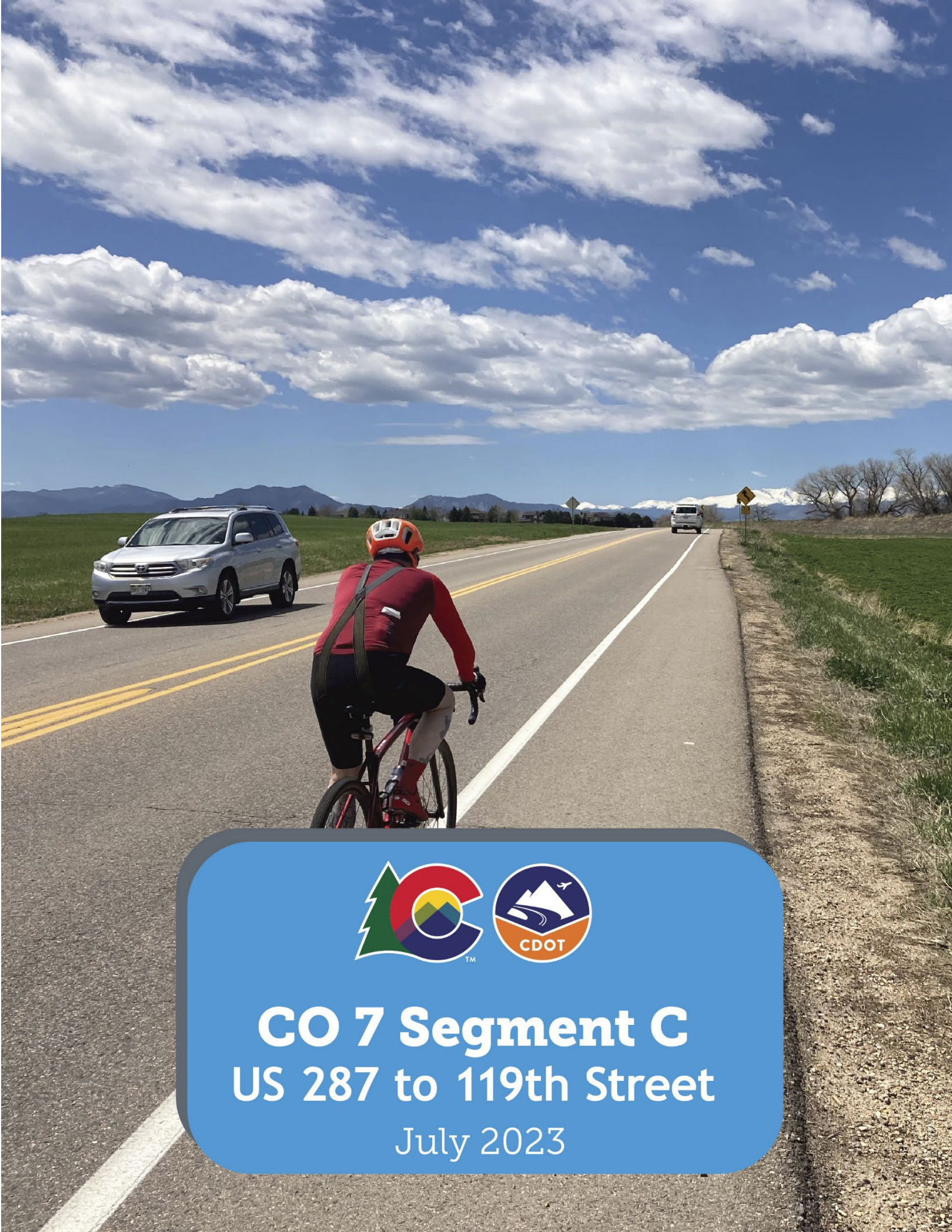

CO 7 Segment C

US 287 to 119th Street

July 2023

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

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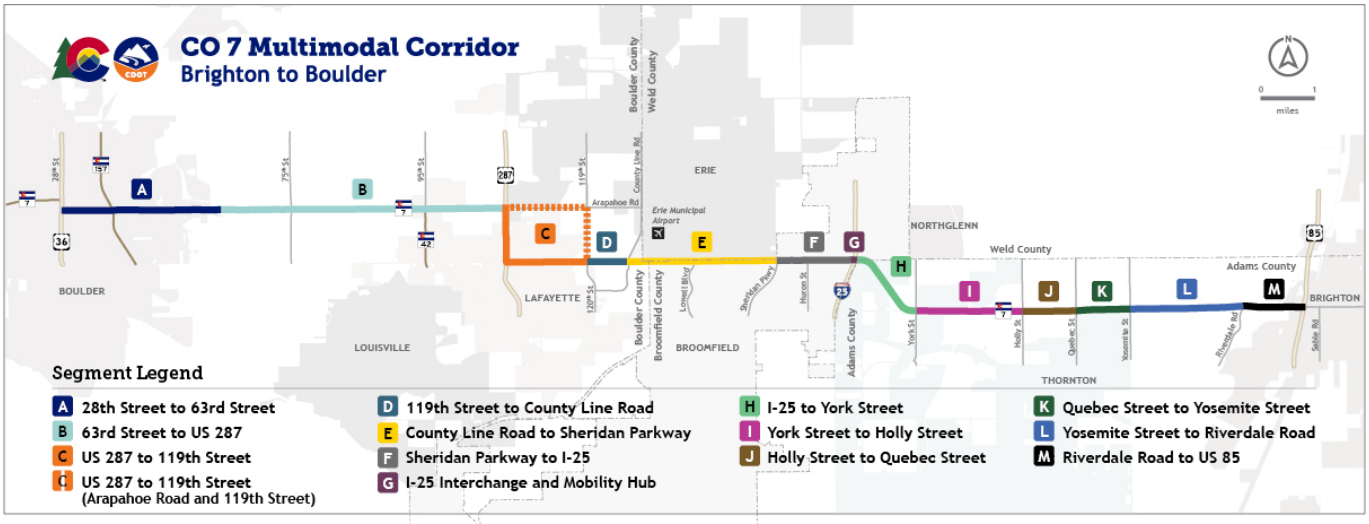
1. Introduction

Colorado State Highway (CO) 7 is a major east/west regional route connecting the northern Denver metropolitan communities. CO 7 is approximately 25 miles between US Highway 36 (US 36) in the City of Boulder and US 85 in the City of Brighton. CO 7 provides access to many major north-south routes, including US 36, US 287, Interstate 25 (I-25), and US 85.

Numerous studies and plans have been completed for CO 7, most recently the 2021 CO 7 Corridor Development Plan (CDP). The CDP establishes 13 segments of the highway, named A through M, as shown on **Figure 1.** The segments are at different phases of planning and design. The CDP recommended completing a concept study to further evaluate necessary multimodal improvements for Segment C. The Segment C Concept Study, which focuses on Arapahoe Road between US 287 and 119th Street, and on 119th Street between Arapahoe Road and CO 7 (Baseline Road), is an outcome of the CDP and is informed by the 2014 SH 7 Planning and Environmental Linkages (PEL) Study (US 287 to US 85). The Northwest Area Mobility Study (NAMS) established CO 7 as an important Bus Rapid Transit (BRT) corridor connecting downtown Boulder to downtown Brighton.

Figure 1. CO 7 Corridor Segment Map



Before the CDP, the PEL Study established a vision and recommended infrastructure improvements for CO 7 between US 287 in Lafayette to US 85 in Brighton. The PEL recommended three parallel routes to handle the increasing regional travel demand between the City of Boulder and CO 7 east of Lafayette while recognizing the physical constraints of CO 7 through the City of Lafayette between US 287 and 119th Street. The three parallel routes include South Boulder Road, Baseline Road, and Arapahoe Road.

The Segment C Concept Study, therefore, focuses on evaluating and recommending multimodal transportation improvements for the northern parallel route, Arapahoe Road between US 287 and 119th Street, and 119th Street between Arapahoe Road and CO 7 (Baseline Road) as shown on **Figure 2**. Although this study focuses on the northern parallel route, it was analyzed in the context of all three roads to ensure alternatives for the northern route work effectively for the overall regional travel shed.

CO 7 Segment C
US 287 to 119th Street
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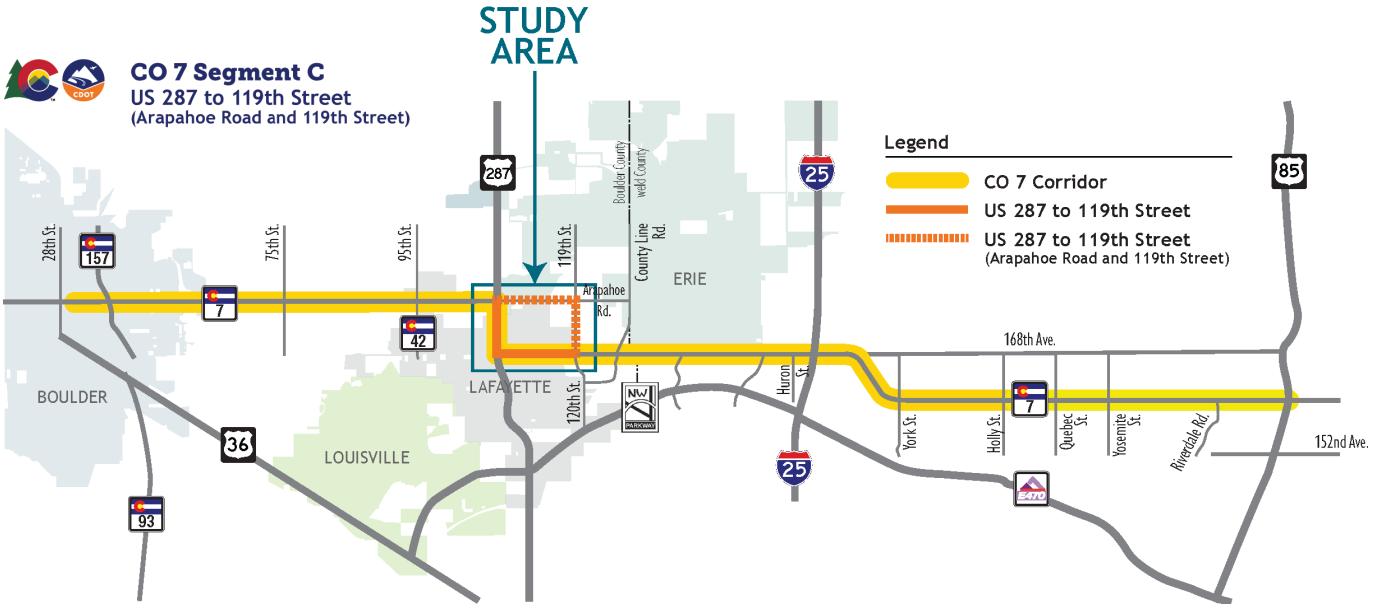
Figure 2. CO 7 Segment C Context Map



Study Area Overview

Segment C is located within three jurisdictions: Boulder County, the City of Lafayette, and the Town of Erie, as shown on **Figure 3**. The land use surrounding Segment C includes agricultural land, low- to mid-density residential neighborhoods, open spaces and parks, and a few commercial developments on the east side of the Arapahoe Road and US 287 intersection. Additional low-density residential neighborhoods are currently being built east of 119th Street in the Parkdale neighborhood of Erie.

Figure 3. CO 7 Segment C Alignment

Related Plans and Studies

CDOT and key stakeholders have completed several studies and planning efforts over the past decade that directly influence Segment C. The following section summarizes the recommendations from these relevant plans specific to Segment C in addition to the CDP and the PEL.

The following related plans and studies were referenced:

- Northwest Area Mobility Study (NAMS)
- State Highway 7 Bus Rapid Transit (BRT) Feasibility Study
- CO 7 Bike Treatment Plan
- Boulder County Transportation Plan
- Erie Transportation Plan
- Lafayette Multimodal Transportation Plan
- CO 7 and 119th Street Intersection Final Design
- Arapahoe Road and 111th Street Intersection Design
- US 287 BRT Feasibility Study

The Existing Conditions Report, **Appendix B**, includes summaries of all of these plans and studies.

Process Overview

The Segment C Concept Study took approximately 14 months to complete and consisted of five primary tasks, as described chronologically below. The development, evaluation, and recommendation of transportation improvements were closely coordinated with local and regional stakeholders and informed by public feedback.

- **Chapter 2** describes the ways in which stakeholders and the public were meaningfully engaged in the process. Key stakeholders for Segment C include Boulder County, the City of Lafayette, the Town of Erie, and the Regional Transportation District (RTD).
- The study process began with the evaluation of existing and forecasted future conditions. **Chapters 3** and **4** summarize the existing and anticipated future conditions.
- The development of alternative concepts and possible alternatives was guided by a series of "Corridor Needs." These six needs communicate the deficiencies and challenges the project sought to address and are described in **Chapter 5**.
- **Chapter 6** describes the alternatives development and two-tier evaluation process.
- The process culminated in a series of recommended improvements and an implementation plan for next steps described in **Chapter 7**.

2. Public Engagement

Of the broader CO 7 Corridor Study, Segment C was the first to launch publicly in February 2023. The approach to engagement included key stakeholder and local agency coordination, as well as robust, multi-faceted public communication.

Three unifying themes were identified at the onset of the public engagement planning process and carried throughout the project:

1. To broadly inform those who live or work near CO 7 and who travel along Arapahoe Road and 119th Street about the study and opportunities for meaningful engagement.
2. To ensure that key messaging acknowledged and validated public input from past planning efforts.
3. To ensure that all modes of travel were presented equally for input.

Outreach occurred in three distinct phases to gather feedback that the project team could turn into action – ensuring that the final study recommendations are representative of the mobility needs of the local community members and traveling public. The project team deployed a multi-faceted strategy for in-person and online engagement tools to collect input.

A detailed summary of each phase of engagement is provided and key findings can be found throughout the report to supplement technical findings and recommendations. **Appendix A** provides a detailed summary of public input and comments.

Phase 1: Inform and Consult

Timing

Phase 1 of outreach for Segment C launched the week of February 6, 2023. This phase was anchored by an online public survey in addition to other digital communication and concluded on March 12.

Goals/Outcomes

The goal of Phase 1 was to make local and regional travelers aware of the study, to frame it within the context of the entire CO 7 corridor study, to acknowledge and show how past input was being put into action, and to better understand public experiences, values, and future desires.

Methods

To accomplish the first goal of awareness, the project team developed an introductory video highlighting the regional significance of Segment C in improving travel experience and connecting communities from Boulder to east of Lafayette in the future. This short one-minute video was designed to quickly educate and capture attention. Segment C also had a dedicated project page on the CDOT website where the video was hosted, along with links to the public survey.

A public survey was marketed alongside the project video and was developed to capture input that would inform alternatives, validate past input, and prioritize initial findings unique to Segment C. The survey was carefully crafted to avoid mode-vs-mode while allowing for prioritization and grounding the importance of all corridor needs. To provide further context and depth of understanding, the survey included a five-minute video that thoroughly explained each of the draft corridor needs so that participants could make informed decisions as they answered the last several questions of the survey. The survey was translated and offered in Spanish.

CO 7 Segment C
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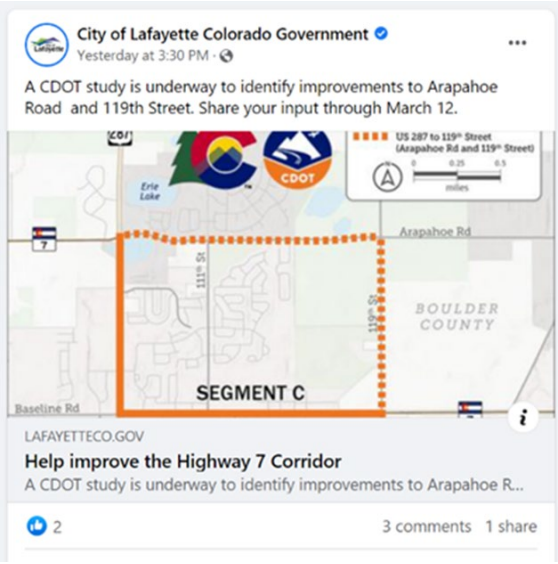

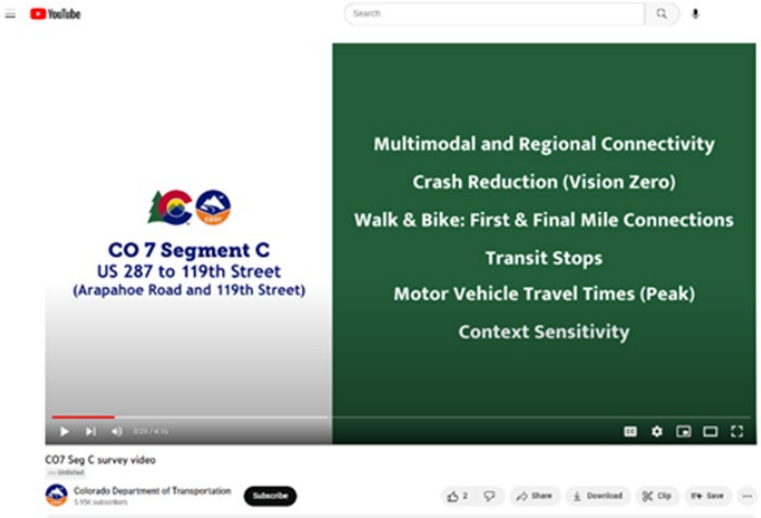

The project team partnered closely with staff and public information officers (PIOs) from the Town of Erie, the City of Lafayette, and Boulder County to spread the word and attract participation in the survey. Agencies relied heavily on their social media and website channels, as well as utility bills, e-newsletters and more. Posts were engaged with and yielded excellent participation.

Key Findings of Phase 1

447 people responded to the survey; **3,067** YouTube views of the draft corridor needs video; Social promotions reach of more than **14,000** with strong levels of engagement through comments, likes, and shares

The following list summarizes responses. Themes and detailed results are shown in **Appendix A.**

- Respondents participated from Lafayette (45%) and Erie (55%).
- Respondents indicated their most common destinations to be very local within Lafayette, Boulder, and Erie, but also traveled to Louisville, Longmont, Broomfield, and Denver.
- Most indicated choose to drive alone when traveling to work or school.
- For non-work-related travel, respondents indicated that they prefer to drive, carpool, bike, walk, or some combination of the previous modes
- Many indicated that daily travel takes longer than it has in the past but is somewhat predictable.
- Many expressed that they do not feel safe when biking/walking.
- In-line with previous public input, respondents agreed with the need to improve access to transit, as well as bike and pedestrian improvements.
- Most respondents indicated that signal timing and intersection improvements would ease congestion along Arapahoe Road and 119th Street.
- Many open comments highlighted frustration with facilities not currently accommodated, growth, and development in the region.

CO 7 Segment C
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Phase 2: Inform and Collaborate

Timing
Phase 2 launched April 12 and remained open through May 5, 2023. The condensed project timeline helped to maintain momentum and consistency in messaging. Phase 2 was anchored by an online commenting map and an in-person outreach event.

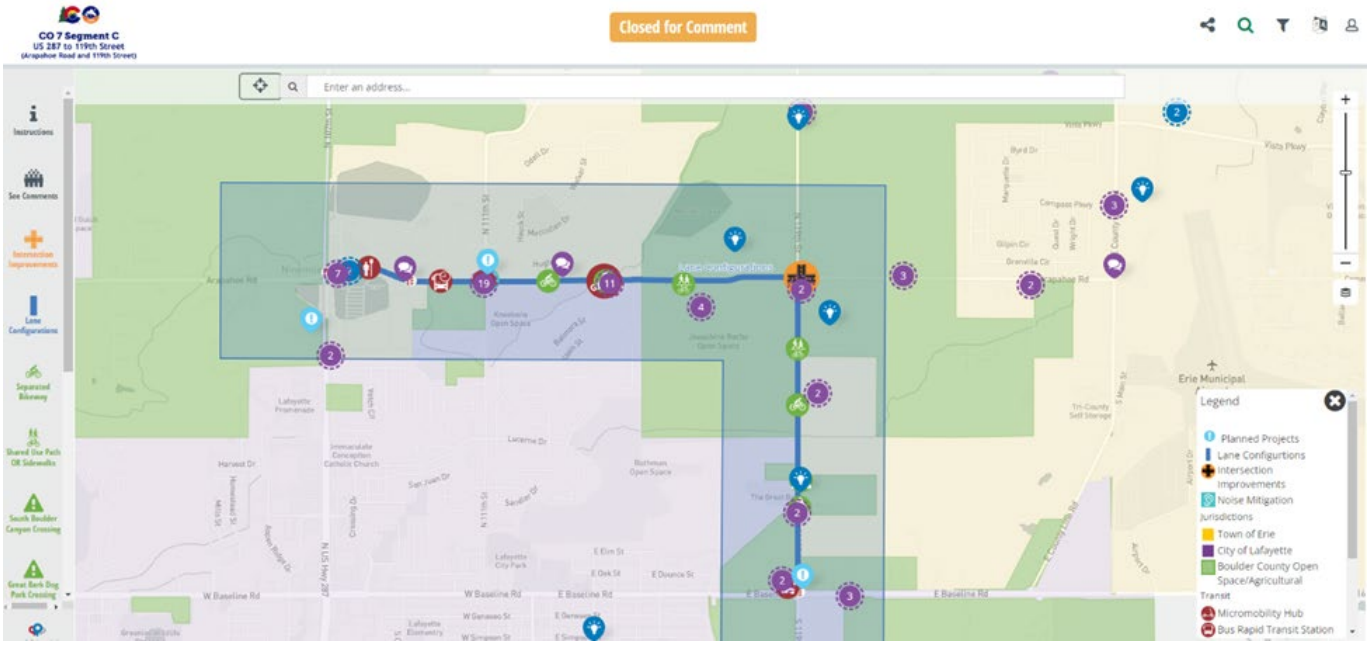
Goals/Outcomes
The goal of Phase 2 was to show how Phase 1 input was used to develop "project ideas" or alternatives. A secondary goal was to continue to educate any participants who may not have engaged with the first phase and to reinforce the regional significance of Segment C within the broader corridor. Additionally, it was critical in Phase 2 to educate the public about tradeoffs and community context.

The team carefully crafted messaging and content that highlighted the impact of some project ideas and set future expectations. The outcome of Phase 2 was to understand what project ideas the public was most interested in to inform a final alternative that had a combination of elements that represent public needs.

Methods
In mid-April, the online commenting map launched. The map featured project ideas by category, as well as roadway cross sections and intersection configurations. Participants were able to provide open-ended comments. They were able to explore project ideas, which featured an explanation, precedent imagery, and the ability to like/dislike project ideas or to vote on preferred ideas in locations with multiple options. Within the first week, more than 1,000 map interactions were received.

The project team also went to the community, hosting a booth at the Erie Earth Day event. Most attendees stopped by the booth that featured boards mirroring the online map. To actively engage in a similar fashion to the online activity, event attendees placed dots on boards to indicate preferences and had an opportunity to place sticky notes for open-ended comments.

Again, partnership with local agency staff and PIOs resulted in two successful and meaningful engagement opportunities.



Note: During Phase 2, Town of Erie staff engaged with local homeowners associations with support from the project team to present and foster conversations about the study. Comments, input, and summaries of those conversations are available in **Appendix A**.

Key Findings of Phase 2

More than **300** participants provided **1,703** survey responses

On average, each respondent engaged with approximately **8** project ideas on the map.

70 open-ended comments were captured online.

Social promotions had a reach of more than **14,000** with strong levels of engagement through comments, likes and shares.

158 dots were placed on the boards at the event and most attendees engaged in conversations about several project ideas. In-person responses at the event were similar to those captured online and are included in the following summary. The survey, results, and open-ended responses can be found in **Appendix A**.

- Respondents prefer the two-lane configurations.
- Most indicated a preference toward a roundabout vs. traditional intersection improvement.
- Bike and pedestrian improvements received the greatest number of responses, indicating a strong community desire for these enhancements.
- Respondents preferred separation for shared use paths and bikeways over on-street bike facilities.
- Respondents had varied sentiments for transit enhancements, with most indicating a desire for bus rapid transit and bus stop enhancements. Conversely there was a strong sentiment against a micromobility hub and bus priority signals.
- Respondents were in favor of noise mitigation along Arapahoe Road.
- Open-ended comments indicated a strong desire for safety improvements, bike and pedestrian facilities, transit access, and easing congestion.
- Many open-ended comments expressed frustration with growth and development and the lack of capacity on current facilities.

Phase 3: Inform

Timing

In June 2023, the final recommendations were presented to the community through project webpage updates marketed through local agency communication channels.

Goals/Outcomes

Critical to this final phase is to show how public input shaped the final recommendations, to reinforce the regional significance, to frame limitations and challenges and tradeoff decisions that were made, to present the final recommendations as optimized improvements that minimize impacts and to set the stage for what comes next. The outcome of Phase 3 is for local agencies to be well-prepared for next steps and for the community to understand that this is the first step toward future regional travel enhancements.

Methods

The final recommendation was developed into a concept map and presented on the project webpage. Key messaging was also distributed through the local agency social media and website platforms. It was provided to the local agencies to continue conversations with their local constituents.

Engagement with Local, Regional, and State Agencies

Foundational to the success of this study was engagement and coordination among CDOT, Town of Erie, City of Lafayette, Boulder County, and RTD. Representatives from each agency participated on the project team and will continue to coordinate during the further development of concepts and implementation of future improvements.

Key Findings Phase 1	Key Findings Phase 2
Phase I input validated draft corridor needs highlighting a strong community desire to improve regional connectivity and enhance multimodal options. The project team used this information to focus project ideas on roadway and intersection enhancement ideas and a variety of bike, pedestrian, and transit improvements. The project team began to formulate a variety of alternatives and project ideas.	Phase 2 stakeholder conversations highlighted the importance of context sensitivity. The project team presented more than a dozen ideas for improvements from transit and bike-ped to roadway and intersection improvements. This offered the community a chance to explore each idea and provide input. This feedback helped the team to refine a final recommendation that addresses corridor needs and is a reflection of what the community values most.

3. Existing Conditions

An inventory of Arapahoe Road between US 287 and 119th Street and 119th Street between Arapahoe Road and CO 7/Baseline Road was completed to understand how the current corridors serve eastern Boulder County and the communities of Lafayette and Erie. Data were collected primarily from CDOT, Boulder County, the City of Lafayette, and the Town of Erie. Other sources included Denver Regional Council of Governments (DRCOG), Google Earth aerial overview, and Google Street View. New traffic counts were also collected.

The inventory included roadway characteristics (e.g., number of travel lanes, location of traffic control devices, posted speed limit), an inventory of multimodal facilities (e.g., bicycle lanes, sidewalks, trail crossings), a traffic operational analysis, a safety analysis, and information on current and future transit service and amenities. Highlights of the current conditions are presented in the following section and the full Current Conditions Report is included in **Appendix B**.

Land Uses

The land use surrounding Segment C includes agricultural land, low- to mid-density residential neighborhoods, open spaces and parks, and a few commercial developments, as shown on **Figure 4**. The Town of Erie manages two-thirds of the Arapahoe Road segment, with Boulder County managing only a small section on Arapahoe Road. 119th Street is under the jurisdiction of the Town of Erie. **Figure 4** shows land uses and zoning from Boulder County, the City of Lafayette, and the Town of Erie. The Town of Erie is currently updating their Comprehensive Plan and land use designations.

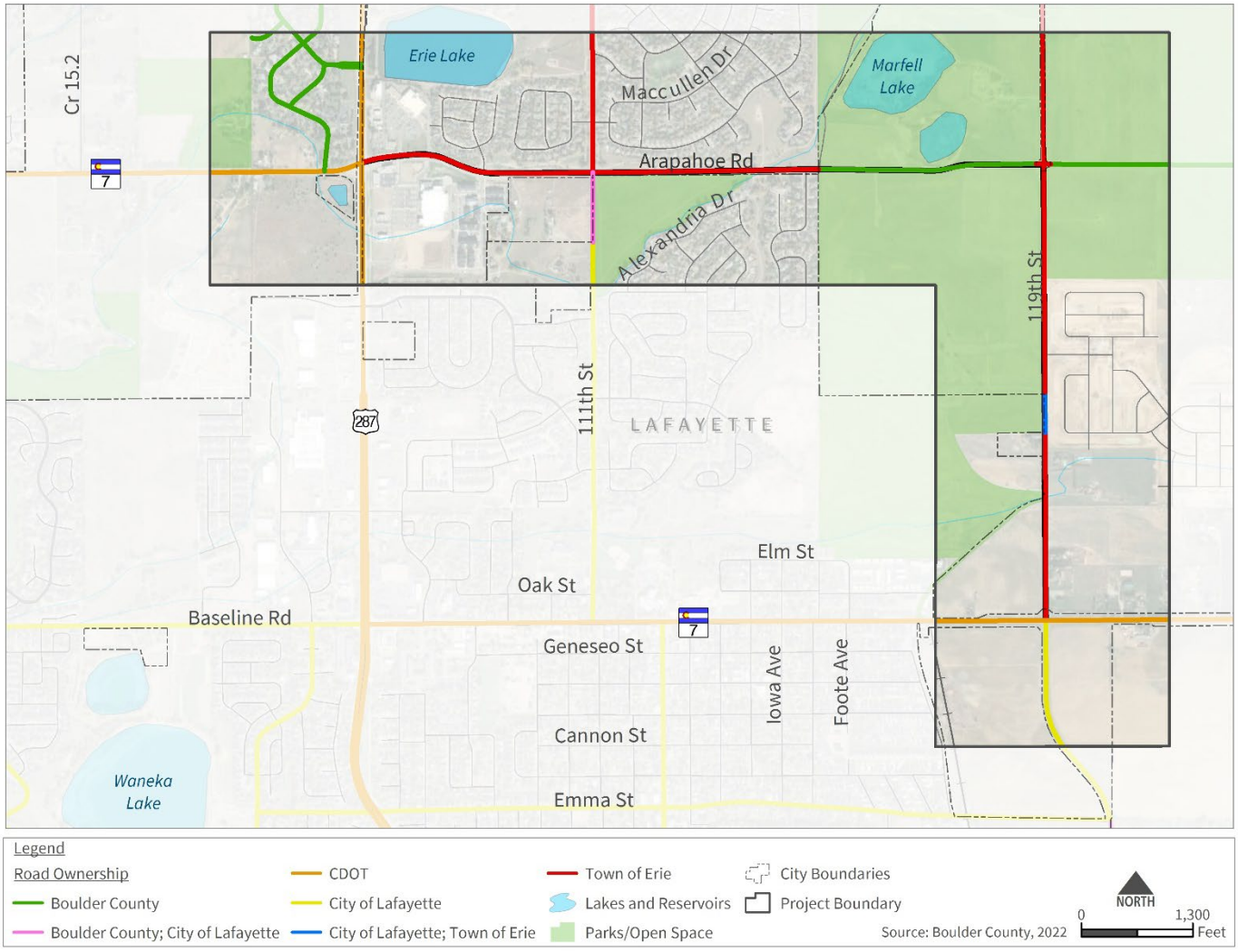
The new Nine Mile mixed use project (southeast quadrant of US 287 and Arapahoe Road) and planned uses in Lafayette at US 287 are envisioned as transit-ready developments that will become transit-oriented areas when BRT services arrive in the next 7 to 10 years. This includes new commercial uses and 308 apartments in Erie at the southeast corner of US 287 and Arapahoe. The Town of Erie has currently zoned this area as Planned Development (PD). Zoning could change based on the results of the Comprehensive Plan update. The commercial anchors include a Safeway in the Arapahoe Ridge commercial area and a 103,000-square-foot Lowe's Home Improvement center, and under construction is a King Soopers grocery store.

Heading east on Arapahoe Road, the corridor is surrounded by single family residential developments on both the north and south sides. Land remains undeveloped and zoned by Boulder County as Agricultural or Rural Residential approaching the intersection of 119th Street. Most land uses adjacent to 119th Street are zoned Low/Rural residential by the Town of Erie and Boulder County, except for a small public park and a segment zoned as Development Resource (DR) by the City of Lafayette. Land east of 119th Street, which is zoned as low-density residential by the Town of Erie, is currently under development (Parkdale). This new development will include 455 units on 218 acres (density of 2.1 dwelling units per acre), with direct access onto 119th Street.

The following developments proximate to the corridors are currently under review:

- **The Meritage Homes development** south of Arapahoe Road, just west of 111th Street. This 20-acre property was zoned Rural Residential by Boulder County and was recently annexed as Medium-Density Residential by the Town of Erie. It includes a proposed density between 5 to 10 dwelling units per acre.
- **The Silo Subdivision development** on Arapahoe Road, west of US 287. The site is located within the City of Lafayette. It was annexed in May 2016 and currently includes a proposal for 453 single-family and multifamily units on 80 acres of land (5.7 dwelling units per acre).

Figure 4. Road Ownership



Key Findings

- Most of the agricultural and undeveloped land is protected or conserved (conservation easements) by Boulder County as open space. There are also some municipal and some joint municipal and county open space areas. Land around the Arapahoe Road and 119th Street intersection has been designated as Open Space by land acquisition and/or conservation easements. Other large Open Space designations include Kneebone and Lafayette Great Park.
- Land annexations and developments have recently occurred within the corridor study area. Land in proximity to US 287 is expected to be developed in the near future. Similarly, based on zoning regulations, land in proximity to the Baseline Road (CO 7) and N 119th Street intersection is also expected to be developed in the future.

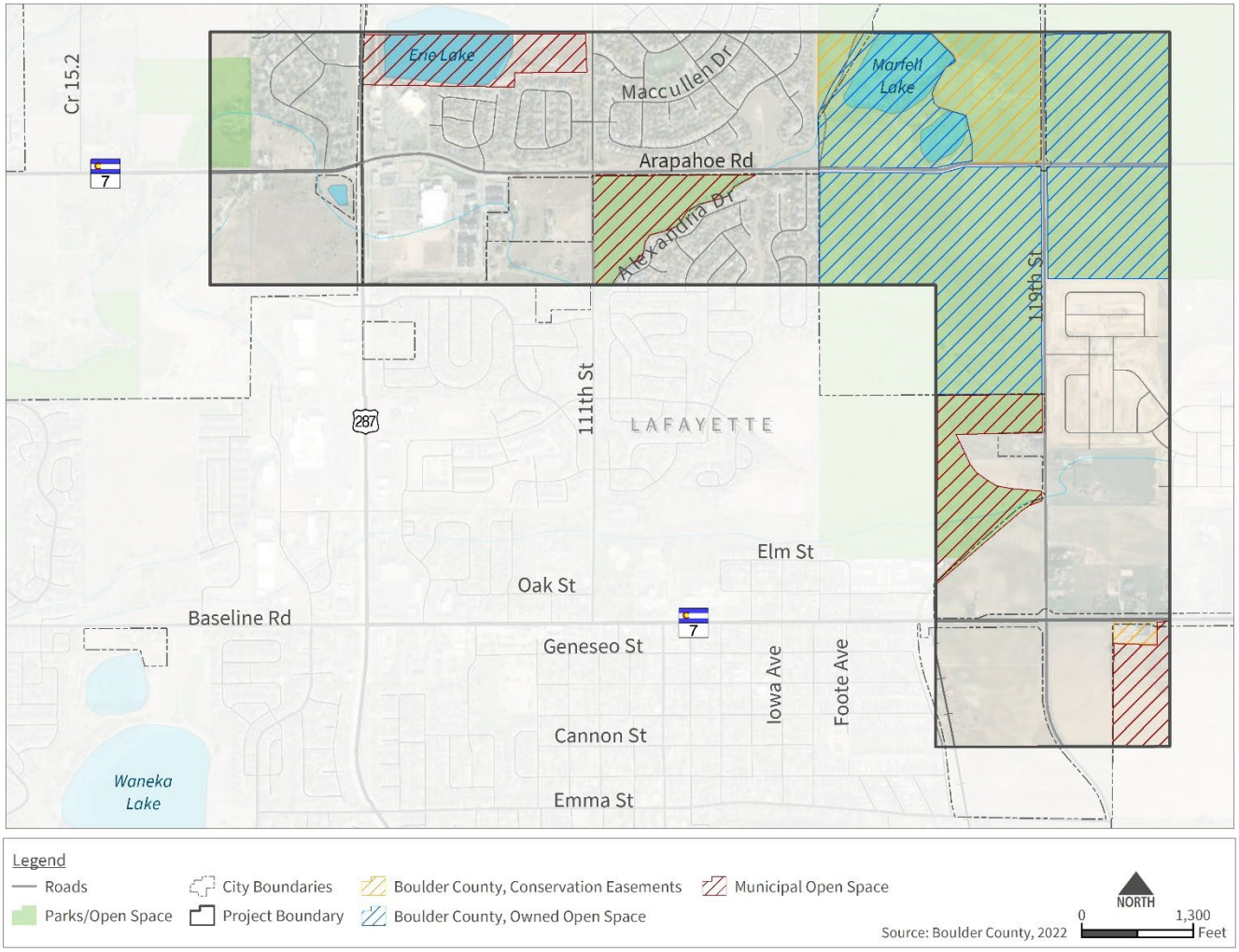
Open Spaces

Boulder County has a long history of protecting Open Space. The County has sought to foster community awareness and support toward the goal of preserving Open Space to conserve wildlife and plant ecosystems, preserve agricultural land, preserve the natural beauty of the surrounding area and prevent sprawl since 1961, when it implemented its first action plan. Throughout the years, the County has acquired land through direct purchase, leased from other government agencies, established conservation easements for devoting to Open Space, and jointly managed property for devoting it to Open Space. Boulder County has classified most of the unincorporated land in the study area as Open Space. The Town of Erie and the City of Lafayette also have Open Space designations within the study area. **Figure 5** shows these locations on a map. Below are the classifications by type and jurisdiction.

Open Space Designations

- **Boulder County Owned Open Space**: Property owned in its entirety by the County gives the County full management authority over the parcel, except where third parties have pre-existing interests, such as oil and gas leases or utility easements. Includes nearly 500 acres within the corridor.
- **Boulder County Conservation Easements**: Conservation easements remain in private ownership, but the use and development of the parcels are restricted.
- **Municipal Open Space**: These lands are owned and/or regulated by cities and towns in Boulder County. Boulder County does not have authority over municipal Open Space, unless it is a jointly owned property that Boulder County manages. Includes:
  - **City of Lafayette Open** Space, including Kneebone and Rothman
  - **Town of Erie Open Space**, including Erie Lake
  - **City of Lafayette/Boulder County Open Space**, including Waneka Centennial Farm

Figure 5. Open Space



CO 7 Segment C
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Existing Transportation Infrastructure

Typical right-of-way (ROW)

Arapahoe Road
130–200 ft

119th Street
60–70 ft
(some areas approximately 48 ft)

Most constrained section - 119th Street near the Baseline Road/CO 7 intersection

Based on the City of Lafayette parcel data and a desktop review. A more detailed ROW survey will be required when Segment C moves into preliminary and final design to understand the implications to these properties.


Arapahoe Road (looking west) approaching US 287


Arapahoe Road west of 119th Street


119th Street south of Arapahoe Road

Arapahoe Road is an east/west two-lane arterial road with five signalized intersections. It has a recently widened segment with four vehicle through lanes from US 287 to Beasley Drive. This segment is separated by a raised median from US 287 to the commercial center access roads (Safeway) and includes turn lanes onto US 287. From the commercial access roads to Beasley Drive, the travel lanes are separated by a painted median, with turn lanes at Beasley Drive and commercial intersections. Heading east, Arapahoe Road is a two-lane road with left turn lanes at all signalized intersections.

N 119th Street is a two-lane north-south arterial road with two signalized intersections. 119th Street has one left turn lane onto Arapahoe Road and no turn lanes at Baseline Road (CO 7). Lane widths within the study area are 11 feet wide (Arapahoe Road and 119th Street), including turn lanes. Shoulders on Arapahoe Road and 119th Street are typically 3 feet wide.

Access Points and Traffic Control Devices

The corridors include numerous individual access points (14), four stop controlled intersections, and six signalized intersections.

Figure 6 shows the locations of these access points and intersections. Five property access drives on Arapahoe Road and seven property access drives on 119th Street do not have any traffic control devices.

Traffic Signals

Two traffic signals have recently been added to new intersections at Arapahoe Road and the Nine Mile commercial center in the southeast quadrant of US 287 and Arapahoe (Safeway, Lowe's Home Improvement, and other small retailers) and at Arapahoe Road and Beasley Drive, providing access to residential neighborhoods north and south of Arapahoe Road. CDOT manages the traffic signals at the intersections of US 287 and Arapahoe Road and at Baseline Road and N 119th Street. The Town of Erie manages the other traffic signals. The Parkdale development, currently under construction, includes a future signalized intersection with access to 119th Street.

Stop Control

Four intersections include a stop sign for access control, as shown on **Figure 6,** and Lafayette's Great Bark Dog Park access to 119th Street and Hawk Ridge Road, both full movement intersections. There are also two commercial accesses on Arapahoe Road, near the US 287 intersection with only right-in right-out (RIRO) movement allowed.

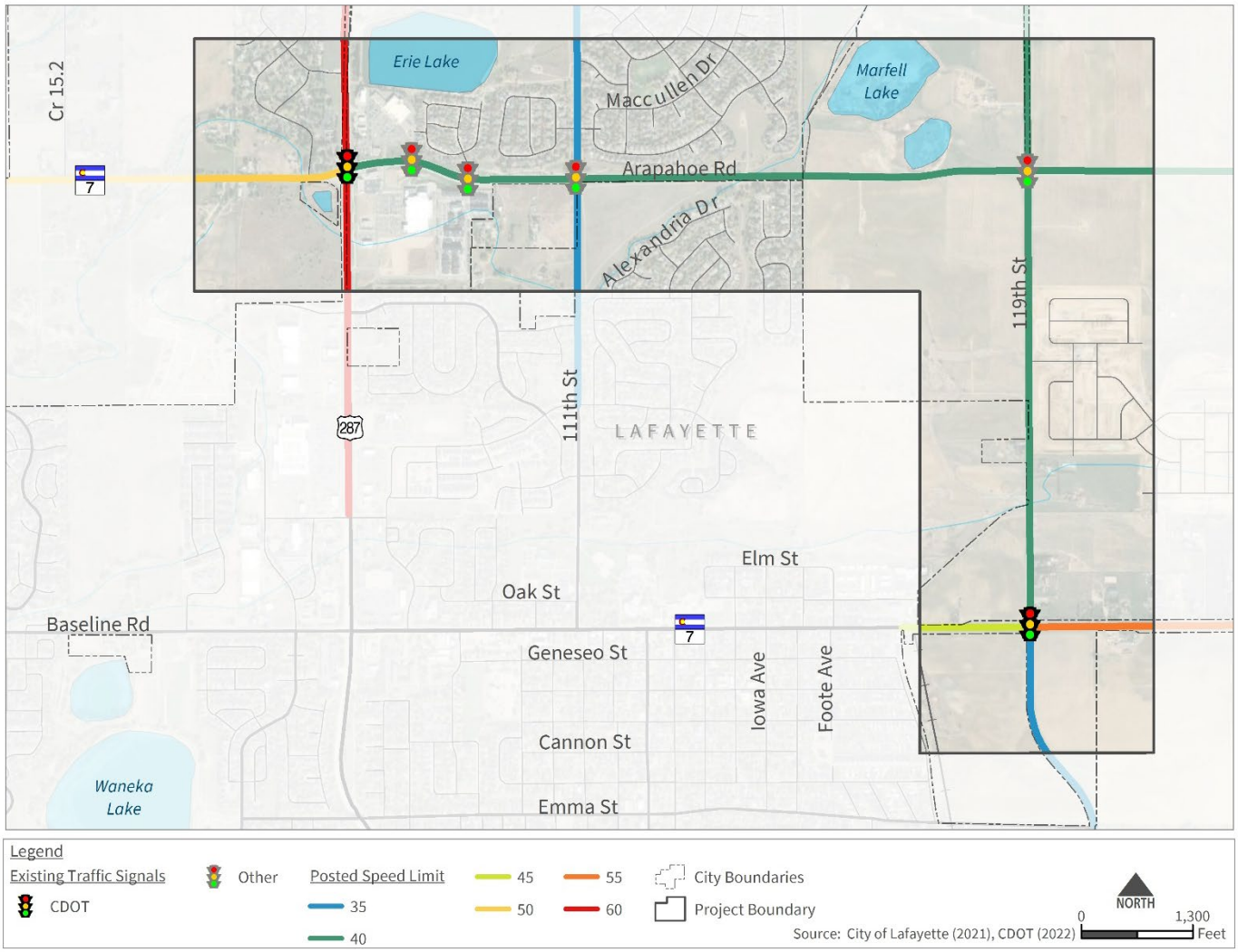
Posted Speed Limits

40 mph (miles per hour) on both Arapahoe Road and N 119th Street, except on the curved segment of Arapahoe Road, where an advisory speed of **30 mph** is posted.

Outside the study area:

50 mph on Arapahoe Road going west (CO 7). **55 mph** on Baseline Road going east (CO 7).

Figure 6. Access Points, Traffic Control Devices, and Posted Speed Limits



Bicycle and Pedestrian Facilities

The current study area is characterized by incomplete and disconnected bicycle and pedestrian facilities; however, sidewalks and trails are often constructed when land is developed. As discussed in the **Land Uses** section, the study area is undergoing significant changes in terms of land use and development, and these new developments are introducing new bicycle and pedestrian facilities.

The north side of Arapahoe Road is the most built-out area along the corridor and includes a paved trail from US 287 to the Town of Erie limits at Hawk Ridge Road. As shown on **Figure 7**, the south side of Arapahoe Road has recently added facilities fronting the Nine Mile development. This development includes wide sidewalks from US 287 to Beasley Drive and crosswalk connections with the north side of Arapahoe Road. Between Beasley Drive and 111th Street, there are no sidewalks on the south side of Arapahoe Road, but a recent development proposal would add paved multiuse trails to this segment. From 111th Street to Hawk Ridge Road, the south side of Arapahoe Road fronts the Kneebone Open Space, and the area is connected through multiuse gravel trails. East of Hawk Ridge Road, there are no pedestrian or bicyclist facilities on the north or south side of Arapahoe Road.

Similarly, all of 119th Street does not have sidewalks or trails along its alignment. The new Parkdale development on 119th, which is currently under construction, has planned sidewalks and trails along its properties fronting 119th Street (under construction as of September 2022).

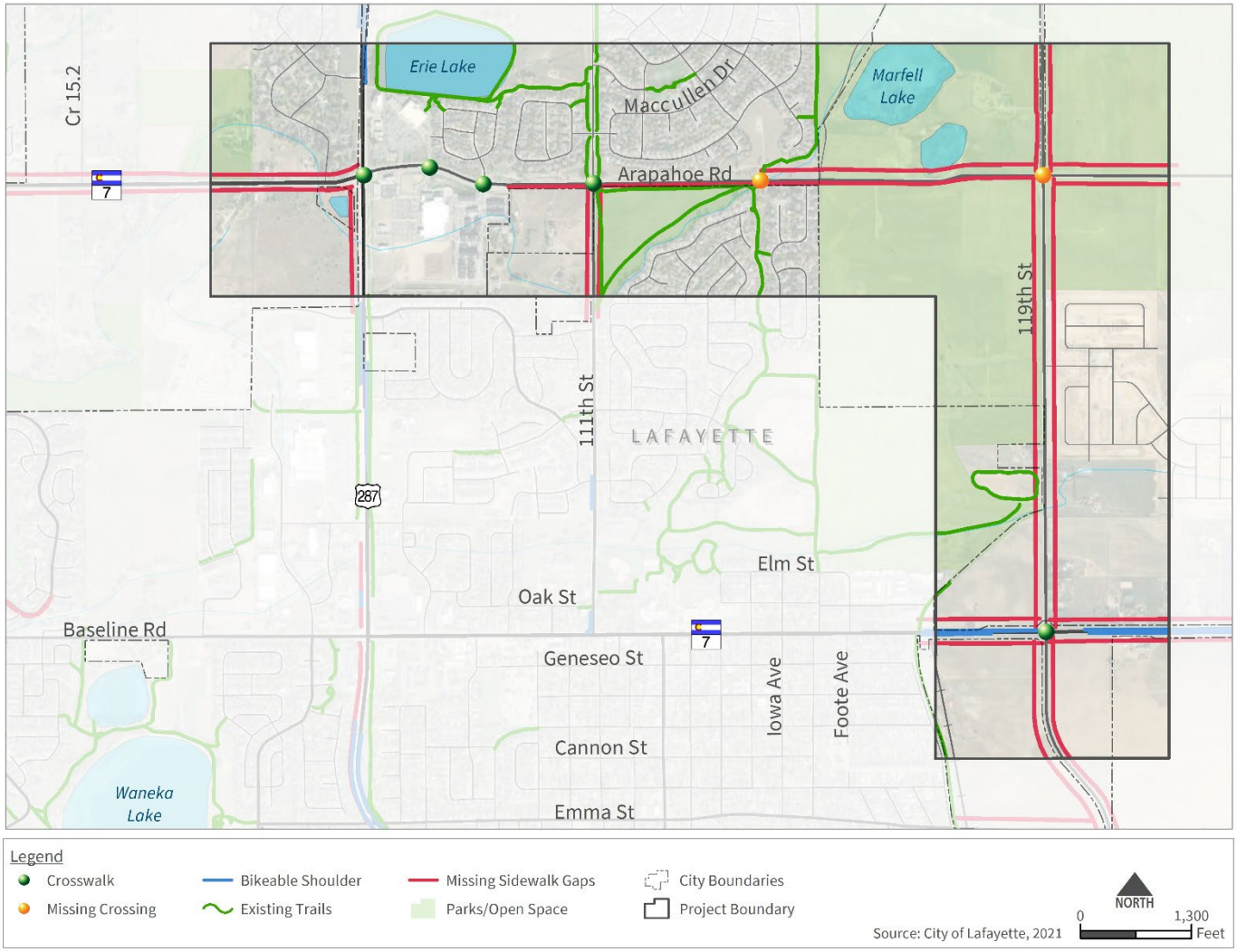
Both Arapahoe Road and 119th Street have 3-foot shoulders, which are not considered adequate for biking. Multiuse trails are bikeable, providing good north to south connectivity across Arapahoe Road and west of the Great Bark Dog park on 119th Street. The South Boulder Trail does not have a designated/protected crossing of Arapahoe Road.

Key Findings

Based on the existing conditions analysis, the following land use and infrastructure changes are anticipated over the next 30 years:

- The Town of Erie manages both Arapahoe Road and 119th Street, with Boulder County managing a small section on Arapahoe Road. There are six signalized intersections within the study area. CDOT manages both intersections on CO 7, with the Town of Erie managing the rest.
- There are several property access roads (14) in addition to two community access roads (Hawk Ridge Road and The Great Dog Park access road).
- There are ROW constraints at certain locations on 119th Street and Arapahoe Road.
- Future development provides an opportunity to define access management, complete missing sidewalks, provide adequate infrastructure to support land use, redefine the appropriate road type to serve the communities' needs and acquire needed ROW at locations with limited space.

Figure 7. Pedestrian and Bicycle Facilities



Safety Analysis

Vision Zero:

A safety approach with the core principle that it is never ethically acceptable for people to be killed or seriously injured when moving within the road transportation system. It switches the responsibility of roadway users to a shared responsibility between system designers and people on the road. DRCOG has adopted *Taking Action on Regional Vision Zero*, a plan that establishes a target of zero fatalities and serious injuries on the Denver region's transportation system.

Roadway safety can be characterized by the ability of a person to travel freely without injury or death. Roadway safety is usually assessed through a qualitative and quantitative evaluation of crash histories by travel mode. This evaluation sheds light on crucial information such as locations with an overrepresentation of crashes, crash types, and crash severity issues.

For this study, safety analyses included reviewing recent crash history, as well as outcomes and goals of the Vision Zero programs established by DRCOG and Boulder County for the Segment C study area. Crash history was collected from the Vision Zero Suite software tool developed by DiExSys, which aggregates crash records from databases of several jurisdictions in Colorado.

172 crashes between 2015 and 2019 at signalized intersections within the study area, as depicted on **Figure 9**.

Arapahoe Road & US 287 intersection identified as the location with the highest crash frequency.

120 property damage only (PDO) crashes

51 injury crashes (INJ)

1 fatal crash (FAT)

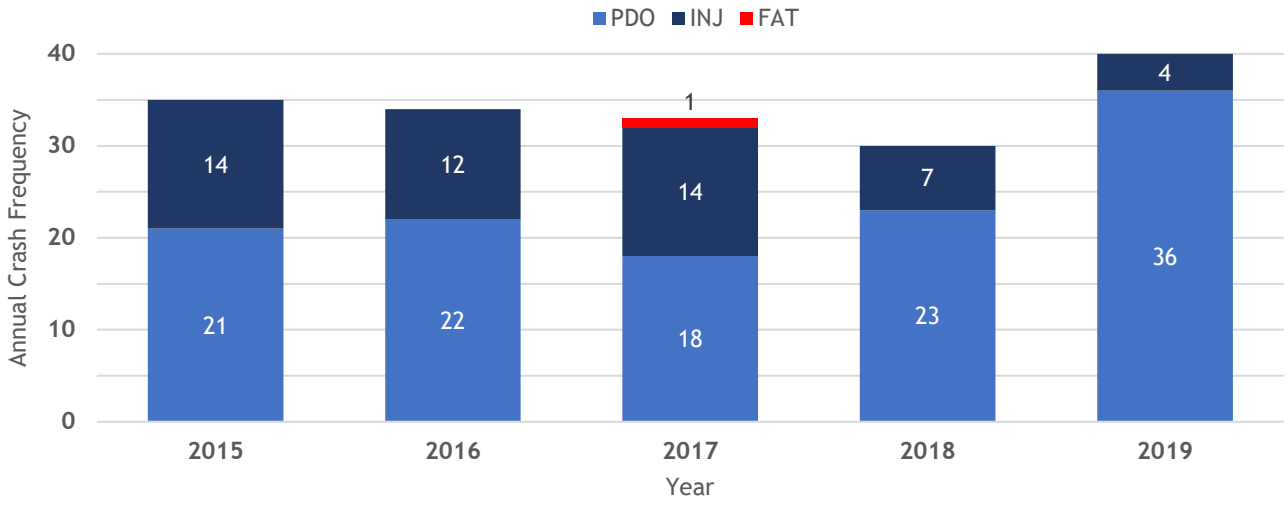
34 crashes from 2015 to 2017

30 crashes in 2018

40 crashes in 2019 as depicted on **Figure 8**

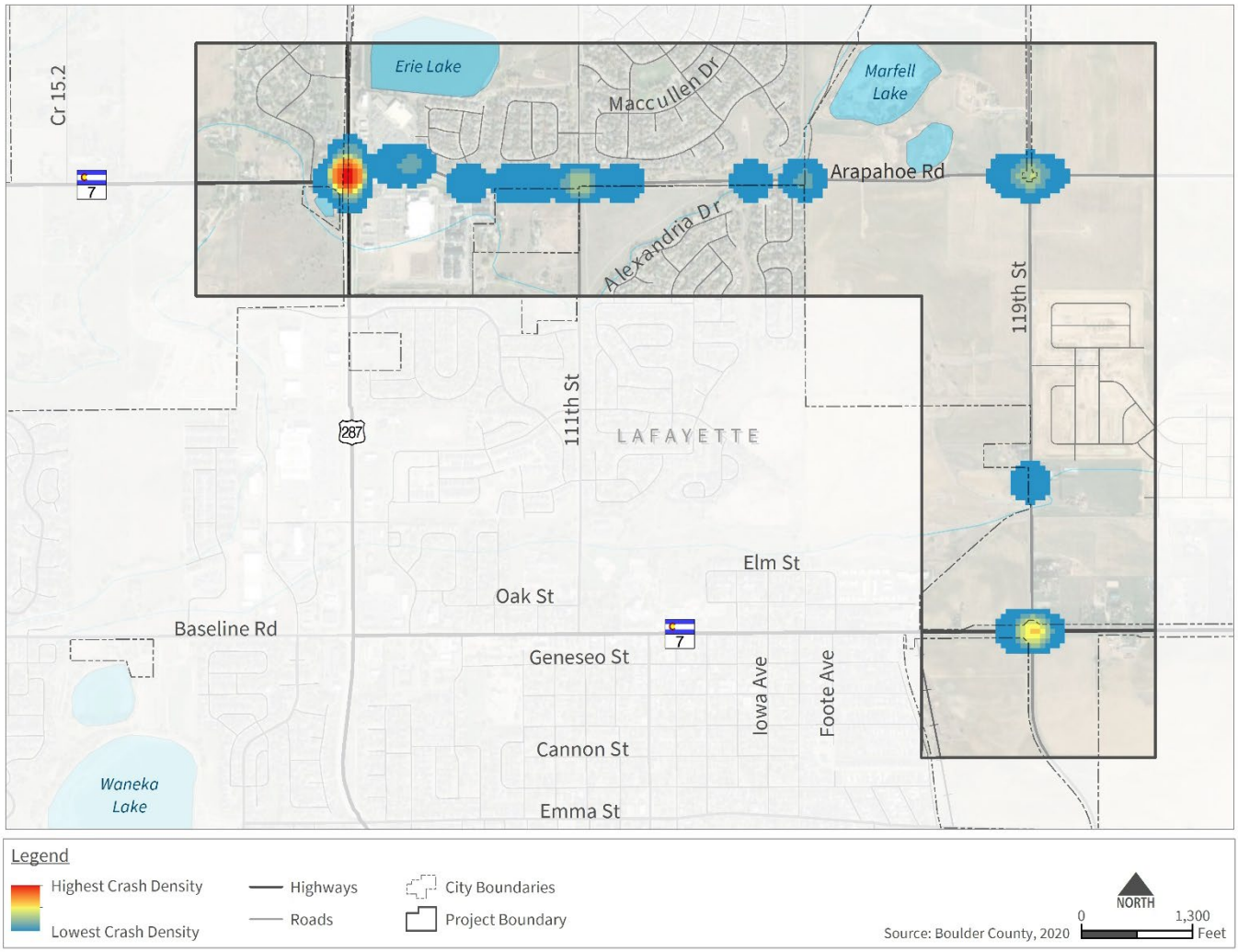
13 severe crashes (INJ and FAT) per year from 2015 to 2017

Figure 8. Reported Crashes by Year on Segment C



Source: DiExSys Vision Zero Suite (2015-2019)

Figure 9. Crash Density Map



Source: Boulder County 5-yr crash data (2015-2019)

Intersection Crash Rates

To understand the relative frequency of crashes at signalized intersections, crash rates were calculated as the number of crashes recorded per million entering vehicles (MEV) at the intersection. Available traffic count data were used to determine annual average daily traffic (AADT). When volumes were not available for minor streets, AADT was estimated based on major road traffic volumes. **Table 1** summarizes crash frequency and crash rates at each signalized intersection. The Baseline Road & 119th. intersection has the highest crash rate, with 4.86 crashes per MEV. Arapahoe Road & US 287 has the second highest crash rate (4.51 crashes per MEV), followed by Arapahoe Road & 119th Street (3.22), and Arapahoe Road & 111th Street (2.99).

Table 1. Signalized Intersection Crash Rates

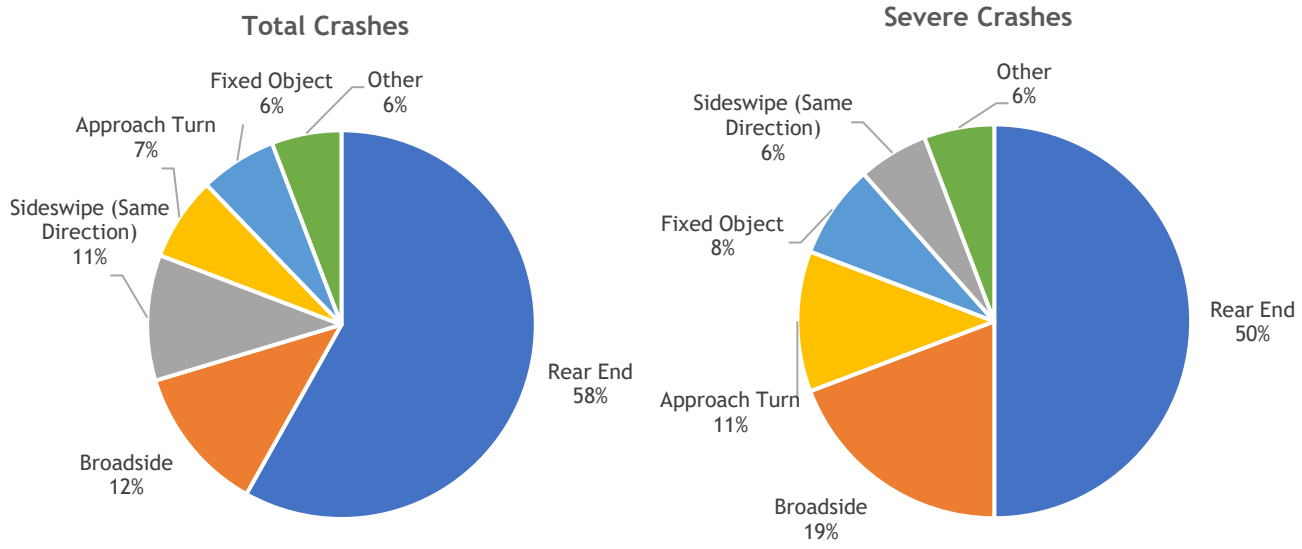
Studied (Signalized) Intersections	Crash Frequency				Crash Rate (Crashes / MEV)
	PDO	INJ	FAT	Total	
Arapahoe Rd. & US 287	63	23	1	87	4.51
Arapahoe Rd. & Safeway Access	4	2	0	6	1.17
Arapahoe Rd. & Beasley Dr.	1	1	0	2	0.39
Arapahoe Rd. & 111th St.	10	7	0	17	2.99
Arapahoe Rd. & 119th St.	11	7	0	18	3.22
Baseline Rd. & 119th St.	31	11	0	42	4.86

MEV = million entering vehicles

Crash Types

A variety of crash types occurred within the study area. As shown on **Figure 10**, Rear End crashes were the most common crash type, representing 58 percent of the total crash history, followed by Broadside (12 percent) and Sideswipe – Same Direction (11 percent). Of severe crashes (INJ and FAT crashes), Rear Ends were the most common crash type, representing 50 percent of recorded severe crashes. Broadsides were the second most common severe crash type (19 percent), followed by Approach Turn (11 percent).

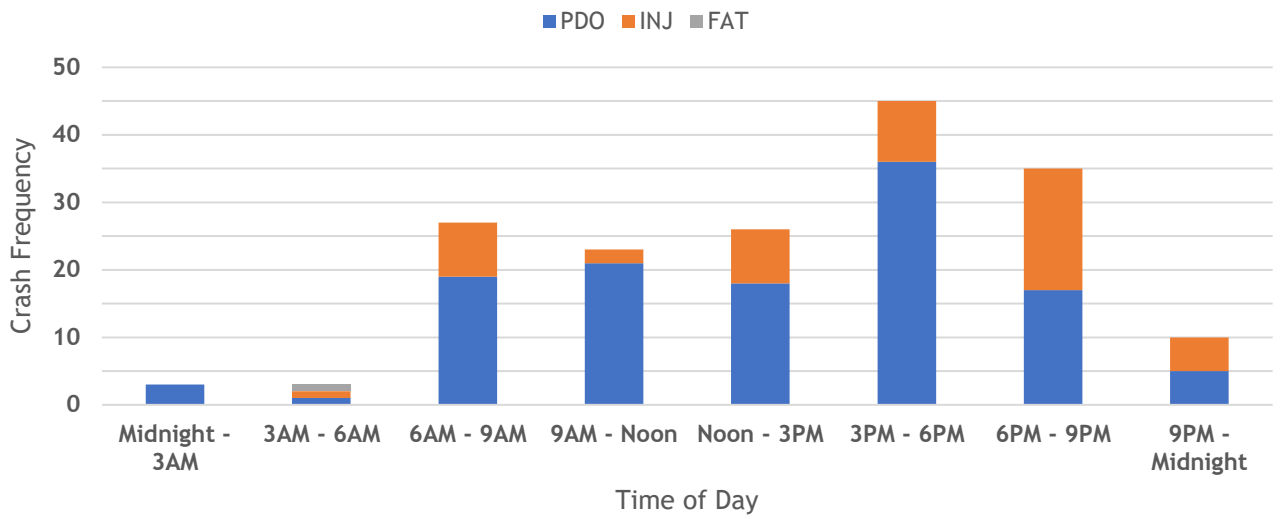
Figure 10. Crash Types



Crashes by Time of Day

Figure 11 shows crashes by time of day. Twenty-five percent of crashes occur between 3 PM and 6 PM, which is concurrent with the PM peak travel period. Over two-thirds (67.2 percent) of crashes involving an injury happened between noon and 9 PM.

Figure 11. Crashes by Time of Day



Existing Vision Zero Programs

DRCOG Regional Vision Zero Network has identified critical corridors and a high injury network (HIN) for assisting local jurisdictions in identifying areas with the highest density of FAT and INJ crashes in the region. US 287 and Baseline Road are both identified as part of the DRCOG HIN. Similarly, Boulder County's Vision Zero Plan Crash Analysis has identified US 287 as a one of the roads with the highest number of severe and fatal crashes in Boulder County. The US 287 and Arapahoe Road intersection has recently undergone significant reconstruction, adding east/west through and turn lane capacity, and 119th Street and Baseline Road has a planned and funded reconstruction. Hence, the corridor study segments of Arapahoe Road and 119th Street are not within the HIN or critical corridor, and both of the intersections where the corridors intersect with the HIN have been or are in the process of being reconfigured to improve both safety and capacity.

Killed and Serious Injury (KSI) Crashes

Vision Zero programs often emphasize the importance of reducing all crashes, but especially those resulting in fatalities or serious bodily injury. During the study period, three (3) killed and serious injury (KSI) crashes occurred, all at the Arapahoe Road & US 287 intersection:

- A Broadside crash involved a westbound motorist and a southbound motorist. The crash occurred in early morning hours under dark-lighted conditions. Weather and/or road conditions were not cited as contributing factors nor were drugs and/or alcohol. One person was killed, and one person was seriously injured.
- A Fixed Object crash involved a northbound motorist who hit a traffic signal pole. The crash occurred late at night under dark-lighted conditions with snowy road conditions. Alcohol was cited as a contributing factor. One person was seriously injured.
- A Fixed Object crash involved an eastbound motorist who hit a traffic sign and a light/utility pole. The crash occurred around dawn. Weather and/or road conditions were not cited as contributing factors, but alcohol was. One person was seriously injured.

Pedestrian and Bicycle Crashes

Vision Zero programs also emphasize the importance of reducing crashes involving non-motorized road users, such as pedestrians and bicyclists, as they are more susceptible to being seriously injured or killed in a crash. During the study period, one (1) pedestrian crash occurred at the Arapahoe & US 287 intersection:

- An eastbound motorist making a left-turn struck a westbound pedestrian. The crash occurred in the afternoon. Weather and/or road conditions were not cited as contributing factors, nor were drugs and/or alcohol. The pedestrian sustained non-incapacitating injuries.

Level of Service of Safety Analysis

Several study area intersections have recently undergone significant reconstruction or have planned projects that will substantially alter their configuration and provide safety benefits, among other improvements. The signalized intersection of Arapahoe Road and 119th Street does not have any recent or planned improvements. The Town of Erie has plans for interim improvements at the Arapahoe Road and 111th Street intersection that will add northbound and southbound left turn lanes (these turning movements are currently made from the through lane). Additional analyses were conducted to evaluate the magnitude and nature of existing safety problems at these two intersections.

The goal of the crash analysis process is to determine the magnitude of and nature of safety problems using data-driven techniques and statistical analyses. Safety Performance Functions (SPFs) were used to evaluate the magnitude of safety problems within the study area. Pattern recognition and diagnostic techniques were used to assess the nature of safety problems.

Safety Performance Functions and Level of Service of Safety

The magnitude of safety problems was evaluated using SPFs, which measure the relationship between traffic exposure, measured in average daily traffic (ADT), and crash count for the intersection measured in crashes per year. The SPF models provide an estimate of the normal or expected crash frequency for a range of ADT among similar facilities. Two kinds of SPFs were calibrated. The first (Total) addresses the total number of collisions, and the second (Severe) looks only at collisions resulting in injury or fatality. These SPFs aid in assessing the magnitude of the safety problem from a frequency and severity standpoint.

Development of SPFs lends itself to the conceptual formation of Level of Service of Safety (LOSS). LOSS uses quantitative measures (80th Percentile, Mean, 20th Percentile of the SPF) and qualitative descriptions to characterize the safety of roadway segments or intersections relative to expected values.

LOSS reflects how the roadway segment is performing with respect to its expected crash frequency and severity at a specific level of ADT. If a safety problem is present, LOSS will describe its magnitude only from the frequency and severity standpoint. The nature of the problem is determined through diagnostic analysis using direct diagnostics and pattern recognition techniques.

Loss Categories:

LOSS I - Below 20th Percentile. Indicates a low potential for crash reduction.

LOSS II - 20th Percentile to Mean. Indicates a low to moderate potential for crash reduction.

LOSS III - Mean to 80th Percentile. Indicates a moderate to high potential for crash reduction.

LOSS IV - Above 80th Percentile. Indicates a high potential for crash reductions.

Direct Diagnostics and Pattern Recognition

The roadways within the project limits were tested for the presence of patterns related to crash type, severity, direction of travel, road conditions, and time of day, among other attributes. Crash patterns were identified by comparing the causal factors recorded at study area locations to normative percentages of similar facilities using binomial distributions. Any causal factor with at least five occurrences and exceeding the 95 percent confidence level of the binomial distribution is considered a pattern.

Key Findings

The following points summarize the key findings of safety analyses presented in this study:

- Several factors identified in the crash history suggest that a portion of the recorded crash frequency can be attributed to congested travel conditions.
- Rear End and Sideswipe crashes, commonly observed during congested conditions along corridors with signalized intersections, represent about 69 percent of the crash history.
- About 42 percent of recorded crashes occurred between 6 AM and 9 AM or between 3 PM and 6 PM, consistent with peak travel periods within the study area.
- The Baseline Road & 119th Street and Arapahoe Road & US 287 intersections had the highest crash frequencies, as well as the highest crash rates with respect to traffic volume.
- The planned improvements at the Arapahoe Road & 111th Street intersection have potential for reducing crashes, particularly approach turn crashes.
- DRCOG and Boulder County Vision Zero programs have previously identified US 287 and CO 7 as locations of concern, but intersections within the corridor study area have been or are being reconfigured.
  - Arapahoe Road & US 287 has recently been reconfigured, including safety enhancements.
  - Baseline Road (CO 7) & 119th Street has a planned and funded reconfiguration, including safety enhancements.

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Arapahoe Rd and 111th St
Crash Profile

Urban 2-Lane Divided Signalized intersection

Total crash frequency = **LOSS II**

Severe crash frequency = **LOSS III**

Moderate potential for crash reduction

Per Vision Zero Suite Database (2015-2019)

17 Crashes with **7** resulting in injury

Out of **17** Crashes, **5** had "Dark-Lighted conditions," with **2** resulting in injury

Out of **17** Crashes, **11** were Rear End crashes, with **3** resulting in injury

Out of **17** Crashes, **10** had "Driver Preoccupation and/or Driver Inexperience" as a notable factor, with **4** resulting in injury.

Arapahoe Rd and 119th St
Crash Profile

Urban 2-Lane Divided Signalized intersection

Total and Severe crash frequency = **LOSS II**

Moderate potential for crash reduction

Per Vision Zero Suite Database (2015-2019)

18 Crashes with **7** resulting in injury

Out of **18** Crashes, **3** involved "Snow/Sleet/Hail conditions."

Out of **18** Crashes, **3** were Side Swipe crashes, with **0** of resulting in injury.

Traffic Operations

Vehicular traffic counts for the study area were collected and compiled from CDOT, the City of Lafayette, and new traffic counts recorded in August 2022. These counts included traffic data from 2011 until 2021 for the segments in the study area and cross streets. However, only 2021 and 2022 counts were used for vehicle traffic estimates. Traffic counts were collected for the corridor study, including turning movement counts and ADT counts at key locations within the study area. Two daily traffic counts were collected on Arapahoe Road east of US 287 and on 119th Street just north of the Baseline Road intersection. **Figure 12** shows vehicular traffic count locations and volumes.

As described previously, Segment C is the north leg of the trident of roads that serve east/west travel between CO 7 to the east and Boulder and points west of 119th Street. The three roads currently carry approximately 32,700 vehicles per day (vpd) west of 119th Street, with 9,600 vpd on South Boulder Road, 12,600 vpd on Baseline Road (CO 7), and 10,500 vpd on Arapahoe Road.

Traffic operations within the study area were evaluated according to techniques documented in the *Highway Capacity Manual (HCM), 6th Edition* (2016) by the Transportation Research Board. Level of service (LOS) is a qualitative measure of traffic operational conditions based on roadway capacity and vehicle delay. Levels of service are described by a letter designation ranging from LOS A to LOS F; with LOS A representing the best possible conditions and LOS F representing highly congested conditions. For signalized traffic control, LOS represents an average of the delays for all movements at the intersection. Synchro traffic analysis software was used to develop the LOS calculations based on the *HCM 6th Edition* methodology.

Analyses were performed to evaluate current (Year 2022) operational conditions at the study area signalized intersections. Weekday AM and PM peak hour traffic counts were performed in August 2022. Town of Erie and CDOT staff furnished signal timing information. Findings are provided in **Table 2**.

Table 2. Current Intersection Levels of Service

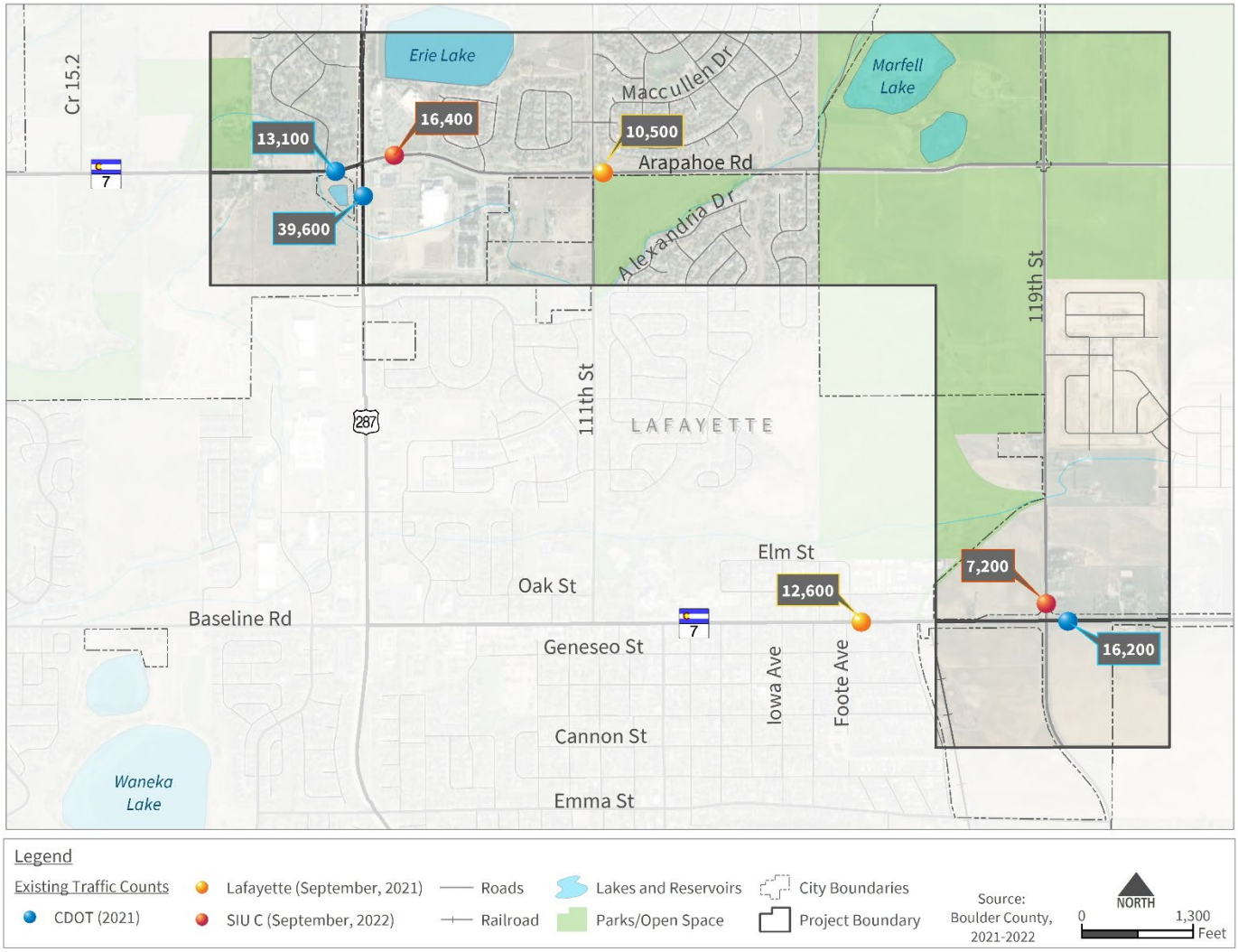
Intersection	Intersection Level of Service (Average Delay in sec/veh)	
	AM Peak Hour	PM Peak Hour
Arapahoe Rd./US 287	E (64)	D (40)
Retail Access	B (13)	A (9)
Beasley Dr.	B (18)	A (5)
Arapahoe Rd./111th St.	C (32)	B (10)
Arapahoe Rd./119th St.	C (27)	C (27)
119th St./CO 7 (Baseline Rd.)[1]	D (40)	D (38)

[1]Operational analyses based on approximate signal timing; actual timing information may alter findings.

As shown, all intersections currently operate at overall LOS E or better during peak hours. Though no intersections operate at LOS F, top operational concerns within the study area include the following intersections/movements:

- **119th Street/Baseline Road** (pending incorporation of signal timing information). The southbound approach accommodates all movements within a single approach lane, causing LOS F operations along this approach.
- **Arapahoe Road/111th Street** The northbound intersection approach accommodates all movements within a single approach lane, causing LOS F operations along this approach.
- **Arapahoe Road/US 287**. Multiple left turn movements operate at LOS F.

Figure 12. Daily Traffic Counts



Bicycle and Pedestrian Operations

Pedestrian and Bicycle Counts

Available pedestrian and bicycle counts were recorded at all signalized intersections. Data were recorded during the AM peak and PM period periods on Tuesday, August 30, 2022. There was no differentiation between pedestrians and bicyclists, and bicyclists were recorded both in the crosswalk and on-street. Arapahoe Road and 111th Street has the highest number of pedestrians and bicyclists in the corridor study relative to the other crosswalks in the area. The recently built intersections at Arapahoe Road and the Safeway access, and Arapahoe Road and Beasley Drive also have pedestrian or bicyclist movement through the intersection.

Prevailing Multimodal Travel Patterns

Bicycle and pedestrian activity data are available from other sources, one of those being Strava. Strava data are collected from users through their smart phone application, compiling anonymized trip data.

Strava Global Heatmap shows where there is a higher concentration of trips within the study area. These are mainly found between 111th Street and Hawk Ridge Road and people using the South Boulder Trail. There is also significant use on the dog park trail that connects to the Great Bark Dog Park. It is important to note that Strava data typically overrepresent recreational travel because Strava captures use only from people who use the application. The data typically do not capture utilitarian trips such as walking to bus stops. Nonetheless, Strava provides a good understanding of how pedestrians and bicyclists are using trails and roads.

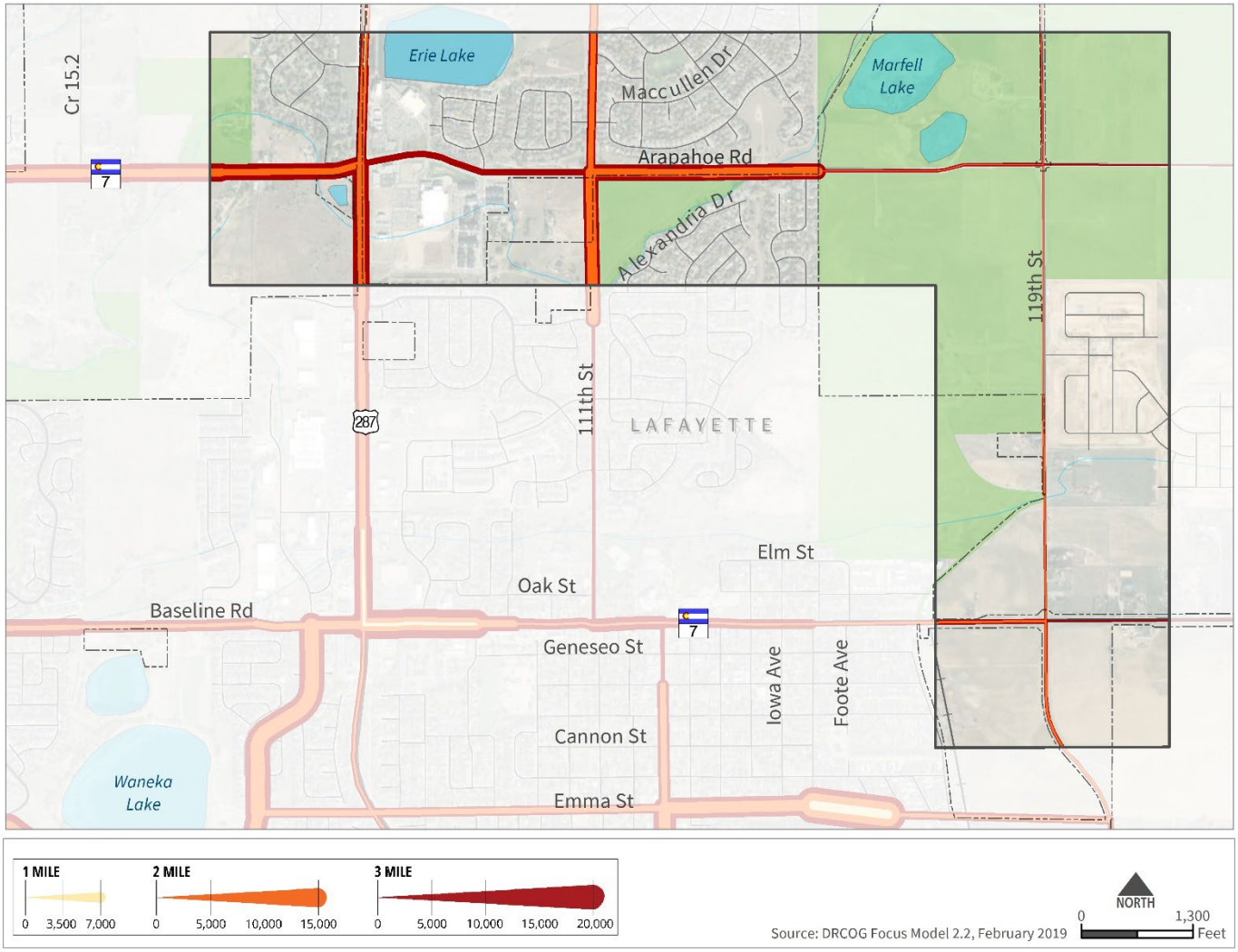
Short Trip Analysis

Using the DRCOG regional travel model, a short trip analysis was completed to identify corridors with a high proportion of short-distance trips in 2020. While these short trips are likely currently being made by automobile, it is useful to identify corridors with a higher number of short trips because these represent trips that could potentially be converted to bicycle or pedestrian trips.

Figure 13 shows the estimated short trips in 2020. The three-color bandwidths reflect trips less than 1 mile (yellow), trips 1 to 2 miles in length (orange), and trips 2 to 3 miles in length (red). The wider the band, the more short-distance trips occur along the corridors.

Figure 13 also shows that the majority of the model estimated 2020 trips within this area happened on Arapahoe Road between 111th Street and Hawk Ridge Road. It is important to note that the recent Nine Mile development, southeast of the US 287 and Arapahoe Road intersection, has significant commercial floor space and, as shown by the pedestrian counts, there is also activity on Arapahoe Road between 111th Street and US 287. Similarly, future pedestrian and bicyclist movement across N 119th Street from the recent (under construction) Parkdale development to the Great Bark Dog Park is expected.

Figure 13. DRCOG 2020 Estimated Short Trips (1-3 miles)



Level of Traffic Stress

Bicycle and pedestrian Level of Traffic Stress (LTS) analyses were conducted to gain a deeper understanding of the bicycle and pedestrian network, beyond roadways with designated facilities. Bicycle and pedestrian LTS is a rating given to roadway segments that indicates how comfortable a roadway may feel for an average adult biking and walking. It is important to emphasize that the rating scale is calibrated so that Levels 1 and 2 would be considered comfortable for an average adult who is interested in biking but may have some concerns regarding safety, while Levels 3 and 4 may only feel comfortable to more experienced or confident riders.

Level 1 is considered to be a comfortable roadway for all ages and abilities.
Level 2 is thought to be generally comfortable for most people riding bikes and walking.
Level 3 is comfortable for only confident bicyclists, and walking is uncomfortable but possible.
Level 4 roadways are considered generally uncomfortable, and walking is a barrier or impossible.

The analysis reveals that the arterials within the study area are high stress roadways with limited bike and pedestrian facilities and can make it difficult to navigate comfortably. All bicycle and most pedestrian segments have a LTS of 4, and some segments of Arapahoe Road (west of Hawk Ridge Road) have a LTS of 3. The pedestrian LTS analysis does not account for the multiuse trail that is currently under construction on 119th Street adjacent to Parkdale.

Key Findings and Future Needs

Existing pedestrian and bicycle infrastructure has some missing gaps on Arapahoe Road and most of 119th Street. These gaps have a direct effect on the operational analysis.

- Arapahoe Road has missing infrastructure in proximity to 111th Street, where most pedestrians and bicyclists are found within the study area. Pedestrian and bicyclist access to commercial land uses on US 287 and Arapahoe Road is important but currently limited. Arapahoe Road has limited pedestrian and bicyclist connectivity east of Beasley Drive. The current proposed development between Beasley Drive and 111th Street. has planned pedestrian and bicyclist infrastructure.
- East of Hawk Ridge Road and 119th Street, there is no current pedestrian or bicyclist infrastructure along Arapahoe Road. Similarly, the Arapahoe Road. and 119th Street. intersection has no pedestrian crosswalks or sidewalks. Open Space designation and regulations could hinder connectivity for the pedestrian and bicyclist network if no infrastructure is built. This lack of infrastructure could add to the already high level of stress for pedestrians and bicyclists within the study area.
- Pedestrian and bicyclist crossings are also missing on South Boulder Trail across Arapahoe Road, where, based on Strava data, there is significant trail use. Similarly, future crossings should be considered for pedestrians and bicyclists accessing the Great Bark Dog Park across 119th Street (from the new Parkdale development).

Transit

Transit plays an important role in the current and future CO 7. In addition to providing an alternative mobility choice for the corridor, planned improvements will impact the design of CO 7 in the future.

This section focuses on the current and future transit service and infrastructure of Segment C, mainly Arapahoe Road and 119th Street, while also giving context to the other roads to make sure that transit alternatives work effectively for the system and overall travel needs. Existing conditions describe the current service operated by RTD in 2022, as well as changes to be implemented under the board-adopted System Optimization Plan (SOP) developed for the Reimagine RTD study. SOP implementation began with the May 2023 runboard and will continue to be implemented over time in the coming years. Ridership data are provided for 2019, 2020, and 2022 to compare levels before and after COVID and to show trends over the last three years. The future conditions description is based on planned improvements detailed in recent studies, including the concurrent US 287 BRT Study and the 2018 State Highway 7 BRT Study.

Existing Transit Service and Amenities

RTD operates transit service in the form of fixed-routes, using different levels of bus service. **Table 3** summarizes the service characteristics of transit currently operating in the study area.

Table 3. Existing Transit Route

Route Name	Range	Service Route	Frequency
JUMP	Local	Between the Downtown Boulder Station and Arapahoe Ridge High School along Arapahoe Road (CO 7) with branches to Erie and the Lafayette Park-n-Ride.	Hourly through most of the day on weekdays and similar service on weekends starting slightly later in the morning during the summer; every 30 minutes August through May when school is in session with 15 minute service within Boulder
225	Local	Between the Downtown Boulder Station and Lafayette Park-n-Ride along Baseline Road	Every 30 minutes through most of the day on weekdays and similar service on weekends starting slightly later in the morning.
DASH	Local	Between the Downtown Boulder Station and the Lafayette Park-n-Ride via Broadway and South Boulder Road	Every 30 minutes through most of the day and every 60 minutes in the late night on weekdays with similar service on Saturdays starting slightly later in the morning . Hourly service on Sundays and Holidays through most of the day.
LD	Regional	Along US 287 and US 36 through Lafayette with local stops and service to the Lafayette Park-n-Ride. Most of the service is focused between downtown Longmont and the US 36 & Broomfield Station, with two trips in each direction during peak hours (southbound in the morning and northbound in the afternoon) that run through to Denver Union Station.	Every 30 minutes during the peak period and every 60 minutes during the off-peak period on weekdays. On Saturdays, service runs every two hours through most of the day, but there is no Sunday or Holiday service.

NOTE: Route JUMP and Route 225 descriptions and frequency are based on current service; these routes will be modified with implementation of the System Optimization Plan (SOP) in the near future.

Figure 14 shows a map of existing fixed transit routes and bus stops. Route JUMP is the primary transit service on the CO 7 corridor with Route LD crossing the corridor on US 287. The Route JUMP has a branch that splits off to Erie from Arapahoe Road at 111th Street and runs north from 119th Street.

Most bus stops in the study area consist of the standard RTD bus stop sign posted on a pole with the basic route information. Several stops within the urban area of Lafayette feature benches and some feature shelters. Some of the bus stops have sidewalk access, others lack sidewalk access making it challenging and unsafe for people to access and wait for the bus.

Figure 14. Existing Bus Routes and Stops

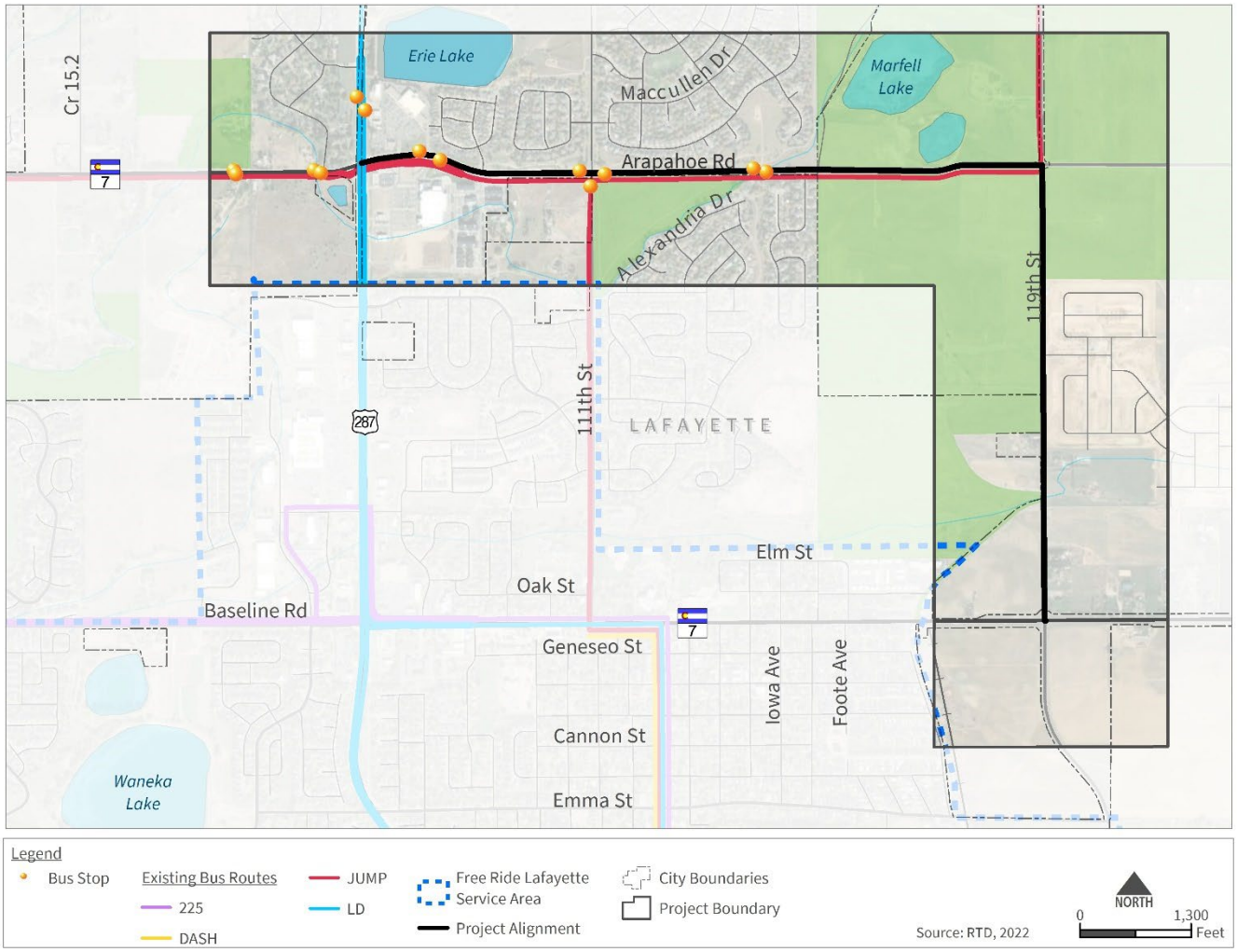


Table 4 and **Table 5** show recent ridership data by route and stop for activity in the study area only. These data, collected by Automatic Passenger Counters (APCs) on buses, are weekday averages collected over the January service change period, also known as a "runboard" (January through May) of the year listed in the table. This part of the year was selected as it provides the most consistent and reliable data with fewer holidays and more typical days where riders are regularly commuting to work and school.

Table 4. Recent Ridership by Stop

Stop Name	Average Weekday Boardings			Percent Change	
	2019	2020	2022[1]	2019-2020	2020-2022
Lafayette Park-n-Ride (DASH)	105.72	150.18	95.87	**42.06%**	-36.17%
Lafayette Park-n-Ride (JUMP)	76.27	77.48	41.62	1.58%	-46.29%
Lafayette Park-n-Ride (LD)	99.56	116.70	34.62	17.22%	**-70.34%**
Lafayette Park-n-Ride (225)	97.87	108.95	66.76	11.32%	-38.73%
Lafayette Park-n-Ride Total	379.43	453.32	238.86	19.48%	-47.31%
Merlin Dr./E Spaulding St.	34.19	42.49	24.31	24.26%	-42.80%
W Baseline Rd./N Carr Ave.	27.12	29.25	17.26	7.88%	-41.00%
Sir Galahad Dr./South Boulder Rd.	29.70	24.66	18.94	-16.97%	-23.19%

[1]Ridership for 2022 is affected by COVID-19, and a Pandemic Operations Plan has been in place since April 19, 2020.

The ridership by stop data have been condensed to show the most popular stops in the study area, which include the Lafayette Park-n-Ride, the area near the Baseline Road and US 287 stop (W Baseline Road/N Carr Avenue), and stops near the two main schools with high student ridership east of the Lafayette Park-n-Ride: Merlin Drive/E Spaulding Street stop serving the Peak to Peak Charter School and Sir Galahad Drive/South Boulder Road stop serving Justice High School. The most notable trend from these data is the overall decline in ridership from 2020 to 2022, which dropped more for commuter stops (Route LD at Lafayette Park-n-Ride) than other stops. The stop for Justice High School has the lowest reduction in ridership.

Table 5. Recent Ridership by Route

Route	Average Weekday Boardings			Percent Change	
	2019	2020	2022[1]	2019-2020	2020-2022
DASH	144.53	182.72	113.84	**26.43%**	-37.70%
JUMP	298.18	311.70	142.58	4.53%	-54.26%
LD	163.29	191.14	53.78	17.06%	**-71.87%**
225	192.20	206.84	111.09	7.61%	-46.29%

[1] Ridership for 2022 is affected by COVID-19, and a Pandemic Operations Plan has been in place since April 19, 2020.

53% decrease between 2020-2022 for all four routes (boardings) in the study area (excludes boardings out of study area).

Commuter Route LD experienced the largest decline likely due to new work from home trends.

Route DASH saw a significant ridership increase in the study area from 2019 to 2020.

Route Dash experienced a **21%** decrease between 2019 and 2022.

As transit continues to recover from the COVID-19 pandemic, routes that provide basic transit service to a variety of community amenities, such as Route 225, JUMP, and DASH, should perform better than routes more focused on service peak commute riders, such as Route LD. This provides a good outlook for service in Lafayette and on the CO 7 corridor and validates previous ridership model projections, which consider various dips in ridership that occur due to changes in the economy.

Transit service changes are planned based on RTD's Reimagine study, resulting in the SOP, which is intended to steer route network changes for the next five years. Route JUMP, described as the Route JUMP X proposal, focuses its service on a more streamlined route between the Downtown Boulder Station and the Lafayette Park-n-Ride. This route runs along CO 7 from Boulder up to US 287 (107th Street) and then to Baseline Road, to Public Road, and terminates at the Lafayette Park-n-Ride. Route 225 has a similar route plan in the SOP as the current route, which serves the popular Baseline Road and US 287 area, plus the two schools east of the Lafayette Park-n-Ride, terminating at the Park-n-Ride. The proposed route adds a new "225T" pattern, which takes over the former JUMP branch to Erie.

Transit Key Findings and Future Needs

- Existing transit service in the study area closely matches what is proposed in the Reimagine RTD SOP, which is anticipated to be implemented in the near future. Ridership in the area on all routes has decreased over the last two years, although regular, non-commute-oriented routes should continue to recover and see steady increases over the years. Prior to the covid service cuts a significant portion of service-oriented workers in the Boulder area used the Jump to commute in off-peak hours. Without regular service all day, this use will likely not recover. Ridership modeling projections made for the long term, such as the 2040 horizon year for the State Highway 7 BRT Feasibility Study, remain valid.
- BRT service using a mixture of exclusive ROW and running in mixed traffic is proposed for both the US 287 and CO 7 corridors. This service will share station locations near the Segment C study area including at Baseline and 119th and a "super station" on US 287 at approximately Lucerne Drive. Preliminary station design work has been completed as studies related to bus transit improvements and BRT implementation have progressed. Consideration should be made in the design and construction of CO 7 Segment C improvements for transit stations and requirements for the BRT implementation. This primarily involves passenger access to the BRT station and space for bus stops, while also considering the flow of the transit vehicles, including queue jumps.

4. Future Conditions

Future Land Use

DRCOG has prepared regionwide forecasts of growth for travel demand modeling purposes. Base year 2020 and forecast year 2050 were used to estimate growth in the area. DRCOG's 2050 land use forecasts were adjusted with local jurisdictions as a part of the CO 7 Systems Planning Level Tool (SPLT) in August 2022. DRCOG's travel demand model subdivides the region into traffic analysis zones (TAZs). **Table 6** summarizes the 12 TAZs within the study area. Over 5,200 new households and more than 3,100 new jobs are expected in the study area by 2050.

Figure 15 and **Figure 16** show household and employment growth over the next 30 years. By 2050, a significant number of households are expected in the TAZs east of 119th Street, and employment growth is concentrated in the TAZ south of Arapahoe Road east of US 287. This corresponds with the development mentioned previously (Nine Mile) which was developed in 2021.

Table 6. Summary of Forecasted Growth

TAZ ID	Households			Employment		
	2020 HH	2050 HH	HH Growth	2020 EMP	2050 EMP	EMP Growth
90	809	1,976	1,167	121	375	254
91	66	184	118	19	69	50
92	490	620	130	96	96	0
93	157	157	0	281	305	24
94	64	74	10	90	90	0
210	140	733	593	1,096	1,316	220
213	550	1,675	1,125	560	1,589	1,029
214	715	862	147	125	336	211
215	177	422	245	33	196	163
216	27	1,438	1,411	145	512	367
218	25	28	3	202	550	348
219	622	920	298	843	1,300	457
TOTAL	3,842	9,089	5,247	3,611	6,734	3,123
% Growth			**137%**			**86%**

Source: DRCOG Focus 2.3.1 with land use adjustments by local jurisdictions

Figure 15. Forecasted Household Growth (2020-2050)

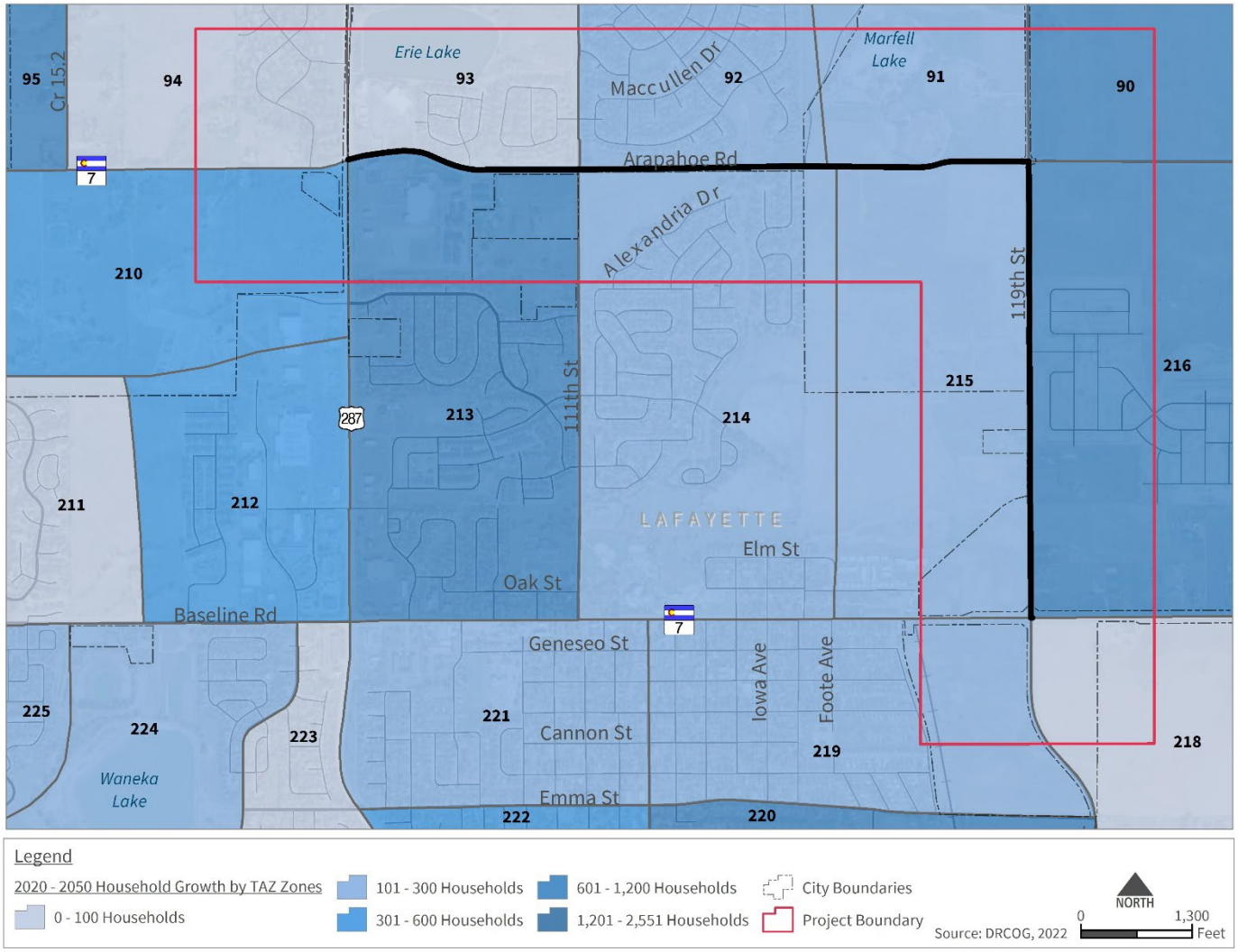
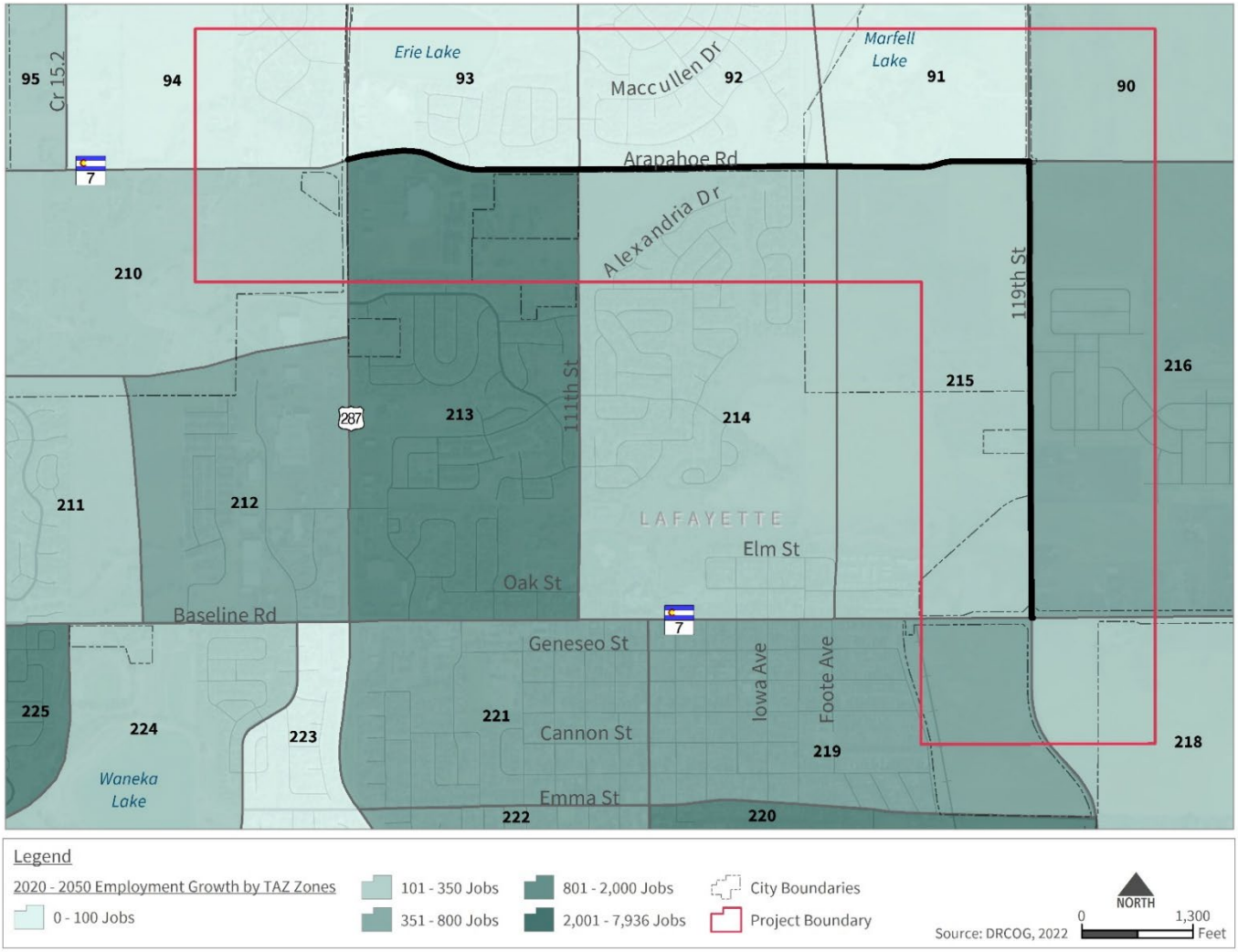


Figure 16. Forecasted Employment Growth (2020-2050)



Future Transit Service

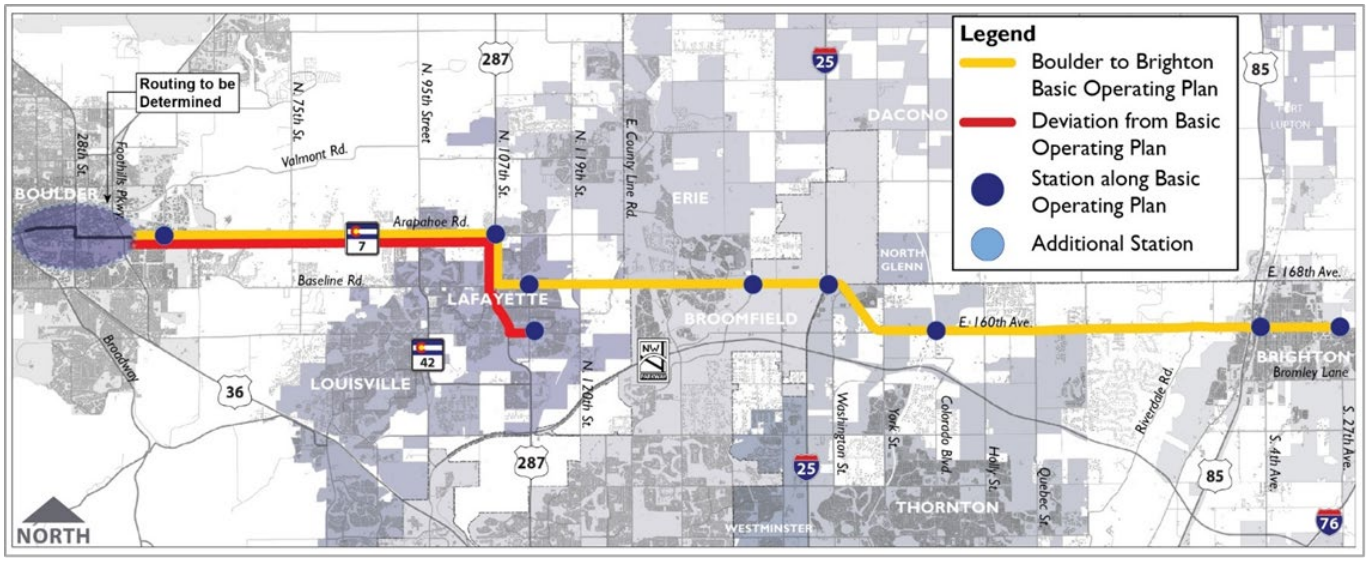
The State Highway 7 BRT Feasibility Study, completed in 2018, evaluated the practicability of enhanced bus service along the CO 7 corridor between Boulder and Brighton. Various operating alternatives were tested to evaluate alternative station locations and to provide information about how BRT would perform in mixed traffic and exclusive and semi-exclusive ROW alternatives. A detailed ridership modeling forecasting analysis was conducted to project average weekday passenger activity for all alternatives, using the year 2040.

Figure 17 shows the selected routes and stations adopted in the 2018 study. Route Pattern 1 provides direct service between Boulder and Brighton, while Route Pattern 2 has a deviation to the Lafayette Park-n-Ride. Projected ridership is similar for each pattern, assuming a 7.5-minute peak frequency and 15-minute off-peak frequency: 8,650 average daily boardings for Route Pattern 1 and 8,700 average daily boardings for Route Pattern 2. If both route patterns are operated, as proposed in the study, each route would be operated at 15-minute peak frequency and 30-minute off-peak frequency, providing a combined 7.5-minute peak frequency and 15-minute off-peak frequency. The resulting ridership projections are estimated to be 8,675 average daily boardings, which results in approximately 54 boardings per trip in the peak periods, assuming 18 hours of service per weekday.

Figure 17. State Highway 7 BRT Routes and Proposed Stations (from 2018 BRT Study)

Also analyzed was a third route pattern operating between Boulder and Lafayette, where a significant portion of the ridership is expected. This additional route pattern alternative is shown on **Figure 18**. Average daily boardings, with 7.5-minute peak frequency and 15-minute off-peak frequency, are projected to be 7,374 in 2040. This option is similar to the current and SOP proposed Route JUMP X service and would be an interim faster service option for transitioning to the BRT service, where the majority of ridership potential exists. This BRT route pattern would replace the Route JUMP while introducing BRT service to the full corridor. As ridership and adjacent development increase, particularly in the area of CO 7 and I-25, this route pattern could be extended further east.

Figure 18. State Highway 7 BRT Route Pattern 3

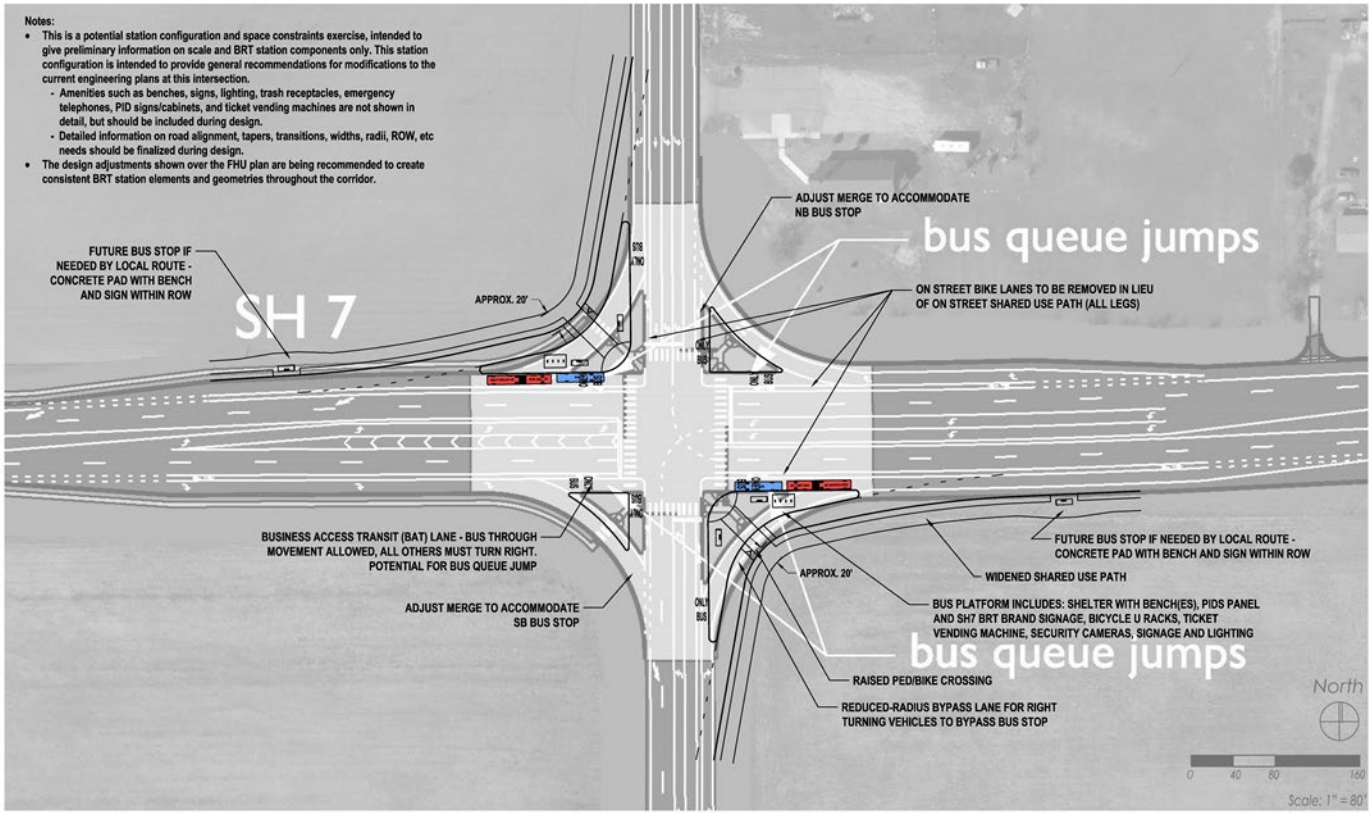


Boulder County is currently studying the feasibility of BRT service on the US 287 corridor between Longmont and Broomfield. The study will recommend the type and location of capital investments that will enhance transit travel times. While the study is ongoing, BRT stations have been proposed in the CO 7 Segment C study area, and there would be at least one station that would serve both the CO 7 and US 287 BRT, allowing efficient transfers between the two routes for passengers.

The proposed BRT stations in Segment C are at US 287 and CO 7 and at 119th Street and CO 7 (Baseline Road).

The implications of the future BRT planning to Segment C involve consideration of infrastructure needs to support future bus service improvements, notably at the planned BRT stations. Preliminary station designs have been completed from recent studies. **Figure 19** shows a potential design for the 119th Street and CO 7 (Baseline Road) BRT station, with passenger boarding areas that allow enough space for two buses to stop (eastbound and westbound) and consideration of queue jumps to allow the buses to bypass traffic at the intersection. Local route interfacing should be considered for northbound and southbound movements to include transfers between the local Route 225 and the BRT service. The primary factor is to consider local bus and BRT operations, along with passenger access and space for transit infrastructure, when designing the highway cross sections located at a proposed BRT station.

Figure 19. Example of BRT Station Design for 119th Street and CO 7 (Baseline Road)



Travel Demand Forecasts

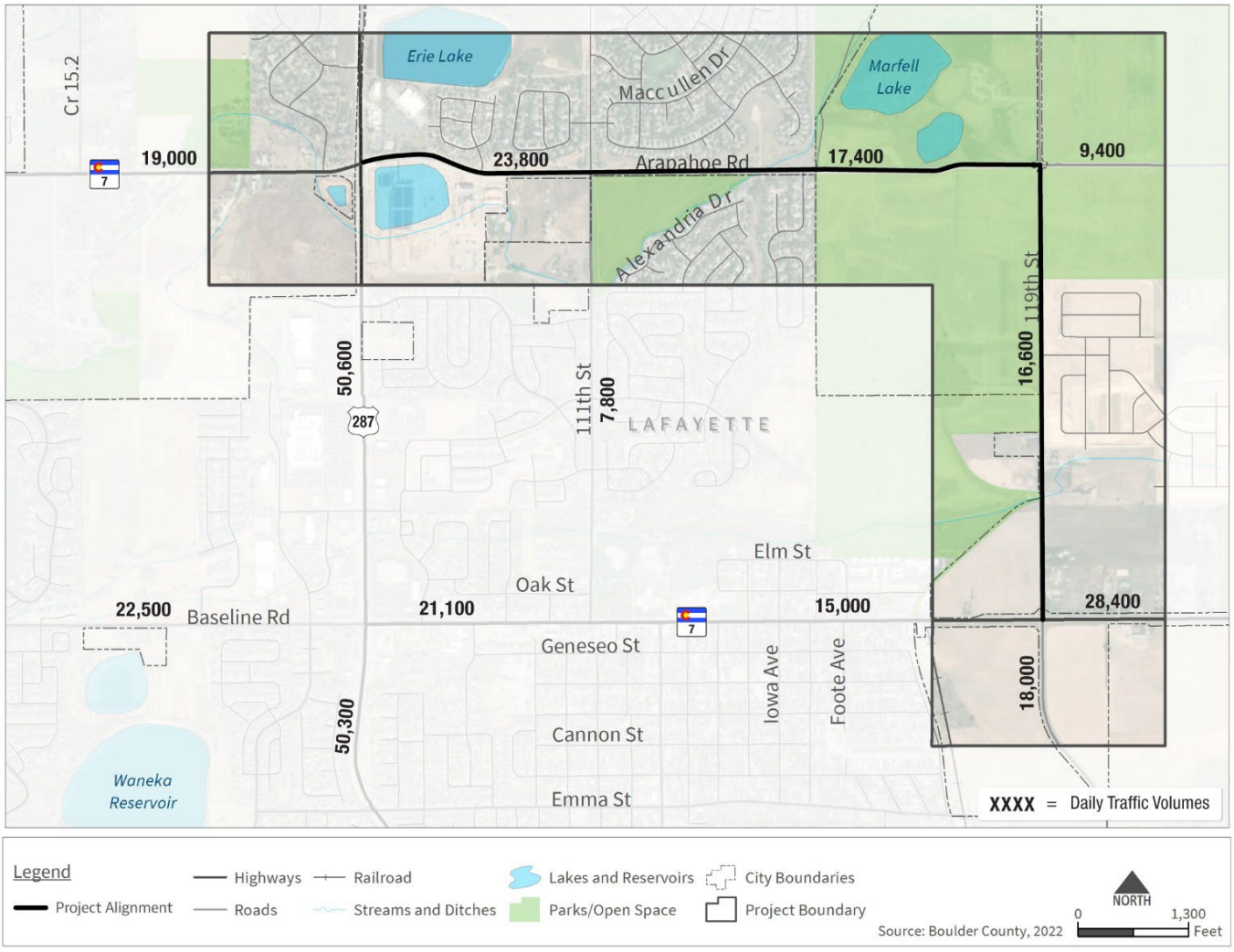
2050 Travel Demand Forecasts

The DRCOG travel demand model (Version 2.3.1) was used to establish 2050 traffic forecasts for the CO 7 corridor (Brighton to Broomfield), including the Arapahoe Road and 119th Street portions of Segment C. The DRCOG 2050 land use forecasts were adjusted based on input from the local agencies, as described in the future land use section on **page 34**. The DRCOG 2050 model was modified to include the improvements planned for the CO 7 corridor. Detailed documentation of the forecasting process is included as part of the CO 7 SPLT project.

Corridor Forecasts

Figure 20 shows the resulting daily traffic forecasts near Segment C. The 2050 traffic forecasts account for widening of CO 7 east of 119th Street; however, no other streets near Segment C are assumed to be widened. The traffic forecasts account for BRT service (as described in the future transit section on **page 37**), as well as transit-only lanes on Arapahoe Road (CO 7) west of US 287 and Baseline Road (CO 7) from 119th Street to the east. Through Segment C, the BRT will operate on Baseline Road in mixed traffic. As shown, the resulting traffic forecasts on Baseline Road and Arapahoe Road are similar, with slightly higher traffic volumes forecasted on Arapahoe Road between US 287 and 119th Street.

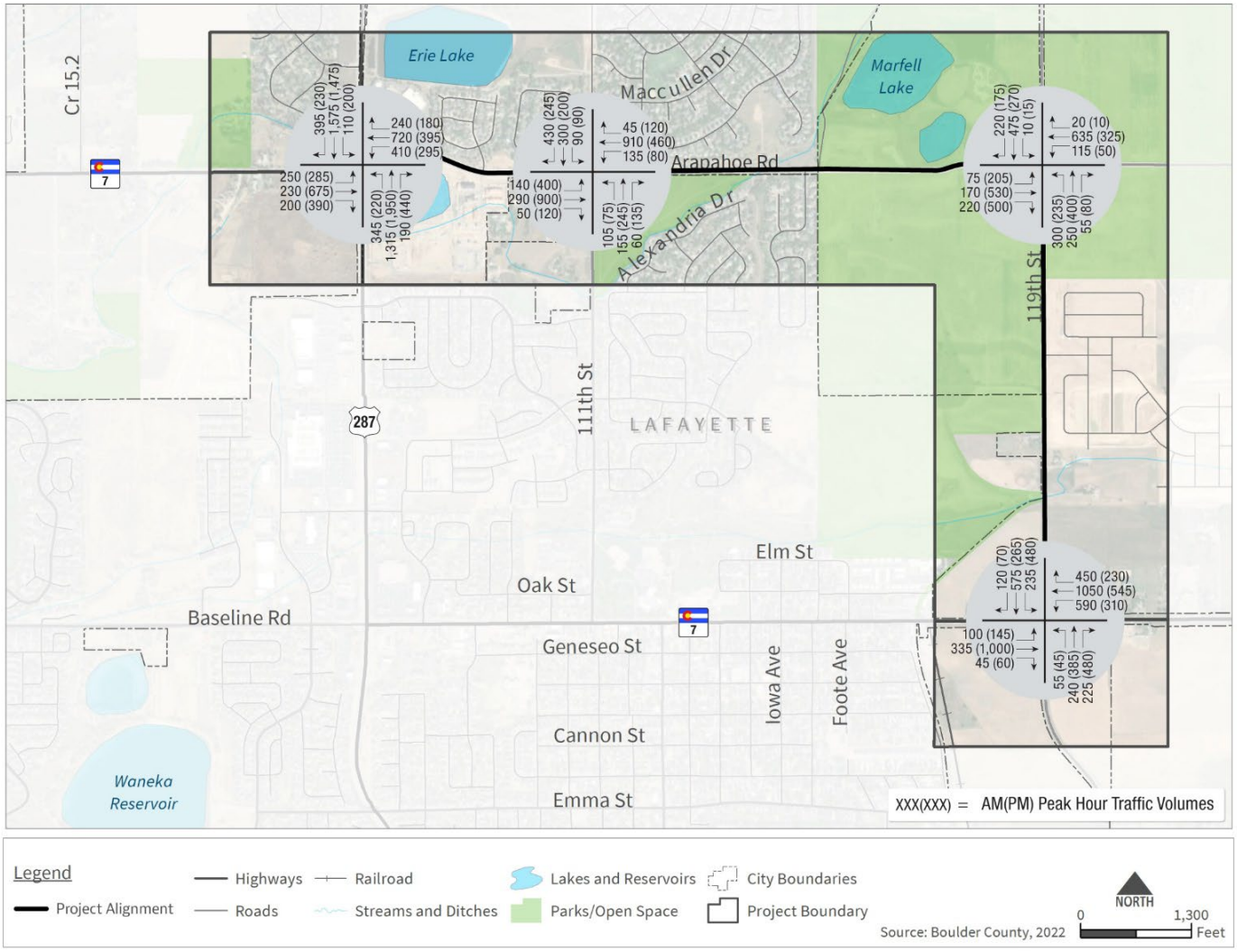
Figure 20. 2050 Daily Traffic Forecasts



Turning Movement Forecasts

Morning and afternoon turning movement forecasts were developed for key study area intersections as shown on **Figure 21**.These peak hour forecasts were used as the basis for the future traffic operational analysis.

Figure 21. 2050 AM and PM Peak Hour Traffic Forecasts



Future Traffic Operations

Future traffic operations within the study area were evaluated according to techniques documented in the *Highway Capacity Manual (HCM), 6th Edition* (2016) by the Transportation Research Board. Level of service (LOS) is a qualitative measure of traffic operational conditions based on roadway capacity and vehicle delay. Levels of service are described by a letter designation ranging from LOS A to LOS F; with LOS A representing the best possible conditions and LOS F representing highly congested conditions. For signalized traffic control, LOS represents an average of the delays for all movements at the intersection. Synchro traffic analysis software was used to develop the LOS calculations based on the *HCM 6th Edition* methodology.

Analyses evaluated future (Year 2050) operational conditions at the study area signalized intersections. As noted previously, improvements are planned and funded at two study area intersections. These improvements are described below and are included in the "No Action" future operational analysis. The resulting intersection operations are summarized in **Table 7**.

- **119th Street/Baseline Road**. The funded intersection improvements include additional turn lanes, additional eastbound and westbound through lanes, accommodation for future transit queue jump lanes, space for future BRT stations, bike lanes on all legs, sidewalks in the northwest quadrant, and grading for future sidewalks in the remaining intersection quadrants.
- **Arapahoe Road/111th Street**. The funded improvements will focus on adding northbound and southbound left turn lanes and resetting a signal pole to address safety concerns.

Table 7. No Action 2050 Intersection Levels of Service

Intersection	Intersection Level of Service (Average Delay in sec/veh)	
	AM Peak Hour	PM Peak Hour
Arapahoe Rd./US 287	F (84)	E (74)
Retail Access	B (15)	B (18)
Beasley Dr.	B (20)	A (8)
Arapahoe Rd./111th St.[1]	F (84)	E (80)
Arapahoe Rd./119th St.	F (106)	F (92)
119th St./CO 7 (Baseline Rd.)[1]	E (66)	E (76)

[1]2050 No Action includes the planned and funded intersection improvements at Arapahoe Rd. & 111th St. and Baseline Rd. (CO 7) & 119th St.

As shown, for the 2050 No Action alternative, four of the study area intersections are projected to operate at LOS F during either the AM or PM peak hour or both. These future operational conditions help to establish the need for improvements on Segment C and will be used to inform alternatives development.

5. Corridor Needs

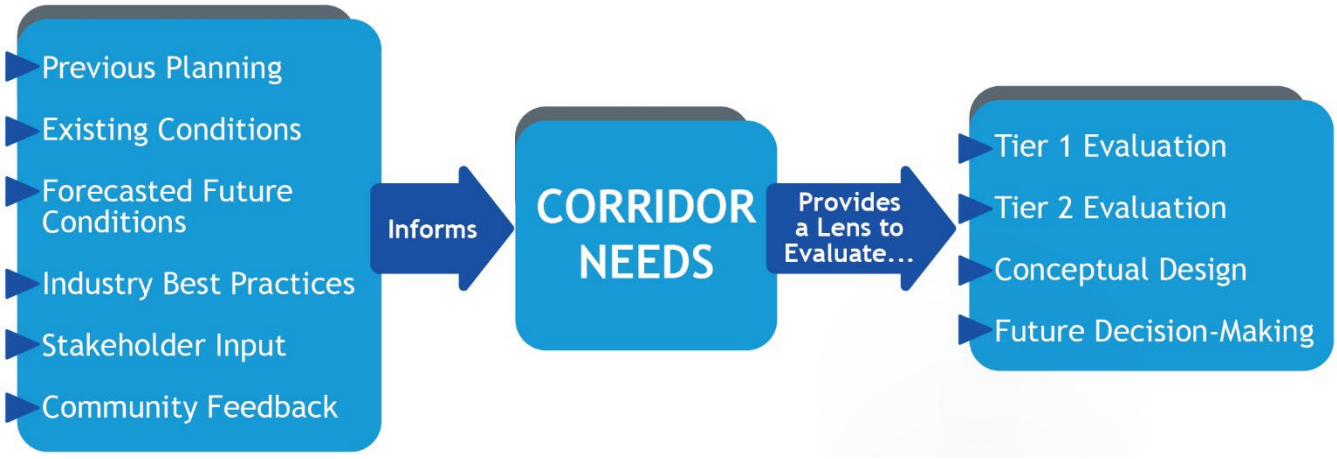
A series of guiding statements, known as Corridor Needs, were developed to communicate the deficiencies and challenges the study was seeking to address.

The Corridor Needs were identified based on previous planning, evaluation of existing conditions and forecasted future conditions, feedback from local and regional stakeholders and the public, and industry best practices.

Corridor Need	Description
	**Multimodal and Regional Connectivity** – CO 7 (Baseline Road) between US 287 and 119th Street is constrained. Baseline Road, Arapahoe Road, and 119th Street lack multimodal infrastructure. Arapahoe Road and 119th Street should address multimodal connectivity needs while supporting east/west regional travel needs as a parallel route to Baseline Road.
	**Crash Reduction Toward Vision Zero** - The current roadway design is not compatible with multimodal travel demands, and there is a higher-than-expected number of injury crashes at some intersections. A Vision Zero approach is needed to eliminate serious injury and fatal crashes, while improving comfort and safety for all users.
	**Walk, Bike, First and Final Mile Connections** - Walk, bike, scoot, and wheel connections along and across the corridors are incomplete, making it difficult for all people, but especially teens, tweens, older adults, people experiencing disabilities, underserved communities, and car-free households who reside in and near the area to access food, shopping, social services, rideshare, and transit services.
	**Transit Stops** - The JUMP route is the only transit service in the corridor, and it has limited service in this section. The current stops are inadequate to meet the needs of people trying to access future RTD local routes in the corridor, CO 7 Bus Rapid Transit (BRT) Starter Service, and future US 287 BRT.
	**Motor Vehicle Travel Times** – AM and PM travel times have increased over the last decade on typical weekdays. Traffic delays and predictable flow for automobiles and buses are expected to worsen due to changes in the surrounding communities.
	**Context Sensitivity** - Land uses vary along the corridors with multiple open spaces in close proximity. It is essential that treatments reflect the unique characteristics of adjacent land uses and complement the context of the surrounding environment.

Figure 22 illustrates the corridor needs development process and how these needs were applied to alternatives development and decision-making on recommendations.

Figure 22. Corridor Needs Development Methodology



Corridor Needs can also be used as a framework for future decision-making beyond the Segment C Concept Study.

6. Alternatives Development and Evaluation

The Alternatives Development and Evaluation process was completed in two phases, Tier 1 and Tier 2. The purpose of Tier 1 was to identify a broad range of multimodal elements for consideration along Arapahoe Road and 119th Street. After the initial qualitative screening in Tier 1, the remaining multimodal elements were grouped together into three Packaged Alternatives, each with a different emphasis. The Packaged Alternatives were further evaluated in Tier 2.

Tier 1 Alternatives Development and Evaluation

Tier 1 Alternatives Development

Tier 1 resulted in a broad range of multimodal elements as candidate improvement types for consideration along Arapahoe Road and 119th Street. The improvement ideas were derived from the assessment of existing and future conditions, as well as from the stakeholder and public engagement. To provide structure to the process, the improvement types were grouped into the following categories:

- **Access control** – such as the limitation and/or consolidation of driveways
- **Accessibility** – such as construction, reconstruction, and/or widening of sidewalks
- **Amenity** – such as wayfinding for trail connections
- **Cross-sections** – such as number of through lanes, bike lanes, and medians
- **Intersection improvements** – such as roundabouts and channelized turn lanes
- **Multimodal improvements** – such as pedestrian at-grade and grade-separated crossings
- **Speed management** - such as traffic calming infrastructure and real-time speed feedback signs (SFS)
- **Transit amenities, service** – such as bus stop enhancements
- **Other** – such as pavement materials (concrete vs. asphalt) and lighting

The full list of improvement ideas by category is included in **Table 8.**

Table 8. Tier 1 Improvement Ideas Evaluated

Category	Improvement Idea
Access control	Limitation and/or consolidation of driveways
ADA accessibility	Directional curb ramps (add or replace)
ADA accessibility	Sidewalks (construction, reconstruction, and/or widening)
Amenity	Pedestrian lighting
Amenity	Wayfinding
Cross-section	Shoulder (addition, widening)
Cross-section	Shared use path
Cross-section	Bike lanes
Cross-section	Buffered bike lanes
Cross-section	Protected bike lanes
Cross-section	Two-way left-turn lane
Cross-section	Reversable center lane
Cross-section	Median
Cross-section	Narrow travel lane(s)
Cross-section	Widening to two travel lanes in each direction

Category	Improvement Idea
Intersection improvement	Intersection capacity improvements (additional turn lanes)
Intersection improvement	Intersection capacity improvements (additional through lanes)
Intersection improvement	Intersection reconfiguration (e.g., 119th & Arapahoe to make NB to WB and EB to SB predominant)
Intersection improvement	Roundabout
Intersection improvement	Channelized turn lane
Intersection improvement	Smaller intersection
Intersection improvement	Protected-only left movements
Multimodal improvements	Pedestrian at-grade crossing (Signalized, HAWK, RRFB)
Multimodal improvements	Underpass
Multimodal improvements	Overpass
Multimodal improvements	Curb bulbouts
Multimodal improvements	Median refuge island
Multimodal improvements	Leading pedestrian interval
Multimodal improvements	Raised crosswalks
Multimodal improvements	Conflict-zone markings
Multimodal improvements	Trail connections
Speed management	Tightened corner radii at intersections
Speed management	Traffic calming infrastructure (chicanes, traffic circles, speed tables, etc.)
Speed management	Real-time speed feedback signs (SFS)
Transit amenities	Micromobility stations at bus stops
Transit amenities	Regional mobility hub
Transit service	On-demand microtransit

Other improvement ideas to be considered in the preliminary and final design are listed in **Appendix D**.

Tier 1 Evaluation

Each improvement idea was qualitatively evaluated based on its ability to support the corridor needs. **Table 9** summarizes the simple yes/no evaluation prompt for each corridor need.

Table 9. Tier 1 Evaluation Prompts

Corridor Needs	Evaluation
Multimodal and regional connectivity	Will the improvement add multimodal infrastructure and/or address multimodal connectivity needs?
Crash reduction toward Vision Zero	Will the infrastructure reduce or eliminate serious injuries and fatalities?
Walk, bike, first and final mile connections	Will the infrastructure complete connections along and across the corridors? Will the improvement ease travel difficulties, especially for impacted populations?
Transit	Will the infrastructure meet the needs of people trying to access local and regional transit?
Motor vehicle travel times	Will the infrastructure decrease traffic delays and make travel more predictable for vehicles and buses?
Context sensitivity	Will the infrastructure reflect the unique characteristics of adjacent land uses and complement the context of the surrounding environment?

Of the 37 improvement types evaluated in Tier 1, the following 6 were not advanced for inclusion in Tier 2: conventional bike lanes, smaller intersection, pedestrian overpass, raised crosswalks, traffic calming infrastructure (chicanes, traffic circles, speed tables, etc.) and on-demand microtransit as they do not support and/or are in conflict with one or more of the Corridor Needs. The remaining 31 improvement types were retained for further consideration in the Tier 2 evaluation.

Tier 2 Alternatives Development and Evaluation

With a comprehensive list of candidate improvement types, the project team bundled compatible improvements into three Packaged Alternatives, each with a distinct emphasis. Input from the first phase of public and stakeholder engagement influenced the development of the three Packaged Alternatives.

The Alternatives included:

- **Alternative A** – Optimize the Existing Right-of-Way
- **Alternative B** – Match Travel Patterns
- **Alternative C** – Maximize Multimodal Capacity

Alternative A

Alternative A seeks to minimize any impacts beyond the existing ROW, recognizing that many of the surrounding land uses are protected open spaces and residential neighborhoods.

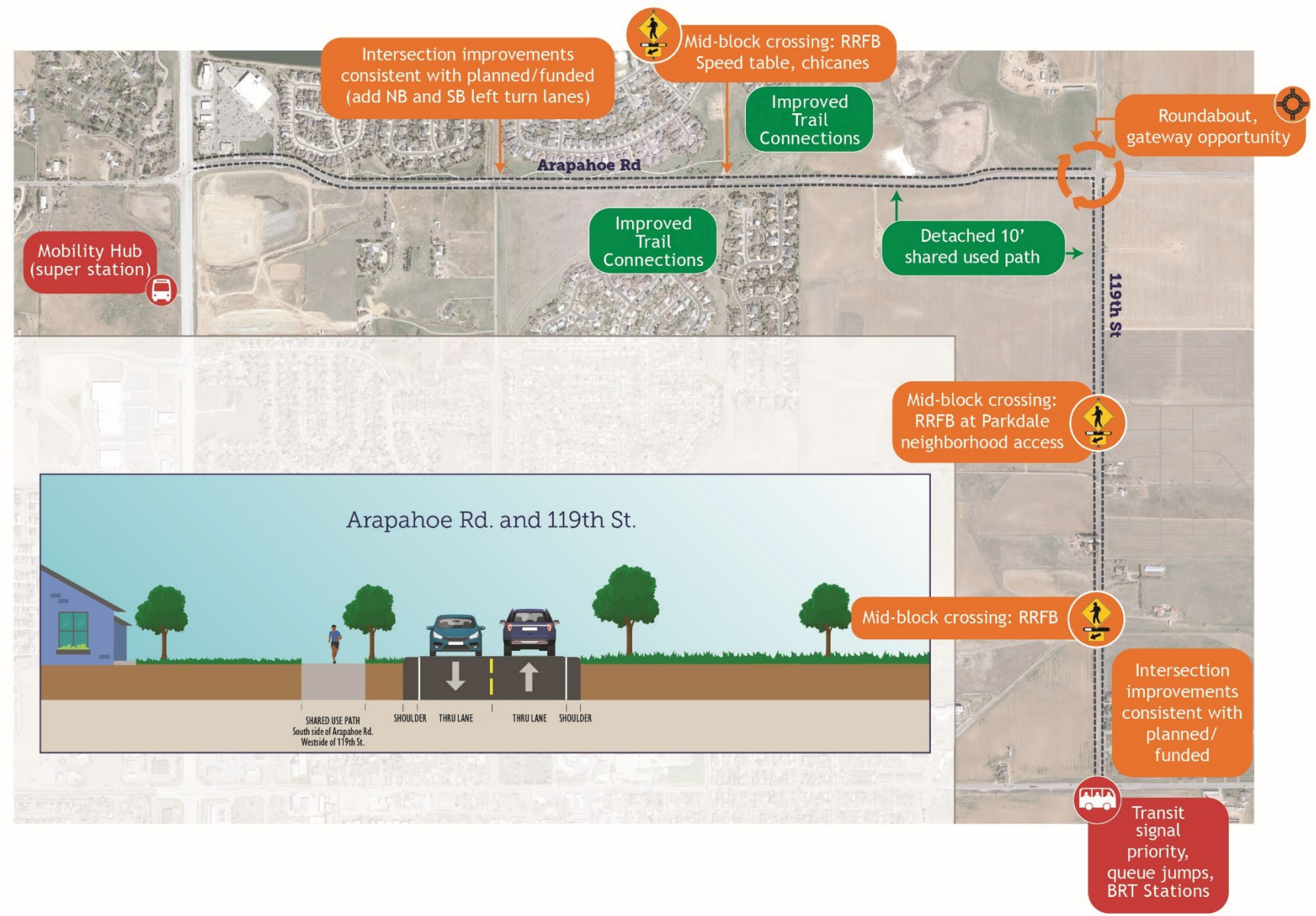
Alternative A includes one 11' vehicular travel lane in each direction and adds 4' shoulders. A detached 10' shared use path on the south side of Arapahoe Road and the west side of 119th Street is the multimodal accommodation for both bicycles and pedestrians. New pedestrian mid-block crossings are introduced at the South Boulder Canyon Creek Trail crossing, Parkdale neighborhood access from 119th Street, and at the Lafayette Great Park. Alternative A includes a roundabout at the Arapahoe Road and 119th Street intersection and retains the planned intersection improvements at Arapahoe Road and 111th Street and at Baseline Road/CO 7 and 119th Street. **Figure 23** illustrates the key features of Alternative A.

Key Features of Alternative A

- One 11' travel lane in each direction, 4' shoulders
- Rural cross section with no curb and gutter
- Detached 10' shared use path
  - South side of Arapahoe Road, west side of 119th Street
- Mid-block crossings, Rectangular Rapid-Flashing Beacon (RRFB), at South Boulder Canyon Creek Trail crossing, Parkdale neighborhood access, and Lafayette Great Park
- Planned intersection improvements at Arapahoe Road and 111th Street and at Baseline Road/CO 7 and 119th Street
- Roundabout at the Arapahoe Road and 119th Street intersection

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Figure 23. Alternative A Key Features



Alternative B

The guiding theme of Alternative B was to match the dominant travel patterns of the CO 7 travel shed, notably westbound (toward the City of Boulder) in the morning peak period and eastbound in the evening peak period.

Alternative B includes one 11' vehicular travel lane in each direction and adds a 14' reversible center travel lane. Detached 6' sidewalks on both sides of the roads are included to accommodate pedestrians. Separated bikeways are included to provide a dedicated space for cyclists. The separated bikeway is directional on Arapahoe Road (west of South Boulder Canyon) and two-way on Arapahoe Road (east of South Boulder Canyon) and 119th Street. Mid-block Pedestrian Hybrid Beacons (PHBs) are introduced at the South Boulder Canyon Creek Trail crossing and at the Lafayette Great Park.

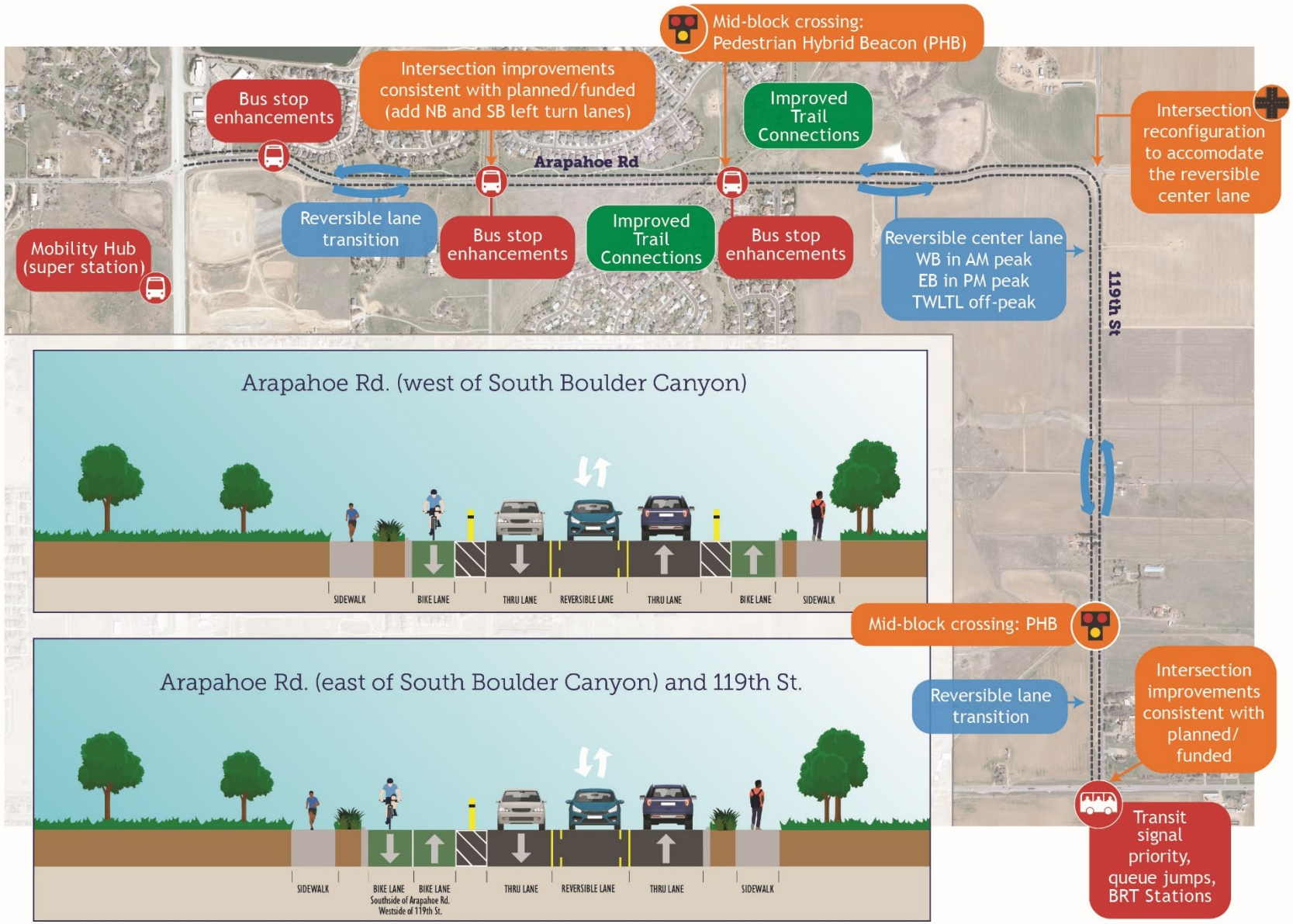
Alternative B reconfigures the intersection at Arapahoe Road and 119th Street to accommodate the reversible center lane. And the planned intersection improvements at Arapahoe Road and 111th Street, and Baseline Road/CO 7 and 119th Street are retained. **Figure 24** shows the key features of Alternative B.

Key Features of Alternative B

- One 11' travel lane in each direction, 14' reversible center lane,
- Urban cross section with curb and gutter
- Detached 6' sidewalks on both sides
- Separated bikeway
  - Directional on Arapahoe Road (west of South Boulder Canyon)
  - Two-way on Arapahoe Road (east of South Boulder Canyon) and 119th Street (west side)
- Mid-block crossings (PHBs) at South Boulder Canyon Creek Trail crossing and Lafayette Great Park
- Planned intersection improvements at Arapahoe Road and 111th Street, and Baseline Road/CO 7 and 119th Street
- Intersection reconfiguration at Arapahoe Road and 119th Street

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Figure 24. Alternative B Key Features



Reversible Center Lane Traffic Analysis

The general premise of the reversible center turn lane would be to accommodate the directionality of traffic flow on Arapahoe Road and 119th Street while minimizing ROW impacts. The center lane would be used for northbound (119th Street) and westbound (Arapahoe Road) traffic during the AM peak period; the direction that approximately 70 percent of future (2050) traffic is expected to travel. Conversely, during the PM peak period, approximately 60 percent of future (2050) traffic is expected to travel eastbound (Arapahoe Road) and southbound (119th Street); therefore, the center lane would be reversed in the PM peak hour to accommodate the heavier movement.

Reversible lanes work best when left turns are minimal or non-existent, like for bridges, tunnels, and freeways. There are few arterial street reversible lane applications in the United States. One example is Lafayette Street in Santa Clara, California. The reversible lane extends 5 blocks (approximately 1,000 feet) and includes overhead signing to denote the directionality of the center lane. Notably, the reversible lane terminates in advance of major intersections with heavy left turn movements.

Arapahoe Road & 111th Street Intersection

The project team evaluated the operation of the signalized Arapahoe Road and 111th Street intersection. The heavy eastbound and westbound left turn volumes at this intersection (as documented in **Chapter 4**) negate the benefit of a reversible center lane. The westbound left turn movements would be permitted only from the center lane in the AM peak period, while the eastbound left turn movements would also be permitted only from the single eastbound through lane during the AM peak period. In both cases, left turning motorists are required to wait for a gap in oncoming traffic to complete the left turn movement. The opposite configuration would occur during the PM peak period – with eastbound left turns being made from the center lane. In both peak periods, the heavy left turn volumes, with no dedicated left turn traffic signal phase, would cause significant queuing and impede the flow of through traffic. The average delay for general traffic, including buses, at the intersection with the reversible center lane in 2050 is projected to be 119 seconds/vehicle during the AM peak hour and 113 seconds/vehicle during the PM peak hour (compared to 84 seconds/vehicle and 80 seconds/vehicle, respectively in the 2050 No Action alternative).

Arapahoe Road & 119th Street Intersection

The Arapahoe Road and 119th Street intersection is projected to carry a heavy northbound to westbound left turn movement in the AM peak period with a correspondingly heavy eastbound to southbound right turn movement in the PM peak period; in addition to significant through travel patterns on both Arapahoe Road and 119th Street. To make the reversible center lane concept work, the project team considered several innovative intersection treatments to accommodate the reversible lane through the intersection to accommodate the heavy regional travel pattern. A grade separation and significant ROW would be required to achieve this while providing adequate operations for general traffic, including buses. It would result in indirect routing for northbound/southbound and eastbound/westbound travelers, requiring them to maneuver through (and incur delays at) two intersections instead of a single intersection.

Figure 25 shows the conceptual design of the Arapahoe Road and 119th Street intersection with the reversible lane.

Figure 25. Reversible Lane at Arapahoe Road and 119th Street

Other Considerations

In addition to the poor traffic operations at the Arapahoe Road & 111th Street intersection and the indirect routing and ROW impacts at the Arapahoe Road & 119th Street intersection, several other considerations are associated with a reversible center lane that would result in potential negative impacts on the Arapahoe Road and 119th Street corridors:

- **Operations & Maintenance** – Intelligent Transportation System elements are required for reversible lane control, structures for signal head placement, communications to a traffic management center for operational control, etc. If the reversible lane were barrier separated, daily shifting of the barriers would be required.
- **Safety** – There is potential for confusion at driveway/access points along the reversible lane alignment. Motorists exiting their driveway/access may experience confusion on which direction the reversible lane is operating and could pull into the center lane in the wrong direction, resulting in an increased likelihood of head-on crashes. Because the center lane would be a shared left turn lane with through movements, there would be an increased likelihood of rear-end crashes.
- **Bicycle & Pedestrian Crossings** – A pedestrian refuge at the trail crossings could not be accommodated due to use of the center lane as a reversible lane.

Creation of Alternative B-2

After consultation with the stakeholders, the initial Alternative B was modified to eliminate the reversible center lane from further consideration. The modified Alternative B, B-2, eliminates the reversible lane and instead includes left turn lanes at intersections, standard intersection capacity improvements at Arapahoe Road and 119th Street and at Arapahoe Road and 111th Street, and median refuges at pedestrian mid-block crossings.

Alternative C

The guiding theme of Alternative C was to maximize the multimodal capacity of Arapahoe Road and 119th Street. Alternative C includes the more robust enhancements for all travel modes, relative to the other Packaged Alternatives.

Alternative C includes two 11' vehicular travel lane in each direction and a 14' raised center median. Detached 10' shared use paths on both sides of the roads are included to accommodate pedestrians and cyclists. A pedestrian underpass is included at the South Boulder Canyon Creek Trail crossing, and a PHB with a median refuge is included at Lafayette Great Park. The planned intersection improvements at Arapahoe Road and 111th Street, and Baseline Road/CO 7 and 119th Street are retained, along with recommended intersection improvements at Arapahoe Road and 119th Street. In addition, raised crosswalks at the channelized right turns at Baseline Road/CO 7 and 119th Street are recommended. Transit improvements, such as bus stop enhancements and transit signal priority along Arapahoe Road, are also included. To further enhance the bus stops at South Boulder Canyon, a micromobility hub is included.

Micromobility Hubs

Mobility hubs are community focal points that seamlessly integrate various transportation modes, provide supportive multimodal infrastructure, and serve as a placemaking strategy to activate activity centers. Mobility hubs can vary in size, programming, and design to respond to the context and function of each location. Factors that influence the investment level in a mobility hub include existing transit service, land use characteristics, and population and employment densities.

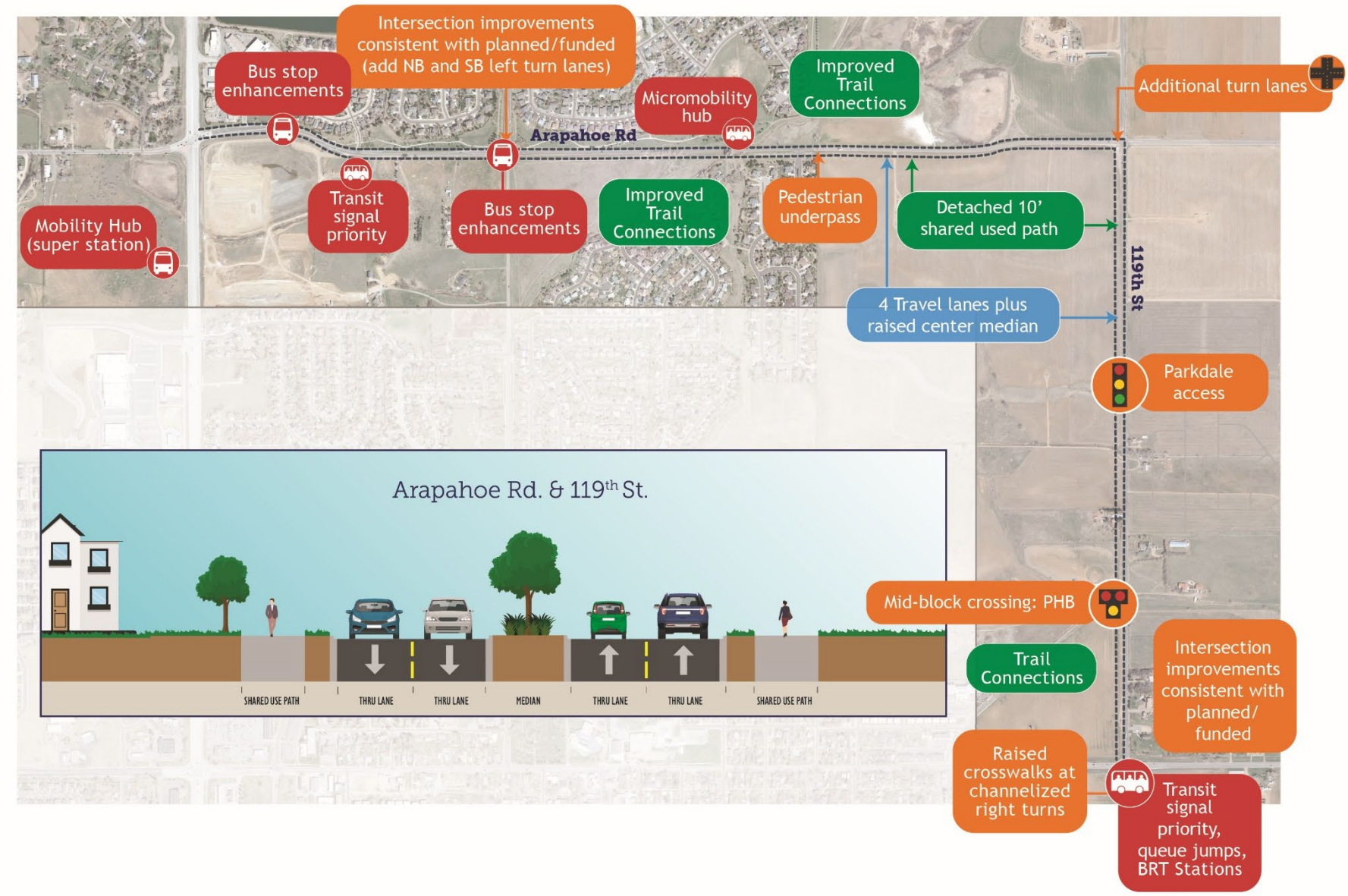
Figure 26 shows the key features of Alternative C.

Key Features of Alternative C

- Two 11' travel lanes in each direction and a 14' raised center median
- Urban cross section with curb and gutter
- Detached 10' shared use paths on both sides of the roads
- Pedestrian underpass at South Boulder Canyon Creek Trail crossing
- Mid-block crossing (PHB) with median refuge at Lafayette Great Park
- Raised crosswalks at channelized right turns at Baseline Road/CO 7 and 119th Street
- Planned intersection improvements at Arapahoe Road and 111th Street, Arapahoe Road and 119th Street, and Baseline Road/CO 7 and 119th Street
- Micromobility hub at South Boulder Canyon; bus stop enhancements
- Transit signal priority (extra green for buses) along Arapahoe Road

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Figure 26. Alternative C Key Features



Tier 2 Evaluation

The three Packaged Alternatives, including both versions of Alternative B, and the No Action Alternative, were qualitatively and quantitatively evaluated based on their ability to address the corridor needs. Rather than evaluating as a means to select the "best" alternative, it was an exercise to understand the strongest aspects of each alternative to inform the development of the Recommended Alternative.

Table 10 summarizes the evaluation criteria by corridor needs.

Table 10. Tier 2 Evaluation Criteria

Corridor Needs	Evaluation Criteria
Multimodal and regional connectivity	• To what extent does the alternative address multimodal connectivity? • To what extent does the alternative support east/west regional travel? • Does the alternative balance multimodal and regional travel needs?
Crash reduction toward Vision Zero	• How many safe system components are included? • Would the alternative increase or reduce vehicle travel speeds? • Would the alternative increase or reduce ped/bike conflict points with vehicles? • Would the alternative mitigate the higher than expected injury crashes at intersections?
Walk, bike, first and final mile connections	• Would the alternative provide a low stress walking/wheeling environment along the corridors? • Would the alternative provide a low stress bicycling/scooting environment along the corridors? • Would the alternative provide safer crossings of the corridors for biking and walking?
Transit	• Would the alternative improve bus stop amenities? • Would the alternative improve transit speed and reliability?
Motor vehicle travel times	• Would the alternative improve motor vehicle travel times? • Would the alternative improve motor vehicle travel time reliability?
Context sensitivity	• Would the alternative complement the context of the surrounding environment (e.g., open space)? • Would the alternative minimize vehicle travel on Baseline Road through Lafayette, allowing a more walkable environment and improved access to community resources? • Would additional ROW and/or an easement be required for this alternative? If so, how much? • How does this impact livability for residents within 800' of the corridor? Considering noise, air quality, and visual impacts.

The alternatives were rated on the following scale:

- The alternative would have a very low benefit toward the corridor need.
- The alternative would have a low benefit toward the corridor need.
- The alternative would have a moderate benefit toward the corridor need.
- The alternative would have a high benefit toward the corridor need.
- The alternative would have a very high benefit toward the corridor need.

The results of the Tier 2 evaluation are shown in **Table 11**.

Table 11. Tier 2 Evaluation

Corridor Need	No Action	Alternative A Optimize Existing ROW	Alternative B-1 Match Travel Patterns (Reversible Center Lane)	Alternative B-2 Match Travel Patterns (Two-Way Left Turn Lane; Median Pedestrian Refuges)	Alternative C Maximize Multimodal Capacity
	●	●	●	●	●
Multimodal and Regional Connectivity	• To what extent does the alternative address multimodal connectivity? Lowest; no new multimodal facilities or crossings added. • To what extent does the alternative support east/west regional travel? Lowest; no changes to roadway configuration. Planned improvements at Arapahoe Road & 111th Street and at 119th Street & CO 7 will have slight improvements. • Does the alternative balance multimodal and regional travel needs? No.	• To what extent does the alternative address multimodal connectivity? Low; 10' sidepath added only to the south side of Arapahoe Road and west side of 119th Street. No on-street bike facilities. At-grade RRFB pedestrian crossings. • To what extent does the alternative support east/west regional travel? Lowest; no changes to roadway configuration. Planned improvements at Arapahoe Road & 111th Street and at 119th Street & CO 7 will have slight improvements. • Does the alternative balance multimodal and regional travel needs? Somewhat.	• To what extent does the alternative address multimodal connectivity? Medium; 6' sidewalk added to both sides of Arapahoe Road and 119th Street. On-street buffered bike lane/two-way cycletrack provided. At-grade PHB crossings. • To what extent does the alternative support east/west regional travel? High. Center reversible lane can match variable travel patterns by time of day and day of week; however, compromises local left-turn lanes. Planned improvements at 119th Street & CO 7 will improve regional travel. • Does the alternative balance multimodal and regional travel needs? Yes.	• To what extent does the alternative address multimodal connectivity? High; 6' sidewalk added to both sides of Arapahoe Road and 119th Street. On-street buffered bike lane/two-way cycletrack provided. At-grade PHBs with median refuges crossings. • To what extent does the alternative support east/west regional travel? Medium. Center left-turn lane will separate out turning vehicles from through vehicles, reducing delay. Planned improvements, plus additional turn lanes at Arapahoe Road & 111th Street and at 119th Street & CO 7, will improve regional travel. • Does the alternative balance multimodal and regional travel needs? Yes.	• To what extent does the alternative address multimodal connectivity? High; 10' sidepath added to both sides of Arapahoe Road & 119th Street. Grade-separated pedestrian crossing at South Boulder Canyon Creek Trail and PHB with median refuge crossing of 119th Street. • To what extent does the alternative support east/west regional travel? High. Additional capacity (one-travel lane in each direction) provided in both directions. Planned improvements, plus additional turn lanes at Arapahoe Road & 111th Street and at 119th Street & CO 7, will improve regional travel. • Does the alternative balance multimodal and regional travel needs? Yes.

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Corridor Need	No Action	Alternative A Optimize Existing ROW	Alternative B-1 Match Travel Patterns (Reversible Center Lane)	Alternative B-2 Match Travel Patterns (Two-Way Left Turn Lane; Median Pedestrian Refuges)	Alternative C Maximize Multimodal Capacity
	●	●	●	●	●
Crash Reduction Toward Vision Zero	• How many safe system components are included? 1. Planned channelized turn lanes at 119th Street & Baseline Road/CO 7. • Would the alternative increase or reduce vehicle travel speeds? Posted speed is not anticipated to change. • Would the alternative increase or reduce ped/bike conflict points with vehicles? The planned channelized turn lanes at 119th Street & Baseline Road/CO 7 add a safer/defined crossing. • Would the alternative mitigate the higher than expected injury crashes at intersections? No.	• How many safe system components are included? 8 (e.g., shared use path, roundabout, RRFB crossings) • Would the alternative increase or reduce vehicle travel speeds? Posted speed is not anticipated to change; however, mid-block crossings may slightly reduce vehicular travel speeds. • Would the alternative increase or reduce ped/bike conflict points with vehicles? The planned channelized turn lanes at 119th Street & Baseline Road/CO 7 add a safer/defined crossing. Roundabout at Arapahoe Road & 119th Street and the RRFBs add safer/defined crossings. • Would the alternative mitigate the higher than expected injury crashes at intersections? Yes, significantly.	• How many safe system components are included? 7 (e.g., sidewalk, buffered bike lanes, channelized turn lanes) • Would the alternative increase or reduce vehicle travel speeds? Posted speed limit is to be determined; however, prioritizing the NB>WB and EB>SB movements may increase corridor travel speeds. • Would the alternative increase or reduce ped/bike conflict points with vehicles? The planned channelized turn lanes at 119th Street & Baseline Road/CO 7 add a safer/defined crossing. The PHBs add safer/defined crossings. • Would the alternative mitigate the higher than expected injury crashes at intersections? Yes, moderately.	• How many safe system components are included? 8 (e.g., sidewalk, buffered bike lanes, channelized turn lanes, two-way left-turn lanes/center median) • Would the alternative increase or reduce vehicle travel speeds? Posted speed limit is to be determined; however, travel speed is anticipated to remain similar to current conditions. • Would the alternative increase or reduce ped/bike conflict points with vehicles? The planned channelized turn lanes at 119th Street & Baseline Road/CO 7 add a safer/defined crossing. The PHBs add safer/defined crossings. • Would the alternative mitigate the higher than expected injury crashes at intersections? Yes, moderately.	• How many safe system components are included? 9 (e.g., detached shared use path, center median, pedestrian underpass and PHB) • Would the alternative increase or reduce vehicle travel speeds? Posted speed limit is to be determined; however, travel speed is anticipated to increase slightly given more vehicular travel lanes. • Would the alternative increase or reduce ped/bike conflict points with vehicles? The planned channelized turn lanes at 119th Street & Baseline Road/CO 7 add a safer/defined crossing. The PHBs add safer/defined crossings. The underpass removes a conflict point. • Would the alternative mitigate the higher than expected injury crashes at intersections? Yes, most significantly.

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Corridor Need	No Action	Alternative A Optimize Existing ROW	Alternative B-1 Match Travel Patterns (Reversible Center Lane)	Alternative B-2 Match Travel Patterns (Two-Way Left Turn Lane; Median Pedestrian Refuges)	Alternative C Maximize Multimodal Capacity
Walk, Bike, First and Final Mile Connections	●	●	●	●	●
	• Would the alternative provide a low stress walking/wheeling environment along the corridors? No. • Would the alternative provide a low stress bicycling/scooting environment along the corridors? No. • Would the alternative provide safer crossings of the corridors for biking and walking? Only the planned channelized turn lanes at 119th Street & Baseline Road/CO 7.	• Would the alternative provide a low stress walking/wheeling environment along the corridors? Yes, shared use paths. • Would the alternative provide a low stress bicycling/scooting environment along the corridors? Yes, shared use paths and wider shoulders. • Would the alternative provide safer crossings of the corridors for biking and walking? Yes, channelized turn lanes and mid-block RRFB crossings, and crossings at the roundabout.	• Would the alternative provide a low stress walking/wheeling environment along the corridors? Yes, detached sidewalks. • Would the alternative provide a low stress bicycling/scooting environment along the corridors? Yes, buffered bike lanes/cycletrack. • Would the alternative provide safer crossings of the corridors for biking and walking? Yes, channelized turn lanes and mid-block PHB crossings.	• Would the alternative provide a low stress walking/wheeling environment along the corridors? Yes, detached sidewalks. • Would the alternative provide a low stress bicycling/scooting environment along the corridors? Yes, buffered bike lanes/cycletrack. • Would the alternative provide safer crossings of the corridors for biking and walking? Yes, channelized turn lanes and mid-block PHB crossings.	• Would the alternative provide a low stress walking/wheeling environment along the corridors? Yes, wide detached sidewalks. • Would the alternative provide a low stress bicycling/scooting environment along the corridors? Yes, wide detached sidewalks. • Would the alternative provide safer crossings of the corridors for biking and walking? Yes, channelized turn lanes, a mid-block PHB crossing, and a pedestrian underpass.
Transit	●	●	●	●	●
	• Would the alternative improve bus stop amenities? Low. Planned improvements at 119th Street & CO 7 will add far-sided BRT stops. Planned mobility hub near Arapahoe Road & US 287. • Would the alternative improve transit speed and reliability? Low. Planned improvements (additional travel lanes, BRT stop) at 119th Street and	• Would the alternative improve bus stop amenities? Low. Planned improvements at 119th Street & CO 7 will add far-sided BRT stops. Planned mobility hub near Arapahoe Road & US 287. RTD expressed concerns about the roundabout at Arapahoe Road & 119th Street (future bus stop locations).	• Would the alternative improve bus stop amenities? Medium. Planned improvements at 119th Street & CO 7 will add far-sided BRT stops. Planned mobility hub near Arapahoe Road & US 287. Local bus stop enhancements recommended along Arapahoe Road. • Would the alternative improve transit speed and	• Would the alternative improve bus stop amenities? Medium. Planned improvements at 119th Street & CO 7 will add far-sided BRT stops. Planned mobility hub near Arapahoe Road & US 287. Local bus stop enhancements recommended along Arapahoe Road. • Would the alternative improve transit speed and	• Would the alternative improve bus stop amenities? High. Planned improvements at 119th Street & CO 7 will add far-sided BRT stops. Planned mobility hub near Arapahoe Road & US 287. Local bus stop enhancements recommended along Arapahoe Road **and** local micromobility hub recommended at South

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Corridor Need	No Action	Alternative A Optimize Existing ROW	Alternative B-1 Match Travel Patterns (Reversible Center Lane)	Alternative B-2 Match Travel Patterns (Two-Way Left Turn Lane; Median Pedestrian Refuges)	Alternative C Maximize Multimodal Capacity
	CO 7/along CO 7 will improve transit speed and reliability.	• Would the alternative improve transit speed and reliability? Low. Planned improvements (additional travel lanes, BRT stop) plus TSP and queue jumps at 119th Street & CO 7/along CO 7 will improve transit speed and reliability.	reliability? Medium. Additional capacity along Arapahoe Road & 119th Street would improve bus speed and reliability of future transit.	reliability? Low. Additional turn-lanes along Arapahoe Road & 119th Street would *slightly* improve bus speed and reliability of future transit.	Boulder Canyon Creek Trail. • Would the alternative improve transit speed and reliability? High. Additional capacity and TSP along Arapahoe Road & 119th Street would improve bus speed and reliability of future transit.
Motor Vehicle Travel Times	●	●	●	●	●
	• Would the alternative improve motor vehicle travel times? Low. Without any improvements beyond those that are funded, motor vehicle travel times will continue to increase as local and regional travel increases. • Would the alternative improve motor vehicle travel time reliability? Low. Reliability will continue to diminish with increased congestion levels.	• Would the alternative improve motor vehicle travel times? Moderate. Arapahoe & 119th Street intersection improved to LOS B/C with roundabout. • Would the alternative improve motor vehicle travel time reliability? Moderate. Limited opportunities to improve reliability through adaptive signal timing (roundabout).	• Would the alternative improve motor vehicle travel times? Low. Travel time benefits not realized with reversible lane due to heavy left turn volumes • Would the alternative improve motor vehicle travel time reliability? Low. Limited opportunities to improve reliability through adaptive signal timing but some opportunity to adjust flow of reversible lanes.	• Would the alternative improve motor vehicle travel times? Moderate to High. Intersection improvements address primary congestion at Arapahoe/119th (LOS D/C). • Would the alternative improve motor vehicle travel time reliability? Moderate. Some opportunity to improve reliability through adaptive signal timing.	• Would the alternative improve motor vehicle travel times? High; intersection improvements address congestion at Arapahoe/119th (LOS D/C) and Arapahoe/111th (LOS C/C). • Would the alternative improve motor vehicle travel time reliability? High; Some opportunity to improve reliability through adaptive signal timing; additional capacity enables more effective incident management.

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Corridor Need	No Action	Alternative A Optimize Existing ROW	Alternative B-1 Match Travel Patterns (Reversible Center Lane)	Alternative B-2 Match Travel Patterns (Two-Way Left Turn Lane; Median Pedestrian Refuges)	Alternative C Maximize Multimodal Capacity
	●	●	●	●	●
Context Sensitivity	• Would the alternative complement the context of the surrounding environment (e.g., open space)? Yes. This alternative maintains a rural character and does not impact surrounding land uses. • Would the alternative minimize vehicle travel on Baseline Road through Lafayette, allowing for a more walkable environment and improved access to community resources? Not anticipated as no vehicular improvements are a part of this alternative. • Would additional ROW and/or an easement be required for this alternative? If so, how much? No. • How does this impact livability for residents within 800' of the corridor? Anticipated increase in noise as vehicle volumes increase, decrease in air quality as vehicle volumes increase, and no visual impacts.	• Would the alternative complement the context of the surrounding environment (e.g., open space)? Yes. This alternative maintains a rural character and does not impact surrounding land uses. • Would the alternative minimize vehicle travel on Baseline Road through Lafayette, allowing for a more walkable environment and improved access to community resources? Not anticipated as major vehicular improvements are not a part of this alternative. • Would additional ROW and/or an easement be required for this alternative? If so, how much? Yes, approximately 28,100 square feet (almost all at the roundabout intersection at Arapahoe Road & 119th Street). • How does this impact livability for residents within 800' of the corridor? Anticipated increase in noise as vehicle volumes increase (no more than the No Action), decrease in air	• Would the alternative complement the context of the surrounding environment (e.g., open space)? No. This alternative has significant impacts to open spaces. • Would the alternative minimize vehicle travel on Baseline Road through Lafayette, allowing for a more walkable environment and improved access to community resources? Yes, anticipated, as vehicular travel would be improved on 119th Street & Arapahoe Road. • Would additional ROW and/or an easement be required for this alternative? If so, how much? Yes, approximately 1,049,400 square feet (north/east sidewalk and Arapahoe/119th intersection). • How does this impact livability for residents within 800' of the corridor? Anticipated increase in noise as vehicle volumes increase (slightly less than the No Action) and vehicles are slightly closer to	• Would the alternative complement the context of the surrounding environment (e.g., open space)? Somewhat. This alternative maintains a rural character and minimizes impacts to the surrounding land uses. • Would the alternative minimize vehicle travel on Baseline Road through Lafayette, allowing for a more walkable environment and improved access to community resources? Yes, anticipated, as vehicular travel would be improved on 119th Street & Arapahoe Road. • Would additional ROW and/or an easement be required for this alternative? If so, how much? Yes, approximately 138,800 square feet (north/east sidewalk). • How does this impact livability for residents within 800' of the corridor? Anticipated increase in noise as vehicle volumes increase (slightly less than the No Action) and vehicles are slightly closer to	• Would the alternative complement the context of the surrounding environment (e.g., open space)? Somewhat. This alternative offers additional capacity to support the changing land uses (agriculture to neighborhoods) and minimizes impacts to the surrounding land uses. • Would the alternative minimize vehicle travel on Baseline Road through Lafayette, allowing for a more walkable environment and improved access to community resources? Yes, anticipated, as vehicular travel would be improved on 119th Street & Arapahoe Road. • Would additional ROW and/or an easement be required for this alternative? If so, how much? Yes, approximately 274,500 square feet (both shared-use paths). • How does this impact livability for residents within 800' of the corridor? Anticipated increase in noise as vehicle volumes

Corridor Need	No Action	Alternative A Optimize Existing ROW	Alternative B-1 Match Travel Patterns (Reversible Center Lane)	Alternative B-2 Match Travel Patterns (Two-Way Left Turn Lane; Median Pedestrian Refuges)	Alternative C Maximize Multimodal Capacity
		quality as vehicle volumes increase (no more than the No Action), and no visual impacts (no more than the No Action).	properties, decrease in air quality as vehicle volumes increase (slight increase more than the No Action) and vehicles are slightly closer to properties, and significant visual impacts (more travel lanes, wider roadway, and overhead signing and lighting required for reversible lane).	properties, decrease in air quality as vehicle volumes increase (slight increase more than the No Action) and vehicles are slightly closer to properties, and slight visual impacts (more travel lanes, wider roadway). Landscaping center median could complement the open spaces.	increase and vehicles are closer to properties, decrease in air quality as vehicle volumes increase, and visual impacts because of the additional travel lanes. Landscaping center median could complement the open spaces.

Traffic Operational Analysis

The 2050 AM and PM peak hour traffic forecasts described in **Chapter 4** were used as the basis for the traffic operational analysis of the three alternatives, plus the No Action alternative. The Arapahoe Road & 111th Street and Arapahoe Road & 119th Street intersections are the two intersections that would vary significantly among the alternatives. It should be noted that congestion at the US 287/Arapahoe Road intersection may constrain vehicles from access to the Segment C corridors during the busiest times of the day. The CO 7 Segment B project is evaluating operational improvements at the US 287/Arapahoe Road intersection.

Detailed analysis worksheets are included in **Appendix D**.

Table 12. Alternative Comparison: 2050 AM/PM Peak Hour Traffic Operations

	No Action	Alternative A: Optimize Existing ROW	Alternative B: Match Travel Patterns	Alternative C: Expand ROW to Maximize Multimodal Capacity
Arapahoe Road & 111th Street	Existing signalized intersection + planned/funded NB and SB left turn lanes	Existing signalized intersection + planned/funded NB and SB left turn lanes	Reversible center lane	Existing signalized intersection + planned/funded NB and SB left turn lanes and 2 EB and WB through lanes
	F/E	F/E	F/F	D/C
Arapahoe Road & 119th Street	Existing signalized intersection	Two-lane roundabout	Dual intersections with grade separation	Signalized intersection with additional lanes: dedicated EB right turn lane, second NB left turn lane, 2 EB and WB through lanes
	F/F	B/C	B/B	C/C

7. Recommendations and Next Steps

Recommended Corridor Design

The Recommended Corridor Design combines features of all three packaged alternatives. The Recommended Corridor Design used packaged Alternative B-2 as a base, while including features from Alternative A and Alternative C. The recommended improvements are intended to create safe and accessible corridors for all travel modes while minimizing the impacts to the surrounding land uses. The Recommended Corridor Design focuses on improving the intersections and multimodal facilities, which is consistent with the approach recommended in the SH 7 PEL and CDP. The Recommended Corridor Design was developed through a collaborative process with stakeholders from the adjacent municipalities and with strong consideration for the community input received throughout the process.

Roadway

The Recommended Corridor Design includes four travel lanes on Arapahoe Road from US 287 to just east of 111th Street with an urban cross section. Two travel lanes with a rural cross section/no curb and gutter are recommended on Arapahoe Road from just east of 111th Street to 119th Street. The Recommended Corridor Design includes two travel lanes, one in each direction, on 119th Street from Arapahoe Road to the Baseline Road/CO 7 intersection with a rural cross section/no curb and gutter, as well as intersection signalization at the Parkdale neighborhood access. Finally, the Recommended Corridor Design carries forward the intersection improvements consistent with the CO 7 plans at 119th Street and Baseline Road/CO 7. Both Arapahoe Road and 119th Street will include 5' shoulders and be posted at 35 mph.

Intersections

Intersection improvements at the Arapahoe Road and 111th Street intersection are recommended to include two eastbound and two westbound through lanes, in addition to the northbound and southbound left turn lanes that are currently planned/funded. A westbound center left-turn lane is recommended on Arapahoe Road to access Hawk Ridge Road. It is recommended to retain both a roundabout or a signalized intersection option at the intersection of Arapahoe Road and 119th Street. The roundabout and the signalized intersection should be designed to accommodate all users, particularly bicyclists and pedestrians. These intersection improvements will help to address the regional travel demand and improve reliability of the Segment C corridors.

Bicycle and Pedestrian

The recommended corridor design includes improvements both along and across Arapahoe Road and 119th Street to accommodate bicycles and pedestrians. A mid-block PHB at the South Boulder Canyon Creek Trail crossing is recommended as a near-term improvement, with a pedestrian underpass recommended if/when funding becomes available. Another mid-block PHB is recommended at the Great Bark Dog Park and trail, providing connectivity between the Burlington Trail west of 119th Street and the Parkdale shared use path east of 119th Street. Detached 10' shared use paths are recommended on the south side of Arapahoe Road and the east side of 119th Street. The east side of 119th Street was selected as the preferred location to optimize access for adjacent residents. On the west end of Arapahoe Road (from US 287 to 111th Street) and south end of 119th Street (from the mid-block crossing to Baseline Road), shared use paths are recommended on both sides of the street. The portion of the shared used path though the Kneebone Open Space may need to be crusher fines surface in the near-term, however, a paved surface is recommended for the long-term. The shared use path crossing of the south leg of the Arapahoe Road and 119th Street intersection is a key crossing for bicyclists and pedestrians. As noted above, the intersection should be designed to facilitate this key crossing for bicyclists and pedestrians.

Transit

Transit improvements, such as bus stop enhancements along Arapahoe Road are also included. Bus stop enhancements could include amenities such as benches, shade structures, trash cans, bicycle parking, and real-time bus tracking. The micromobility hub could include these amenities as well as shelters, covered bike parking, real-time bus tracking, lighting, and/or a small rideshare/passenger loading zone.

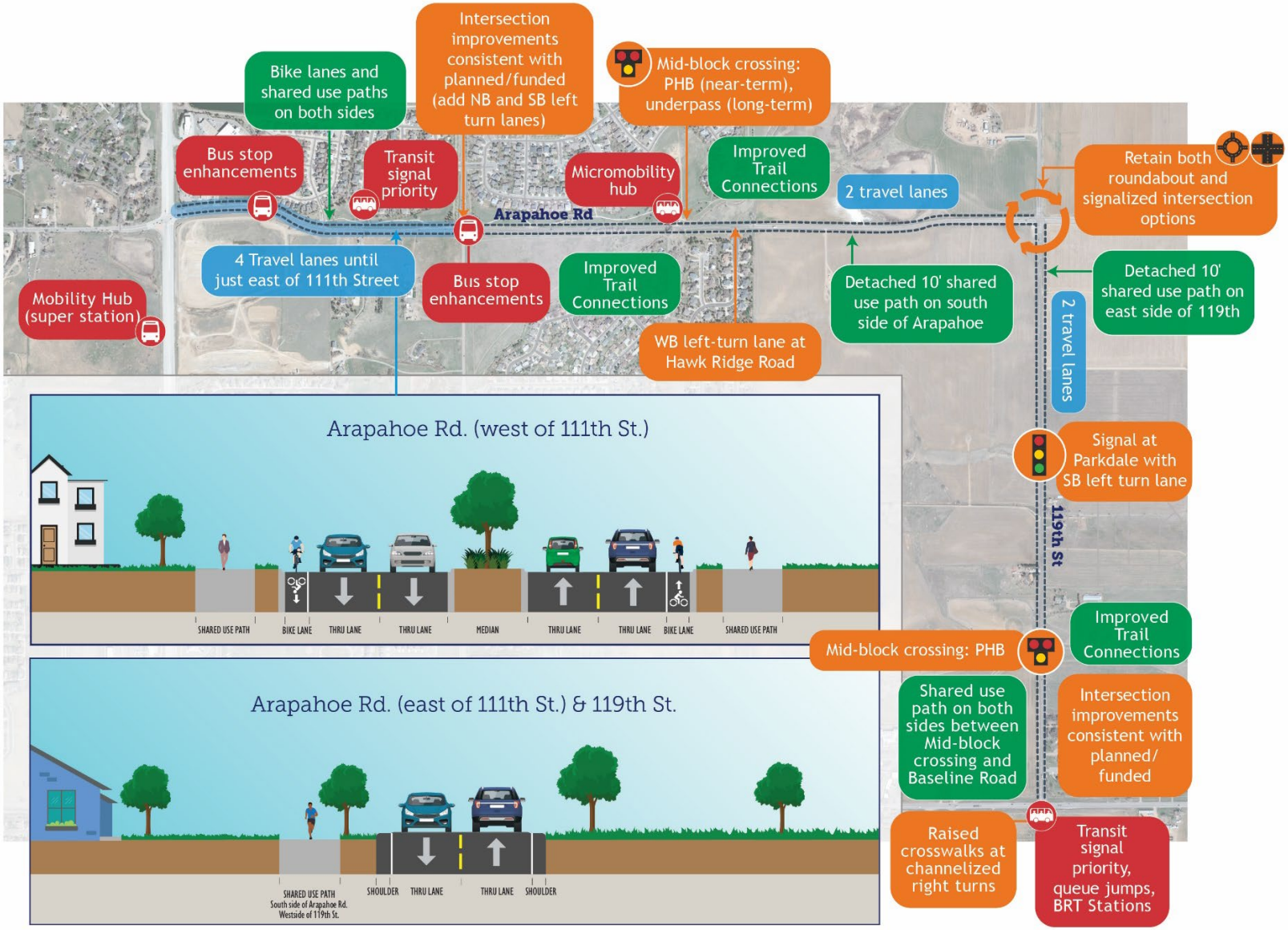
Figure 26 shows the key features of the Recommended Corridor Design.

Key Features of the Recommended Corridor Design

- Four travel lanes on Arapahoe Road from US 287 to just east of 111th Street, 5' bike lanes, with an urban cross section including curb and gutter
- Intersection improvements consistent with planned/funded (add NB and SB left turn lanes) at the Arapahoe Road and 111th Street intersection
- Two travel lanes on Arapahoe Road from just east of 111th Street to 119th Street, 5' shoulders, with a rural cross section/drainage ditch
- Mid-block PHB at the South Boulder Canyon Creek Trail crossing as a near-term improvement; long-term improvement as an underpass
- Dedicated left-turn lane at Hawk Ridge Road
- Detached 10' shared use path on the south side of Arapahoe Road and the east side of 119th Street, and on both sides of Arapahoe Road between US 287 and 111th Street and both sides of 119th Street between the mid-block crossing and Baseline Road
- Intersection improvements, either a roundabout or a signalized intersection, at the intersection of Arapahoe Road and 119th Street (both options retained for further consideration in the preliminary/final design phase)
- Two travel lanes on 119th Street from Arapahoe Road to the Baseline Road/CO 7 intersection (with a rural cross section/no curb and gutter)
- Intersection signalization at the Parkdale neighborhood access
- Mid-block PHB at the Great Bark Dog Park providing connectivity between the Burlington Trail west of 119th Street and the Parkdale share use path east of 119th Street
- Intersection improvements consistent with funded design at 119th Street and Baseline Road/CO 7
- 35 mph design speed

CO 7 Segment C
US 287 to 119th Street
(Arapahoe Road and 119th Street)

Figure 26. Recommended Corridor Design



Cost Estimates

The Recommended Corridor Design is estimated to cost between $23M and $24M, depending on the intersection configuration at Arapahoe Road and 119th Street. In developing the cost estimates, summarized in **Table 13**, key items were identified and quantified using the conceptual design CADD files included in **Appendix E**. Historical unit cost data was applied to generate line-item costs. A contingency was applied to these line-item costs and a series of percentage of total project costs to capture items that were not quantified at the conceptual level (i.e., drainage, utilities etc.). Items such as ROW acquisition and inflation were not captured in the cost estimates. No conceptual design was completed for the pedestrian underpass of Arapahoe Road; the cost estimate for the underpass in **Table 13** is a planning-level lump sum.

Table 13. Conceptual Cost Estimates

Improvements	Conceptual Project Cost Estimate
Arapahoe Road and 119th Street Intersection	
Option 1: Roundabout	$3,000,000
Option 2: Traditional Signalized Intersection Improvements	$4,000,000
119th Street (south of Arapahoe Road to north of Baseline Road)	$4,500,000
Arapahoe Road Improvements (Beasley Street to west of 119th Street)	$7,500,000
Pedestrian Underpass of Arapahoe Road (long-term recommendation)	$8,000,000
Total Cost	**$23M - $24M**

The conceptual cost estimates are included in **Appendix F.**

Implementation Plan

The Recommended Corridor Design will be implemented over time and as funding becomes available for final design and construction. The Town of Erie, City of Lafayette, and Boulder County staff will be responsible for advancing additional study, final design and engineering, and for identifying funding sources for construction. The following steps are recommended to advance the design and construction of the recommended design for Segment C.

Step 1: Shared Use Paths Coordination

- Town of Erie staff to work in conjunction with Boulder County and City of Lafayette staff to obtain a grant to complete trail design and construction:
  - This effort will further study the ability to add fencing adjacent to the Boulder County lands, applying state fencing recommendations.
  - Any new fencing would be located up to 12’ back from the current ROW edge to allow for a new easement agreement. The easement agreement would allow for the construction of a new crusher fines trail.
  - The new trails will be parallel only to Arapahoe in the 10’ easement on the south side from the 119th intersection to City of Lafayette boundary and parallel to 119th in the 10’ easement on the east side from the 119th intersection to the new pathway constructed by Parkdale

  - The study will evaluate how a 10' to 12' easement from the edge of the current ROW could accommodate an 8' wide crusher fines trail and connect to 119th and the City of Lafayette Open Space trails.
  - The City of Lafayette will work with City of Lafayette Open Space to make the current trail on Kneebone all-weather.
  - The state recommended fencing would include section breaks, gates, and locks that allow Boulder County's agricultural lease holder roadway access to move agriculture equipment from adjacent properties.
- Town of Erie staff to work in conjunction with Boulder County and City of Lafayette staff on an intergovernmental agreement to outline maintenance agreements, closures for noxious weed management, construction roles, and compensation costs for any loss of agriculture production over a specified period

Step 2: Arapahoe Road and 111th Street Intersection Coordination

- Continue to evaluate the design options and ROW easements to implement the recommended design.
- Coordinate with current and future landowners submitting conceptual plans for new developments near this intersection; ensure the recommendations identified in this study are included.
  - Those landowners and/or development partners will be responsible for coordinating their access and fair share contribution toward the recommended intersection improvements.
- Coordinate with Lafayette Open Space on any Kneebone Open Space easement necessary to accommodate the intersection improvements and/or the shared use path on the south side of Arapahoe Road. All signal and drainage facilities should be contained within ROW. If for some reason that is not possible, a utility easement from Open Space may be required. The use of Lafayette Open Space is charter driven, and any modifications to it will require City Council and Lafayette Open Space Advisory Committee (LOSAC) approval.

Step 3: Corridor Preliminary and Final Design

- The Town of Erie and City of Lafayette will collaborate (with support from Boulder County, CDOT and RTD) to identify funding to complete preliminary and final design for Arapahoe Road (Beasley Street to 119th Street) and 119th Street (Arapahoe Road to north of Baseline Road). This effort should include further analysis of the Arapahoe Road & 119th Street intersection to select a roundabout or traditional signalized intersection improvements.
- CDOT will lead the preliminary and final design of the "super station" located along US 287 between Baseline Road and Arapahoe Road to serve future CO 7 BRT service and US 287 BRT service.
- CDOT will advance CO 7 Segment B (Arapahoe Road west of US 287) preliminary and final design (in collaboration with Boulder County, Erie, and Lafayette), including an operational evaluation of the US 287 & Arapahoe Road intersection.

Step 4: Construction Funding

- The Town of Erie and City of Lafayette will collaborate (with support from Boulder County, CDOT and RTD) to identify construction funding for the Segment C Recommended Design. Construction funds could be a combination of local funds, federal or state grants, and developer contributions.

Step 5: Arapahoe Road & 119th Street Intersection

- Beginning with the CO 7 PEL (2014), there has been continued support (including from this Segment C Concept Study) to address multimodal, operational, and safety improvements at nodes along the three-pronged route of Arapahoe Road, Baseline Road, and South Boulder Road connecting CO 7 to the east with the City of Boulder to the west. Consistent with this emphasis, the Arapahoe Road & 119th Street intersection should be considered for the initial construction phase. The construction cost is estimated at $3 million - $4 million, depending on the final intersection design selection.

Step 6a: 119th Street Improvements

- Construct cross-sectional improvements to 119th Street between the CO 7/119th Street project (funded for construction in 2023) and the Arapahoe Road & 119th Street intersection.
- Coordinate with adjacent developers on construction of the shared use path.
    - City of Lafayette for the west side of 119th between Baseline Road and the mid-block crossing at the Great Bark Dog Park
    - Town of Erie for the east side of 119th between Baseline Road and 119th Street
- The construction cost is estimated at $4.5 million.

Step 6b: Arapahoe Road Improvements

- Construct cross-sectional improvements to Arapahoe Road between Beasley Street and the Arapahoe Road & 119th Street intersection.
- Coordinate with adjacent developers on construction of the shared use path and roadway widening.
    - Town of Erie for the development southwest of Arapahoe & 111th Street
- The construction cost is estimated at $7.5 million.

Step 7: South Boulder Canyon Creek Trail Underpass of Arapahoe Road

- City of Lafayette and Town of Erie work together to study the feasibility of a pedestrian underpass of Arapahoe Road at the South Boulder Canyon Creek Trail.
- If deemed feasible, complete preliminary and final design and seek funding opportunities through partnerships and grants to construct the underpass.
- The construction cost is estimated at $8 million.

Appendix A. Community Engagement Summaries

Appendix B. Current and Future Conditions Report

Appendix C. Environmental Overview

Appendix D. Operational Analysis

Appendix E. Conceptual Design – Recommended Corridor Design

Appendix F. Conceptual Cost Estimates