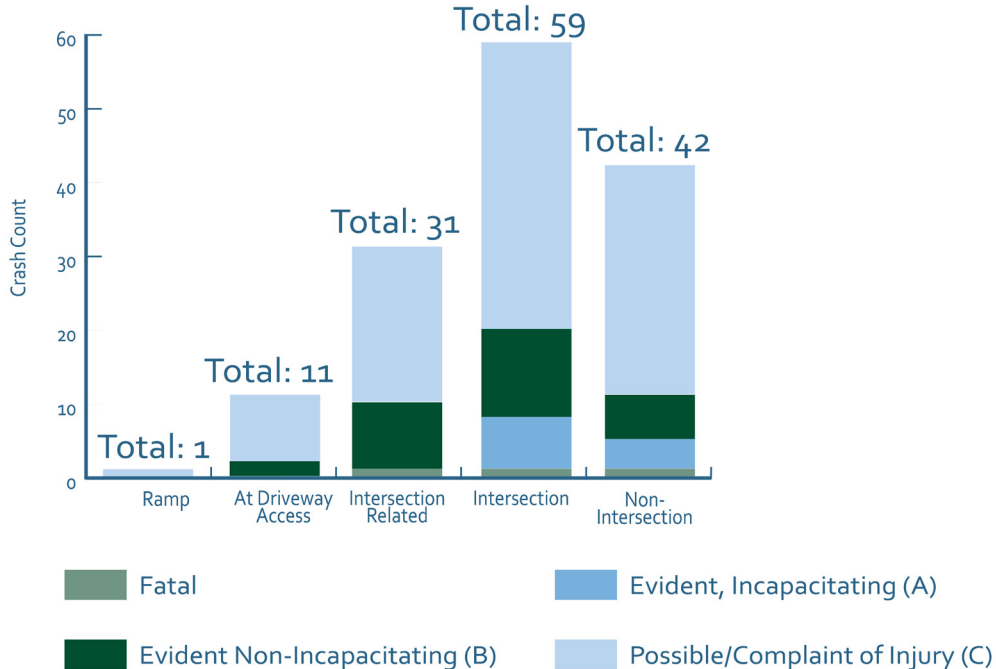


Figure 9 explains in more detail the number of fatal and injury crashes by crash location. Out of the three (3) fatal crashes, the majority, 66% (2 crashes) took place at the intersection or were related to the intersection, while 33% (1 crash) was not related to an intersection. In the case of the 40 more severe injury crashes (Type A and B), which include incapacitating (A) and non-incapacitating (B) incidents, 70% occurred at the intersection or were intersection-related, 25% were unrelated to intersections, and 5% occurred at driveway access points. A total of 100 possible injury crashes (C) were recorded, with 60% occurring at intersections or being intersection-related, 31% being non-intersection related, 9% at driveway access points, and 1% on ramps.

In summary, the majority of fatal and injury-related crashes occurred at an intersection or were intersection related. A total of 63% (90 out of 143 fatal and injury crashes) occurred in the intersection or related to it.

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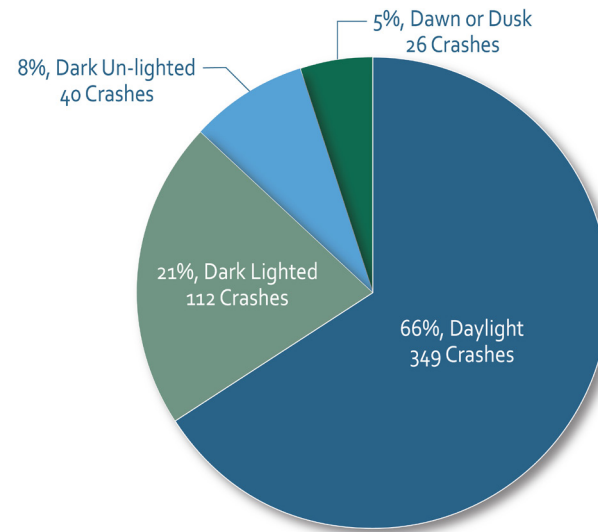
FIGURE 9. ALL FATAL AND INJURY CRASHES BY ACCIDENT LOCATION



Crash by Lighting Condition

Figure 10 shows the percent of crashes by lighting conditions. A significant majority, constituting 66% of the 528 crashes, occurred during daylight hours. Furthermore, 21% of crashes, 112 in total, occurred in conditions with limited lighting, while an additional 8%, equivalent to 40 crashes, happened in dark un-lighted areas. Five percent of crashes, 26 crashes in total, occurred during the transitional periods of dawn or dusk. One crash among the 528 recorded incidents had no lighting conditions reported.

FIGURE 10. PERCENTAGE OF CRASHES BY LIGHTING CONDITION



Crash Type

Summarizing the data shown in Table 1, on the next page, it becomes evident that rear-end crashes were the most prevalent crash type, accounting for 48.9% (258 crashes) of the total crashes on the corridor, followed by approach turn crashes comprising 18% of the total crashes. Broadside crashes constituted 12.1% (64 incidents) of the total crashes.

The crash types that resulted in the highest percentage of fatal and injury crashes were broadside and approach turn crashes, which saw 64% and 52% fatal and injury crashes, respectively. While nearly half of the total crashes were the result of a rear end crash, those crashes tend to be less severe

TABLE 1. CRASH TYPE BY SEVERITY

Crash Type	Crash Count			Total Crashes	Percent of Total
	PDO	Injury (A, B, C)	Fatal		
Rear End	198	53	1	258	48.9%
Approach Turn	62	32	1	95	18.0%
Broadside	39	25	0	64	12.1%
Sideswipe Same Direction	35	3	0	38	7.2%
Overtaking Turn	7	2	0	9	1.7%
Overtaking	7	2	0	9	1.7%
Wild Animal	4	1	0	5	0.9%
Curb or Island	3	2	0	5	0.9%
Head On	4	1	0	5	0.9%
Embankment or Ditch	2	3	0	5	0.9%
Sideswipe Opposite Direction	1	3	0	4	0.8%
Traffic Sign or Post or Overhead Sign Structure	3	0	0	3	0.6%
Traffic Signal Pole or Equipment	2	1	0	3	0.6%
Pedestrian	2	1	0	3	0.6%
Light or Utility Pole	1	2	0	3	0.6%
Concrete Barrier	3	0	0	3	0.6%
Guard Rail	3	0	0	3	0.6%
Parked Motor Vehicle	1	1	0	2	0.4%
Fence or Fence Part	0	2	0	2	0.4%
Other Fixed Object	2	0	0	2	0.4%
Trees or Shrubs	2	0	0	2	0.4%
Other Object	1	0	0	3	0.2%
Delineator Post	1	0	0	1	0.2%
Large Boulder	0	0	1	1	0.2%
Barricade	1	0	0	1	0.2%
Other Non-Collision	0	1	0	1	0.2%
Totals	384	141	3	528	100%

than broadside and approach turn crashes, with only 23% of them resulting in fatality or injury. Notably, 1 of the 3 fatal crashes was caused by a large boulder. Several other crash types also contributed to injury incidents, such as sideswipe same direction, sideswipe opposite direction, embankment/ditch, each contributing to 3 injury crashes. Furthermore, curbs, overtaking turns, fence, utility pole, and overturning each led to 2 injury crashes in their respective categories. These crash types highlight the diverse factors contributing to both fatal and injury crashes along the corridor.

Intersection Level of Service of Safety

The magnitude of safety problems at intersections is assessed through the use of Safety Performance Functions (SPF). The SPF reflects the relationship between traffic exposure, measured in Average Annual Daily Traffic (AADT), and crash count, measured in crashes per mile per year. The SPF models provide an estimate of the expected crash frequency and severity for a range of AADT among similar facilities. The concept of LOSS characterizes safety of a roadway segment in reference to its expected frequency and severity. If the level of safety predicted by the SPF represents a normal or expected number of crashes at a specific level of AADT, then the degree of deviation from the norm can be stratified to represent specific levels of safety.

LOSS I - Indicates low potential for crash reduction

LOSS II - Indicates low to moderate potential for crash reduction

LOSS III - Indicates moderate to high potential for crash reduction

TABLE 2. INTERSECTION LOSS ANALYSIS

Intersection	LOSS (All)	LOSS (Severe)
Havana Street	I	II
Moline Street	II	II
Oakland Street	I	II
Peoria Street	IV	III
Salem Street	I	II
Foley Road	I	II
Potomac Street	I	II
Sable Street	IV	IV
Cameron Drive	III	III
Chambers Road	IV	IV
Jasper Street	I	II
Laredo Street	II	II
Buckley Road	IV	IV
E-470 Eastbound	I	II
E-470 Westbound	II	II
Tower Road	IV	III

LOSS IV - Indicates high potential for crash reduction

LOSS reflects how the intersection is performing in regard to its expected crash frequency and severity at a specific level of AADT. If a safety problem is present, LOSS describes its magnitude from the frequency and severity standpoint. The nature of the problem may be determined through diagnostic analysis using direct diagnostics and pattern recognition techniques.

The 120th Avenue intersections within the project area were examined and reviewed using level of service of safety and pattern recognition analysis. Crashes that can be attributed to intersections accounted for 59 percent of all crashes. Table 2 provides the Level of Service of Safety (LOSS) by location for the intersections that experienced crashes. Those intersections that did not experience crashes within the study period are assumed to have a LOSS I with

a low potential for crash reduction and are not included in the table.

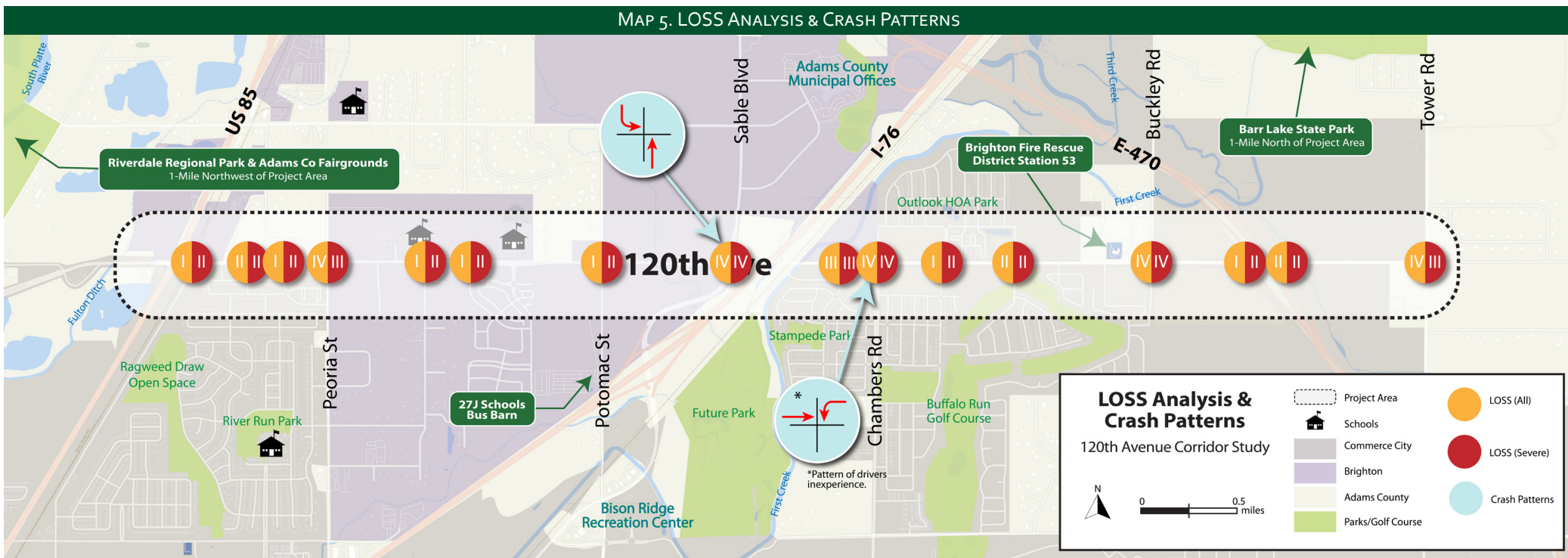
Crash Patterns

The intersections within the project limits were tested for the presence of patterns related to crash type, severity, direction of travel, road conditions, spatial distribution of crashes, time of day, and behavioral attributes. These diagnostic norms were developed using the same data points as the SPF analysis. This section covers notable crash types and conditions over the study period within the project limits.

Each of the locations experiencing LOSS III and LOSS IV conditions were further evaluated to determine whether they reveal any particular patterns that deviate from what would typically be expected for similar facilities.

Patterns were identified at two locations:

MAP 5. LOSS ANALYSIS & CRASH PATTERNS



- Sable Boulevard: Pattern of Approach Turn crashes involving northbound through and southbound left turn movements.
- Chambers Road: Pattern of Approach Turn crashes involving eastbound through and westbound left turn movements and pattern of driver inexperience as a contributing factor.

Crash Summary

The analysis of crash data along 120th Avenue provides a comprehensive overview of vehicular incidents over the past five years between 2017 and 2021, shedding light on severity, distribution, location, lighting conditions, and crash types. With a total of 528 crashes reported, 143 crashes (27%) resulted in a fatality or injury. Yearly trends revealed fluctuations in total crashes, with 2018 experiencing a 36% surge in crashes and 2019 witnessing a further 16% increase. However, a sharp decline occurred in 2020, possibly influenced by the COVID-19 pandemic and other factors, marking a 40% decrease in crashes. Notably, crash locations were concentrated at key intersections along 120th Avenue, with Sable Boulevard, Highway 85, and Chambers Road exhibiting the highest densities. Moderate crash density was observed at the intersections of Peoria Street, Buckley Road, and Tower Road.

Figure 8 noted that most crashes (311 of 528 crashes) occurred at an intersection or were intersection related, while Figure 9 delved into fatal and injury crashes, revealing that 63% (90 out of 143 fatal and injury crashes) predominantly took place at intersections or were intersection related. Crashes were also analyzed based on lighting conditions, highlighting that 66% occurred during daylight hours, 21% occurred in dark-lighted conditions, and 8% occurred in dark unlighted conditions. Table 1 provided a comprehensive breakdown of crash types, revealing that rear-end crashes constituted 48.9% of total incidents, approach turn crashes accounted for 18% of total crashes, and broadside crashes, contributed to 12.1% of total incidents. Broadside and approach turn crashes accounted for the highest percentages of fatal and injury incidents, 64% and 52%, respectively, while rear-end crashes, making up nearly half of all crashes, were less severe, resulting in only 23% fatality or injury.

The magnitude of safety problems at the signalized intersections was evaluated and the LOSS for each identified. A LOSS of III or IV was identified for the intersections of Peoria Street, Sable Street, Cameron Drive, Chambers Road, Buckley Road and Tower Road. These intersections were then tested

for the presence of patterns related to crash type, severity, direction of travel, road conditions, spatial distribution of crashes, time of day, and behavioral attributes. Patterns of approach turn crashes were identified at the intersections of Sable Boulevard and Chambers Road.

In conclusion, this comprehensive analysis serves as a valuable resource for informed decision-making, emphasizing the importance of taking specific actions at key intersections, understanding yearly patterns, and dealing with various types of crashes. The data underscores that vehicular incidents along 120th Avenue are complex, giving a basis for putting effective road safety measures in place.

Environmental, Cultural, and Social Resources

Biological Resources

The purpose of this review is to address existing conditions regarding biological resources and protected species in accordance with the following federal and state regulations or policies:

- U.S. Endangered Species Act (ESA): Protects federally listed plant and animal species with the goal of ensuring their long-term survival. The U.S. Fish and Wildlife Service (USFWS) administers these requirements.
- Colorado Non-game, Endangered, and Threatened Species Conservation Act: Protects state-listed and state special concern species with the goal of ensuring their long-term survival. Colorado Parks and Wildlife (CPW) administers these requirements.
- Bald and Golden Eagle Protection Act (BGEPA): Protects Bald (*Haliaeetus leucocephalus*) and Golden (*Aquila chrysaetos*) Eagles. The USFWS administers these requirements.
- Migratory Bird Treaty Act (MBTA): Protects birds, their active nests, and their eggs (except Rock Doves [*Columbia livia*], European Starlings [*Sturnus vulgaris*], and some other non-native birds). The USFWS administers these requirements.
- Section 404 of the Clean Water Act (CWA): Regulates placement of dredge or fill material into waters of the U.S. (WOTUS), which includes wetlands and non-wetland waters. Impacts to these features

would require permitting through the U.S. Army Corps of Engineers (USACE).

Methodology

A desktop analysis to identify potential biological resources in the project area was conducted using publicly available information, including the following:

- Aerial imagery and street-view photography (Google Earth Pro, 2024)
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) System (USFWS, 2024a)
- Colorado Natural Heritage Program (CNHP) Colorado Conservation Data Explorer (CODEX) List (CNHP, 2024)
- Colorado Parks and Wildlife (CPW) Threatened and Endangered List (CPW, 2023a)
- CPW Species Activity Mapping data (CPW, 2023b)
- USFWS National Wetlands Inventory (NWI) Mapper (USFWS, 2023b), and
- USGS National Hydrography Dataset (USGS, 2023)

Results

The project area is a mix of rural, residential, and commercial infrastructure. There are several neighborhoods within and surrounding the project area, as well as agricultural fields.

Federally Listed Species

Based on a review of the USFWS online IPaC System, there are federally listed threatened (FT), federally listed endangered (FE), proposed endangered (PE), and federal candidate (FC) species with the potential to occur in, or be impacted by, a project in this location (USFWS, 2023a).

The Pallid Sturgeon (*Scaphirhynchus albus*; FE) and Piping Plover (*Charadrius melodus*; FT) are included because they occur downstream of the project area and could be impacted by future 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, may

participate in the South Platte Water Related Activities Program (SPWRAP). If water for future construction projects stemming from this study is sourced from a public water source within the South Platte River basin, potential effects to downstream species would presumably need to 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. 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 project area, they have been addressed under the SPWRAP and are not discussed further.

The potential for the remaining species listed in the IPaC system to occur in the project area was evaluated based on an assessment of habitat and species distributions. There is no suitable habitat in the project area for the Gray Wolf (*Canis lupus*; FE). The majority of the project area is within blocked clearance zone for Preble’s Meadow Jumping Mouse (*Zapus hudsonius preblei*; FT). The easternmost portion of the project area not within the blocked clearance zone does not contain Preble’s Meadow Jumping Mouse habitat. There is minimal habitat potential for the Ute Ladies’-tresses Orchid (*Spiranthes diluvialis*; FT), however distribution is not mapped within Adams County and the closest mapped occurrence is approximately 24 miles southwest of the project area (CNHP, 2022).

There were two species with the potential for occurrence within the project area. The Tricolored Bat (*Perimyotis subflavus*; PE) roosts by hanging from the branches of deciduous trees but is also known to roost in human dwellings or within rock crevices. During the summer months, Tricolored Bats are typically found roosting and foraging in riparian habitats that border rivers and streams. Hibernacula¹ includes caves, mines, buildings, and other human-made structures. There is potential for the habitat of the Tricolored Bat under bridges and human-made structures within the project area. The Tricolored Bat has low potential for occurrence; this species is not yet federally listed, but its listing status should be tracked, and it may require further evaluation in a future NEPA process. The Monarch Butterfly (*Danaus plexippus*; FC) occurs within a variety of habitats that feature their obligate larval host plant,

¹ Hibernacula is scientific term for “caves, mines, structures, etc. that are occupied by animals.

Milkweed (*Asclepias* spp.). There is potential for Milkweed within the project area and potential for migration through the project area. However, there are no ESA requirements for candidate species.

State-listed and State Special Concern Species

CPW lists amphibians, birds, fish, mammals, reptiles, and mollusk species as endangered (SE), threatened (ST), or of special concern (SC) within the state of Colorado (CPW, 2023a). The majority of these species are not expected to occur in the project area because it is outside of their range or appropriate habitat is not present. The CNHP CODEX was reviewed to identify state-listed and special concern species with the potential to occur in the project area.

Black-tailed Prairie Dog (*Cynomys ludovicianus*; SC) colonies were observed during the desktop analysis on the edges along much of the project area, therefore there is also a potential for Burrowing Owls (*Athene cunicularia*; ST) as it provides suitable nesting habitat. Burrowing Owls are also protected under the MBTA.

The common Garter Snake (*Thamnophis sirtalis*; SC) has a low potential for occurrence within potential wetlands; however, it is recommended a field-based wetland delineation be conducted to confirm the existence and boundaries of those wetlands.

Migratory Birds

The MBTA protects birds and their active nests (except for Rock Doves, European Starlings, and some other non-native birds). In Colorado, most nesting and rearing activities occur between April 1 and August 31; however, raptors may nest as early as December. These timeframes are guidelines and nesting birds are protected under the MBTA year-round.

Shrubs, tall grasses, and human-made structures such as bridges could be used as nests for raptors and/or non-raptor birds. There is potential nesting raptor habitat (e.g., large deciduous trees) within 0.5 mile of the project area, and the project area falls within Bald Eagle winter concentration and winter foraging (CPW, 2023b). Additionally, there is a mapped Bald Eagle nest approximately 1.4 miles south of the project area (CPW, 2023b).

Aquatic Resources

Section 404 of the Clean Water Act regulates placement of dredge or fill material into WOTUS, which includes non-wetland waters and wetlands.

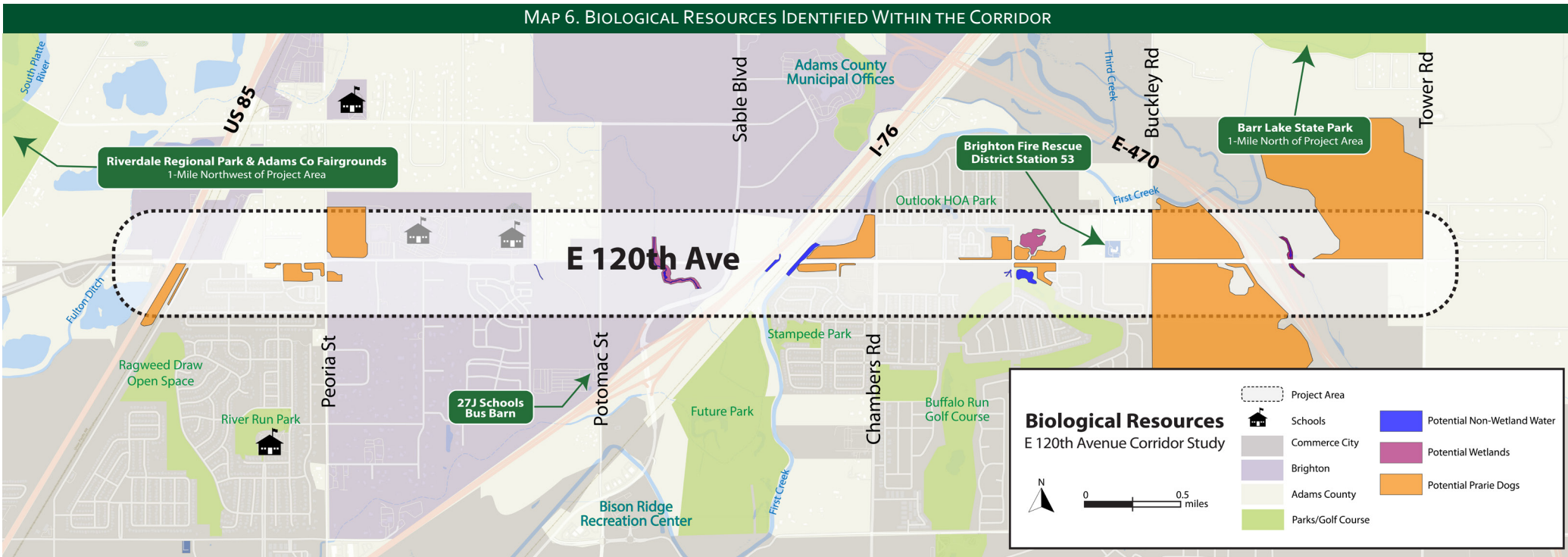
Impacts to WOTUS require permitting through the USACE. As of September 2023, jurisdictional WOTUS are defined to include waters that are “currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide” as well as tributaries of these waters that are relatively permanent, standing, or continuously flowing; and wetlands adjacent to and with a continuous surface connection to these waters. Wetlands are “those 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” (Environmental Laboratory, 1987). Only the USACE has the authority to make jurisdictional determinations.

There are several potential WOTUS within the project area. Second Creek and O’Brian Canal are located in the central portion of the project area and are classified as Riverine Intermittent (R₄SBC) on the NWI. The Burlington Ditch, also located in the central portion of the project area was mapped as Riverine Unconsolidated Bottom (R₅UBFx) on the NWI. Lastly, located in the eastern portion of the project area, Third Creek crosses the project area and is classified as Riverine Intermittent (R₄SBC) on the NWI. Additionally, a pond is located in the central portion of the project area, within a golf course. West of the pond, across Laredo Street, there is a drainage system, possibly associated with the pond.

There is one NWI mapped wetland within the project area, located along the Burlington ditch. This wetland is Palustrine Emergent Persistent (PEM₁C). However, there are potential wetlands located along the shores of all waters mapped. Additionally, near the central portion of the project area, there appears to be a large wetland associated with the drainage system that extends north of the project area.

The location and likely extents of these aquatic resources are shown on Map 6 on the next page.

MAP 6. BIOLOGICAL RESOURCES IDENTIFIED WITHIN THE CORRIDOR



*Biological resources were mapped within a boundary identified as the potential area of disturbance for the proposed project.

Cultural Resources

The purpose of this review is to address existing conditions regarding cultural resources in accordance with the following federal and state regulations or policies:

Methodology

The purpose of this evaluation is to identify historic and potentially historic resources proximate to 120th Avenue between Highway 85 on the west to Tower Road on the east. A cutoff date of 1978 was selected for these identification efforts for potentially historic resources to align with the 50-year age threshold generally used for National Register of Historic Places (NRHP) evaluations, and to provide a five-year buffer. To identify the presence of previously recorded historic resources, a file search of the COMPASS database maintained by the Colorado OAHF was completed for a 300-foot buffered area (cultural resource project area) surrounding 120th Avenue on December 11, 2023. Additionally, to identify parcels with unrecorded, potentially historic

resources within the cultural resources project area, a review of the Adam’s County Assessor’s Office database, as well as a review of the CDOT Historic Sites Viewer database, historical aerial imagery, and topographical maps was completed on December 11, 2023. A cutoff date of 1976 was selected for these identification efforts to align with the 50-year age threshold generally used for National Register of Historic Places (NRHP) evaluations, and to provide a five-year construction horizon buffer.

Results

As a result of the file search, nine (9) previously evaluated resources that are eligible or assumed eligible for listing in the National Register of Historic Places (NRHP) were identified in the cultural resource project area. In addition to the nine (9) previously evaluated resources, twelve (12) newly identified potentially historic resources were identified within or intersecting the cultural resources project area. These 21 resources are shown on Map 7 and identified in Table 3.

MAP 7. PREVIOUSLY EVALUATED RESOURCES ELIGIBLE FOR NATIONAL REGISTER OF HISTORIC PLACES



TABLE 3. PREVIOUSLY EVALUATED RESOURCES IN NATIONAL REGISTER OF HISTORIC PLACES

Site ID	Site Name	Address	Assessment	Last Assessment Date
5AM.3895	Not Listed	NA	106 - Officially eligible	2019
5AM.3901	Not Listed	NA	106 - Officially eligible	2019
5AM.3924.1	US Highway 85 - Segment	NA	Supporting of Overall Eligibility	2019
5AM.459.18	Denver Pacific/Union Pacific Railroad - Segment	NA	Not Listed - Assumed Eligible/Supporting of Overall Eligibility	Not Listed
5AM.459.2	Denver Pacific/Union Pacific Railroad/Northern Subdivision - Segment	NA	106 - Field Eligible	1995
5AM.477.2	O'Brian Canal	NA	106- Officially Eligible/Supporting of Overall Eligibility	2017
5AM.656	McKinley Complex	120th Avenue and Potomac Street	106 - Officially Eligible	2022
5AM.888	Sweany Farm	11945 Peoria Street	106 - Officially eligible	1995
5AM.889	Coffey Farm/Foley Farm	13210 East 120th Avenue	106 - Officially eligible	1995
NA	NA	16521 121st Circle Drive	Potentially Eligible	NA
NA	NA	16760 121st Circle Drive	Potentially Eligible	NA
NA	NA	16620 121st Circle Drive	Potentially Eligible	NA
NA	NA	13767 120th Avenue	Potentially Eligible	NA
NA	NA	11990 Racine Court	Potentially Eligible	NA
NA	NA	12180 120th Avenue	Potentially Eligible	NA
NA	NA	11965 Tower Road	Potentially Eligible	NA
NA	NA	14850 120th Avenue	Potentially Eligible	NA
NA	NA	11990 Tower Road	Potentially Eligible	NA
NA	NA	11910 Tower Road	Potentially Eligible	NA
NA	NA	NA (Parcel 172304201001)	Potentially Eligible	NA
NA	NA	12510 120th Avenue	Potentially Eligible	NA

Environmental Justice Indicators

The purpose of this review is to address existing conditions regarding environmental justice (EJ) in accordance with the following methodology:

Methodology

The term “Environmental Justice” refers to the social equity in sharing the benefits and the burdens of specific projects and/or programs and is addressed by Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898, 1994).

Guidance on how to implement EO 12898 and conduct environmental justice analyses was issued by the Council on Environmental Quality (CEQ, 1997). The CEQ guidance states that minority and low-income populations occur where either:

- The minority or low-income population of the affected area exceeds 50%; or
- The population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Minorities constitute races and ethnic groups and include the following (as identified by the US Census Bureau): Black/African Americans, American Indian/Alaskan Natives, Asians, Native Hawaiian/Pacific Islanders, and Hispanics. Low income is defined as persons/families with incomes at or below the poverty level as determined by the Department of Health and Human Services or the Census Bureau.

To assess EJ populations in the project area, the seven United States Census Block Groups located within 4 Geographic Identifiers¹ (GEOIDs) that are within or adjacent to the project area were evaluated using the State of Colorado Department of Public Health and Environment’s (CDPHE) EnviroScreen Environmental Justice Mapping Tool. The tool gathers and displays data from the Census Bureau 2015-2019 American Community Survey (EnviroScreen, Source). The Block Groups were selected based on their proximity to the project area, the likelihood that residents within these boundaries use the

¹ GEOIDs are numeric codes that uniquely identify all administrative/legal and statistical geographic areas for which the Census Bureau tabulates data.

existing 120th Avenue corridor, and the likelihood that residents within the boundaries would be impacted by future projects potentially resulting from this study.

This evaluation compared the percentage of minority, low-income, and Limited English Proficiency (LEP) populations, each referred to as an “EJ population,” within these seven Block Groups with the Adams County percentages. This comparison was used to determine if there are higher levels of EJ populations in project area than in other parts of the County. Along with minority, low-income, and LEP data, EnviroScreen captures a plethora of other justice indicators, including climate vulnerability, air toxics emissions, noise, ozone, and wildfire risk. More information can be found on the CDPHE EnviroScreen mapping tool website at <https://cdphe.colorado.gov/enviroscreen>.

Results

Within the community project area for this project, no EJ populations were identified as having a higher percentage than that of the County. Block groups assessed as a part of this analysis make up the Community project area, and are as follows:

- Census Tract 85.36, Block Groups 1 and 2 (GEOID 080010085361);
- Census Tract 85.53, Block Group 1 (GEOID 080010085232);
- Census Tract 85.52, Block Group 3 (GEOID 080010085231);
- Census Tract 85.57, Block Group 1 and
- Census Tract 85.56 Block Groups 1 and 2 (GEOID 080010085371).

This evaluation compared the percentage of minority, low-income, and Limited English Proficiency (LEP) populations within these seven Block Groups with the Adams County percentages to determine if there are higher levels of each EJ populations in them than are present in the County. Within the Community project area for this project, there are minority populations present, with the highest percentage seen in GEOIDs 80010085361 and 80010085371, at 42%. However, the percentage of minority populations within the Community project area is lower than the Adams County average of 51%.

Within the Community project area, there were no low-income percentages higher than that of the County average, which is 29%. Results of this evaluation are summarized in Table 4.

Limited English proficiency affects how well people can access services and

information in their community, such as public notices about environmental contamination. Linguistic isolation describes individuals and households that have limited English proficiency or speak languages other than English at home. Within the four GEOIDs, the highest percentage of linguistically isolated populations is approximately 3%, which is lower than the County LEP percentage of 5%.

Additional indicators provided by EnviroScreen may be of interest to the Project Team, which has made a commitment to utilize the Institute for Sustainable Infrastructures’ Envision® framework to expand sustainability and resilience performance of the Project in later phases. For this reason, additional social and environmental factors may be explored in future project tasks.

TABLE 4. ENVIRONMENTAL JUSTICE INDICATOR RESULTS

GEOID/County	Percent People of Color	Percent Low-Income	Percent Linguistic Isolation
80010085231	11%	0%	0%
80010085232	16%	8%	0%
80010085361	42%	8%	0%
80010085371	42%	18%	3%
Average	28%	9%	<1%
Adams County	51%	29%	5%

Existing Traffic Conditions

Level of Service Criteria

Traffic analyses were conducted in accordance with procedures outlined in the Highway Capacity Manual, 6th Edition (HCM). Level-of-Service (LOS) is a measure of the quality of traffic flow and ranges from LOS A (nearly ideal traffic conditions with very little delay for motorists) to LOS F (poor traffic conditions with long motorist delays). LOS C is typically considered a “good” traffic condition. LOS D or better conditions are typically desirable during peak traffic

periods; however, LOS E conditions are not uncommon. LOS F, although undesirable, is also not uncommon for side street traffic movements at full movement, unsignalized intersections with high volume arterial roadways.

Table 5 provides a summary of the HCM unsignalized intersection LOS Criteria. At unsignalized intersections, the LOS reflects that of the worst-case movement.

Table 6 provides a summary of the HCM signalized intersection LOS Criteria. At signalized intersections where timing can be adjusted to match traffic demand, the LOS for each traffic movement is calculated. The traffic-weighted delay is then averaged to report LOS for the intersection as a whole. HCM Signalized Intersection evaluation methods were used to estimate LOS at intersections along 120th Avenue. Where provided by local agencies, existing signal controller settings and Time-of-Day plans were used in the LOS calculation. When signal timing data was not provided, the optimization feature in Synchro was used to estimate a ‘best case’ scenario. Synchro is a traffic operations software that applies the methodologies of the HCM, while also providing additional tools for signal timing optimization.

Existing Intersection Operations

Existing Access

Existing access points along 120th Avenue were identified, with each side-

TABLE 5. LOS CRITERIA FOR UNSIGNALIZED INTERSECTIONS

LOS	Worst-Case Movement Average Delay (sec/veh)
A	<=10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

TABLE 6. LOS CRITERIA FOR SIGNALIZED INTERSECTIONS

LOS	Intersection Average Delay (sec/veh)
A	<=10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80

street leg being counted as a separate access. For example, a 4-legged intersection would include two access points. There are a total of 71 access points along 120th Avenue, including the US 85 and Tower Road intersections. Table 7 provides a summary of those access points.

TABLE 7. ACCESS POINTS SUMMARY

Access Type	Total Access Points
Public Streets & Roads	34
Residential	21
Commercial	6
Public & Institutional	5
Field	5

Of the full movement access points on the corridor, 18 are signalized and 39 are unsignalized. Access points with left-turn out restrictions, also known as $\frac{3}{4}$ movements, occur at Cameron Drive and Moline Street. Access is limited to right-in, right out at 11 points and to right-out only at Prairie View Middle School. At the Prairie View High School- West access, left turns to 120th Avenue are prohibited on weekdays from 7:00-9:00 AM and from 3:00-6:00 PM.

Existing Lane Configuration

Existing lane configuration was collected at 23 key intersections along 120th Avenue within the project limits. Figures 11 & 12, on the next page, show the existing intersection geometry and intersection control.

Existing Traffic Counts

Turning Movement Counts (TMC's) were collected at 23 locations along 120th Avenue. When accounting for individual access points, these traffic counts capture 34 of the total access points noted above and all are at public street intersections with the exception of the two Prairie View High School driveways.

TMCs were collected on October 11, 2023 during the AM peak period (7:00-9:00 AM) and the PM peak period (4:00-6:00 PM). The AM peak hour for 120th Avenue is 7:30-8:30 AM and a peak hour factor (PHF) of 0.88 was identified. The PM peak hour is 4:15-5:15PM, with a PHF of 0.91. Figures 13 and 14 show the turning movement counts for the AM and PM peak hours.

Additionally, existing Vehicles Per Day (VPD) and vehicle classification counts were collected at eight (8) locations along the corridor from October 11-12,

2023. Table 8 shows the existing VPD and truck percentages by location. Traffic volumes range from 13,600 VPD east of Havana to 18,200 VPD west of Tower Road, with a peak of 25,500 VPD west of Cameron Drive. East of the project area, traffic volumes decrease drastically to 3,700 VPD.

On average, a truck percentage of four (4) percent is typical on State-maintained arterial roads within the Denver Regional Council of Governments (DRCOG) planning area. Truck traffic on the 120th Avenue corridor is significantly higher than this. The lowest truck percentage was 5.2% west of Sable, and the highest was 11.1% east of Laredo. East of the project area truck percentages jump up to 18.8%.

TABLE 8. EXISTING VEHICLES PER DAY AND TRUCK PERCENTAGES

Site location	2023 VPD	Truck Percentage
East of Havana	13,600	5.7%
East of Peoria St	14,700	6.5%
West of Sable	16,100	5.2%
West of Cameron	25,500	7.1%
East of Laredo	15,500	11.1%
East of Buckley	20,600	8.5%
West of Tower Rd	18,200	10.1%
East of Tower	3,700	18.8%

FIGURE 11. EXISTING LANE CONFIGURATION (1 OF 2)

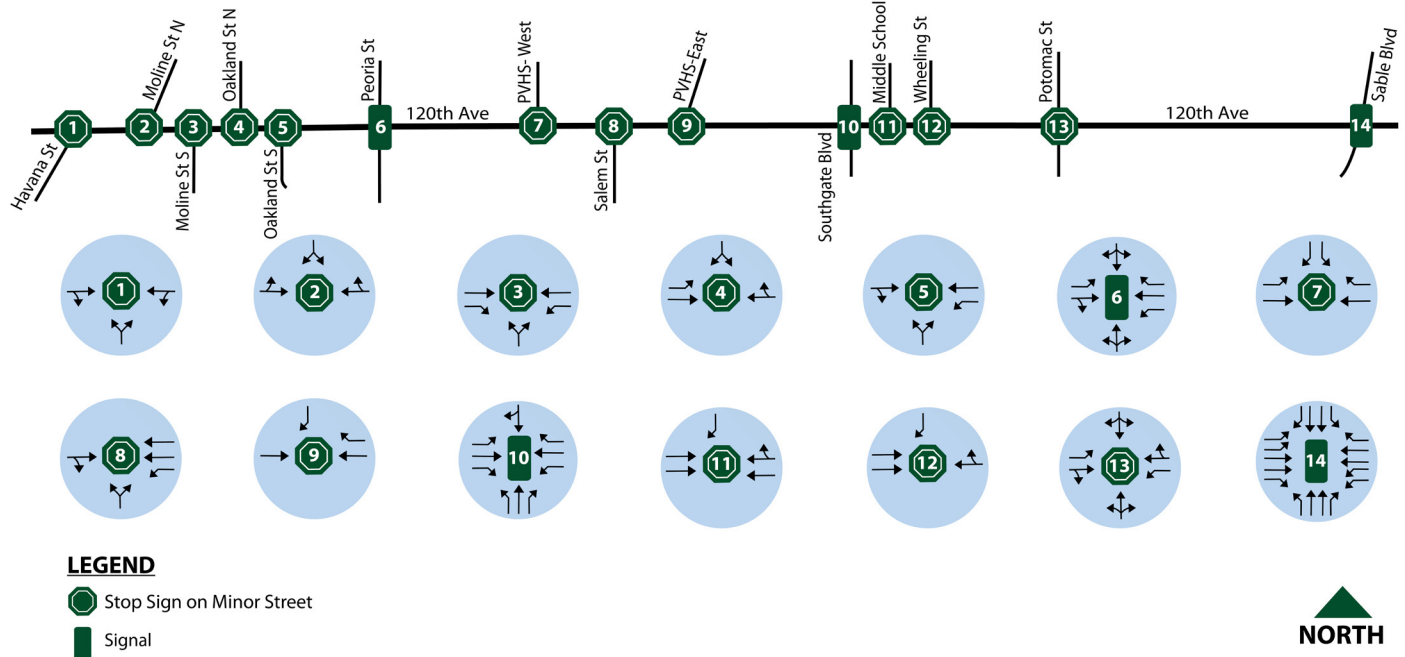


FIGURE 12. EXISTING LANE CONFIGURATION (2 OF 2)

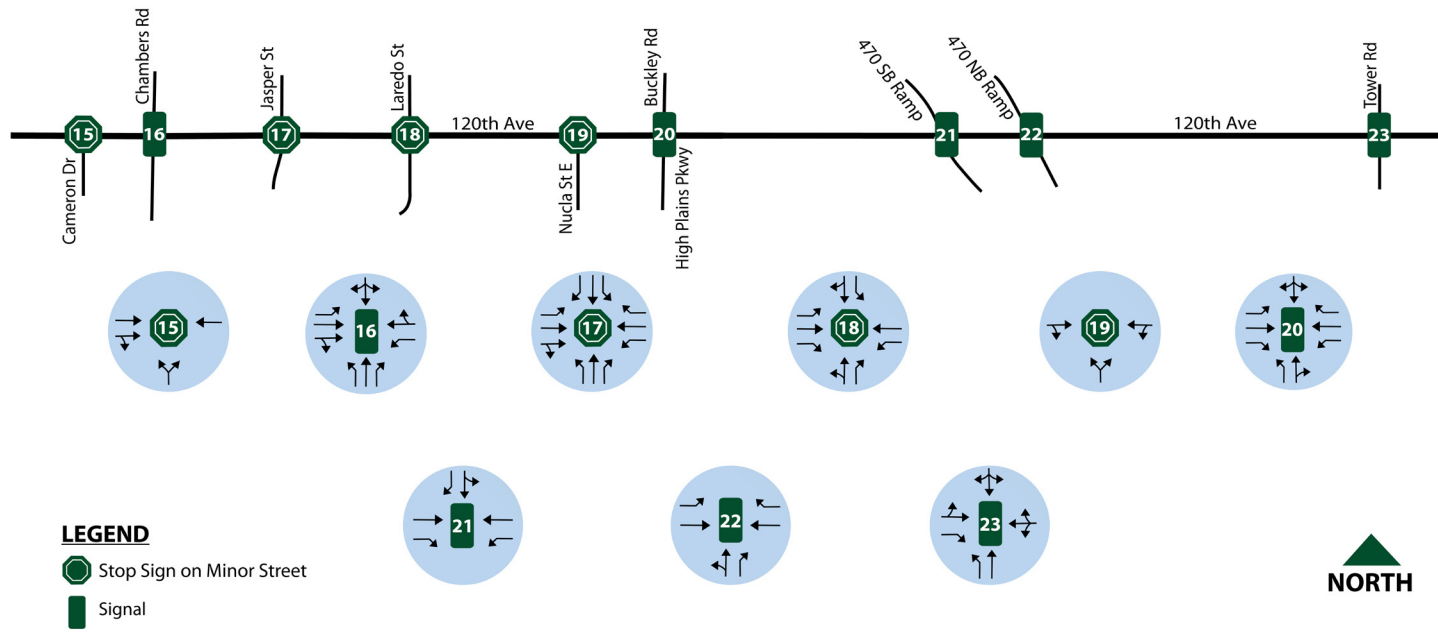


FIGURE 13. EXISTING PEAK HOUR TURNING MOVEMENT COUNTS (1 OF 2)

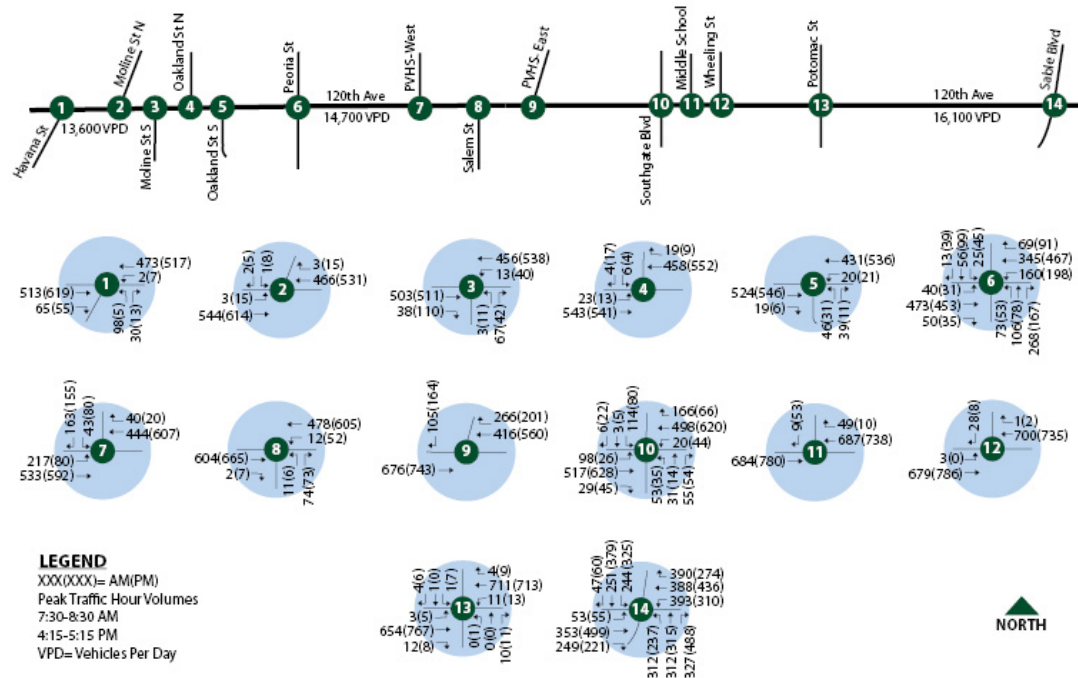
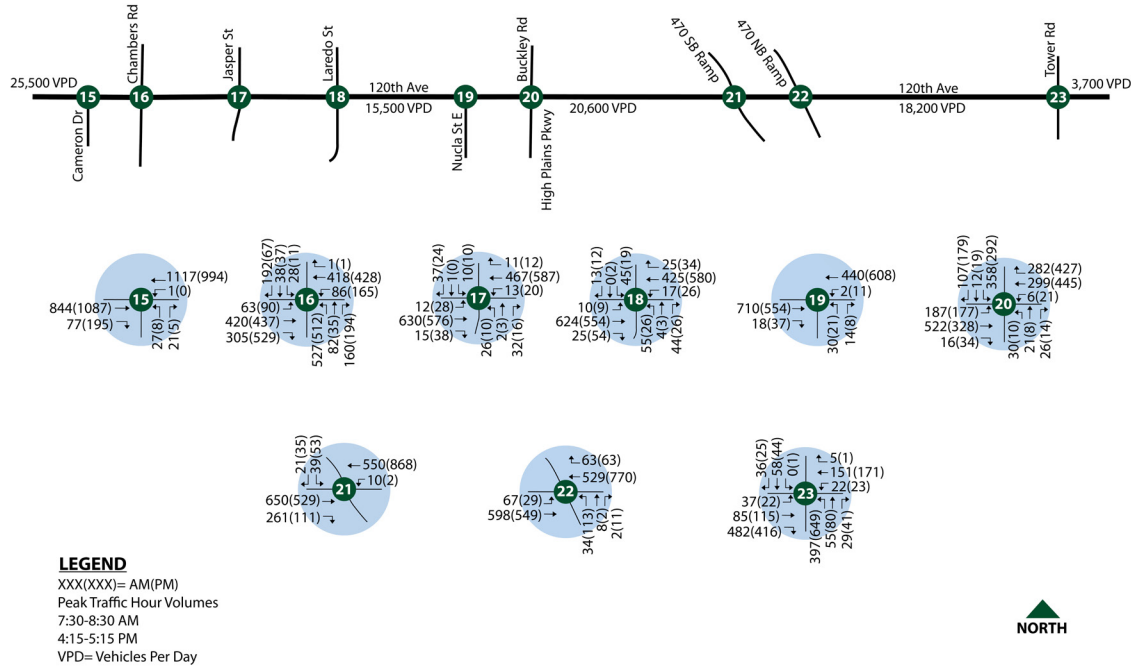


FIGURE 14. EXISTING PEAK HOUR TURNING MOVEMENT COUNTS (2 OF 2)



Existing Operations

Existing traffic operations were evaluated using Synchro, version 11. The following sections outline the results of the stop controlled and signalized intersection-controlled analysis.

Stop Controlled Intersection LOS

LOS and volume-to-capacity (v/c) ratios were calculated for the worst-case movement at the unsignalized study intersections along 120th Avenue (Table 9). Six of the fifteen stop-controlled intersections operate at LOS E or worse during at least one of the peak periods. However, none of the intersections operate with a v/c worse than 0.9, indicating that long queues should not develop for these movements.

Signalized Intersection LOS

Level of service for signalized intersections within the project area were calculated. However the results for some of the signalized intersections did not accurately represent what was observed during the initial field visit for this project. A second field visit was conducted on February 13, 2024, to confirm the analysis. Field observations suggested that corridor operations are worse than calculated at the intersections of 120th Avenue with Peoria Street, Southgate Boulevard, and Buckley Road.

- Peoria Street - Multiple cycle failures were observed during morning and afternoon peaks. Inefficiencies in signal detection and timing, along with constrained geometric conditions for turn movements contribute to the poor operations and long queues blocking access to adjacent lanes.
- Southgate Boulevard - Passenger loading and unloading at Prairie View Middle School queues onto 120th Avenue and blocks adjacent traffic lanes. Multiple cycle failures were observed during morning and afternoon peaks within the school's release time.
- Buckley Road - Queues from westbound right, southbound left, and eastbound left turn traffic create blockages for the through movements. This resulted in multiple cycle failures during the morning and afternoon peaks.

TABLE 9. EXISTING STOP-CONTROLLED INTERSECTION LOS

#	Intersection	AM			PM		
		Movement	LOS	v/c	Movement	LOS	v/c
1	Havana Street	NB	E	0.56	NB	C	0.07
2	Moline Street North	SB	B	0.01	SB	B	0.04
3	Moline Street South	NB	B	0.14	NB	B	0.13
4	Oakland Street North	SB	B	0.03	SB	B	0.05
5	Oakland Street South	NB	C	0.2	NB	C	0.13
7	PVHS-West	SB	E	0.4	SB	D	0.47
8	Salem Street	NB	C	0.22	NB	C	0.22
9	PVHS-East*	SB	A	0	SB	A	0
11	PVMS Entrance	SB	B	0.03	SB	B	0.12
12	Wheeling St	SB	C	0.09	SB	C	0.03
13	Potomac St	SB	D	0.04	SB	E	0.12
15	Cameron Drive	NB	F	0.63	NB	F	0.22
17	Jasper St	NB	D	0.23	SB	E	0.1
18	Laredo St	SB	F	0.43	SB	D	0.23
19	Nucla Street	NB	D	0.22	NB	C	0.12

*Field observations revealed illegal southbound left turns causing queuing along 120th

Table 10 shows intersection delay at the remaining signalized intersections along 120th Avenue. The intersections described above have been identified as having a LOS 'F' based on field conditions. At signalized intersections where a LOS 'E' or 'F' is reported, intersection lane improvements are required per Adams County standards.

The calculated LOS results indicate the remaining signalized intersections currently operate at acceptable levels of service except for Chambers Road. Currently, the north leg of the intersection is a half-street and the resulting split signal phasing contributes to the poor LOS.

Aside from the E-470 Ramp terminals and the Buckley Road intersection, only basic traffic signal controller settings and no time-of-day plans were provided for the corridor intersections. Traffic signal optimization tools available in Synchro were therefore used to estimate cycle length and splits. At locations where overall intersection LOS is 'D' or better, small timing changes may improve the operations of individual movements.

TABLE 10. EXISTING SIGNALIZED INTERSECTION LOS

#	Intersection	AM		PM	
		Delay (sec)	LOS	Delay (sec)	LOS
6	Peoria Street	-	F*	-	F*
10	Southgate Boulevard	-	F*	-	F*
14	Sable Boulevard	35.4	D	36.1	D
16	Chambers Road	71.8	E	89.5	F
20	Buckley Road	-	F*	-	F*
21	E-470 Southbound Ramp	6.6	A	7.1	A
22	E-470 Northbound Ramp	10.4	B	12.6	B
23	Tower Road	32.4	C	31.8	C

*Based on field observations

Reference

- Executive Order (EO) 12898, 1994. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations". Executive Order, Federal Register. February 16, 1994.
- Colorado Department of Public Health, 2022 (CDPHE). "Frequently asked questions". CDPHE EnviroScreen Environmental Justice Mapping Tool. [EnviroScreen FAQ English](#)
- Colorado Natural Heritage Program (CNHP), 2022. "Colorado Rare Plant Guide." Available at: <https://cnhp.colostate.edu/rareplant/master-list/>. Updated April 2022.
- Colorado Natural Heritage Program, 2024, "Colorado's Conservation Data Explorer," Colorado Natural Heritage Program. Available at: <https://cnhp.colostate.edu/maps/codex/>. Accessed January 2024.
- Council on Environmental Quality (CEQ), 1997. "Environmental Justice: Guidance Under the National Environmental Policy Act". Council on Environmental Quality. https://www.energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-EJGuidance.pdf