



Midway Blvd Multimodal Action Plan

PROJECT REPORT



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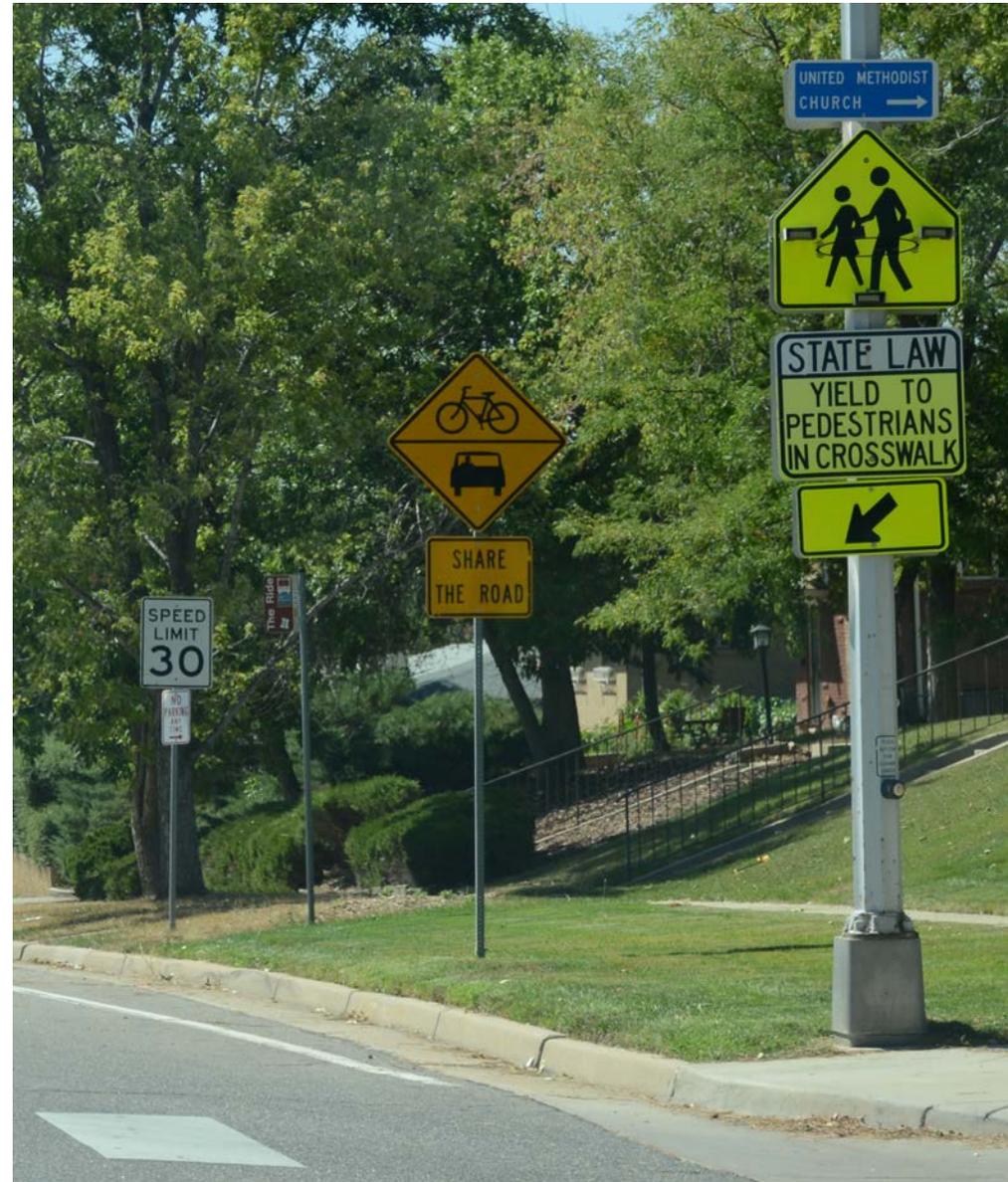
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CHAPTER 1. EXECUTIVE SUMMARY

The Midway Blvd corridor is a five-mile long minor arterial roadway through the heart of the City and County of Broomfield (Broomfield), providing connections to industrial, commercial, park, school, civic, and residential land uses. It is also where 20% of all severe citywide bicycle and pedestrian crashes occur. This project grew out of the Broomfield Bicycle and Pedestrian Assessment, which identified the corridor as the third highest public-comment location in Broomfield and second highest low-stress network priority in Broomfield. Conceptual projects developed as part of this project aim to make Midway Blvd a well-connected and well-maintained multimodal transportation system that safely and effectively accommodates all modes of travel (pedestrian, bicycle, transit, automobile, and freight). Additionally, the concept designs seek to make Midway Blvd a corridor that provides mobility for goods and people of all ages and abilities while supporting economic development, reducing dependence on single occupant vehicles, and minimizing environmental impacts.

With input from the public, multimodal design experts, and Broomfield staff, as well as corridor-specific data and analyses, the project team created short term and long term design alternatives for each segment of the corridor, and ultimately developed an interim and a final concept plan. The Final Concept Plan includes pedestrian and bicycle crossing improvements, updates to lane configurations and signal timing, off-street bicycle facilities (separated from pedestrian facilities in some segments and combined in multi-use paths in others), and sidewalk improvements. Due to the length of the corridor, these improvements are split into “projects” and prioritized, so that engineering design and implementation may occur as funding becomes available.

The following report discusses the reason for and background of the project, describes existing conditions along Midway, and presents project outreach efforts, project alternatives, the proposed corridor concept, and next steps.





CHAPTER 2. PROJECT PURPOSE

Like all of the metro area, Broomfield is experiencing the benefits and challenges associated with the increasing needs for transportation modal choice and changing traffic patterns. For Broomfield, these changing transportation needs mean travel pressure on primary roadways from vehicular and “active transportation” users and safety concerns along the corridor.

The Midway Blvd Multimodal Corridor Action Plan stemmed from the Broomfield Bicycle and Pedestrian Assessment’s recommendation to define projects along Midway Blvd that improve the corridor for multimodal users. This project presents the opportunity to build on Broomfield’s goals of “vision, diversity, and progressive thinking” to transform the Midway Blvd corridor into a safer multimodal roadway that serves to increase travel comfort and connectivity for all users. However, changes like those necessary to create a safe, equitable, low-stress travel environment on Midway can be challenging given the constrained conditions along the corridor. Enhancing multimodal comfort will create trade-off discussions.

The purpose of this project is to explore the existing conditions along the corridor, including how the corridor operates for all modes of transportation today, both from the perspective of technical analyses and user perception obtained through public feedback, and to use this information to develop alternatives and concepts to be prioritized for implementation in the coming years. The final result is a Midway Blvd that better serves the needs of all users in a safe and comfortable environment.

Study Area

The 5-mile long Midway Blvd corridor extends from the Lake Link Trailhead to the Big Dry Creek Trail. Extensive research indicates the need for improvement.

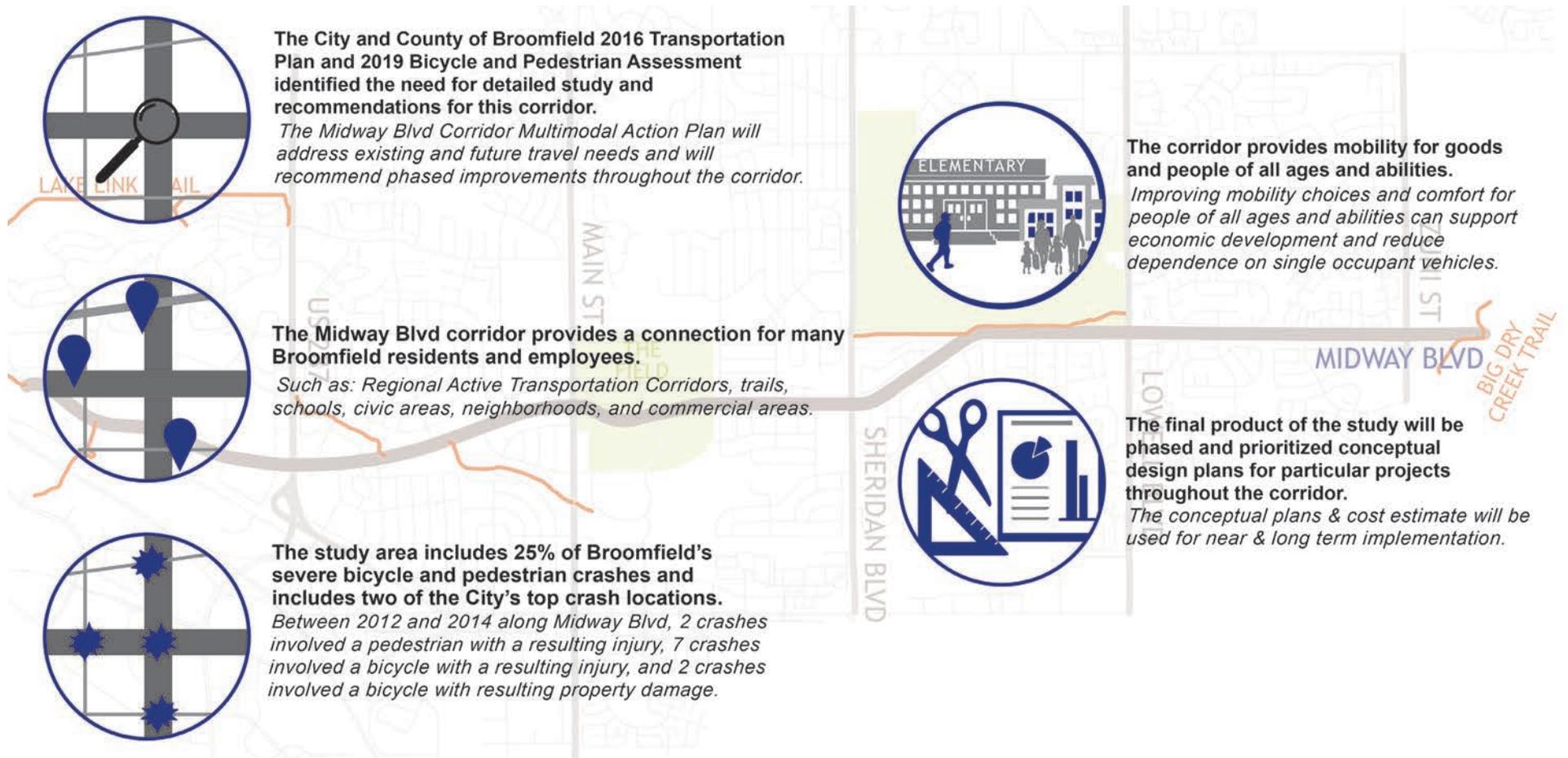


Figure 1: Corridor Description

Vision

Midway Blvd becomes a well-connected and well-maintained multimodal transportation system that safely and effectively accommodates all modes (pedestrian, bicycle, automobile, bus, rail, and freight). The corridor provides mobility for goods and people of all ages and abilities while supporting economic development, reducing dependence on the single occupant vehicle, and minimizing environmental impacts.

Goals

GOAL #1

- ◇ Build low stress streets that accommodate more high-comfort walking and bicycling for all ages and abilities.

GOAL #2

- ◇ Context sensitive designs to achieve greater compliance with posted speed limits.

GOAL #3

- ◇ Reduce the severity and total number of crashes for all modes of travel.

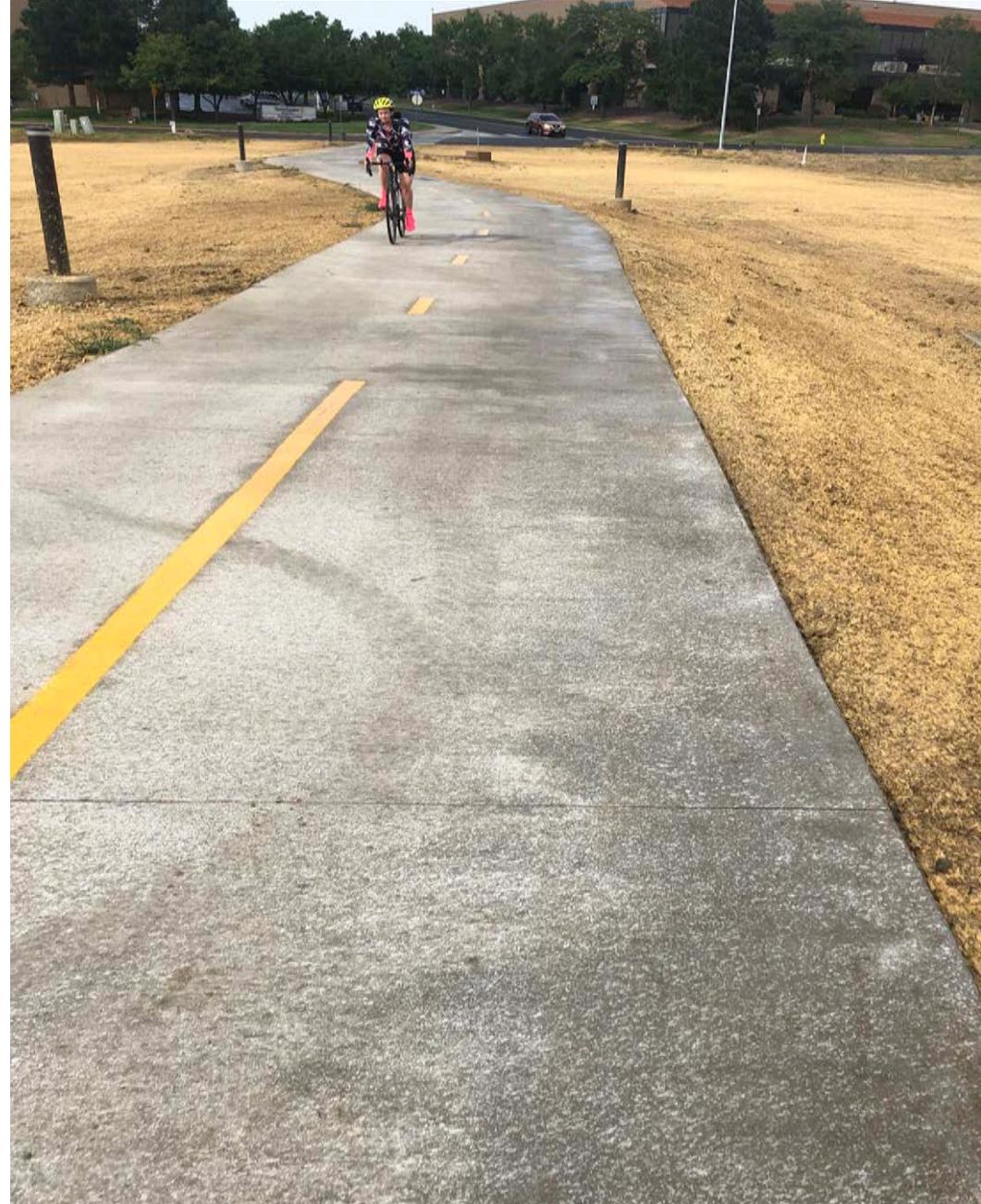
GOAL #4

- ◇ Design streets that integrate into the adjacent neighborhood context.

GOAL #5

- ◇ Preserve and enhance tree canopy and mature or established landscaping for future generations.

Vision and Goals

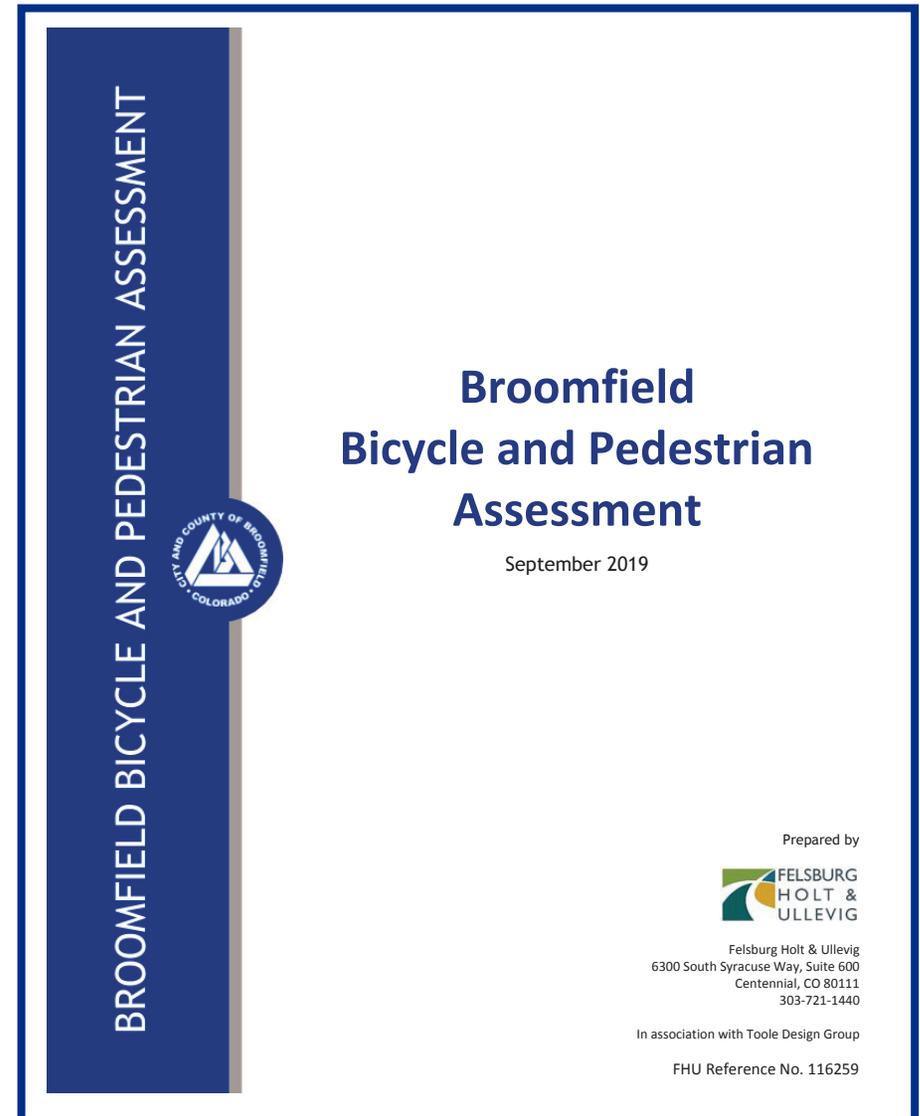


Why Midway Blvd?

Past studies such as the Broomfield Bicycle and Pedestrian Assessment, Transportation Plan, and Comprehensive Plan Update demonstrate a particularly high degree of safety concern and public attention regarding Midway Blvd. A number of the locations which received the highest number of public comments in Broomfield during these studies are on Midway Blvd. These studies concur that multiple facility additions and upgrades are necessary to provide a safer, more comfortable, more connected experience when riding a bicycle or walking in Midway Blvd.

The Broomfield Bicycle and Pedestrian Assessment ranks Midway Blvd very highly in many categories:

- 4th highest priority bicycle corridor overall
- 2nd highest low-stress network priority
- 7th highest sidewalk infill priority
- 3rd highest location for location/corridor-specific comments (behind Shep's Crossing and Industrial Lane)
- Connects Regional Active Transportation Corridors, local trails, schools, civic areas, neighborhoods, and commercial areas



*Source: City and County of Broomfield -
Broomfield Bicycle and Pedestrian Assessment, 2019*

Employment and Job Density

Midway Blvd is an employment hub and connector through the heart of Broomfield.

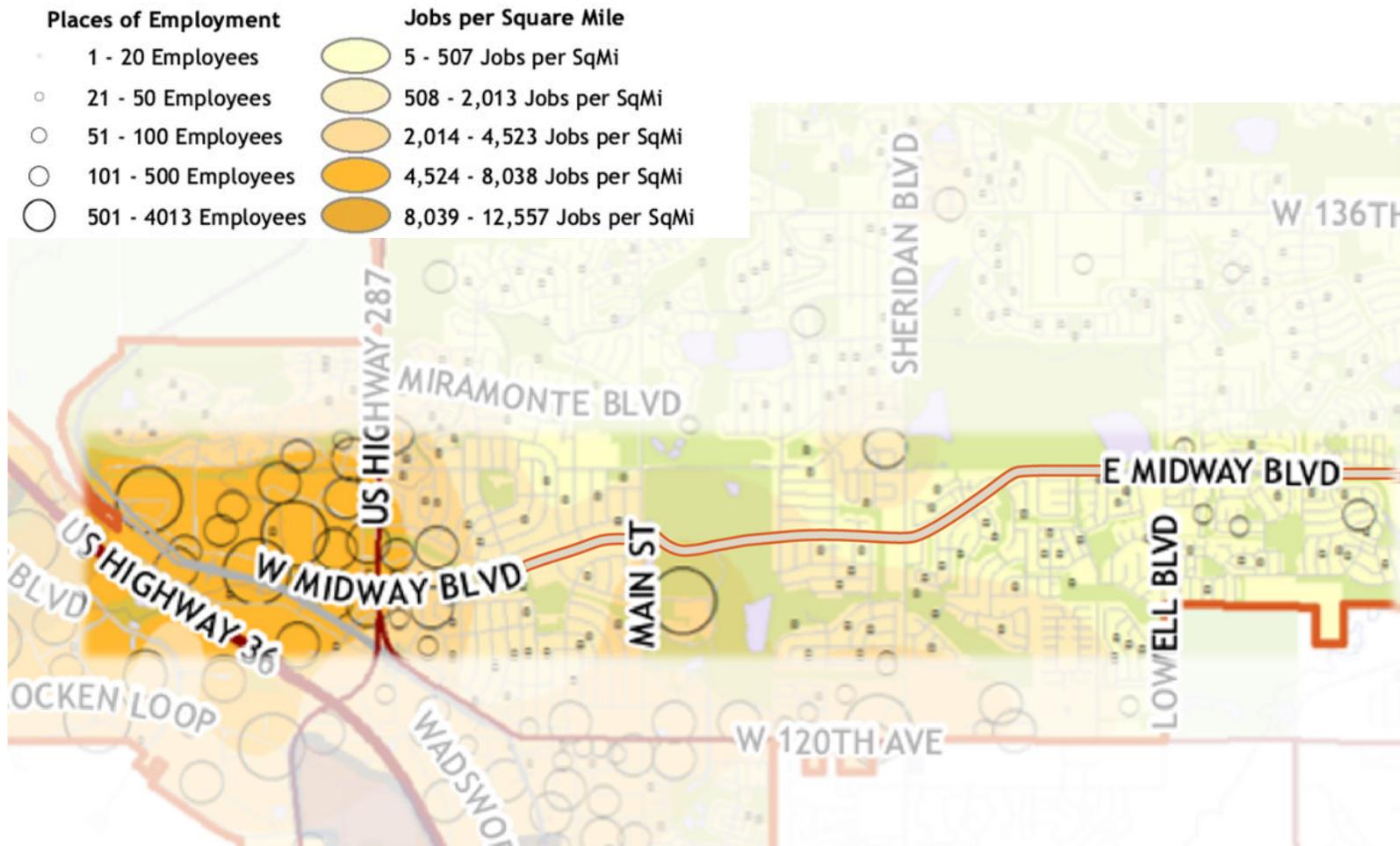


Figure 2: Employment and Job Density

Source: City and County of Broomfield - Comprehensive Plan, 2016

Population Density

Population per square mile 2016

- 0 - 1,000 people per sq mi
- 1,000 - 4,000 people per sq mi
- 4,000 - 22,000 people per sq mi
- 22,000 - 116,000 people per sq mi
- 116,000 - 618,125 people per sq mi

Midway has pockets of high population density, creating the potential for higher walking and bicycling demand along the corridor.

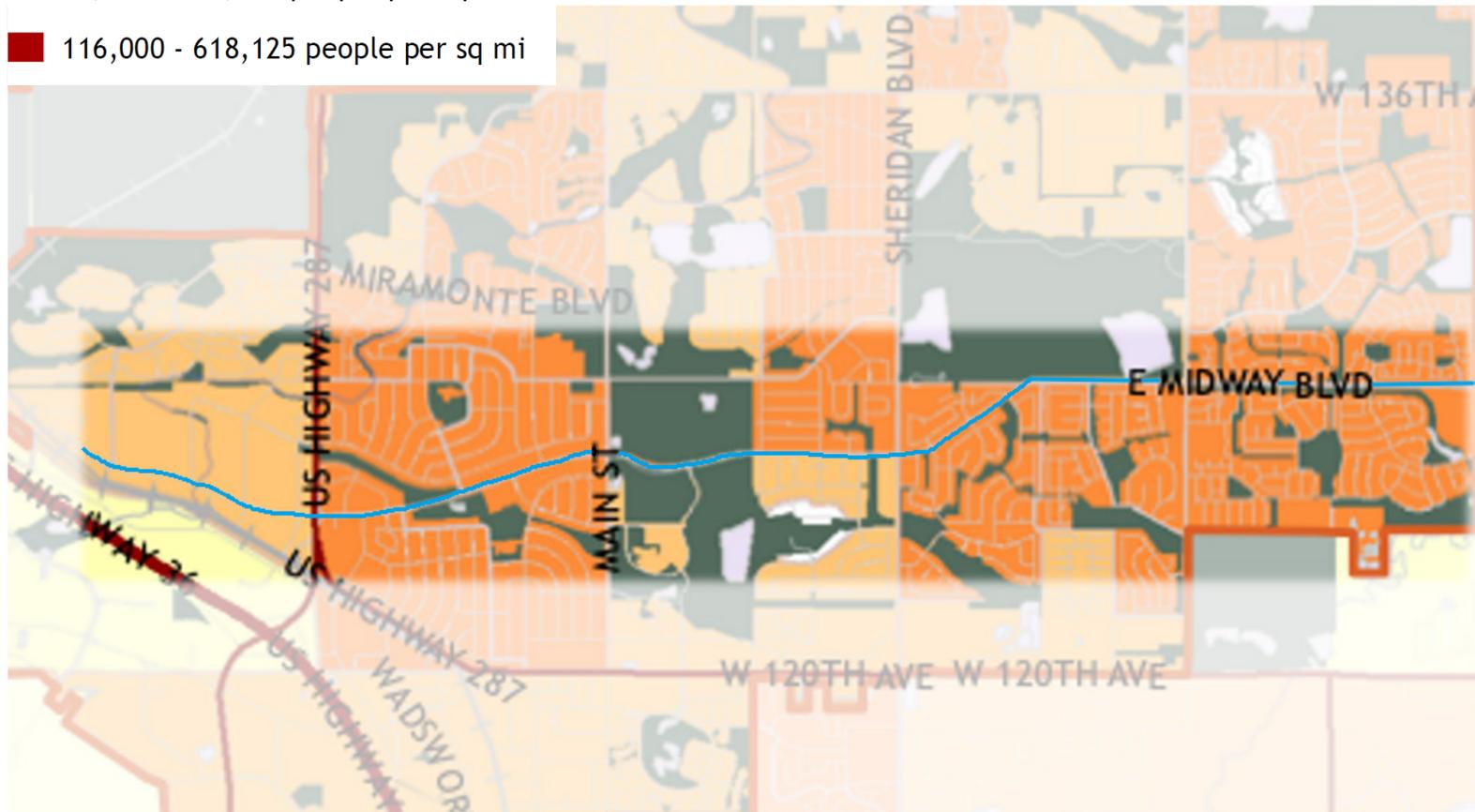


Figure 3: Population Density

Source: City and County of Broomfield - Comprehensive Plan, 2016

Resident Age

Most people living along the corridor are 27 to 53 years of age.

It is important that Midway is accessible for people of all ages and abilities.

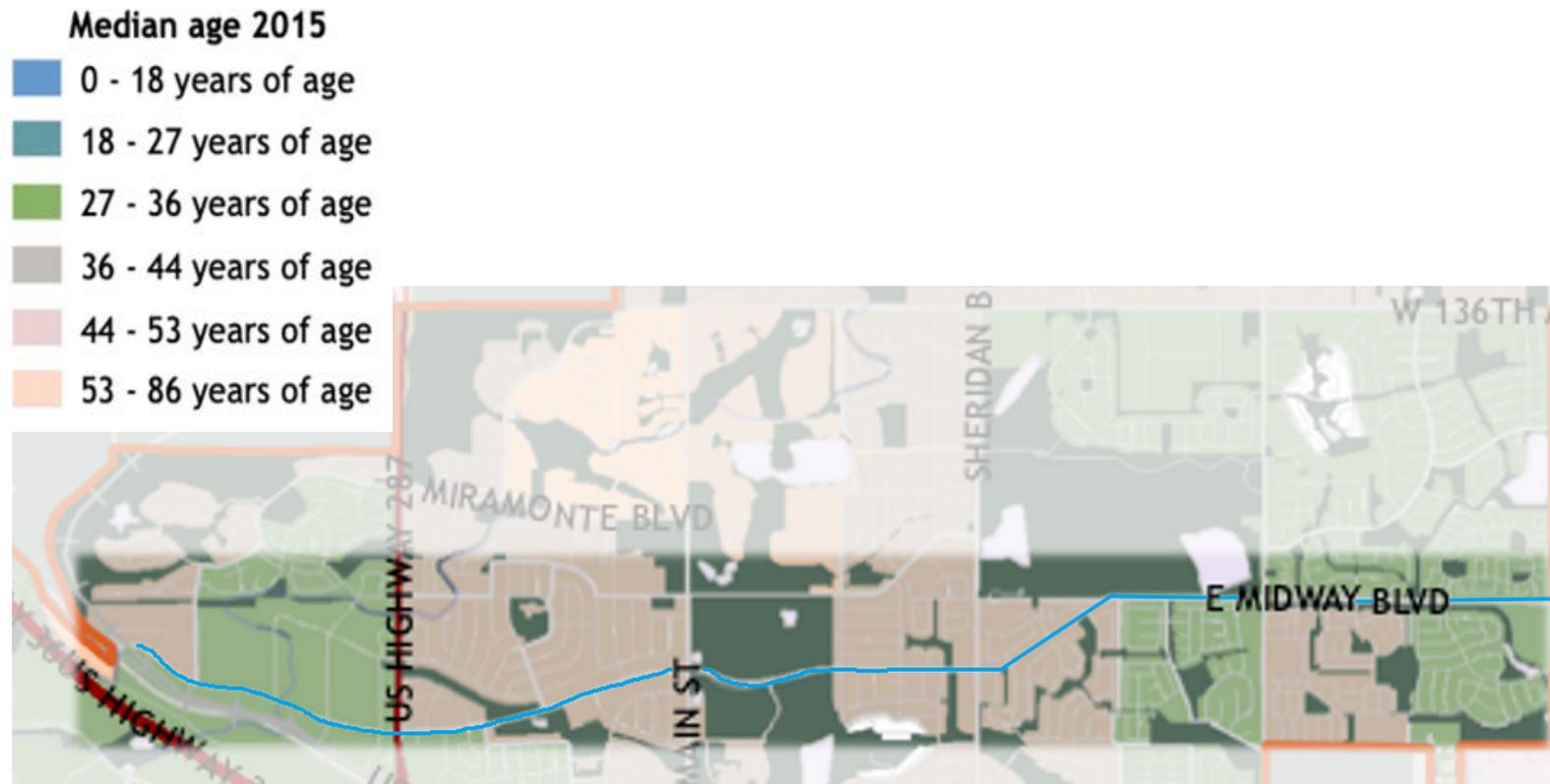


Figure 4: Resident Age

Source: City and County of Broomfield -
Comprehensive Plan, 2016

Diversity Distribution

There is significant diversity in culture, people, and perspectives along the Midway Blvd corridor, highlighting the importance of diversity in outreach methods, and also indicating a potentially wide range of transportation needs.

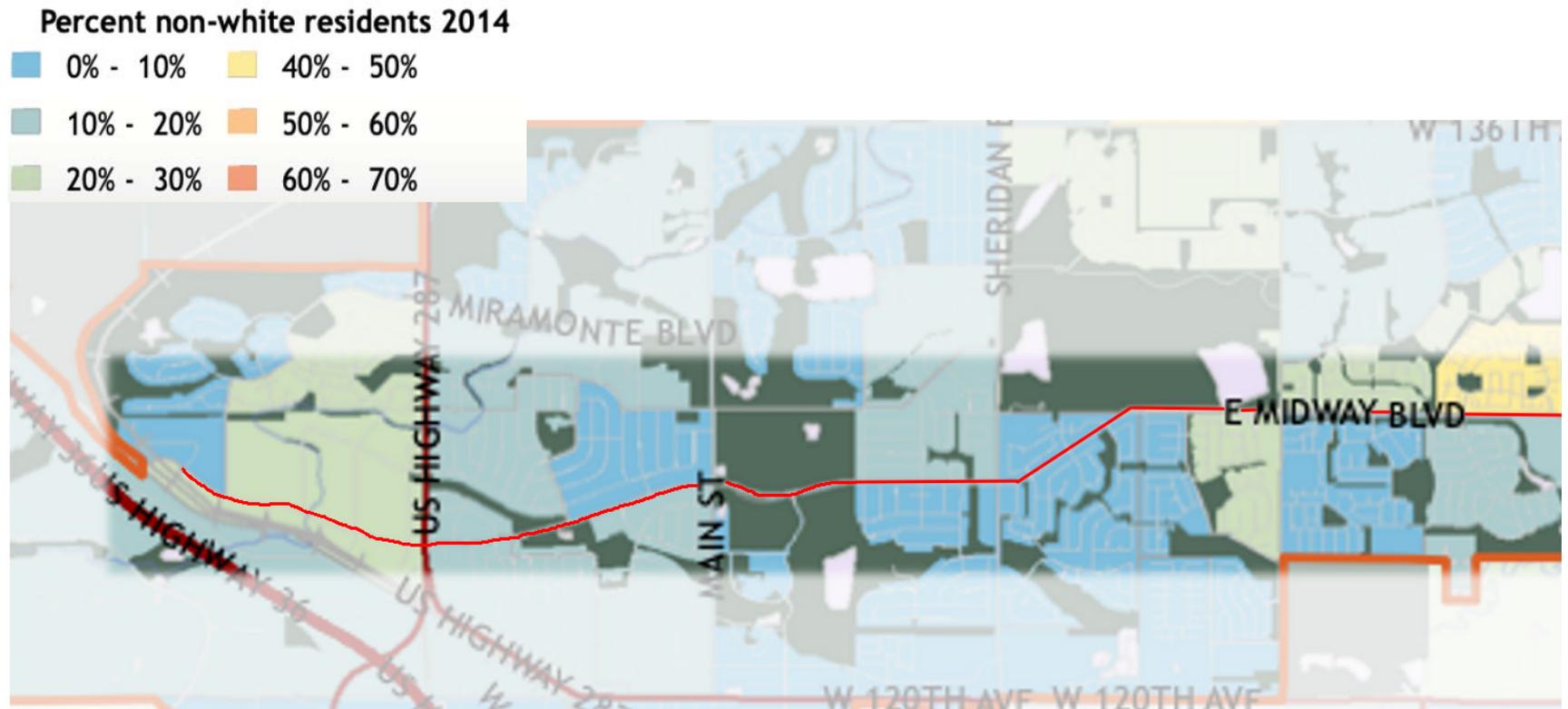


Figure 5: Diversity Distribution

Source: City and County of Broomfield -
Comprehensive Plan, 2016

Level of Traffic Stress

Midway has a high *Level of Traffic Stress (LTS)*.

LTS categorizes roadway characteristics, including traffic speeds and volumes, number of through lanes, and, if applicable, bicycle lane width, to calculate a grade on a scale of 1 to 4, with each grade corresponding to the level of comfort. **The LTS scale has been modified for Broomfield to include a fifth rating: LTS 5. Streets rated LTS 5 are not suitable for biking.*



Figure 6: Level of Traffic Stress

Level of Traffic Stress (LTS)

-  LTS 1 Little traffic stress, suitable for most all bicyclists including children
-  LTS 2 Minimal interaction with traffic, suitable for most adult bicyclists
-  LTS 3 Exclusive riding zone or lane with low speeds, welcome to many current bicyclists
-  LTS 4 High traffic stress, only suitable for “strong and fearless” riders
-  LTS 5 Not suitable for bicyclists

Source: *Broomfield Bicycle and Pedestrian Assessment, September 2019*

Vehicular Traffic Capacity

Research shows that Midway Blvd's 2040 vehicular traffic capacity is adequate for future demand. Additional roadway capacity is not anticipated for any project alternatives.

- Excess Capacity (v/c less than 0.6)
- Below Capacity (v/c between 0.6 - 0.8)
- Near Capacity (v/c between 0.8 - 1.0)
- Slightly Over Capacity (v/c between 1.0 - 1.3)
- Over Capacity (v/c greater than 1.3)



Figure 7: Vehicular Traffic Capacity

Source: Broomfield Bicycle and Pedestrian Assessment, September 2019

Pedestrian Demand

As an active corridor, Midway Blvd has a very high pedestrian demand. Low stress pedestrian facilities should be incorporated into every alternative.

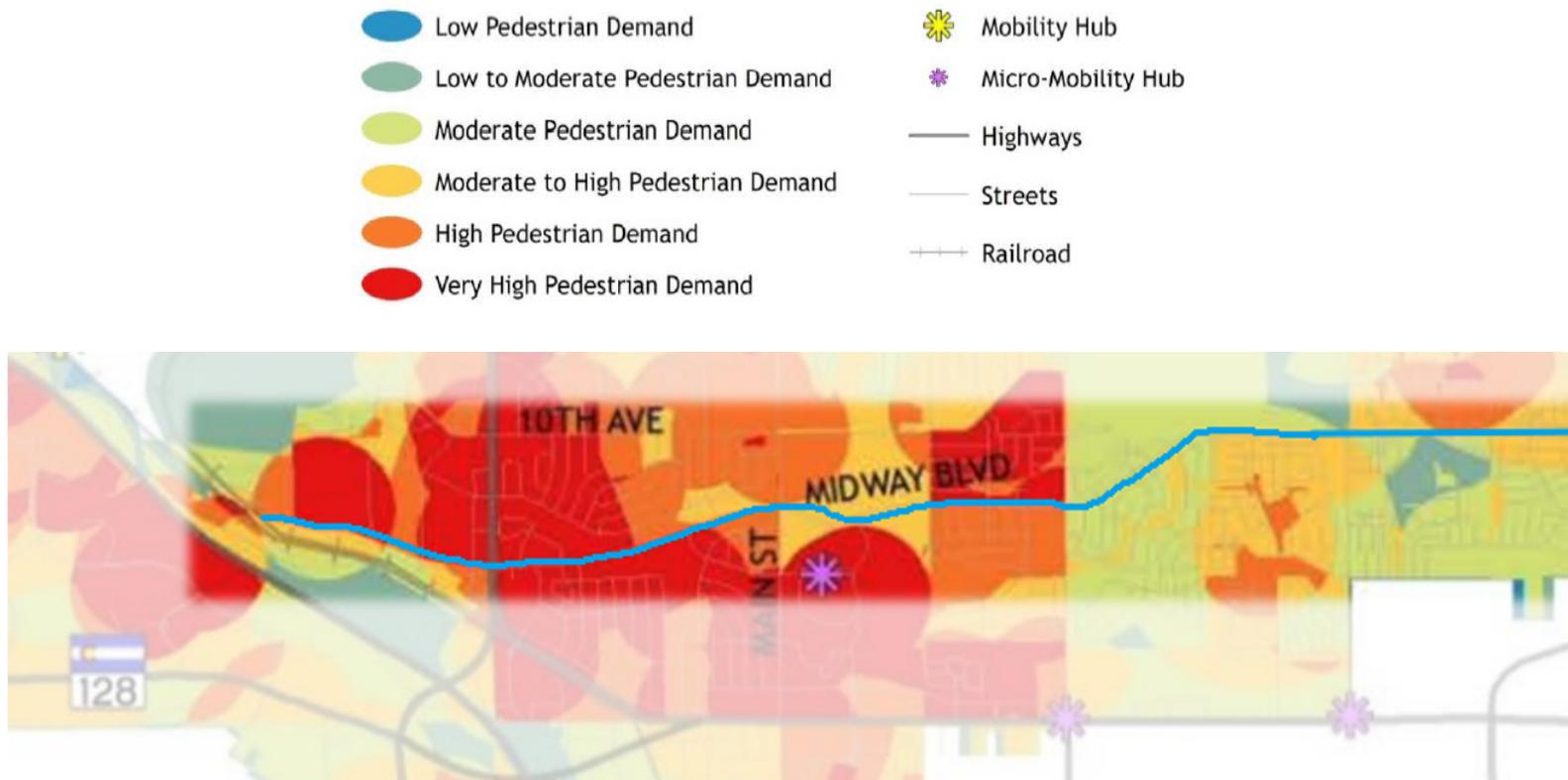


Figure 8: Pedestrian Demand

Source: Broomfield Bicycle and Pedestrian Assessment, September 2019

Bicycle Lane Quality

Midway Blvd currently has incomplete and substandard bicycle lane widths. A bicycle facility is only low stress if it is consistently low stress throughout the corridor.

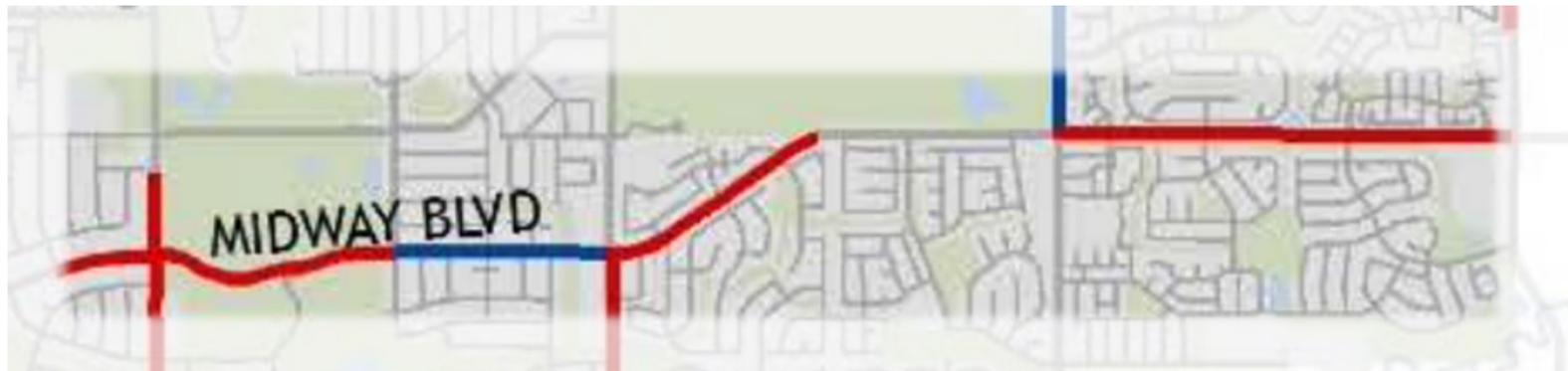


Figure 9: Bicycle Lane Quality

-  Substandard Bike Lane Width
-  Bike Lane On One Side Only

Source: Broomfield Bicycle and Pedestrian Assessment, September 2019

Pedestrian / Bicycle Crash Summary

20% of all severe Citywide bicycle or pedestrian crashes occur in the Midway Blvd corridor.

16 bicycle or pedestrian crashes occurred between 2012 and 2016 on the Midway Blvd corridor.

Crashes involving cyclists or pedestrians have a significantly higher potential for a serious injury or fatal outcome. Improvements which decrease these crashes provide a substantial safety benefit to the community.

Additional details regarding crash history using a more recent analysis period can be found on pages 28-29.



Figure 10: Pedestrian / Bicycle Crash Summary

Crash Severity (2012-2016)

- ▲ Fatality Involving Pedestrian (3)
- Injury Involving Pedestrian (19)
- Injury Involving Bicycle (31)

Source: Broomfield Bicycle and Pedestrian Assessment, September 2019





CHAPTER 3. EXISTING CONDITIONS

Midway Blvd is identified in the Broomfield 2016 Transportation Plan as a 2-lane minor arterial roadway from Lake Link Trail to Sheridan Blvd, and a 4-lane minor arterial roadway from Sheridan Blvd to Huron Street (through Zuni Street). The Midway Blvd Multimodal Action Plan project limits are from Lake Link Trail on the west end to the Big Dry Creek Trail on the east end, approximately 5.5 miles in length.

- Traffic volumes, speeds, and crash history vary significantly throughout the corridor.
- Existing multimodal facilities are inconsistent throughout the corridor and are inadequate for Midway Blvd to serve as a low-stress bicycle and multimodal connection throughout Broomfield.
- Environmental conditions vary throughout the corridor and include potential wetlands, community parks and open spaces, wildlife considerations, historic considerations, and potential impacts to residential areas. Further environmental investigation will need to take place as conceptual alternatives and a selected design are developed.
- Utilities are located throughout the corridor and are located both above and below ground. Existing utilities include electric, gas, communications, traffic, water, stormwater, and wastewater. Further utility engineering will need to take place as conceptual alternatives and a selected design are developed.

The following pages include additional existing conditions gathered from existing City and County of Broomfield sources, as well as new data gathered for this project.

Midway Blvd Corridor

Within the Midway Blvd corridor, speed limits range from 30 miles per hour (mph) to 40 mph. Vehicular travel lanes include single and double lanes in each direction. The corridor has 12 traffic signals and seven other pedestrian crossing treatments.

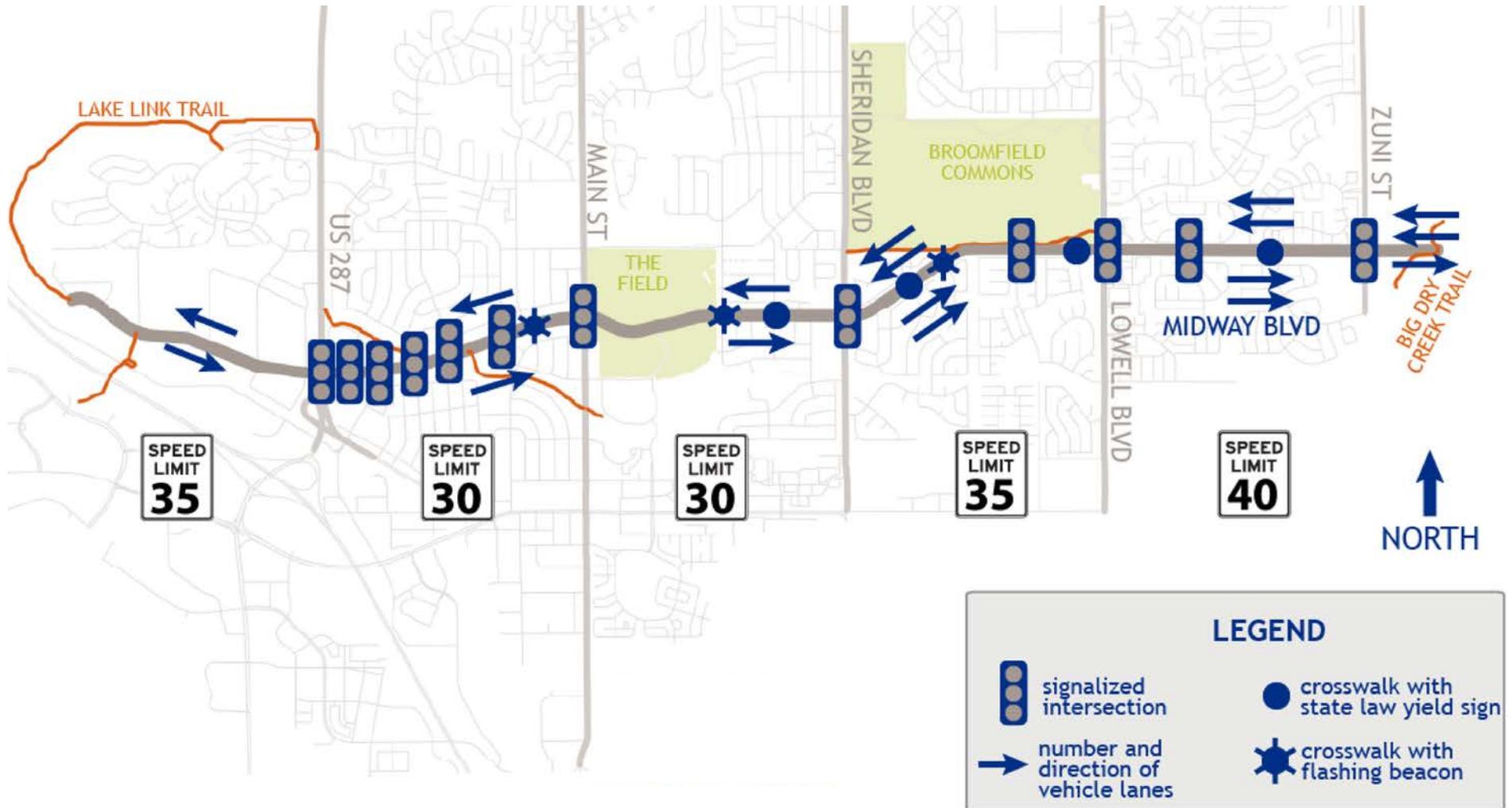
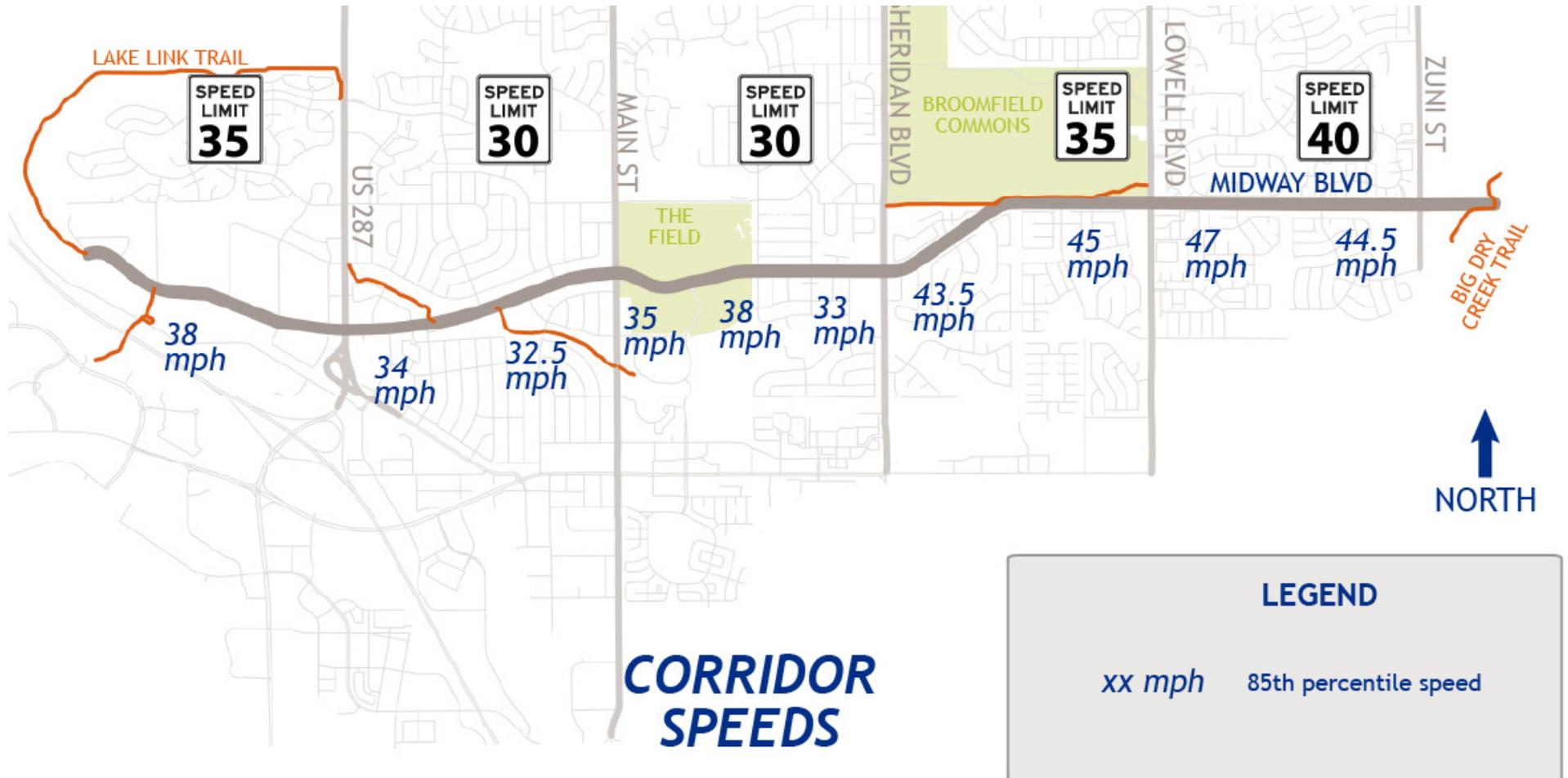


Figure 11: Corridor Infrastructure Characteristics

Corridor Existing Conditions & Speeds

The **85th percentile speeds** (the speed at or below which 85% of all vehicles are traveling) are between 2 and 10 mph over the posted speed limit, depending on location. For example, 15% of vehicles are traveling at least 10 miles per hour above the speed limit adjacent to Broomfield Commons. Some members of the public noted that this data does not reflect their experiences, suggesting that speeds in some segments, such as US 287 to Main Street, may actually be higher in off-peak periods of the day than those shown here.



LEGEND

xx mph 85th percentile speed

Figure 12: Corridor Speeds

Source: City and County of Broomfield

Daily Vehicle Traffic

The **Average Daily Traffic (ADT)** ranges from 4,900 **Vehicles Per Day (VPD)** to 17,800 VPD.

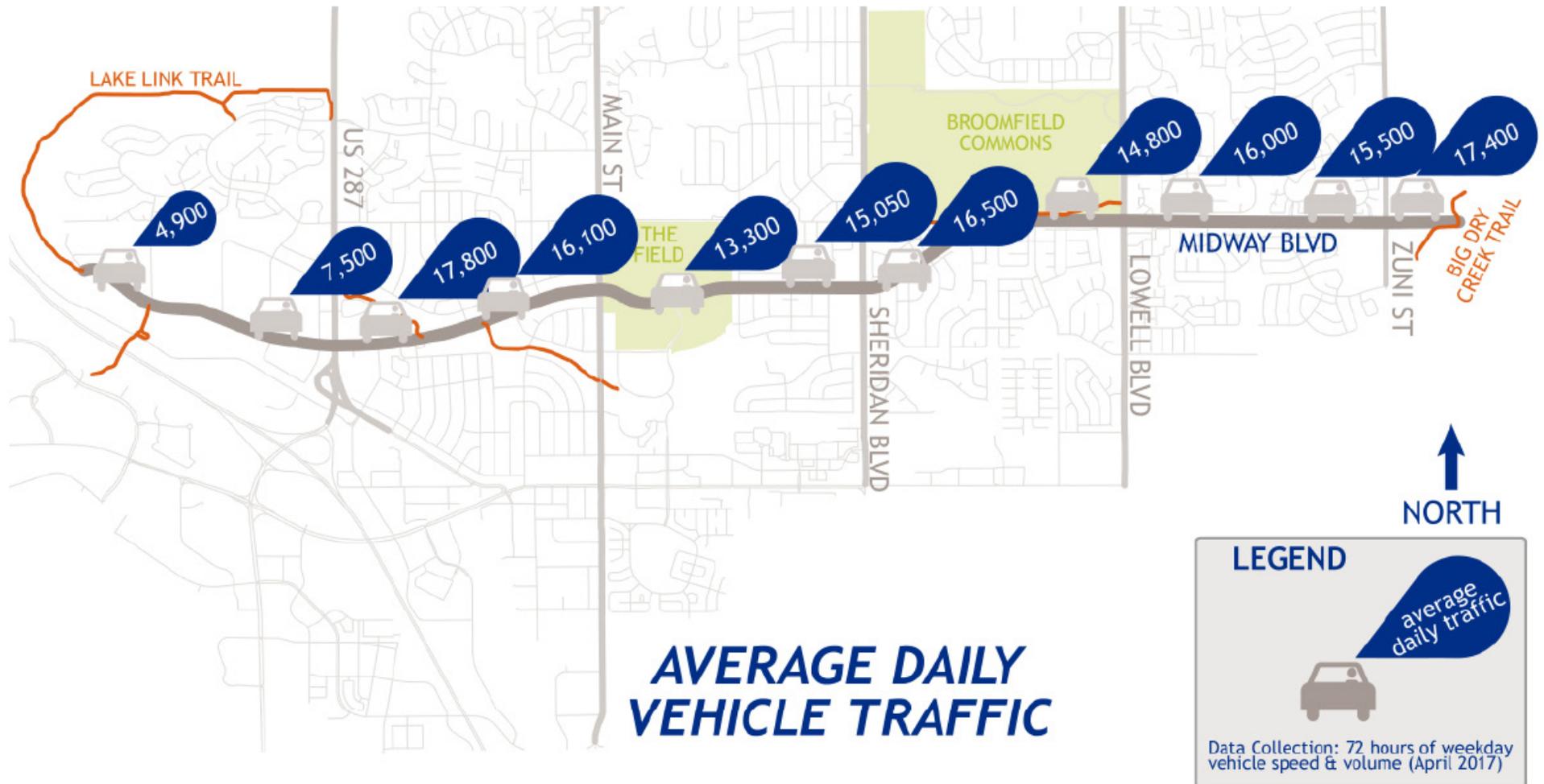


Figure 13: Daily Vehicle Traffic

Source: City and County of Broomfield

Vehicle Level of Service at Signalized Intersections

In rating intersection operating conditions, “*Level of Service*” (LOS) A through F are used, with LOS A indicating very good operation and LOS F indicating poor operation, with most communities (including Broomfield) viewing Level of Service rating D or better as acceptable. With the exception of the US 287 intersection, Midway Blvd has adequate traffic capacity now and in future projections at major intersections.



Figure 14: Vehicle Level of Service at Signalized Intersections

Sources: Peak Hour Intersection Turning Movement Counts (AM and PM peak hours), pre-Covid19 City and County of Broomfield and CDOT counts, supplemented with Nov 2021 and April 2022 counts performed for this project.

See **APPENDIX D: Peak Hour Intersection Level of Service Summary and Modification Scenario Analysis**

Pedestrian Activity at Arterial Intersections

Of the 5 major arterial intersection crossings, pedestrian activity is highest at US 287 and Midway Blvd, as well as Zuni Street and Midway Blvd. This metric is intended to give a general comparison of pedestrian use between arterial intersections to help identify whether particular arterial crossings receive heavier pedestrian use. Pedestrian activity along and across the corridor, particularly near parks, schools, and commercial areas, is difficult to measure at this scale due to variations in access points, travel patterns (often along circuitous parallel routes) and mid-block crossings. Pedestrian volumes, where available, are shown in [Appendix A](#).

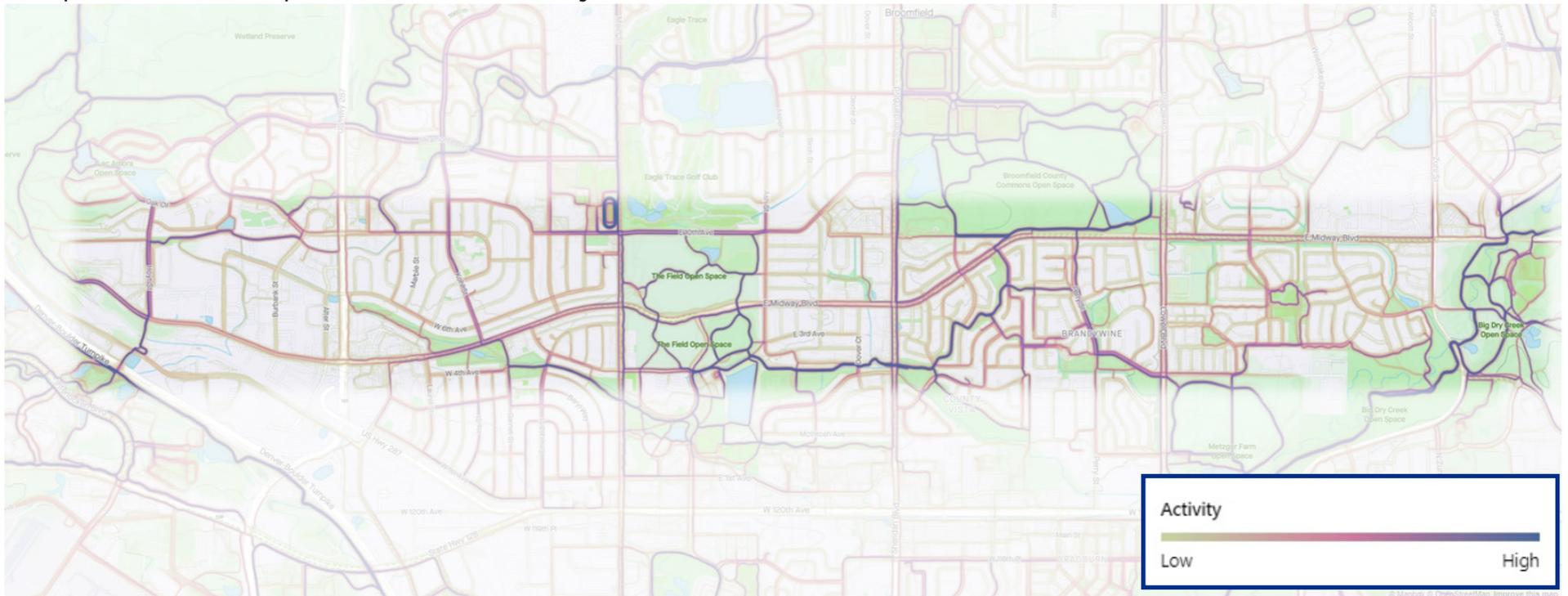


Figure 15: Pedestrian Activity at Arterial Intersections

Source: This report includes aggregated and de-identified data that has been normalized into approximated bicycle, pedestrian, and vehicular analytics by StreetLight Data.

Strava Data Pedestrian Activity

The Midway Blvd corridor is a significant east-west passage for pedestrians. Improvements to safety and ease of crossing should be considered, especially around schools and other public areas. Heaviest pedestrian activity by Strava users, which tend toward recreational trips, are around Kohl, through The Field, and near Vrain and Broomfield Commons, which aligns with expectations for residential land uses and recreational destinations like parks, open spaces, and recreation centers. However, it is likely that many transportation-based trips, which are common adjacent to commercial, transit, and school uses, are not shown in this Strava data.



(Aug 2021 - July 2022)

Figure 16: Strava Data Pedestrian Activity

Source: This report includes aggregated and de-identified data from Strava Metro. Strava data is collected from individuals who voluntarily track individual workout sessions using GPS data and the Strava app. It may not be a reflection of the general public. The service was founded in 2009. As of July 12, 2022, Strava has 95 million active users, a 25% increase from the previous year.

Bicycle Activity

Of the 5 major arterial intersection crossings, bicycling activity is highest at Sheridan Blvd/Midway Blvd and Lowell Blvd/Midway Blvd intersections. This metric is intended to give a general comparison of bicyclist use at arterial intersections to help identify whether particular arterial crossings receive heavier use by people on bicycles. Activity along and across the corridor by people on bicycles, particularly near parks, schools, and commercial areas, is difficult to measure at this scale due to variations in access points and travel patterns (often along circuitous parallel routes). Bicyclist volumes, where available are shown in [Appendix A](#).

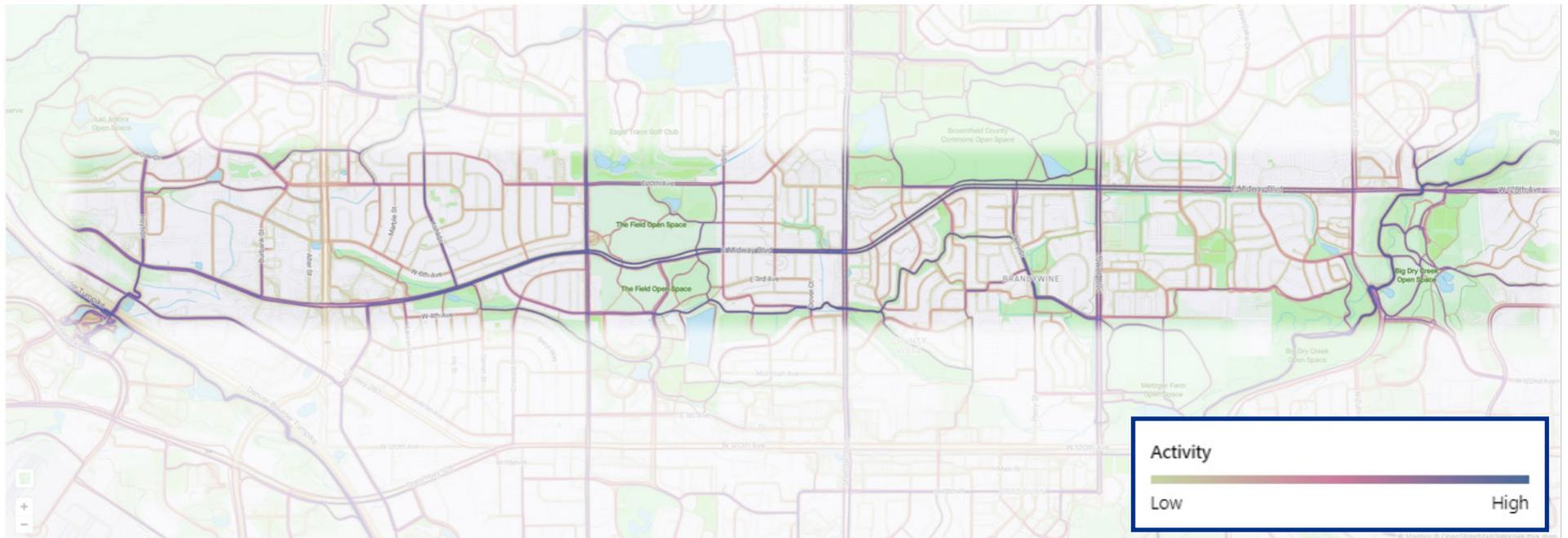


Figure 17: Bicycle Activity at Arterial Intersections

Source: This report includes aggregated and de-identified data that has been normalized into approximated bicycle, pedestrian, and vehicular analytics by StreetLight Data.

Strava Data Bicycle Activity

This corridor of Midway Blvd has a high amount of usage by people on bicycles, comparable to the busiest routes in the surrounding areas. It is an important connection to the US 36 Bikeway as well as other key community destinations such as schools, open space, parks, recreation centers, neighborhoods, government services, and shopping. Improvements to bicycling safety and comfort should be considered, especially around schools and other destinations noted above. Strava users riding bicycles, which tend toward recreational trips, are consistently using the entire corridor, with particularly heavy use from Kohl to Lowell. However, it is likely that many transportation-based trips, which are common adjacent to commercial, transit, and school uses, are not shown in this Strava data.



(Aug 2021 - July 2022)

Figure 18: Strava Data Bicycle Activity

Source: This report includes aggregated and de-identified data from Strava Metro. Strava data is collected from individuals who voluntarily track individual workout sessions using GPS data and the Strava app. It may not be a reflection of the general public. The service was founded in 2009. As of July 12, 2022, Strava has 95 million active users, a 25% increase from the previous year.

Sidewalks and Bicycle Lanes

The existing sidewalk and bicycle lanes along the Midway Blvd corridor vary in width. Some locations have no bicycle lane or no sidewalk.



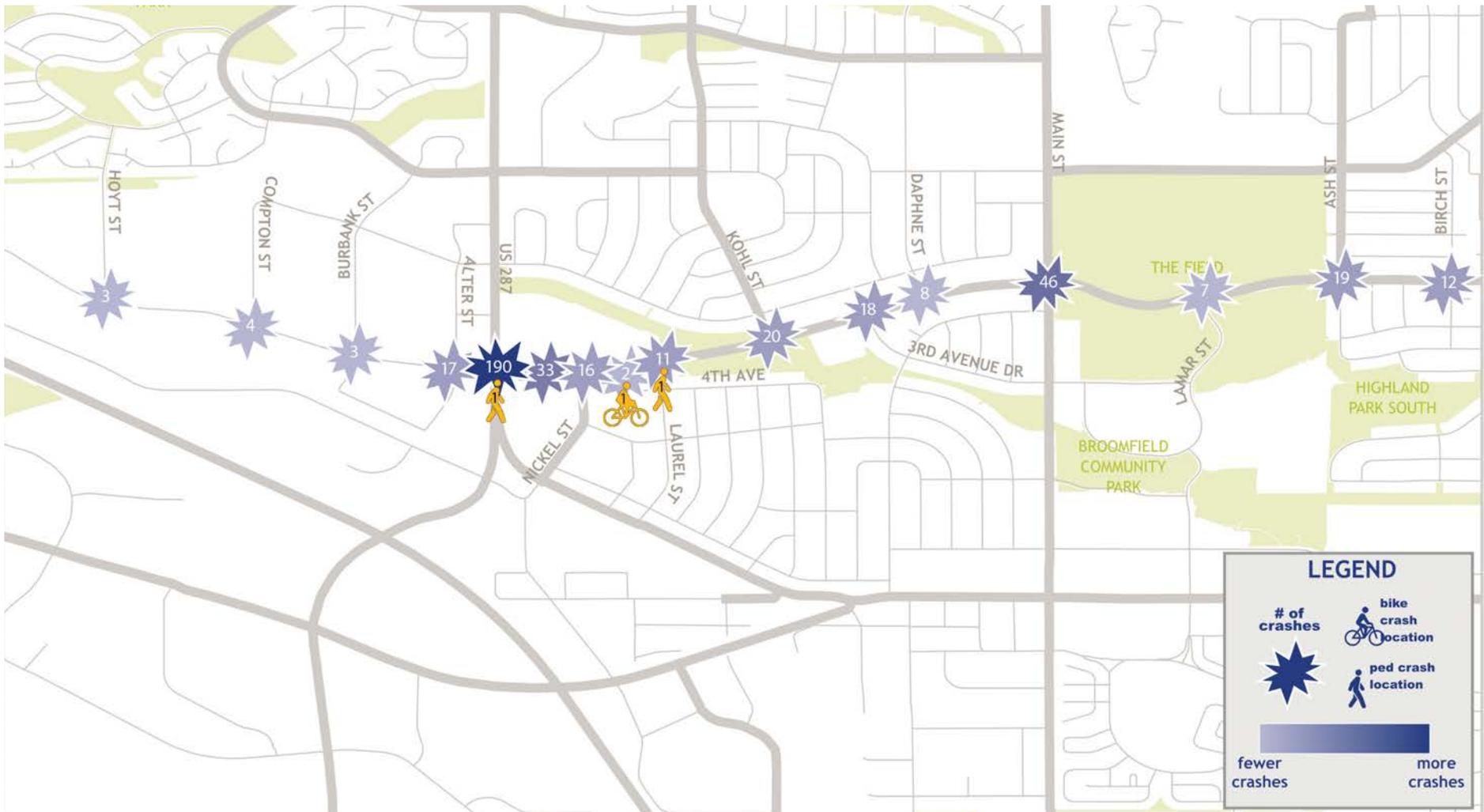
Figure 19: Sidewalks and Bicycle Lanes

Source: City and County of Broomfield, aerial mapping & site visits 2020



Crash History

20% of all severe Citywide bicycle or pedestrian crashes occur on the Midway Blvd Corridor, according to the 2019 Broomfield Bicycle and Pedestrian Assessment. The graphic below shows total numbers of crashes over five years. In general, there are more crashes at the heaviest total volume intersections; however the Zuni St and US 287 intersections have proportionally higher crashes per entering vehicle than the rest of the corridor, implying a need for particular focus at US 287 and at Zuni St (as possible, given coordination with Westminster).



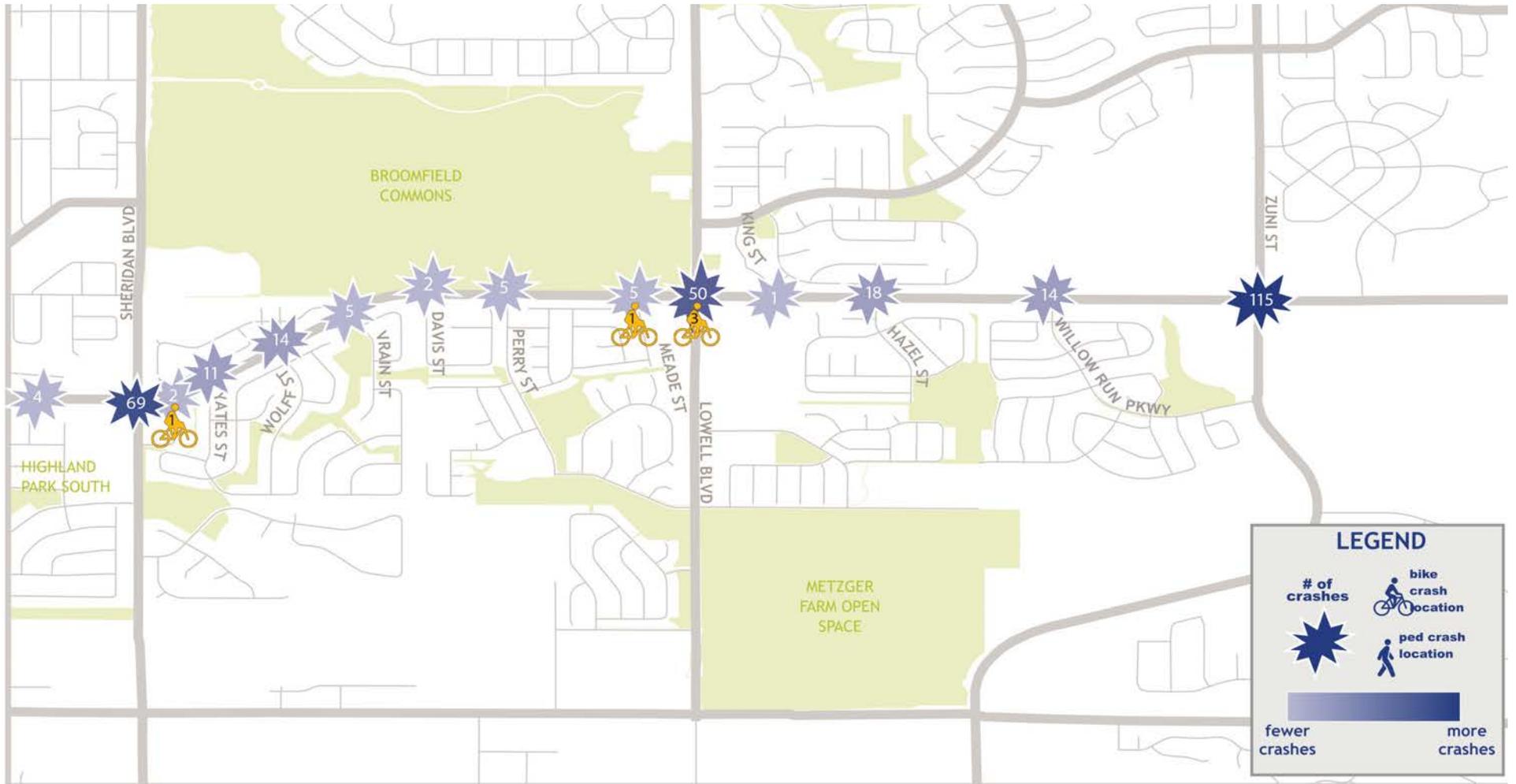


Figure 20: Crash History

Source: City and County of Broomfield crash data from 2015 - 2019 (to exclude years impacted by COVID 19).

Vehicular Travel End-to-End Eastbound

Most trips on Midway Blvd begin or end somewhere along the corridor, and do not represent traffic using Midway as a end-to-end or regional commute corridor. End-to-end eastbound travel from anonymous cell phone data shows percentage of vehicles arriving at Zuni that also pass through these intersections. This shows that only 12% of eastbound vehicles traveled all the way from US 287 to Zuni St, indicating most vehicular traffic on Midway is “local” traffic.

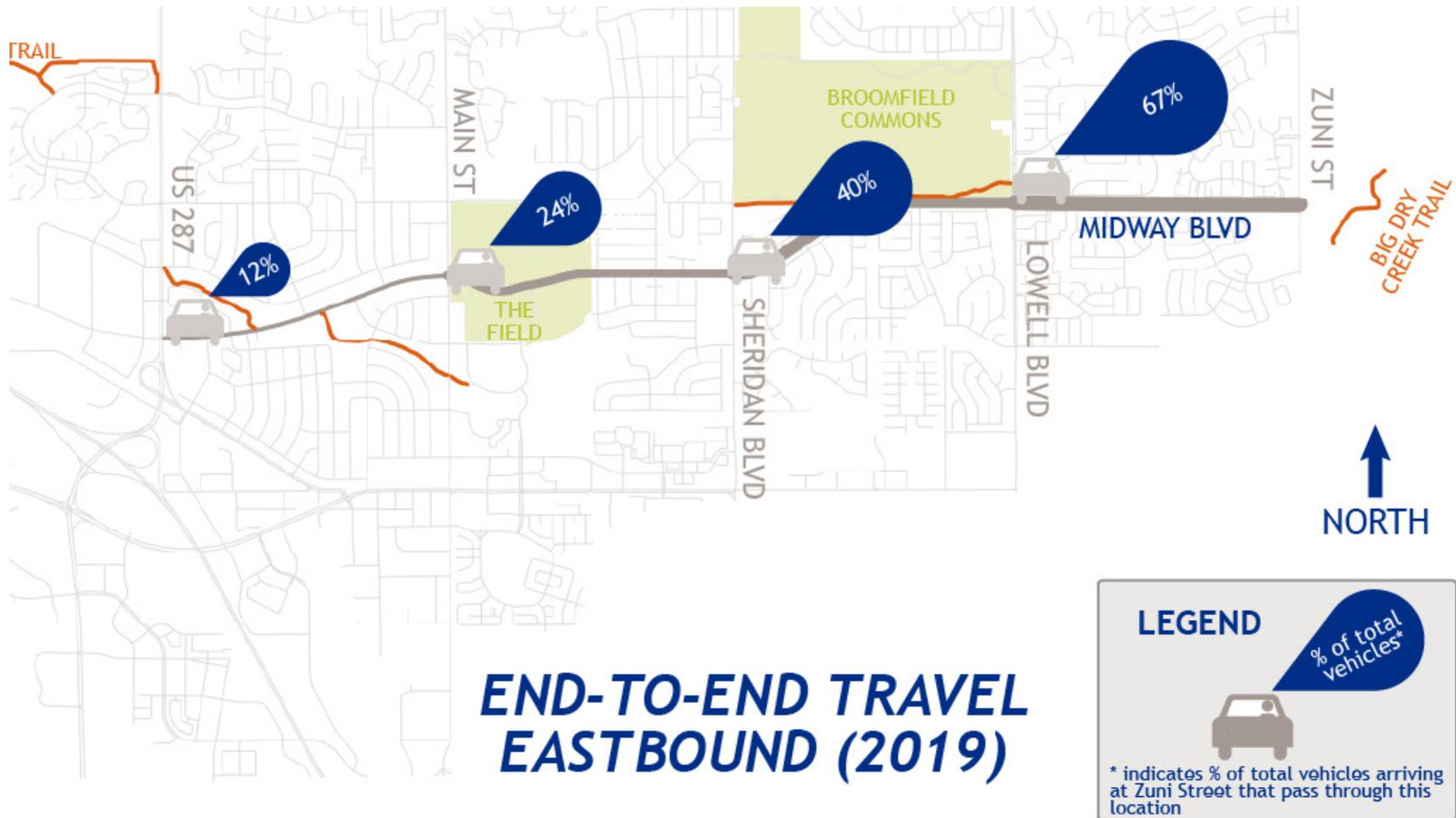


Figure 21: Vehicular Travel End-to-End Eastbound

Source: City and County of Broomfield

Vehicular Travel End-to-End Westbound

Most trips on Midway Blvd begin or end somewhere along the corridor, and do not represent traffic using Midway as a end-to-end or regional commute corridor. End-to-end westbound travel from anonymous cell phone data shows percentage of vehicles arriving at US 287 that also pass through these intersections. This shows that only 13% of westbound vehicles traveled all the way from Zuni St to US 287 indicating most vehicular traffic on Midway is “local” traffic.

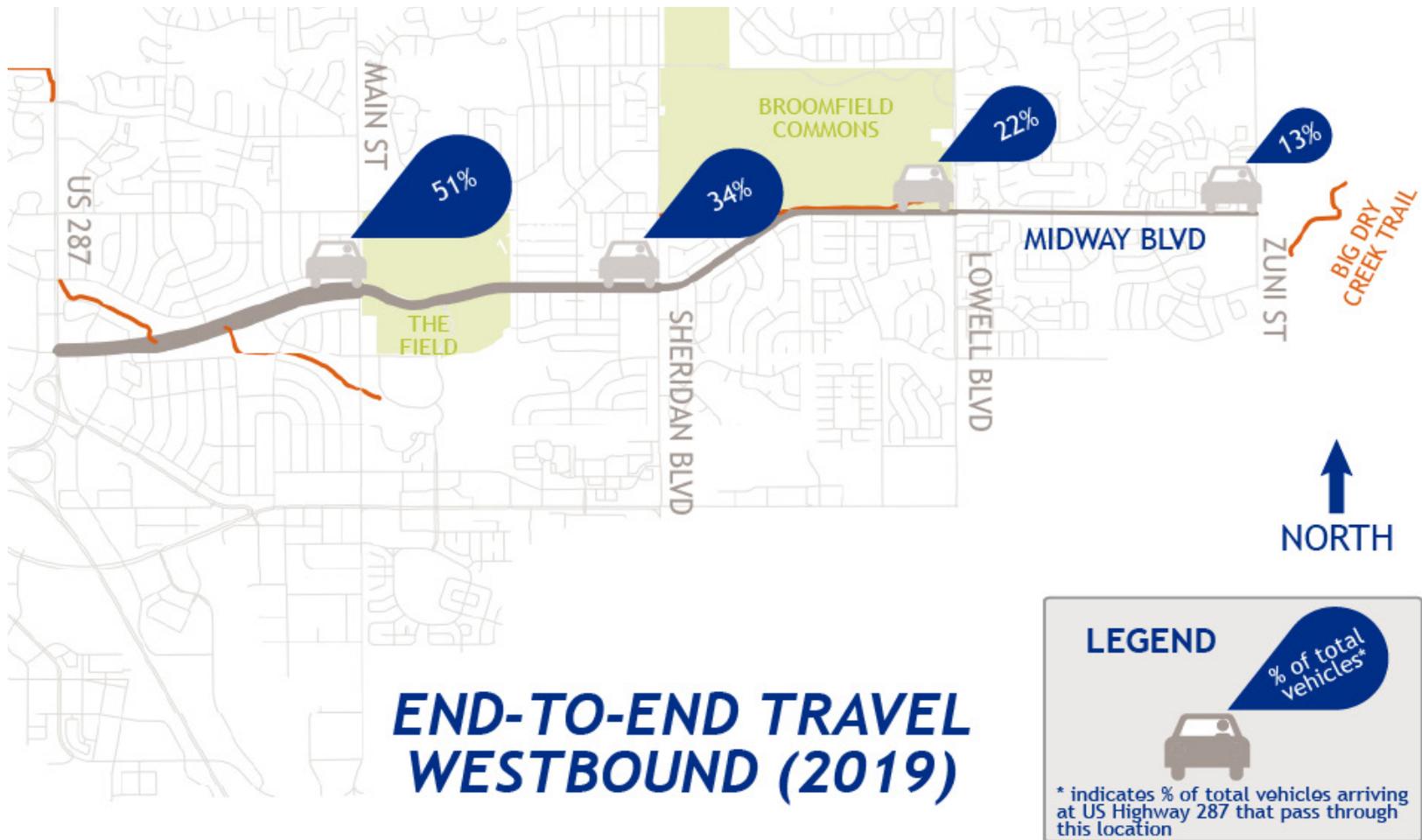


Figure 22: Vehicular Travel End-to-End Westbound

Source: City and County of Broomfield

Parking

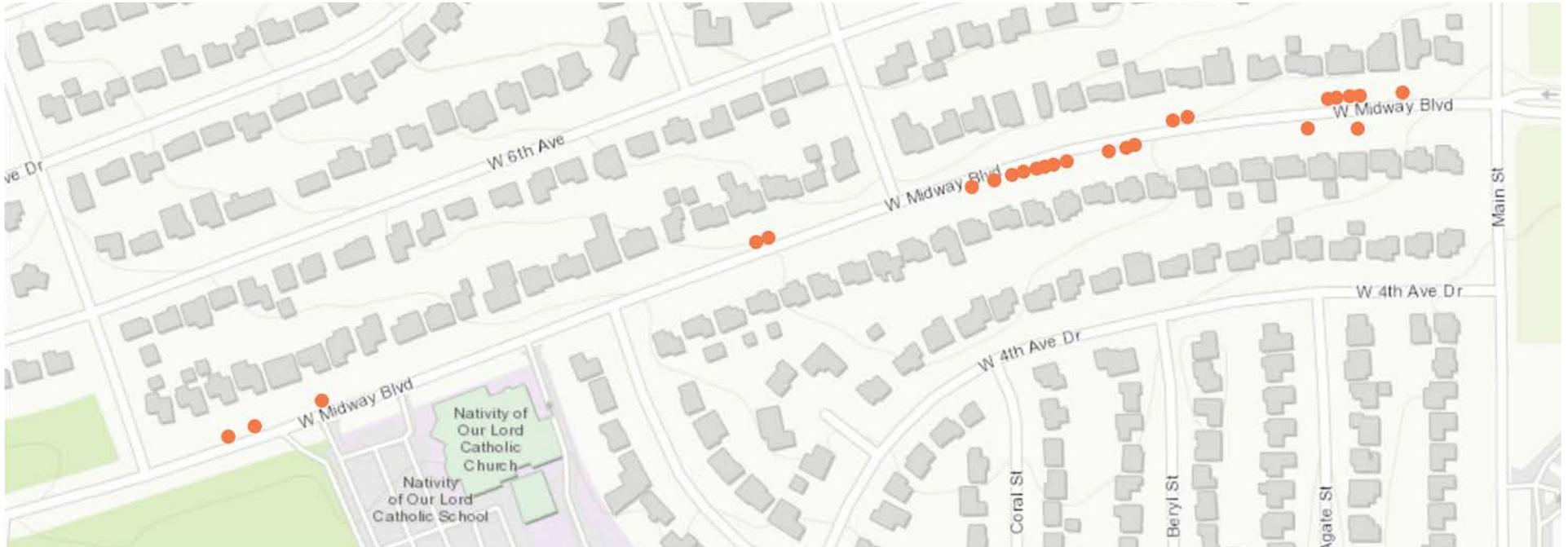


Figure 23: Parking Data

Parking data was collected on Tuesday, April 12, 2022, at 5:00 AM, in an effort to count the heaviest resident-generated parking usage for a “typical” day. Each dot represents a parked car, with 25 cars total parked on Midway Blvd, between Kohl St and Main St. There are approximately 148 total on-street parking spaces, indicating **approximately 17% of the spaces were being utilized during this parking “snapshot.”** All properties in this segment have driveway or alley parking access, with 6 houses that have driveways onto Midway Blvd. Anecdotal resident feedback indicated that parking is heavily utilized during sporting events and practices, school pickup and drop off, and church services.

Parking data was collected in this area because this segment has constrained right-of-way, parking, and landscaped buffers with large trees, creating trade-off discussions for multimodal needs, parking needs, and landscaping/tree canopy needs. **Further study and engagement will be necessary during the future design of this section to ensure the best outcome for all Broomfield residents.**

Source: Idax Data

Transit

Currently, there are no regularly scheduled bus routes offered through RTD along the Midway Blvd corridor. Previously, Route 128 with service between US 36 & Broomfield Station and Wagon Road Park N Ride at I-25/120th Ave with proposed FlexRide connections to the N-Line rail at 124th and Eastlake Station, and Route 112 were in service, which was reduced to only Route 128. Route 128 is now not in service. Broomfield FlexRide offers small-bus transit by first-come-first-serve curb-to-curb service by reservation in the area.

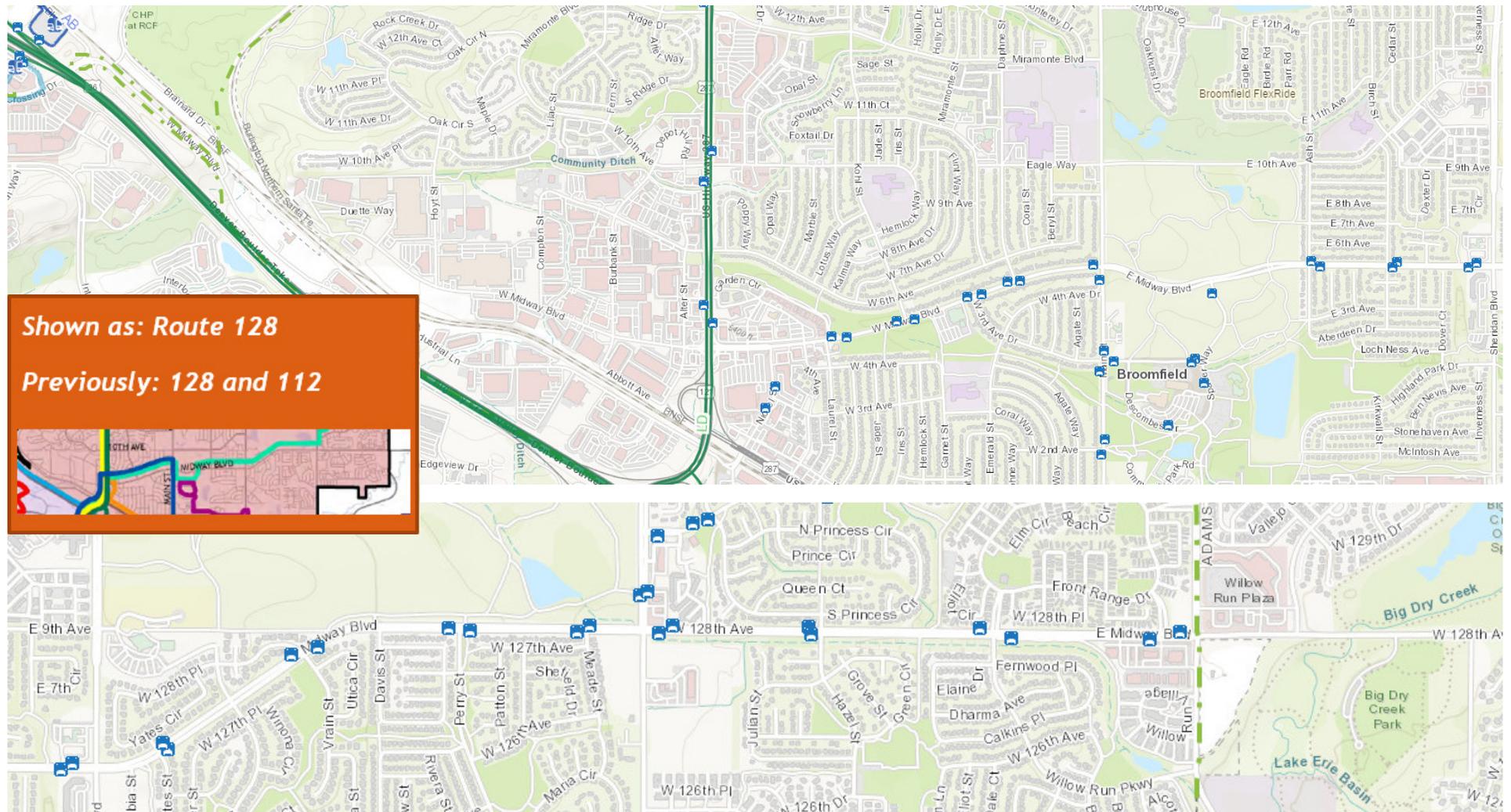


Figure 24: Bus Stops and Routes

Source: RTD Denver



NO PARKING
FIRE LANE

Welcome to the Village
MANUFACTURING COMMUNITY

Midway Blvd Corridor Segments

For the purposes of this report, Midway Blvd is separated into multiple segments based on existing roadway conditions and adjacent land use.

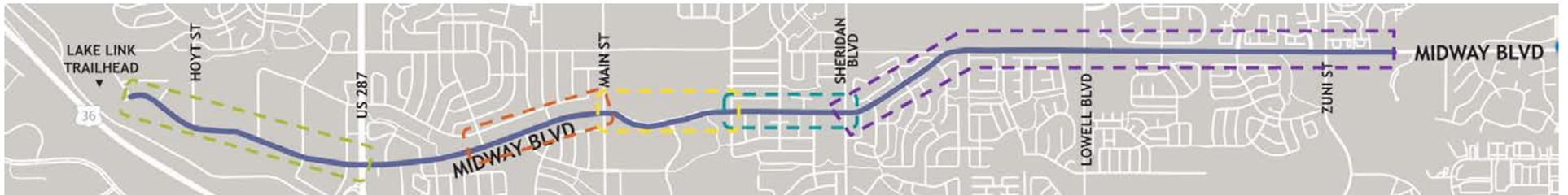


Figure 25: Corridor Segment Map

Starting from the west end of the project limits, the segments are:

1. Lake Link Trail to US Highway 287
2. US Hwy 287 to Main Street*
3. Main Street to Ash Street
4. Ash Street to Sheridan Blvd
5. Sheridan Blvd to Big Dry Creek Trail

* Note: Within the US Hwy 287 - Main Street segment, the US 287 to Laurel St portion varies significantly throughout, therefore this was addressed in a unique process throughout the project.

1. Lake Link Trail to US Highway 287

Midway Blvd between Lake Link Trail and US Highway 287 is a 2-lane roadway section with a two-way left turn lane (TWLTL) in the center of the road. No striped bicycle lanes are present in this segment. Through lane widths are approximately 17 feet including gutter, and the center turn lane is approximately 14 feet wide. 5-foot sidewalks (width varies) are present on both sides of the road and are mostly attached. The total segment length is approximately 1 mile.

The speed limit through this segment is 35 mph with an 85th-percentile speed of 38 mph. Current Average Daily Traffic (ADT) is between 4,900, and 7,500 Vehicles Per Day (VPD) with an anticipated annual growth rate of 1.4% according to the Denver Regional Council of Governments (DRCOG) model. Adjacent land use is industrial with some commercial use, creating a higher percentage of heavy truck traffic than other areas of the corridor. This segment is identified in the Broomfield Transportation Plan, 2016 as a 2-lane minor arterial roadway.

At the west end of this segment (west project limits) is a connection to the Lake Link Trail. The trail connection requires

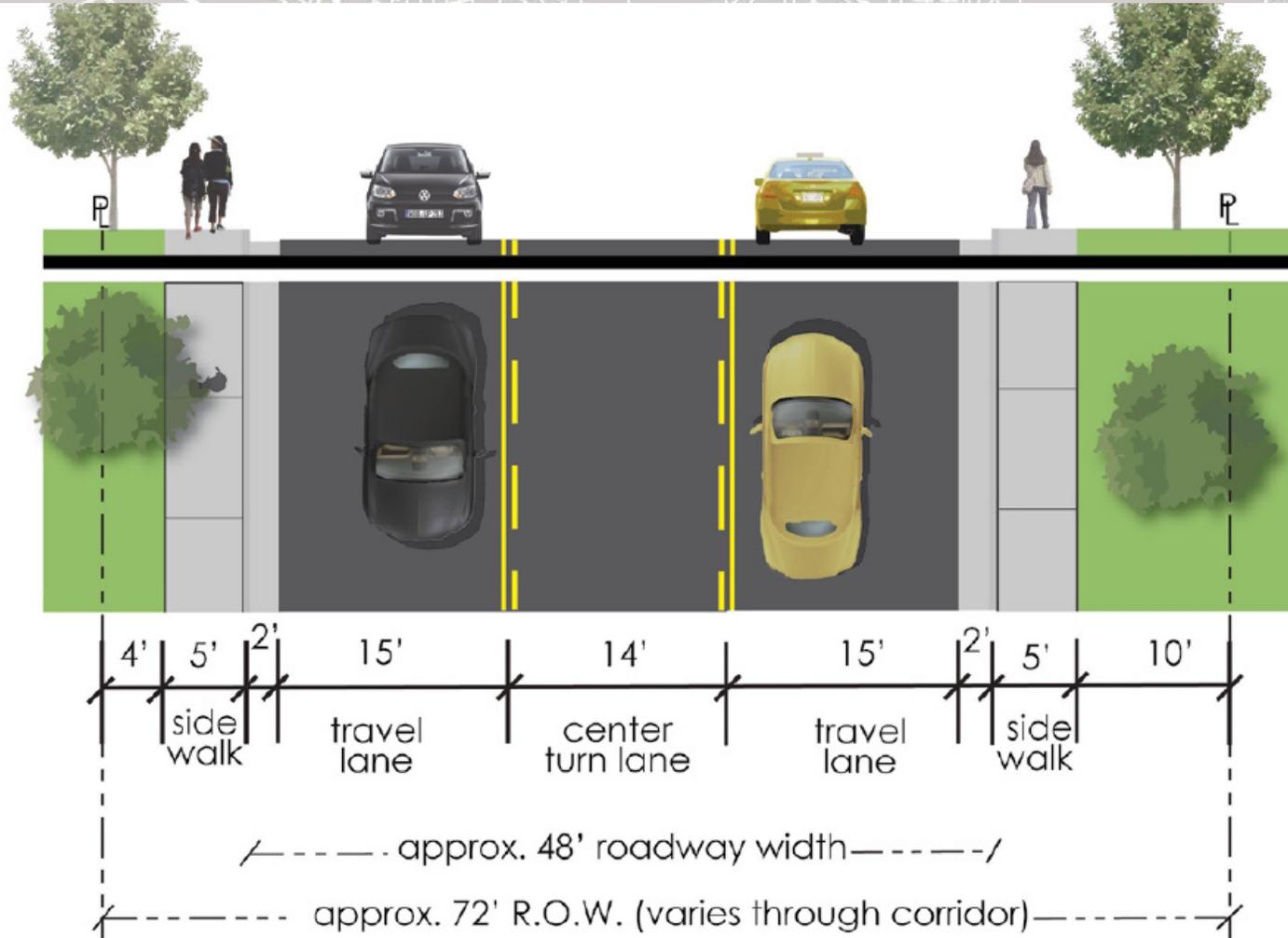
users to either ride on a steep unpaved surface or on a business driveway to access the trail.

Multiple driveway accesses are along this segment, many within close proximity to adjacent driveways or cross streets. Intersections are side street stop-controlled with free movement for Midway Blvd, except for the signalized US Highway 287 intersection at the east end of this segment.

A 5-year crash history along this segment shows a total of 27 vehicular crashes, with zero crashes involving bicyclists or pedestrians. The intersection at US Highway 287 is not included in the above total.

Identified multimodal deficiencies along Segment 1 include narrow sidewalks, multiple driveways in close proximity to each other, a lack of any bicycle facilities, and a substandard trailhead for the Lake Link Trail connection.

Existing Midway Blvd: Lake Link Trail to US 287



(Facing East)

Note: dimensions vary throughout segment.

Figure 26: Lake Link Trail to US 287 Existing Cross Section

2. US Highway 287 to Main Street

This section is broken into two portions, given the differing characteristics:

- A) US 287 to Laurel St
- B) Laurel St to Main St.

A) Midway Blvd between US Highway 287 and Laurel Street varies from 3 to 4 through lanes (2 westbound and 1-2 eastbound). Bicycle facilities consist of sharrows (bicyclists sharing the outside through lane with vehicles) from US Highway 287 to Nickel Street, and approximately 6-foot wide striped bicycle lanes from Nickel Street to Laurel Street. Through lane widths are 10 to 11 feet. Dedicated left-turn lanes are 11 to 12 feet wide. Typical sidewalk widths are 5 to 6 feet on the south side (attached and detached) and 8 to 9 feet on the north side (attached and detached). The total segment length is approximately 1,500 feet.

The speed limit through this segment is 30 mph with an 85th-percentile speed of 34 mph. Current ADT is 17,800 VPD (the highest on the corridor), with an anticipated annual growth rate of just 0.4% according to the DRCOG model. Adjacent land use can be characterized as commercial and retail. This segment is identified in the Broomfield Transportation Plan as a 2-lane minor arterial roadway.

A new 9-foot wide detached path exists on the north side, from the westernmost driveway to Laurel Street. Multiple driveway accesses to commercial and retail businesses are along this segment, many within close proximity of adjacent driveways or cross streets. Three signalized intersections exist within 500 feet of each other along this segment (US Highway 287, the westernmost driveway, and Nickel Street). Other roadway intersections are stop controlled with Midway Blvd having free through movement.

A 5-year crash history along this segment shows a total of 62 crashes, some involving bicycles and pedestrians. This total does not include crashes at the intersection of US Highway 287. 5-year crash history at US Highway 287 shows 190 crashes.

Segment 2 does not have consistent bicycle facilities appropriate for the speed and volume of vehicular traffic. Sharrows are present until the transition to Segment 3, where on-street bicycle lanes start. This segment also has multiple driveways in close proximity to each other.

B) Midway Blvd between Laurel Street and Main Street is a 2-lane section with dedicated left-turn lanes at various locations and small segments of TWLTL. Between Laurel Street and Daphne Street, bicycle facilities consist of sharrows in a few eastbound and westbound locations. Between Daphne Street and Main Street a 4-foot wide marked bicycle lane is present in each direction. On-street parking is present in both directions, with the exception of eastbound Midway Blvd between Kohl Street and West 3rd Avenue Drive. Through lanes are 10 to 12 feet wide, and dedicated right and left-turn lanes are 10 to 12 feet wide. A TWLTL is present adjacent to the church/school with a dedicated left turn lane providing access to the church/school parking lot. Typical sidewalk widths are 5 to 8 feet on both sides, and vary between attached and detached. The total segment length is approximately 3,800 feet.

The speed limit through this segment is 30 mph, with an 85th percentile speed of 32.5 mph; however, peak hour congestion in this segment may impact the 85th percentile speed, indicating off-peak times may see 85th percentile speeds higher than 32.5 mph. Current ADT is 16,100 VPD with an anticipated annual growth rate of just 0.4% according to the DRCOG model.

Adjacent land use is primarily residential, with a church/school located in the middle of the segment on the south side. The school zone is active during drop off and pick up times with a

reduced speed limit of 20 mph. A park is located in this segment on both sides of Midway Blvd east of Laurel Street with a local trail connecting to the sidewalk on the south side.

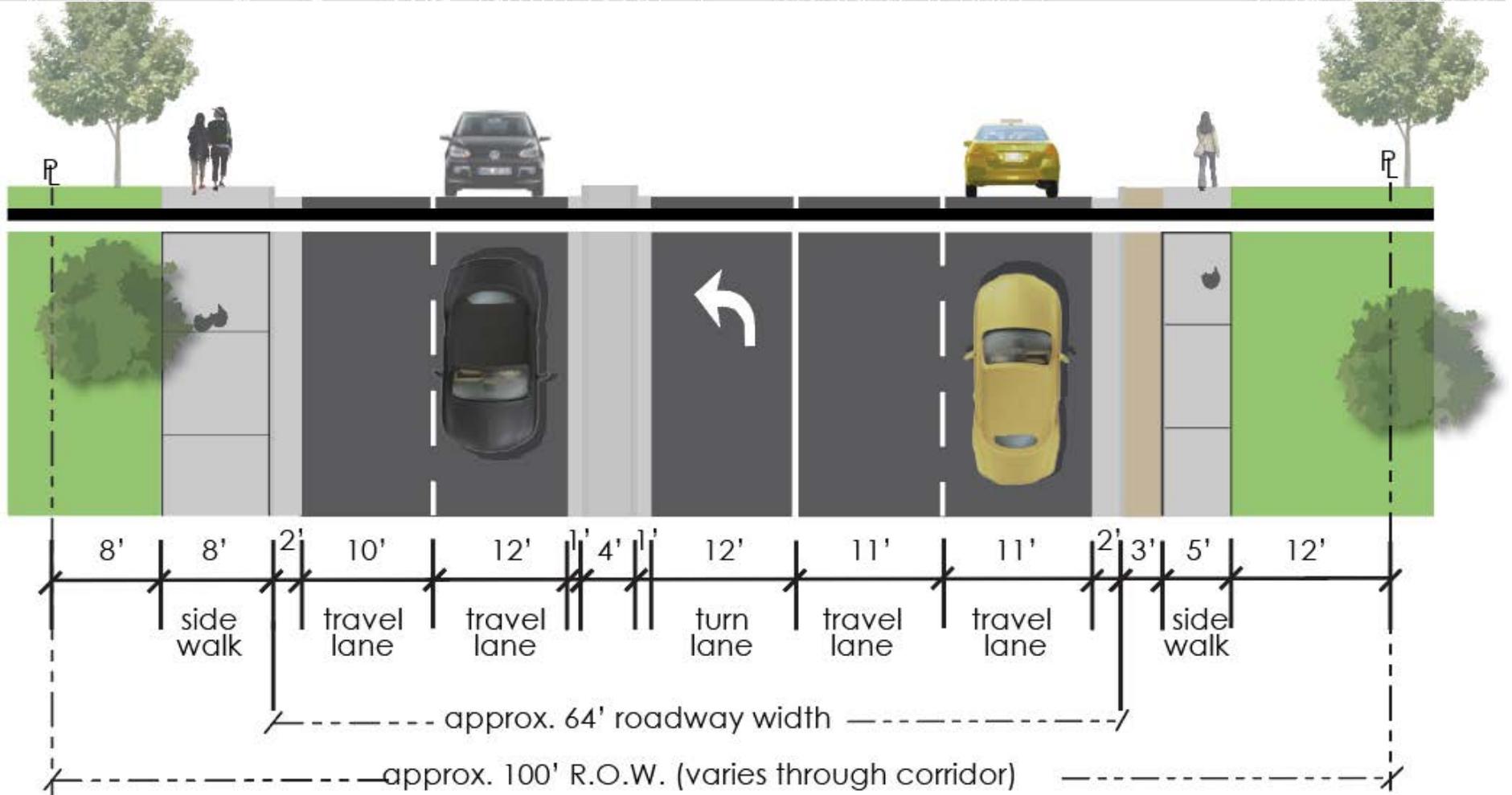
While some residential driveways access Midway Blvd, the majority of residential accesses load to the alley in the rear of the lots.

Signalized intersections along this segment are at a fire signal just east of Laurel Street, Kohl Street, West 3rd Avenue Dr, and Main Street. A side street stop-controlled intersection is present at Daphne Street. A crosswalk with a pedestrian-activated flashing beacon is also present at Daphne Street for pedestrians to cross Midway Blvd west of the intersection.

A 5-year crash history along this segment shows a total of 46 crashes, none of which were reported to involve bicycles or pedestrians. This total does not include crashes at Main Street, which had 46 crashes in the 5 year crash analysis period, none of which involved bicycles or pedestrians.

The most prominent identified multimodal deficiency along Segment 2 is the lack of consistent and low-stress facilities, both on and off-street. On-street parking and school traffic patterns make this a challenging segment to navigate for bicyclists.

Existing Midway Blvd: US 287 to Nickel St

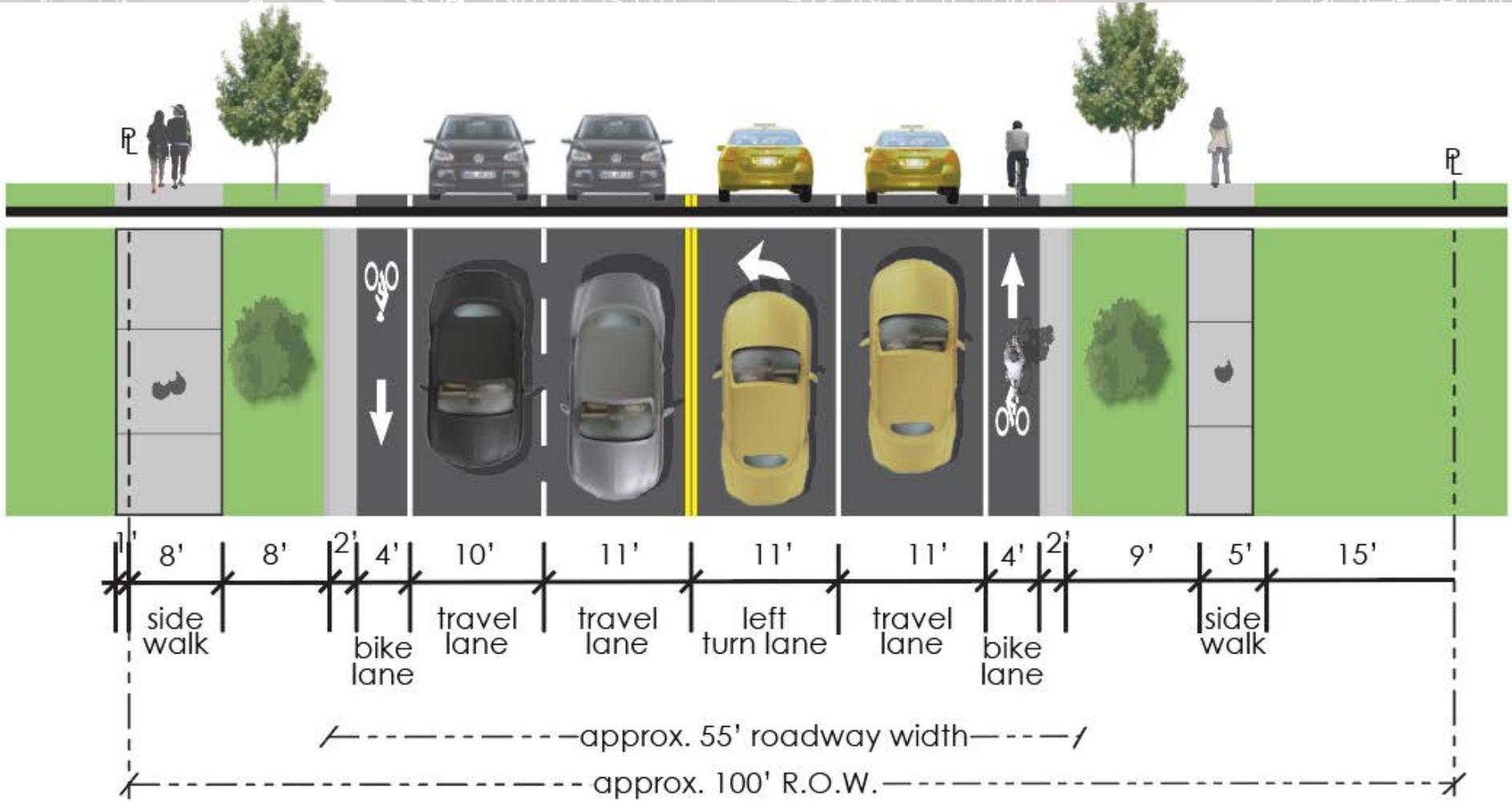
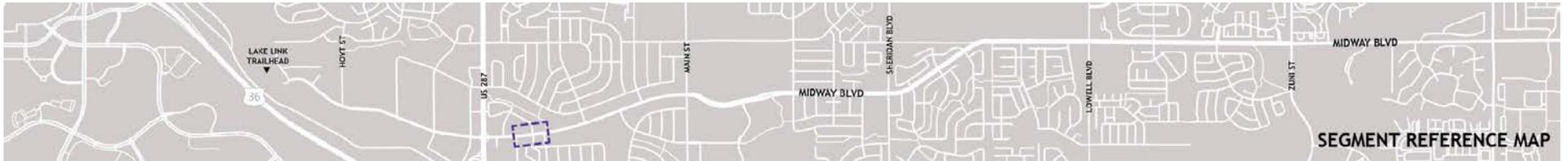


Note: dimensions vary throughout segment.

(Facing East)

Figure 27: US 287 to Nickel St Existing Cross Section

Existing Midway Blvd: Nickel St to Laurel St

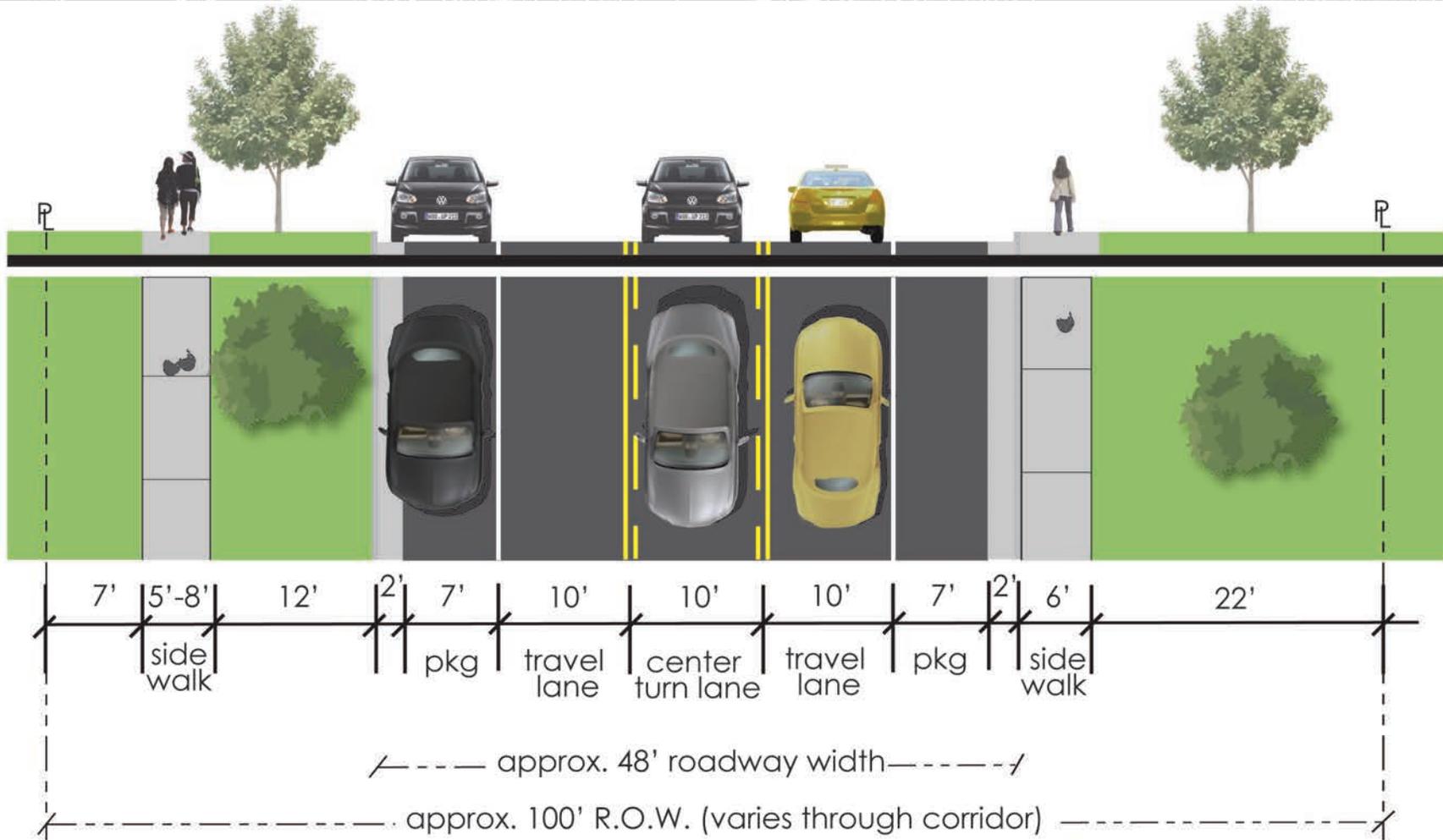
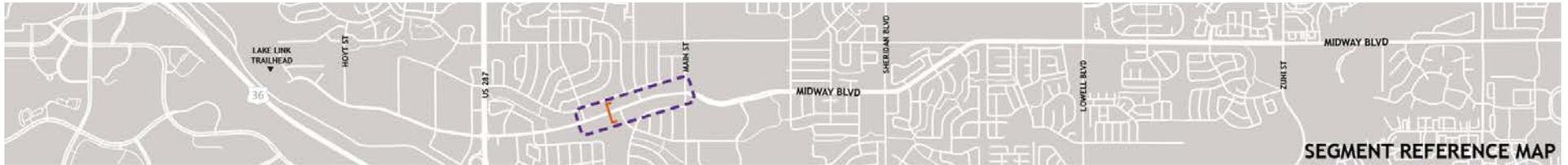


(Facing East)

Note: dimensions vary throughout segment.

Figure 28: Nickel St to Laurel St Existing Cross Section

Existing Midway Blvd: Laurel St to Main St



Note: Existing south sidewalk is detached from road in some locations.

Dimensions and lane configuration vary throughout segment.

(Facing East)

Figure 29: Laurel St to Main St Existing Cross Section



3. Main Street to Ash Street

Midway Blvd between Main Street and Ash Street is a 2-lane section separated by a raised landscaped median of varying width (typical median width is approximately 50 feet). Through lanes are 13 feet wide including gutter. Three gaps in the median exist to accommodate left turn and U-turn movements. One median gap is at Spader Way and two gaps are mid-block. Bicycle facilities consist of 5-foot wide on-street bicycle lanes in each direction. On-street parking is present for both directions of travel. Auxiliary turn lanes are present on Midway Blvd at Spader Way. An 8-foot sidewalk is present on the south side of the road. No sidewalk is present on the north side. Two pedestrian mid-block crossings are present (one at each mid-block median gap). The westernmost crossing is equipped with a rectangular rapid flash beacon. The easternmost crossing is a signed and marked crosswalk. Total segment length is approximately ½ mile.

The speed limit through this segment is 30 mph with an 85th percentile speed between 35 mph and 38 mph. Current Average Daily Traffic (ADT) is 13,300 Vehicles Per Day (VPD) with an anticipated annual growth rate of just 0.5%. Adjacent land use is undeveloped open space with local trail connections. Residential land use starts just west of Ash Street, with the first residential lots adjacent to the west approach to the intersection. Access

for the two residential lots is off of Ash Street.

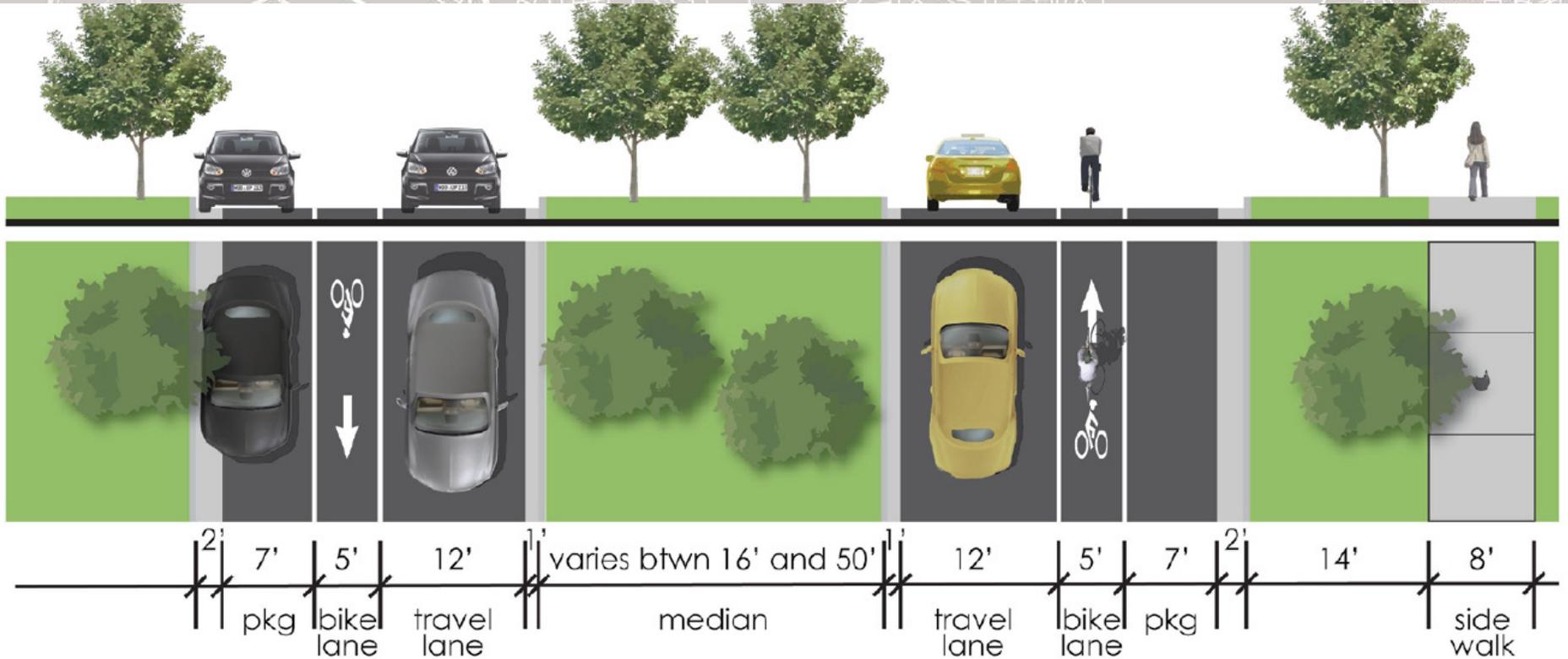
During a field visit in early 2021, and through using aerial imagery, it appears that the on-street parking is rarely used and may only be heavily used during periodic special events.

The only roadway intersection along this segment is at Spader Way and is stop-controlled with Midway Blvd having free through movement.

A 5-year crash history along this segment shows that there were 7 reported crashes between Main Street and Ash Street. The intersection of Ash Street has 19 reported crashes, and none involved bicycles or pedestrians.

The most prominent identified multimodal deficiency along Segment 3 is the lack of sidewalk or trail on the north side. The south side has a detached sidewalk which may currently experience bicycle use due to the lack of comfortable on-street bicycle facilities.

Existing Midway Blvd: Main St to Ash St



----- roadway width varies between 70' and 104' -----

----- Broomfield Roadway and Open Space R.O.W. varies -----

(Facing East)

Note: dimensions vary throughout segment.

Figure 30: Main St to Ash St Existing Cross Section

4. Ash Street to Sheridan Blvd

Midway Blvd between Ash Street and Sheridan Blvd is a 2-lane section separated by a raised landscaped median. Typical median width is 12 feet. Through lanes are 13 feet wide including gutter. Bicycle facilities consist of 5-foot wide on-street striped bicycle lanes. On-street parking is present on the north side (approximately 15 feet wide). The south side has a paved shoulder approximately 5 feet wide between the bicycle lane and curb. Auxiliary left-turn lanes are present at each intersection and at the church driveway just west of Sheridan Blvd. A 5-foot-wide detached sidewalk is present on the north side, separated from the roadway by a landscaped parkway approximately 10 feet wide. The south side has an 8 to 12 foot sidewalk that changes from attached to detached. All intersections in this segment are side street stop-controlled. The intersection of Sheridan Blvd is signalized. Ash Street, Birch Street, and Sheridan Blvd have striped crosswalks. Both crosswalks are signed and marked, and the crosswalk at Ash is enhanced with RRFBs. The total segment length is approximately ½ mile.

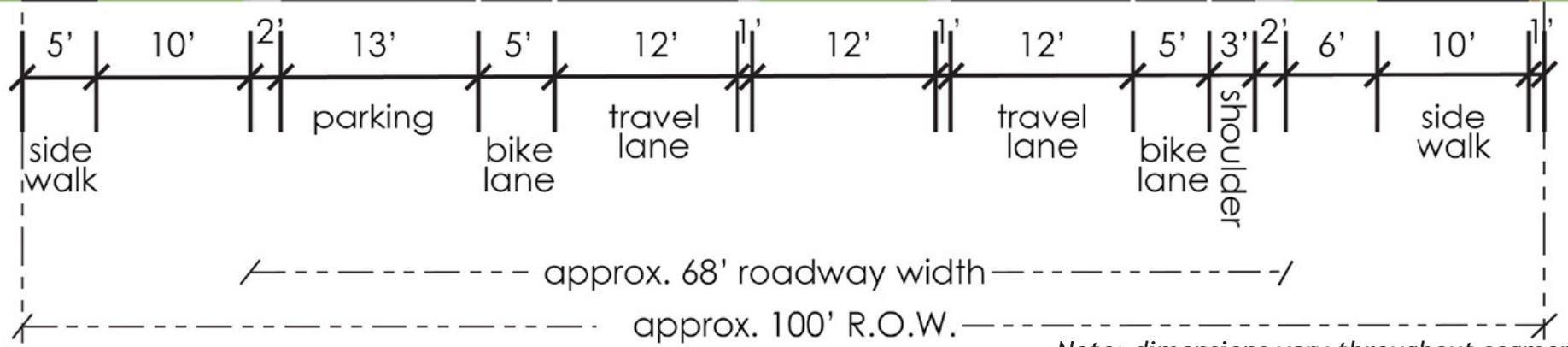
The speed limit through this segment is 30 mph with an 85th percentile speed between 33 mph and 38 mph. Current ADT is 15,050 VPD with an anticipated annual growth rate of just 0.5% according to the DRCOG model. Adjacent land use is primarily

residential with a church on the northwest corner of Sheridan Blvd. Local trail connections are present on the east end of this segment. Residential lots primarily have access from Midway Blvd on the north side, and back to Midway Blvd on the south side.

A 5-year crash history shows 16 crashes between Ash Street and Sheridan Blvd (not including the 19 crashes at Ash Street and 69 crashes at Sheridan Blvd).

The most prominent identified multimodal deficiencies along Segment 4 are the 5' bicycle lanes on each side and the narrow 5' sidewalk on the north side.

Existing Midway Blvd: Ash St to Sheridan Blvd



(Facing East)

Note: dimensions vary throughout segment.

Figure 31: Ash St to Sheridan Blvd Existing Cross Section

5. Sheridan Blvd to Lowell Blvd

Midway Blvd between Sheridan Blvd and Lowell Blvd is a 4-lane section separated by a raised landscaped median. The median width varies between 16 feet and 20 feet. Travel lanes vary between 11 feet and 12 feet including gutter. Turn lanes are present at multiple intersections. A 6-foot (including gutter) bicycle lane is present on both sides of the road for a portion of the segment, as it narrows to a 4-foot shoulder (including gutter) in some segments. A detached walk, typically 8 feet wide, is present on the south side and meanders between the backs of lots and the roadway. There is a 5-foot sidewalk on the north side between Sheridan Blvd and Vrain Street. Between Vrain Street and Lowell Blvd, there is an east-west trail north of Midway Blvd within the open space down an embankment from Midway Blvd. All three of these crosswalks are signed and marked and the crosswalk at Vrain is enhanced with RRFBs.

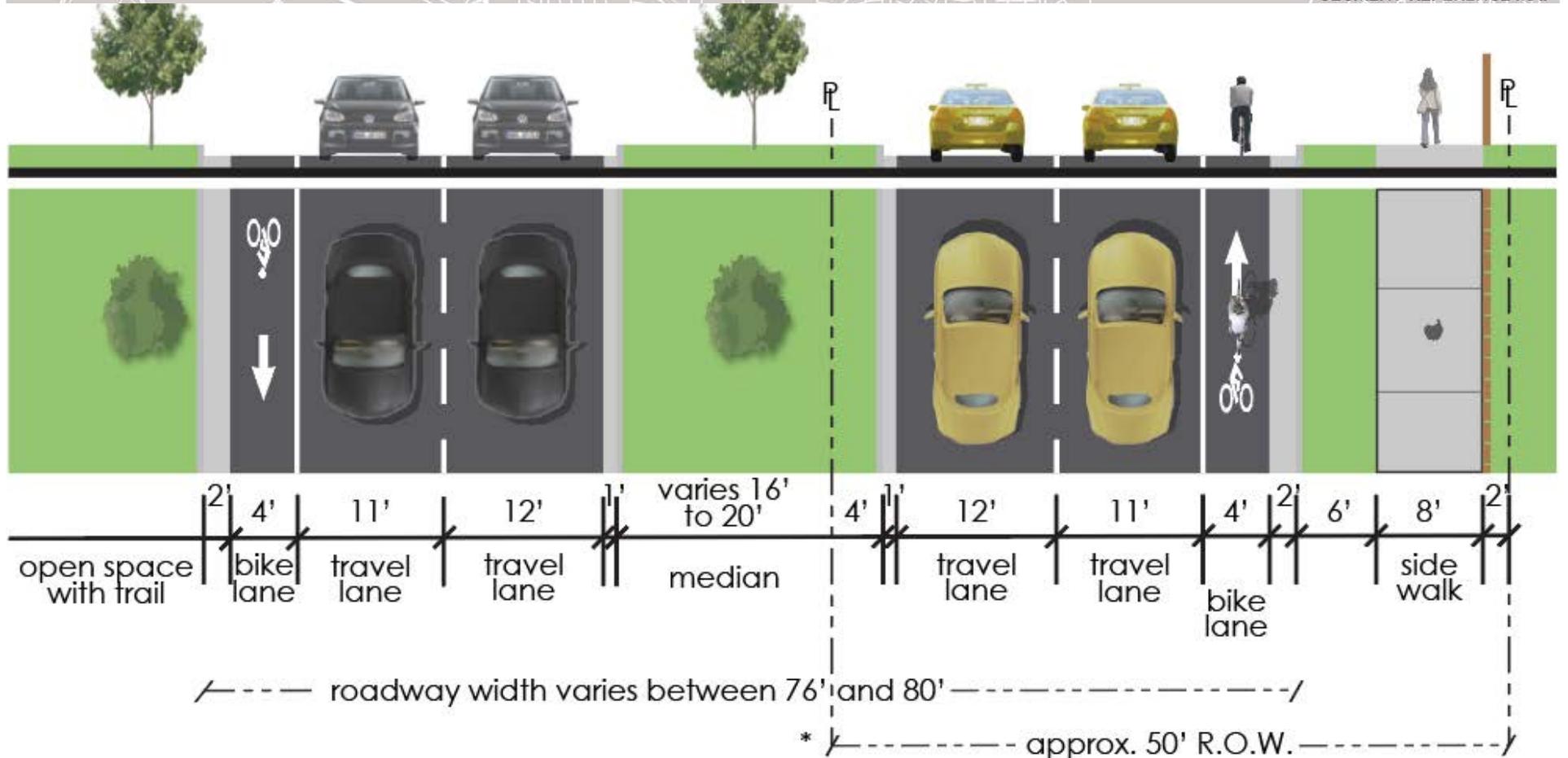
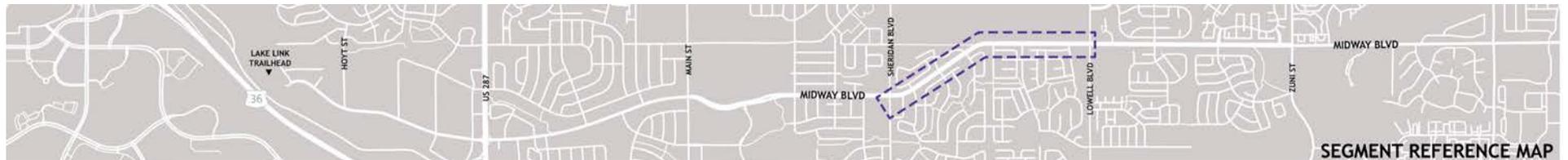
The speed limit through this segment is 35 mph with an 85th percentile speed between 43.5 mph and 45 mph. The current ADT is between 14,800 VPD and 16,500 VPD with an anticipated annual growth rate of 0.1% according to the DRCOG model. Adjacent land use is a mix of residential and undeveloped open space. The residential lots along this segment back to Midway Blvd, with accesses from the side streets.

Three signalized intersections are present within this segment at Sheridan Blvd, Perry Street, and Lowell Blvd. Multiple side street stop-controlled intersections are present along this segment, with Midway Blvd having free through movement.

A 5-year crash history shows 44 crashes along this segment, excluding the intersections at Sheridan Blvd and at Lowell Blvd. Multiple bicycle crashes are among the reported crashes. Lowell Blvd has 50 reported crashes including bicycle crashes.

The most prominent identified multimodal deficiencies along Segment 5 are the lack of consistent bicycle facilities, narrow sidewalk on the north side (where present), and challenges crossing Midway Blvd due to low vehicle compliance at crosswalks. In addition, sight distances feel to short for people in vehicles turning onto Midway Blvd from the side streets due to landscaped medians.

Existing Midway Blvd: Sheridan Blvd to Lowell Blvd



(Facing East)

Note: Dimensions vary throughout segment. ROW on north side varies due to adjacent property belonging to Broomfield ROW.

Figure 32: Sheridan Blvd to Lowell Blvd Existing Cross Section



6. Lowell Blvd to Big Dry Creek Trail

Midway Blvd between Lowell Blvd and Zuni Street is a 4-lane section separated by a raised landscaped median. Median width is typically 14 to 24 feet. Travel lanes vary between 10 feet and 12 feet. Turn lanes are present at multiple intersections. Striped shoulders are present on both sides of the road and are typically 4 feet wide including gutter. An 8-foot detached meandering sidewalk is present on the south side, and a 6-foot detached sidewalk is present on the north side. A signed and marked crosswalk is present at Willow Run Parkway.

East of Zuni Street to the Big Dry Creek Trail is a transitional roadway section within the City of Westminster, eventually becoming a 2-lane roadway section east of Harmony Parkway. The medians are striped, there is a shoulder on the south side with no curb and gutter or sidewalk. Bicycle lanes are not present on either side of the road. There are no paved bicycle or pedestrian facilities along Midway Blvd to the Big Dry Creek Trail.

The speed limit through this segment is 40 mph with an 85th percentile speed between 44.5 mph and 47 mph. Current ADT is between 15,500 VPD and 17,400 VPD with an anticipated annual growth rate of 1.4% according to the DRCOG model. Adjacent

land use is primarily residential with lots backing to Midway Blvd. At Lowell Blvd and near Zuni Street there are commercial and retail uses.

The intersections of Lowell Blvd, Hazel Street, Zuni Street, and the Big Dry Creek Park access are signalized. Multiple side street stop-controlled intersections are present in this segment.

A 5-year crash history shows 33 crashes along this segment, not including the intersections at Lowell Blvd or Zuni Street. At Zuni Street there were 115 reported crashes.

The most prominent identified multimodal deficiency along Segment 6 is the lack of designated bicycle facilities and connection to dry creek trail, and challenges crossing Midway Blvd due to low vehicle compliance at crosswalks and distance between crosswalks. In addition, sight distances feel to short for people in vehicles turning onto Midway Blvd from the side streets due to landscaped medians.

Existing Midway Blvd: Lowell Blvd St to Zuni St

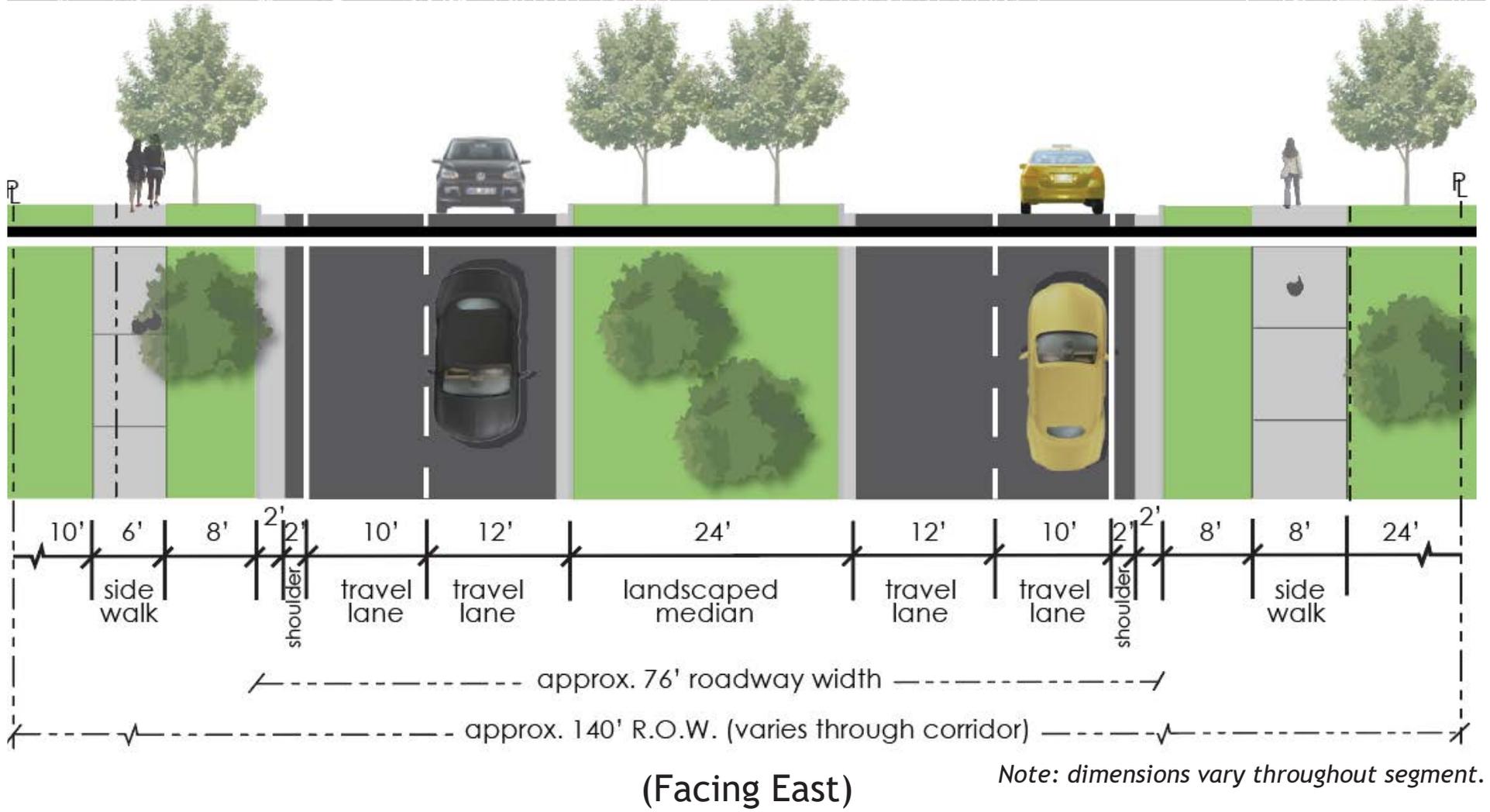


Figure 33: Lowell Blvd St to Zuni St Existing Cross Section

Existing Midway Blvd: Zuni St to Big Dry Creek

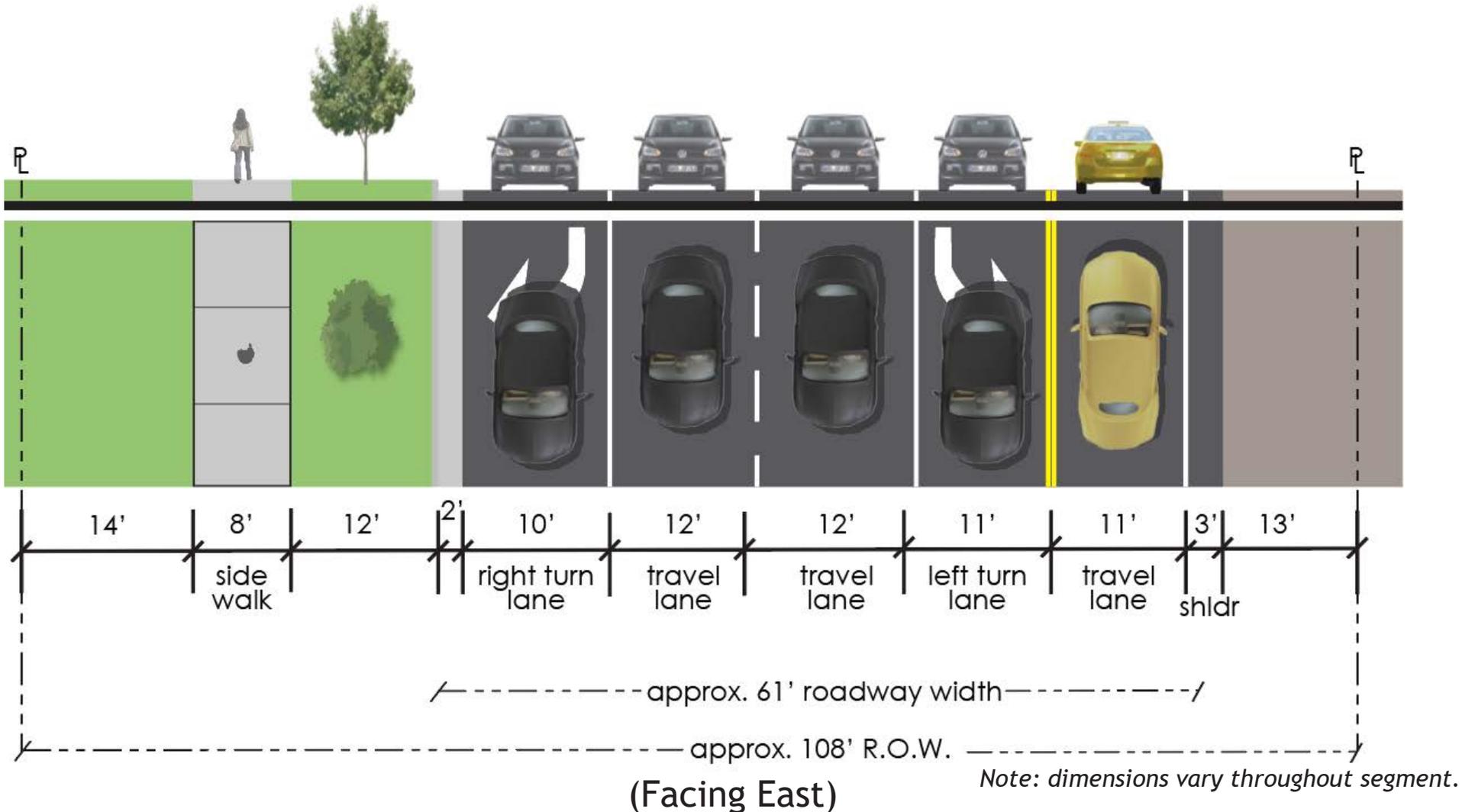
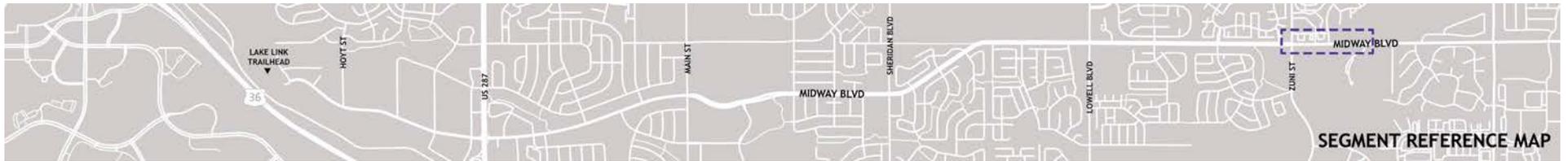


Figure 34: Zuni St to Big Dry Creek Existing Cross Section

Initial Environmental Reconnaissance

The study corridor begins at its western end, near Lake Link Trailhead, with a street cul-de-sac providing access to a Hunter Douglas (ceiling fan) facility. The cul-de-sac is located conveniently near a section line, making the corridor easy to measure as it extends eastward toward the major regional

north-south arterials of US 287 (one mile), Main Street (two miles), Sheridan Blvd (three miles), Lowell Blvd (four miles), and Zuni Street (five miles). The study corridor ends at 5.4 miles in length, on the western side of Big Dry Creek.

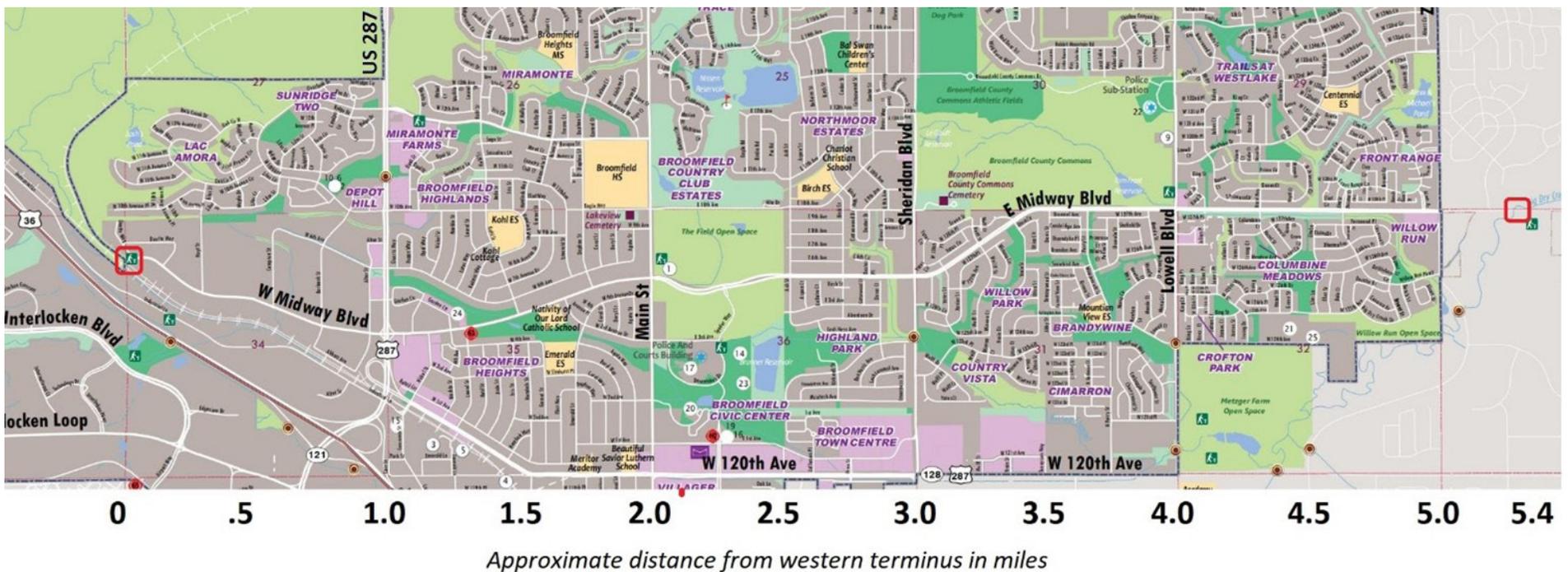


Figure 35: Corridor Mileage Reference Map

1. Potential Wetlands

Impacts to wetlands should be avoided, minimized, and mitigated as required by law and due to the important ecological values of these lands. Among their beneficial uses, wetlands are important for wildlife habitat, water quality, and flood control.

There are eight potential wetlands in the immediate vicinity of Midway Blvd, identified by the National Wetlands Inventory (NWI) that is maintained by the U.S. Fish and Wildlife Service (USFWS).

- Mile 0, south of Midway, not adjacent: 0.22 acre Freshwater Emergent Wetland
- Mile 0.5, north of Midway, not adjacent: 0.23 acre Freshwater Emergent Wetland
- Mile 0.6, crosses road: Community Ditch
- Mile 1.5, crosses road: Drainage
- Mile 2.1, south of Midway: 0.79 acre Freshwater Emergent Wetland
- Mile 2.2, crosses road: Community Ditch
- Mile 4.8, south of Midway, parallel to it: Freshwater Forested/Shrub Wetland
- Mile 5.4, crosses road: Big Dry Creek

Of the eight potential wetlands sites, some would not be affected at all if anticipated corridor improvements are kept largely within existing right-of-way. The only wetlands likely to be encountered are at Community Ditch, about 0.4 miles west of US 287, and just east of Compton Street.





2. Community Parks and Open Space

Broomfield has an extensive and highly connected system of parks and open spaces. Midway Blvd passes along or through several of these areas, which should be taken into consideration during the design process. Land acquisition at these locations should be minimized during the development of the proposed corridor improvements for Midway. Such lands have regulatory protection if the roadway project requires approval from the U.S. Department of Transportation, or if it takes any recreation land that was previously funded with grants under the Land and Water Conservation Fund. The impacts of Midway Blvd improvements could also prove beneficial to parks and open spaces by improving multimodal access to these facilities.

It is assumed that corridor improvements will remain largely within existing Midway Blvd right-of-way, to avoid any takings. Any unavoidable takings would likely be minimal edge effects, not adversely affecting the intended recreational use of the remainder of the affected parcels.

The community parks and open space areas along Midway are as follows:

- Mile 0, west of Midway, adjacent: The Lake Link trail entrance exists at the cul-de-sac which is the study area western terminus. It is unlikely that this area will be impacted as it is located just outside of the study area.
- Mile 1.4, cross road: This is the northern edge of South Midway Park which is a grassy, open area. The only potential impacts to the area involve minor edge effects.
- Mile 2, road bisects: This is The Field Open Space which is a premiere community asset with many amenities. It is highly likely this area will be impacted as the project along Midway must be harmonious (e.g., low speed limit) with the open space uses.
- Mile 2.8, crosses road: Here North Highland Park and South Highland Park are separated by the Midway Blvd. Pedestrian crosswalks are at the west and east ends at Laurel Street and Kohl Street. The only potential impacts to these areas involve minor edge effects.
- Mile 3.3, south of Midway: Midway borders the northern edge of Willow park, a grassy, open area with a playground at the south end of the park. The only potential impacts to the area involve minor edge effects.

- Mile 3.4, north of Midway: The road borders the south edge of Broomfield County Commons, an open space with a nearby trail that parallels the road. The only potential impacts to the area involve minor edge effects.
- Mile 3.7, south of Midway: At this location there is a trail associated with Perry Street West Park and has crosswalk access north into Broomfield County Commons. Impact is likely at this location where maintaining a safe crosswalk is a key focus.
- Mile 4, south of Midway: The trail at this location closely parallels Midway Blvd as a buffer between the road and the neighborhood. It is unlikely that this area will be impacted due to sufficient separation between the road and the trail.
- Mile 4.1, north of Midway: Here the trail/buffer space connects northward from Midway Blvd to Pinion Park. The likelihood of impact is low.
- Mile 4.6, south of Midway: The trail/buffer space connects northward from Midway Blvd to Bronco Park. The likelihood of impact is low.
- Mile 5.2, crosses road: This area is the Big Dry Creek Open Space outside of Broomfield and is owned by others. It is likely that this area will be impacted as the Open Space exists east of the project terminus at the Big Dry Creek Trail.





3. Threatened and Endangered Species

The findings of the 2021 environmental overview for the nearby Broomfield Town Centre proposed project addressed the potential for encountering Federally or State-listed Threatened or Endangered (T&E) species in the Broomfield area. According to the U.S. Fish and Wildlife Service website, Information for Planning and Consultation (IPaC), no T&E species are likely to be present due to lack of suitable habitat.

With regard to Federally-listed species, the main concern in Broomfield is whether or not any proposed action would result in water depletion in the South Platte River basin, potentially affecting fish, birds, and riparian plants downstream in eastern Colorado or Nebraska. No heavily water-intensive construction activities or other uses seem likely for Midway Blvd corridor improvements.

4. Other Wildlife Concerns - Prairie Dogs and Migratory Birds

Two wildlife concerns relevant to the Midway Blvd corridor are the black-tailed prairie dog and migratory birds, including raptor species.

The black-tailed prairie dog (*Cynomys ludovicianus*) is found in the Broomfield area and is of special concern to the community, which led to adoption of the 2003 City and County of Broomfield Policies for Prairie Dog Conservation and Management. This species is not listed as a threatened or endangered species by the U.S. Fish and Wildlife Service, but is eaten as prey by other species that are listed - e.g., the black-footed ferret, swift fox, mountain plover, ferruginous hawk, and the burrowing owl. The prairie dog is commonly found along Colorado's Front Range.

There is ample evidence from aerial and ground-level photography that prairie dog colonies exist along the Midway Blvd corridor.

- Mile 0 to 0.5, south of Midway, adjacent: Burrows and active animals are readily apparent from August 2019 Google Maps ground-level photography. The property at this location seems to have a silt fence around the prairie dog area for 1,500 feet in length along Midway Blvd and roughly 300 feet in depth away from the street. This approximately 11-acre area is on about five parcels of vacant future office/light

industrial land. The likelihood of impact at this location is low. The colony is near the corridor western terminus, where extensive corridor improvements would not be anticipated.

- Mile 4 to 4.2, 100 feet south of Midway, not adjacent: A large prairie dog colony in the southeastern quadrant of the Midway intersection at Lowell Blvd appeared in Google Maps photos from 2019, but public notices indicated that development of the property was imminent. This colony extended for 875 feet along Midway. The likelihood of impact to the colony is low. If the colony still exists, it is well removed from the road and would not be affected by corridor improvements.
- Mile 5 to 5.1, south of Midway, adjacent: Another large prairie dog colony was observed in the southeastern quadrant of the Midway/Zuni intersection, with roughly 750 feet of frontage along Midway. There is a high likelihood of impact at this location. Multiple burrows appear to be mere feet away from the road, likely within existing right-of-way.



Migratory birds, their eggs, and nests are protected under the Migratory Bird Treaty Act (MBTA). Most wild birds commonly found in the United States are protected by the MBTA, with exception of introduced species such as House Sparrow (*Passer domesticus*), Rock Dove (or Common Pigeon) (*Columba livia*), Common Starling (*Sturnus vulgaris*), and Eurasian Collared Dove (*Streptopelia decaocto*). Species that are not typically thought of as migratory and are present throughout the year, including Great Horned Owl (*Bubo virginianus*), Black-Billed Magpie (*Pica hudsonia*), and American Crow (*Corvus brachyrhynchos*) are also protected by the MBTA. In addition to the birds themselves, all active nests are protected, including ground nests, cavity nests, and subterranean nests, used, for example, by western meadowlark (*Sturnella neglecta*), downy woodpecker (*Picoides pubescens medianus*), and western burrowing owl, respectively. The MBTA does not prohibit the destruction of an inactive bird nest without birds or eggs present, if the nest is destroyed or left in place and not collected.

There is potential for nests to be present during the nesting season (generally from April 1 - August 31) as potential nest substrate, including trees and an herbaceous vegetative layer, in portions of the assessment area. The migratory bird nesting season can start as early as February 15th for hawks and continue through the end of August. Additionally, black-tailed prairie dog burrows are potential nesting sites for the western burrowing owl.

Trees along the 5.4-mile Midway Blvd corridor total many hundreds and possibly several thousand, so MBTA-protected bird nests will be found adjacent to Midway Blvd. Some trees could be removed by corridor improvements, and appropriate survey protocols would be followed to minimize effects to migratory birds.

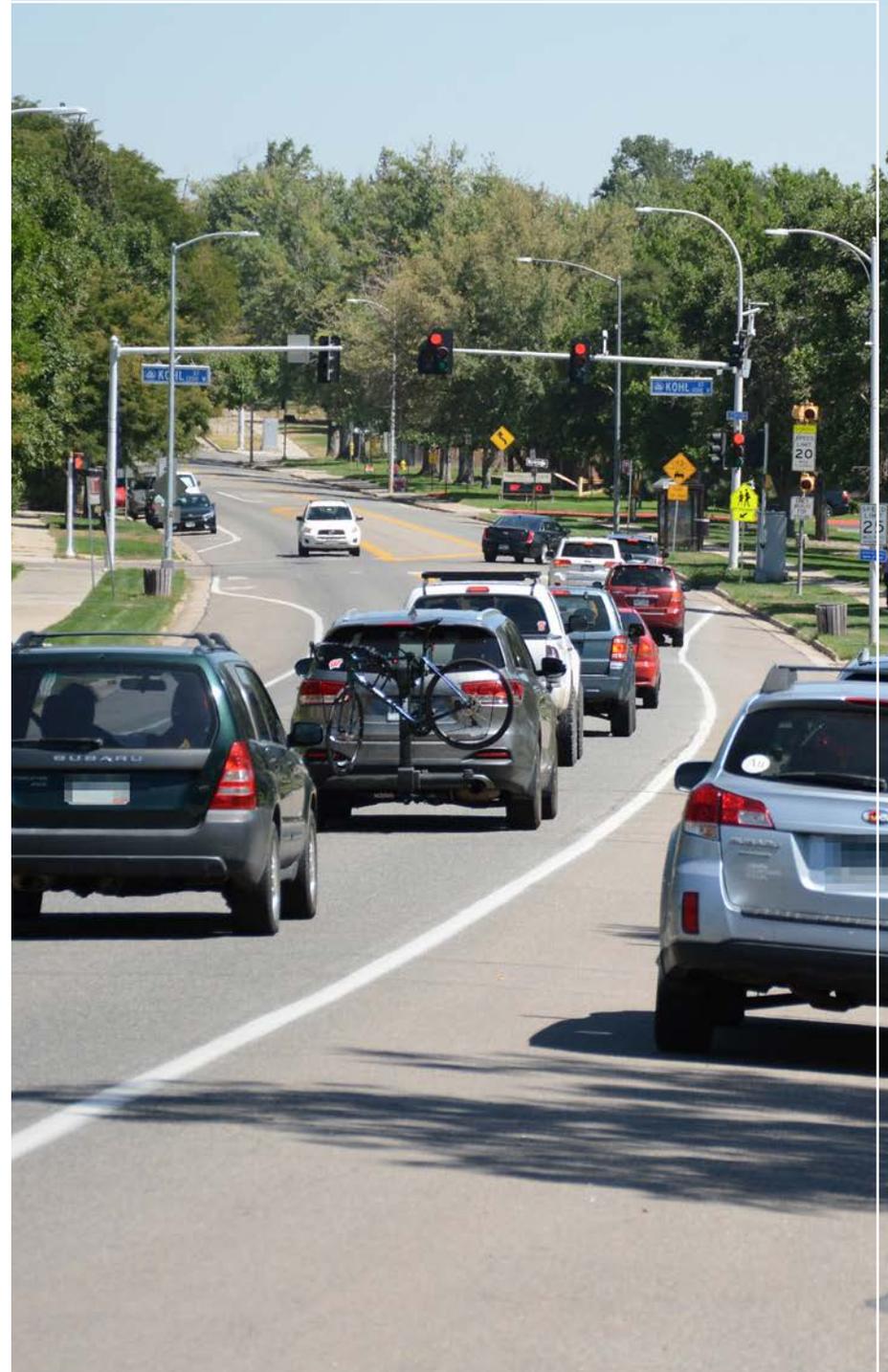
As noted earlier, Midway Blvd corridor improvements presumably will not reach Big Dry Creek, at the eastern end of the study area. This important drainage-way provides a perennial water source, regional wildlife movement corridor, and raptor nesting / predation sites.



5. Historic Properties

Development in the Broomfield area began with dry land farming, followed by railroads coming through in the late 1880s. The Broomfield Open Space, Parks, Recreation and Trails Master Plan states that by 1957, the small community counted only 100 residents. Development began in the 1950s, associated with construction of the Boulder Turnpike, a toll road connecting Denver and Boulder. Broomfield grew to a population of 6,000 and became incorporated in 1961. In 2001, it became Colorado's 64th county. This brief history highlights the fact that the community does not have abundant historic resources. As a general rule, a resource must be at least 50 years old, or nearing that age, to be considered historic. At this time, the 50-year time frame could include properties of historic significance existing since 1971. An online search for all properties in the state listed in the National Register of Historic Places and the Colorado State Register of Historic Properties yielded only two listed sites in the county, and neither is along Midway Blvd. Additional properties could become eligible for listing, if they meet the criteria in the National Historic Preservation Act.

While the corridor can be expected to be largely devoid of historic resources, one resource needing further assessment is the Community Ditch, discussed earlier under the topic of potential wetland impacts. Irrigation canals are often historic, and associated with the agricultural beginnings of a community.



6. Residential Areas

Residential areas are the primary land use along East Midway Blvd, i.e., east of Kohl St. Residential areas can be sensitive to roadway construction impacts including noise, dust, and nighttime lighting.

Most of the residential areas along Midway Blvd consist of suburban, detached single family homes. Direct access to individual residences is not provided from Midway Blvd with one notable exception, found on the north side of the road, in the 900 block of East Midway Blvd between Ash Street and Birch Street. At this location, 13 homes have direct driveway access to Midway Blvd.

One atypical residential area along Midway Blvd is a manufactured housing community, Front Range, north of Midway between Lowell and Zuni (mile 4.0 to 5.0). Manufactured housing is lower cost, with greater development densities, than traditional residential subdivisions. The lower cost of residences is often correlated with lower average household incomes. If there is Federal funding involvement in the Midway corridor improvements, this would be a location to be evaluated with respect to Environmental Justice criteria. Generally, it seems unlikely that there would be disproportionately high and adverse project impacts to the Front Range Manufactured Housing Community.



Initial Utility Reconnaissance

Electric

- Underground three-phase and single-phase primary electric facilities exist along the length of the corridor along with multiple transformers, switch cabinets, and electric pull boxes. It is anticipated that many of these facilities will require relocation or adjustment to accommodate the proposed multi-use path alignments.
- Streetlights, as well as underground secondary lines, will require relocation at various locations along the corridor.
- Existing overhead primary and communication lines crossing Midway at Laurel Street are anticipated to require the relocation of existing power poles.





Gas

- Several steel and PE gas mains varying in size from 12" to 6" exist within the study limits. Larger steel gas mains often have limited outage windows and may have extensive planning, design, and construction schedule constraints that should be considered when evaluating alternatives.
- A 6" transmission gas main crossing Midway on the east side of Sheridan Blvd is not anticipated to conflict with the proposed improvements. If drainage improvements or grade changes extend into Sheridan Blvd, additional horizontal and vertical review of this facility is recommended.
- Additionally, several residential services connect to the gas main in Midway between Kohl and Main, as well as between Ash and Sheridan, that should be evaluated prior to the final design to assess impacts.

Communications

- Zayo and CenturyLink (Lumen) underground communication duct banks cross Midway Blvd on the east and west sides of the intersections with Highway 287, respectively, and are not anticipated to conflict with proposed elements of the project.
- Several underground communication facilities exist along both the north and south sides of Midway for the majority of the study area likely impacting pedestals, manholes, pull boxes, and communication vaults. Further investigation is needed prior to final design to determine the extent of facility relocations required with the proposed improvements.

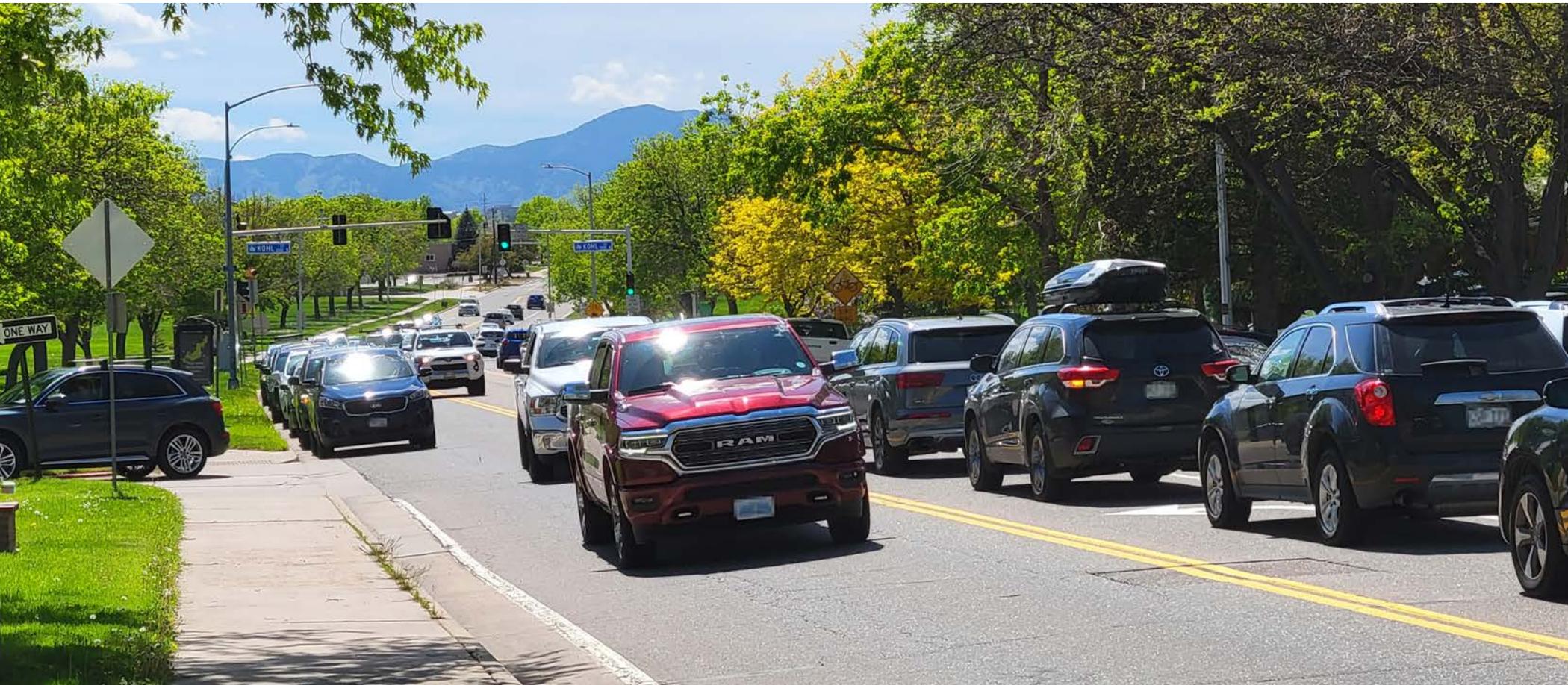


Traffic

- Signals and associated equipment exist at 287/Wadsworth Parkway, Garden Center, Nickel Street, east of Laurel Street (emergency fire signal), Kohl Street, 3rd Avenue Drive, Main Street, Sheridan Boulevard, Perry Street, Lowell Boulevard, Hazel Street, and Zuni Street.
- Additional attention should be paid to these intersections to minimize impacts to signal equipment and associated fiber and electrical systems.

Wet Utilities

- Manholes, water valve boxes, and hydrants may be impacted at various locations throughout the corridor.



Disclaimers

- Existing utility information is based on the best information as provided by the various utility owners. All utilities depicted in this report are based on ASCE Quality level D mapping only.
- Utility conflicts have been evaluated based on horizontal conflicts only. Vertical grade changes and proposed drainage impacts have not been evaluated as part of this initial utilities reconnaissance.



MIDWAY BLVD MULTIMODAL PLAN

Map showing the Midway Blvd corridor in Colorado Springs, including landmarks like schools, government services, and residential areas.

MIDWAY BLVD MULTIMODAL PLAN

Map showing the Midway Blvd corridor in Colorado Springs, including landmarks like schools, government services, and residential areas.

MIDWAY BLVD MULTIMODAL PLAN

SHOW AND TELL: DROP A NUMBERED DOT ON THE MAP TO IDENTIFY/REVEAL YOUR EXPERIENCES ALONG THE MIDWAY BLVD CORRIDOR

Whether driving, walking or cycling, where have you experienced a crash or experienced an incident, where injury or collision could have easily occurred? Driving along the corridor, where do you have trouble making a turning movement? Which direction is most discouraging or challenging to walk or cycle? Where would you avoid walking or cycling? Where would you prefer to walk or cycle?

MIDWAY BLVD MULTIMODAL PLAN

MOSTRAR Y CONTAR: PONGA UN PUNTO EN EL MAPA Y CUÉNTENOS UN POCO SOBRE SUS EXPERIENCIAS A LO LARGO DEL MIDWAY BLVD CORRIDOR.

¿Ha sido conduciendo, caminando o en bicicleta, dónde se le ocurrió a usted o a un incidente en el que una lesión o colisión podría haber ocurrido fácilmente a lo largo del corredor?

¿Al conducir por el corredor, dónde tiene problemas para girar a la izquierda o para hacer un movimiento transversal?

¿Qué parte del corredor es más desalentadora o desafiante para caminar o andar en bicicleta y por qué?

¿En qué parte del corredor se siente más cómodo caminando y conduciendo?

¿Qué intersecciones evita al caminar y conducir?

¿Dónde accede a las paradas de tránsito de RTD? ¿Dónde le gustaría ver el acceso de tránsito?

¿Otra información que le gustaría que el equipo de diseño supiera?

www.voice.com/midwayplan



CHAPTER 4. COMMUNITY OUTREACH

Effective and inclusive community engagement is critical to the Midway Blvd Multimodal Action Plan. Understanding community perceptions and comfort with use of the corridor is a major component of analyzing existing conditions and use. Targeting inclusivity, Broomfield staff developed stakeholder lists and mailing lists for events with a focus on including previously under-served and under-represented populations. Each formal outreach event presentation included simultaneous Spanish interpretation and the opportunity to request additional accommodations, whatever the need.

This project included a number of public engagement opportunities for the entire community to discuss existing conditions, provide feedback on project goals, share their perspective and experience of the corridor, and explore possible future changes.

Outreach efforts throughout the project included:

- 6 “pop up” meetings at community events: National Night Out 2021, Broomfield Days 2021 & 2022, Broomfield Library, Paul Derda Rec Center, and 2022 Oktober Fest.
- Phase-specific emails to key public stakeholders.
- Direct mail post cards to residents (English and Spanish)
- Midway Multimodal Plan information posted on Broomfield Voice throughout project.
- 3 virtual workshops held in September 2021, with a recording posted to the Broomfield Voice website.
- Interactive Broomfield Voice Public Engagement Map produced location-specific public feedback, based on existing conditions
- Discussion Forum Question of the Week posted on Broomfield Voice and official Broomfield social media produced comments, shares, likes, and impressions.
- 6 online Design Alternative surveys were shared on Broomfield Voice: a 3-Minute Quick Input Survey covering the whole corridor, and 5 location-specific surveys.
- Interactive Draft Interim and Future Concept Plans on Broomfield Voice produced location-specific feedback on the draft concepts.
- The public was invited to contact project team via phone, Facebook, Twitter, LinkedIn, NextDoor, email, and phone hotline throughout the project.

Public Involvement Approach and Timeline

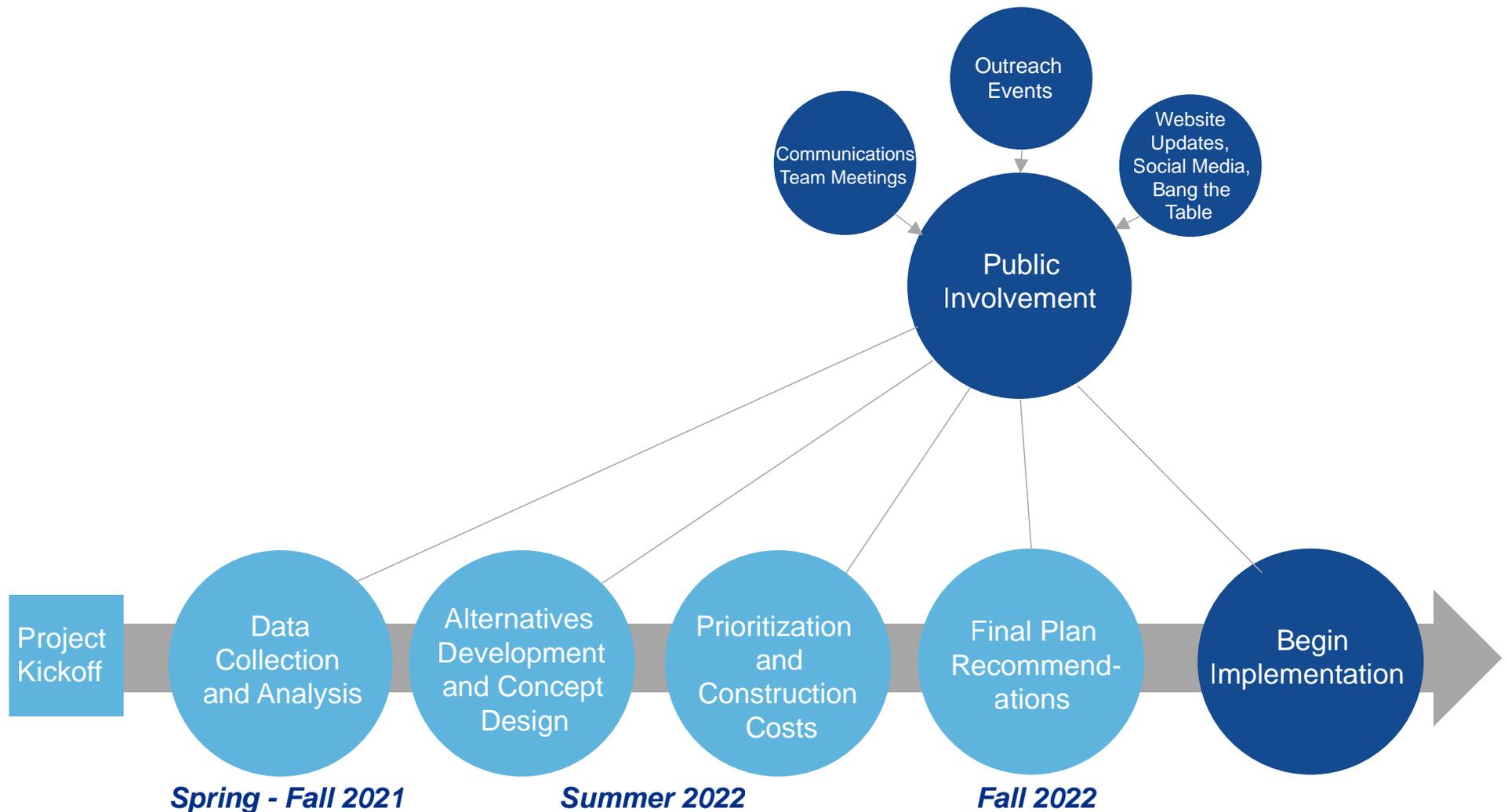


Figure 36: Public Outreach Approach and Timeline



Public Involvement Phased Campaigns

Three phases of public engagement have taken place.

Phase 1: Build Awareness and Confirm Action Plan Goals

From July 2021 through December 2021, multiple means of gathering public feedback were employed. A total of 569 comments were collected.

Phase 2: Explain Options and Defining Priorities

The second phase was focused on online surveys that invited input on the Design Alternatives. The surveys opened in Jan 2022, and closed in March 2022. A total of 721 responses were collected.

Phase 3: Input on Priorities and Actions

After the Alternatives Development process (described in Chapter 5), the proposed Concepts were presented to the public for feedback in August - September 2022. Approximately 500 comments were collected.

In total, approximately 1,800 comments were collected from July 2021 - October 2022.

See **[APPENDIX B: Midway Blvd Outreach Summary Report](#)** for full details of the community outreach process

Public Engagement: Phase 1

Outreach Phase 1: Building Awareness and Confirm Action Plan Goals.

Public Engagement for Phase 1 included:

- Midway Multimodal Project information and upcoming events posted on the Broomfield Voice website throughout the project.
- 21 Interactive Social Media Posts
- Interactive Broomfield Voice Public Engagement Map (English & Spanish) produced location-specific public comments based on existing conditions
- Discussion Forum Question of the Week posted on Broomfield Voice as well as official Broomfield social media.
- Information included in 3 newsletters, inviting the public to participate.
- Emails sent to key public stakeholders, informing them of upcoming events, and inviting them to share and participate.
- 3 Virtual Public Meetings, with a recording posted to the Broomfield Voice website.
 1. 9/20/2021
 2. 9/22/2021
 3. 9/23/2021
- 2 “pop up” meetings at community events:
 - National Night Out (2021)
 - Broomfield Days (2021)



569
Comments

Phase 1 Total Comments

Phase 1 Public Input Significance

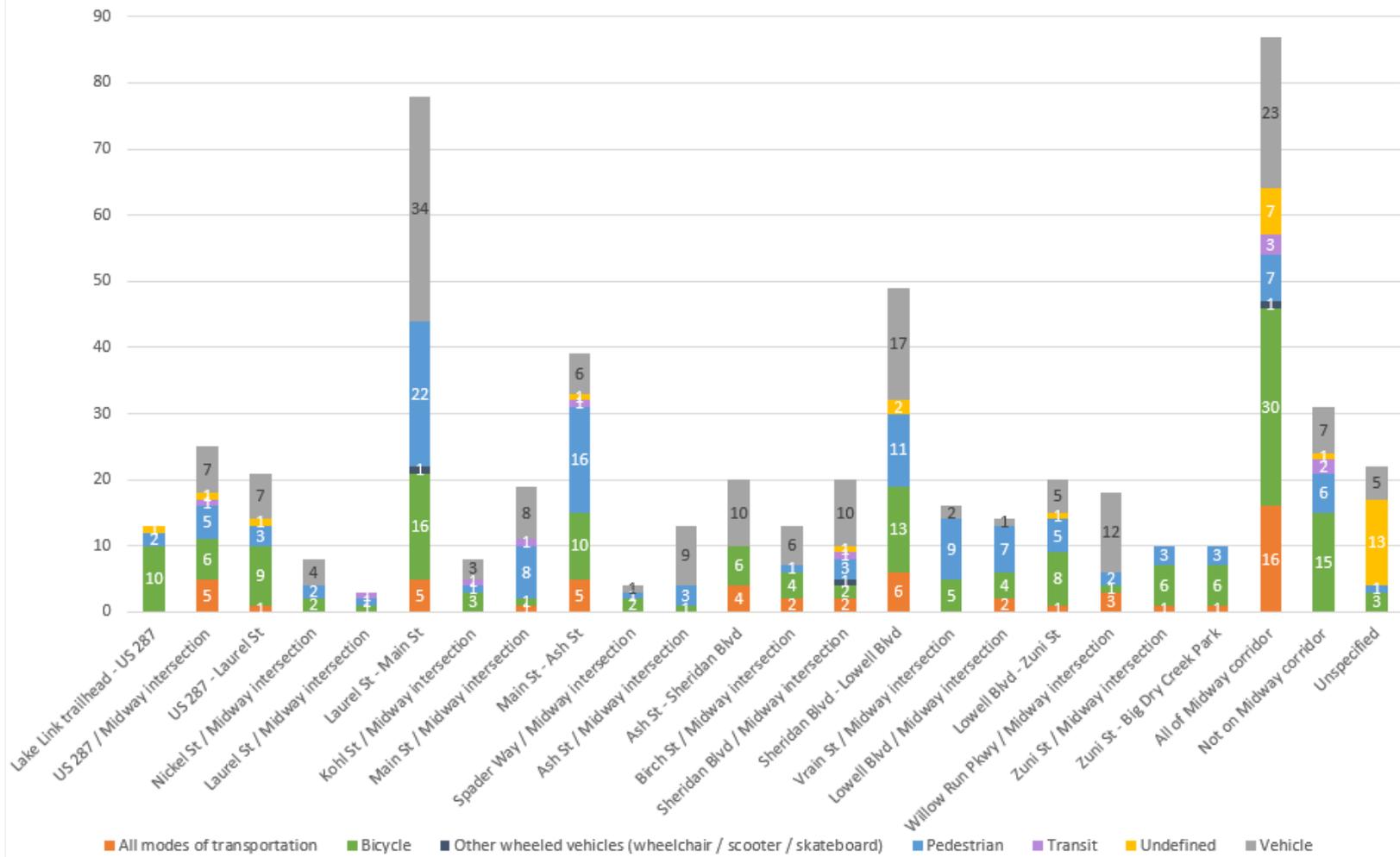


Figure 37: Public Input by Location

Detailed categorization of all of the Phase 1 comments provide guidance on where to focus efforts.

Top Public Concerns:

1. Safety - Crash Concern/ History
2. Safety - Crossing
3. Bicycle Facilities

Top Location Concerns:

1. All of Midway Corridor
2. Laurel St - Main St
3. Sheridan Blvd - Lowell Blvd

Public Engagement: Phase 2

Outreach Phase 2: Explaining Options and Defining Priorities.

Public Engagement for Phase 2 included:

Design Alternatives Online Surveys on the Broomfield Voice webpage. The public surveys were open January 26, 2022 - March 31, 2022, and included:

Three Alternative Design options for each section of the corridor were developed. Details of this process is further discussed in Chapter 5.

- 1 Three-Minute Quick Input Survey, to assess public prioritization of features within the project.
- 5 Segment-Specific Surveys, each included 3 different design alternatives. The public was invited to rate their preferred choice and contribute comments.



Phase 2 Total Comments

The sections include:

- West: Lake Link Trail to US-287
- West-Central: Laurel St to Main St
- Central: Main St to Ash St
- East-Central: Ash St to Sheridan Blvd
- East: Sheridan Blvd to Zuni St

Note: The US 287 to Laurel St segment varies significantly throughout, therefore this was addressed as a Plan View overhead diagram in Phase 3 (Concept) Engagement, instead of cross-sections.

Phase 2 Outreach Advertising:

- Project information and upcoming events posted on the Broomfield Voice website throughout the project.
- 3679 Postcards were mailed out, printed in English & Spanish, inviting the public to participate.
- Emails to key public stakeholders, regarding Design Alternatives.
- 6 weeks of social media pushes
- 2 newsletters

Phase 2 Public Input Significance

- The more than 700 total responses provided by the community increased the project team's understanding of the preferred design concepts along the Midway Blvd corridor.
- Approximately 90% of respondents think the Midway Blvd corridor **needs minor to significant changes.**
- People are most concerned about:
 - Speeding
 - People on bicycles / pedestrian safety
 - Intersection & Crossing safety
 - Congestion
- **Speeding:**
 - Speeding throughout the corridor is a major safety concern
- **Additional protection for people on bicycles and pedestrians:**
 - Off-street protected bicycle lanes with Multi-Use Paths are the stated preference.
 - Many participants indicated they desire to bicycle along the corridor, and will do so if safety improvements are made.
- **Intersection crossing safety improvements.** Areas most frequently focused on by participants:
 - Laurel St - Main St
 - Willow Run Pkwy/Elm Ln intersection
- **Congestion:**
 - The Midway Blvd corridor must be considered in context of surrounding traffic patterns.
 - The safety and traffic-flow benefits of roundabouts were supported.



Public Engagement: Phase 3

Outreach Phase 3: Input on Priorities and Actions.

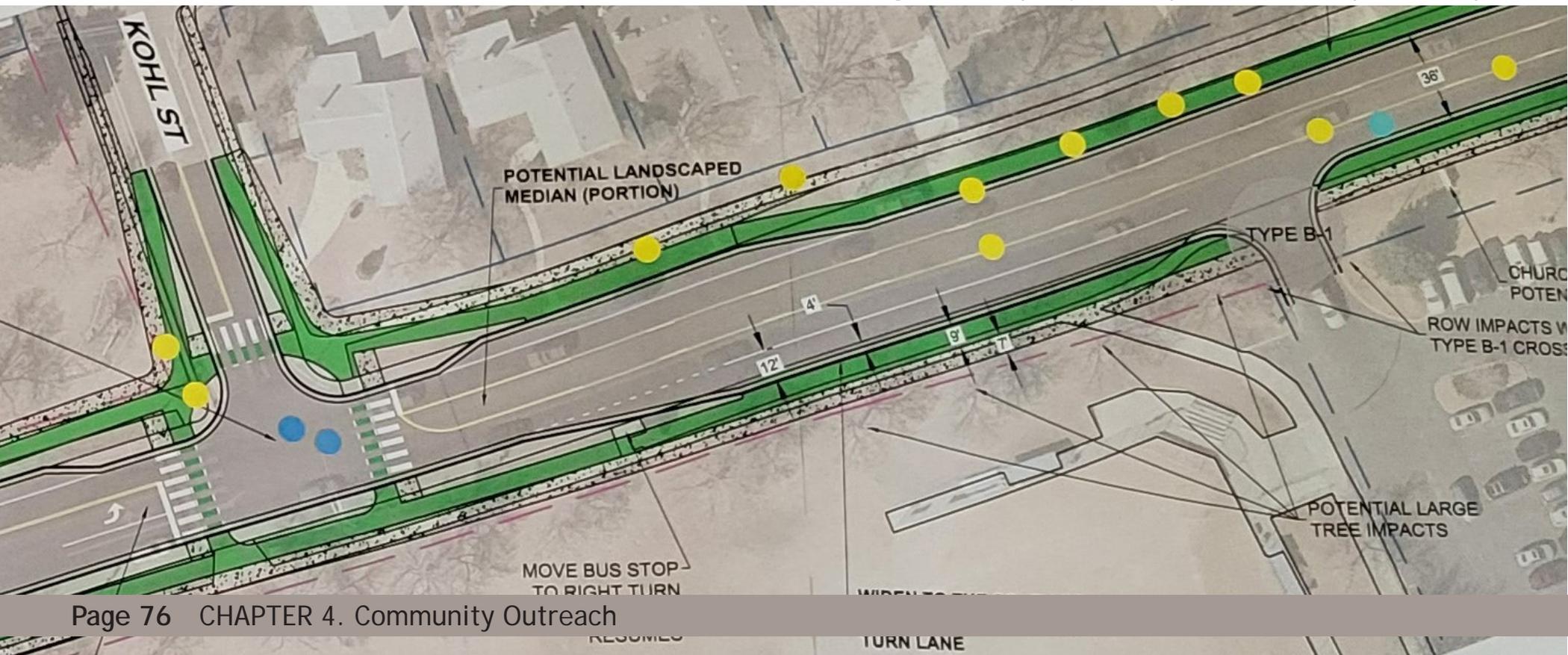
Public Engagement Phase 3 included gathering public feedback on Draft Concept Diagrams (birds-eye-view diagrams) of alternative designs, and the proposed concept. The public were engaged in a variety of ways, including:

- **Interactive Broomfield Voice Public Engagement Map and Responses** produced location-specific public comments based on the Future and Interim Concept Designs.

- Four in-person Public Events

1. Pop-Up at Broomfield Library, 9/10/22
2. Pop-Up at Paul Derda Recreation Center, 9/15/22
3. Broomfield Days 2022, 9/17/22
4. Oktoberfest Senior Lunch, 9/23/22

Figure 38: Sample of Public Input on Phase 3 Proposed Concept



Phase 3 Public Input Significance

Interactive Broomfield Voice Public Engagement Maps:

DRAFT Interim Concept Plans:

- 4,030 views
- 59 comments and responses submitted

DRAFT Future Concept Plans

- 4,233 views
- 171 comments and responses submitted

In-Person Events*:

**The number of comments and individuals engaged at each In-Person Event is an approximation, as comments were collected in a busy environment where individuals shared a varying amount of ideas while speaking with Project Team members.*

1. Pop-Up at Broomfield Library, 9/10/22, 11:30 AM - 2:30 PM
Approximately 50 people engaged
2. Pop-Up at Paul Derda Rec Center, 9/15/22, 4:00 - 7:30 PM
Approximately 30 people engaged
3. Broomfield Days 2022, 9/17/22, 10:00 AM - 3:30 PM
Approximately 300 people engaged
4. Oktoberfest Senior Lunch, 9/23/22, 11:00 AM - 1:30 PM
Approximately 30 people engaged

The key issues from these online input and these conversations were captured, as follows:

- The public demonstrated they were very interested in this project, with the large majority of comments in support of the project.
- The largest number of comments and concern was in the Laurel St - Main St section.
- An interest in the speed, crossing, and safety benefits of roundabouts surfaced in discussions about intersection safety.
- Residents raised concerns regarding the possibility of losing parking near their property.



Phase 3 Total Comments

Public Engagement All Phases Cumulative Significance

Outreach Advertising for all 3 Phases of Public Engagement:

- Project information and upcoming events posted on the Broomfield Voice website throughout the project
- Ongoing forum topics and questions on Broomfield Voice
- Ongoing targeted social media posts, including Facebook, Instagram, Twitter, LinkedIn, & NextDoor
- 2 rounds of 3679 postcards mailed, for Phase 2 and Phase 3 (English & Spanish)
- Phase-specific emails to key public stakeholders.
- Information included in 21 newsletters
- 9 public events (3 virtual, 6 in-person)
- 2 online interactive map projects, 1 focused on existing conditions and 1 focused on concept plans
- 6 Design Alternative surveys



Total Input:

- Approximately 1,800 total comments

Total Comments

Significance:

Throughout all three phases of the Public Engagement, reoccurring themes have emerged:

- The public is interested, engaged, and invested in the Midway corridor, and travel the area for a variety of activities and purposes.
- People consistently express interest in how bikeways can serve the Midway Corridor, with strong preference to off-street protected bicycle lanes or multi-use paths.
- Concerns for safety of people walking and on bicycles is a major theme.
- Crossing the road, especially near schools and parks, raises legitimate concerns for pedestrian safety.
- Intersection safety is a major concern.
- Some residents are concerned about the possibility of losing parking near their property.
- Speeding is a major concern, especially on the eastern portions of the corridor.
- Long queues and traffic congestion is a concern.
- The options presented in this project have been met with a majority of positive feedback.



CROSS SECTION NOTE:
Proposed cross sections shown are base cross sections for each roadway segment. Cross section will vary depending on presence of trees, road for turn lanes, and parking demand (where present). Bike lane is at elevation of sidewalk.

CROSS SECTION B

CROSS SECTION B - Existing and Proposed

Protected Bike Lane/Multi-Use Path Concept - Central





CHAPTER 5. ALTERNATIVES DEVELOPMENT

The project team utilized the following process to review possible alternatives and arrive at the most effective recommended design option.

1. Develop Cross Section Alternatives
2. Public Preference Survey for Each Alternative
3. Compare to Design Criteria
4. Technical Committee Evaluation
5. Evaluation of All Feedback and Data to Select Preferred Alternative

The following pages describe these steps in more detail.

1. Develop Cross Section Alternatives

For the purposes of Cross Section Alternatives, the 5-mile corridor was divided into five segments, based on the similar existing roadway conditions and adjacent land use.

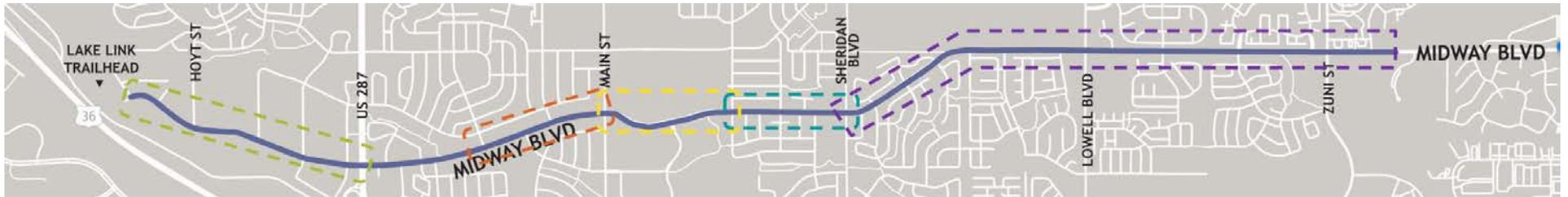


Figure 39: Corridor Segment Map

Starting from the west end of the project limits, the segments are:

1. (WEST) Lake Link Trail to US Highway 287
2. (WEST CENTRAL) Laurel Street to Main Street
3. (CENTRAL) Main Street to Ash Street
4. (EAST CENTRAL) Ash Street to Sheridan Blvd
5. (EAST) Sheridan Blvd to Zuni Street

Note: The US 287 to Laurel St segment varies significantly throughout, therefore this was addressed as Draft Concept Diagrams (birds-eye-view diagrams) in Phase 3 (Concept) Engagement, instead of cross-sections.

For each segment, three alternative designs were developed, addressing the public's greatest concerns.

Option 1 reflected the Interim Concepts, which offer a lower-cost shorter-term option that could be implemented sooner.

Options 2 & 3 reflected Future Concepts, which offer more ideal designs, knowing they may take longer, and be a higher cost to implement.

Automated vehicles were discussed; however, it is not a focus of this study.

Cross Section Alternatives: (WEST) Lake Link Trail to US Highway 287

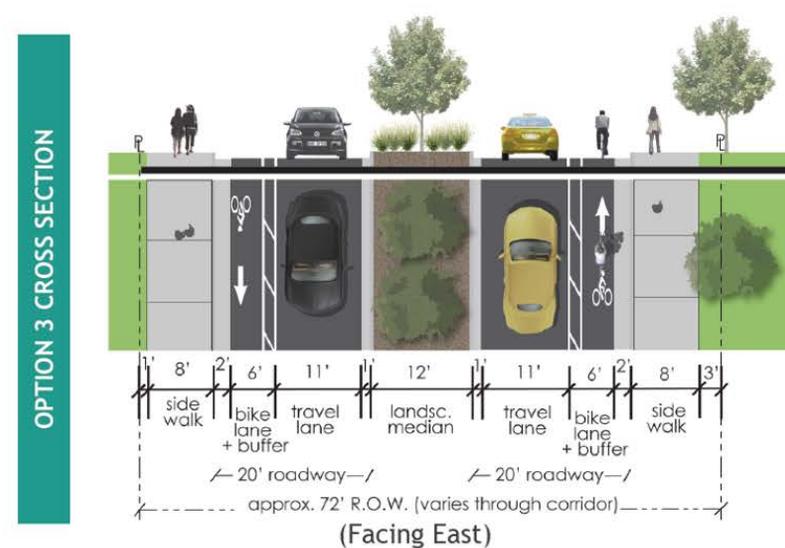
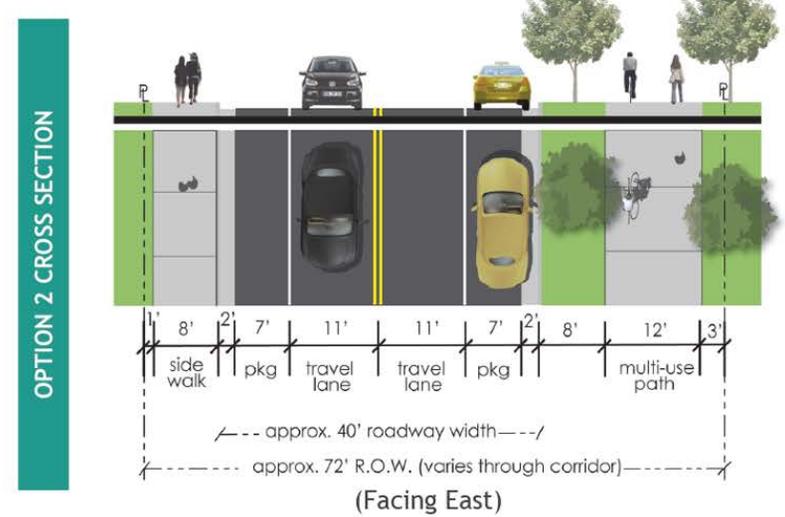
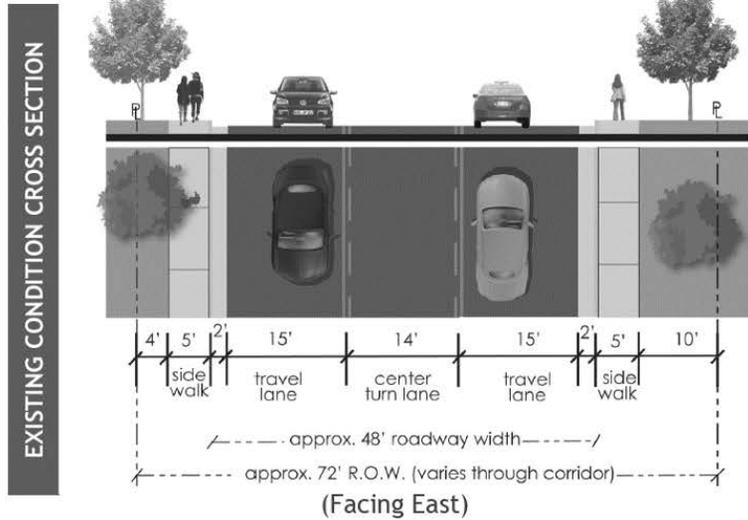


Figure 40: Cross Section Alternatives: Lake Link Trail to US Highway 287

Cross Section Alternatives: (WEST CENTRAL) Laurel St to Main St

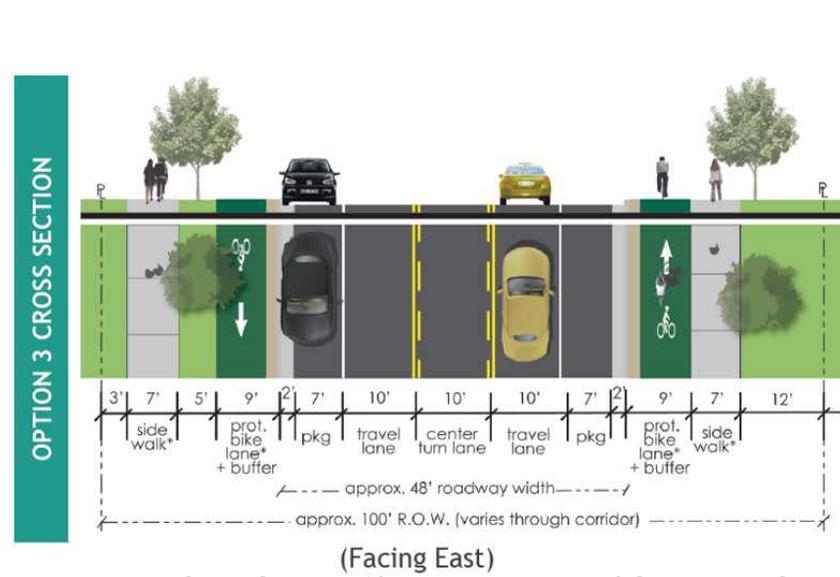
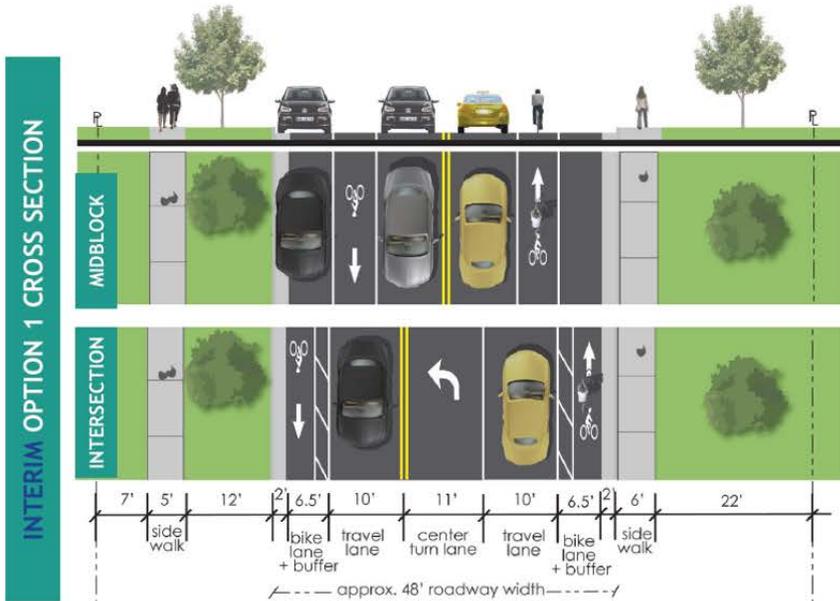
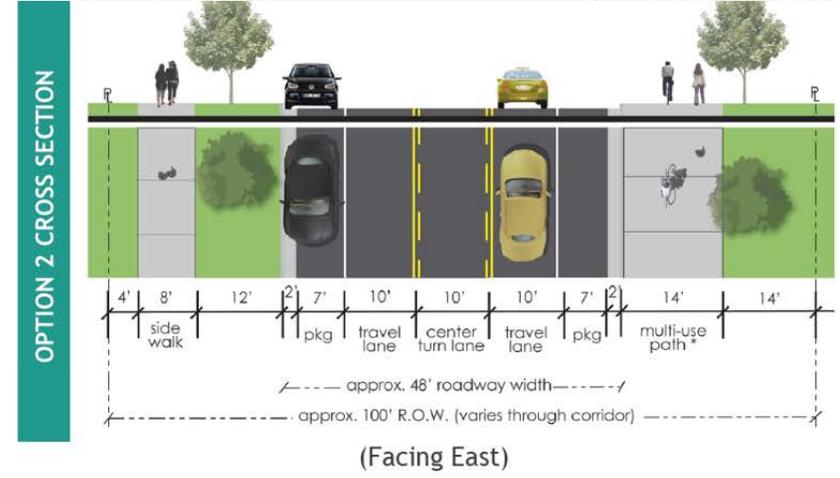
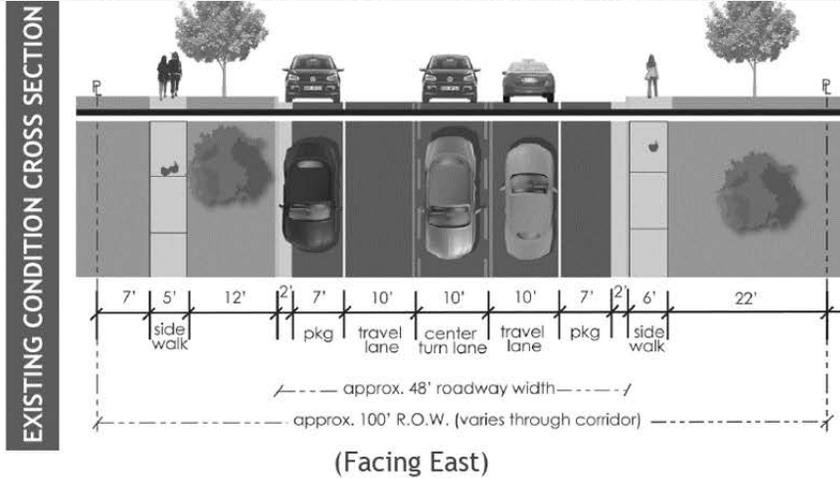
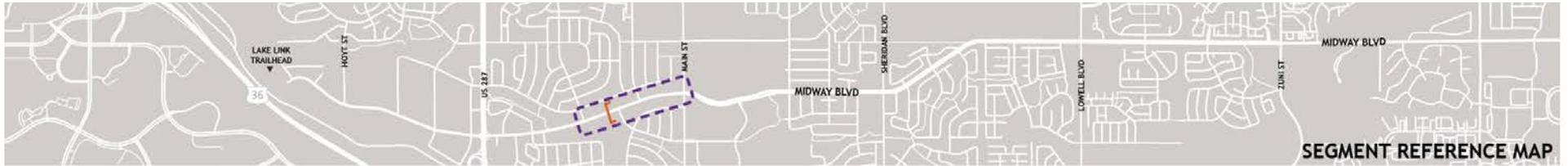
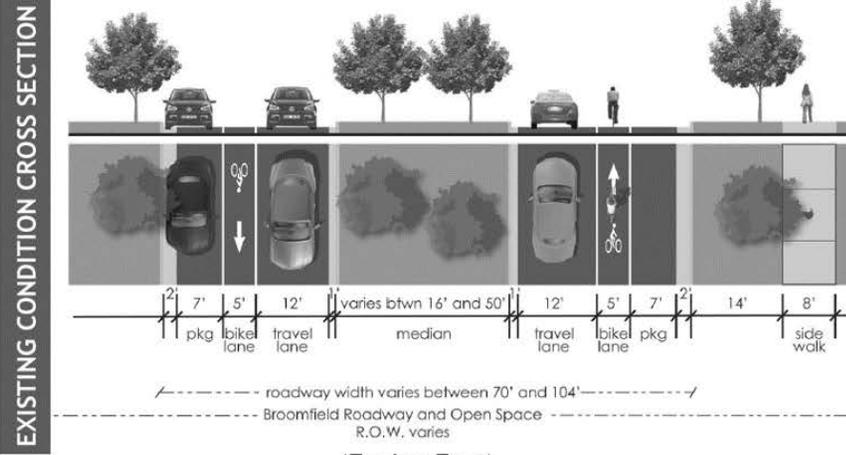


Figure 41: Cross Section Alternatives: Laurel St to Main St

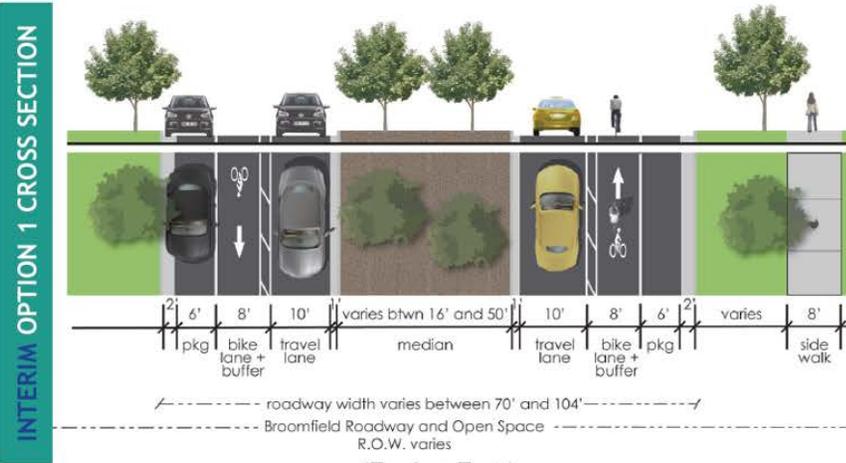
Cross Section Alternatives: (CENTRAL) Main St to Ash St



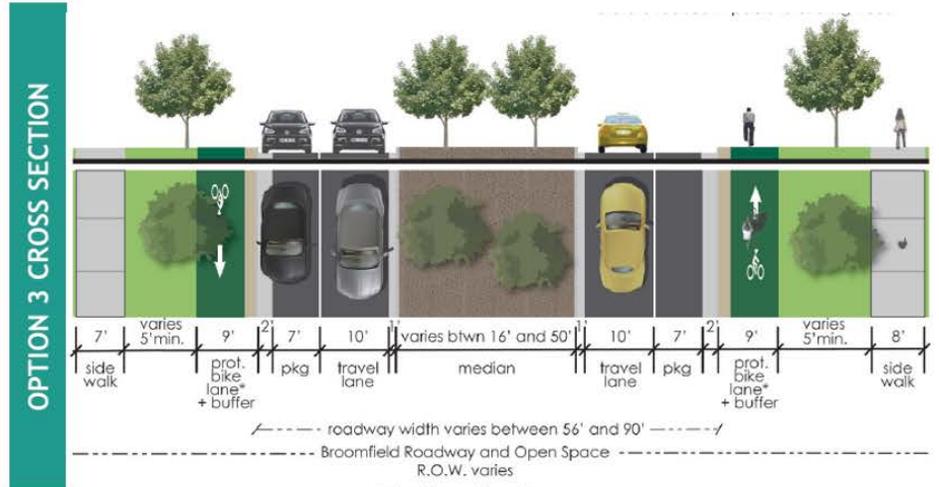
(Facing East)



(Facing East)



(Facing East)



(Facing East)

Figure 42: Cross Section Alternatives: Main St to Ash St

Cross Section Alternatives: (EAST CENTRAL) Ash St to Sheridan Blvd

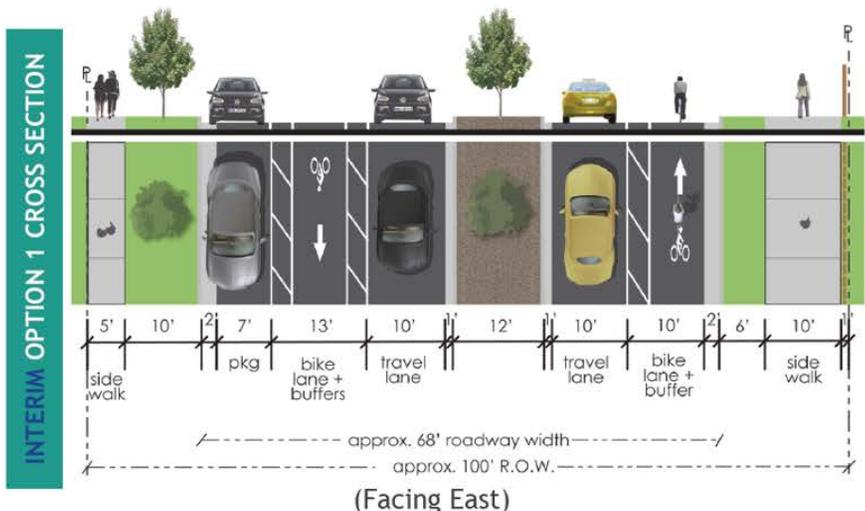
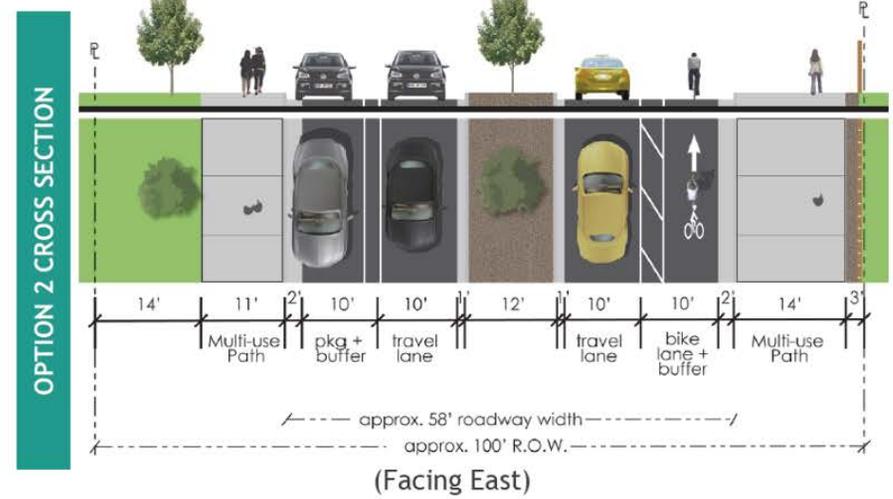
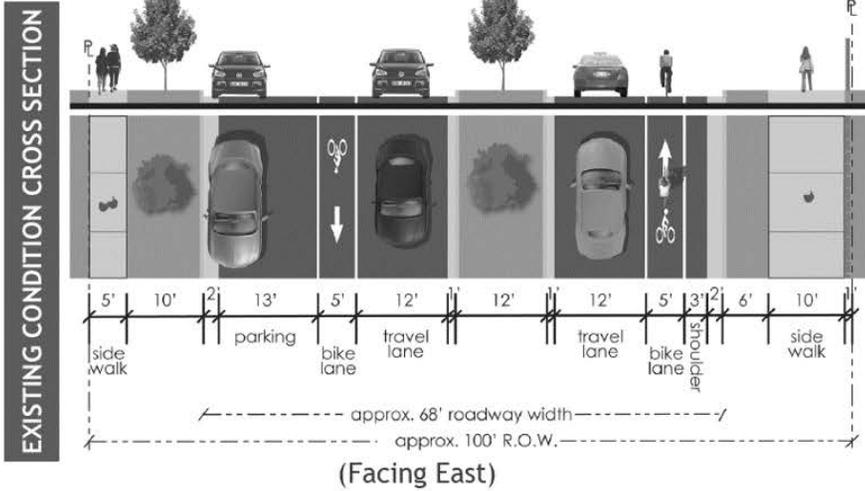


Figure 43: Cross Section Alternatives: Ash St to Sheridan Blvd

Cross Section Alternatives: (EAST) Sheridan Blvd to Zuni St

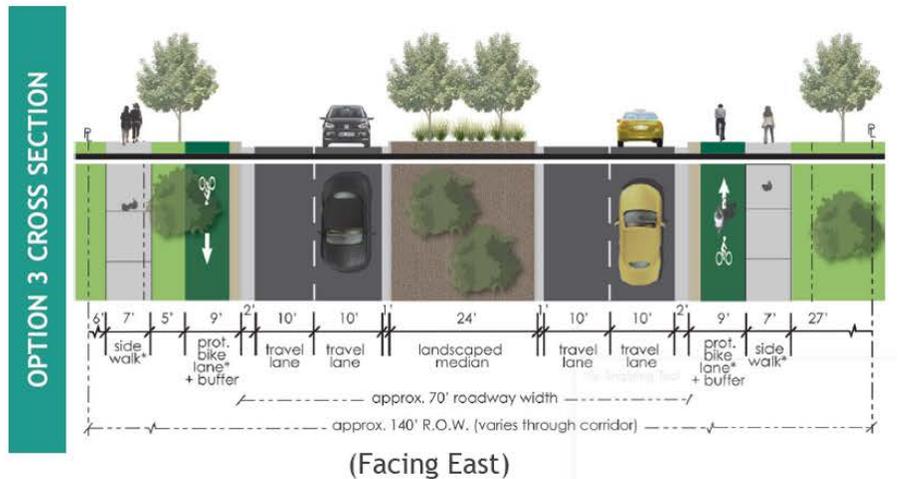
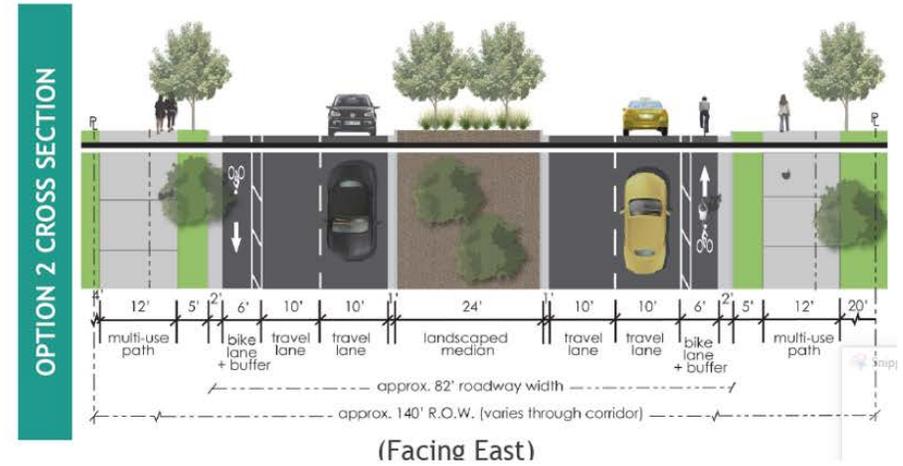
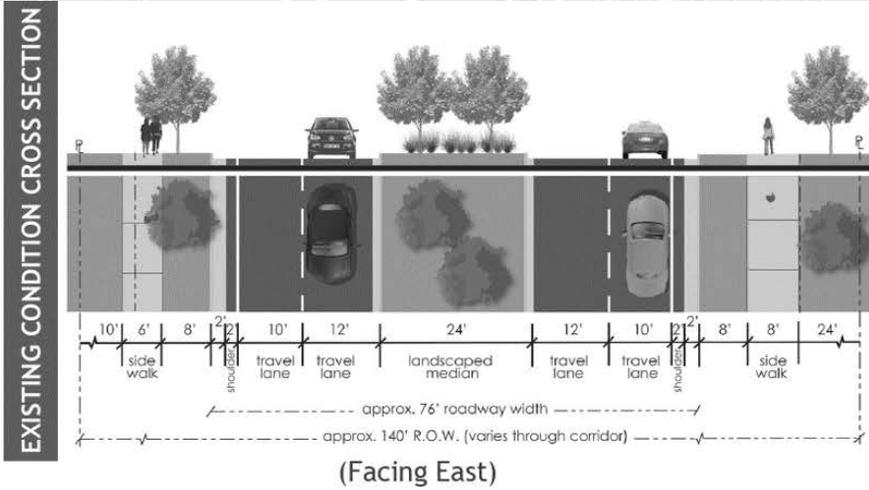


Figure 44: Cross Section Alternatives: Sheridan Blvd to Zuni St

2. Compare to Design Criteria

The project team documented each alternative's Key Design Features in 5 different categories:

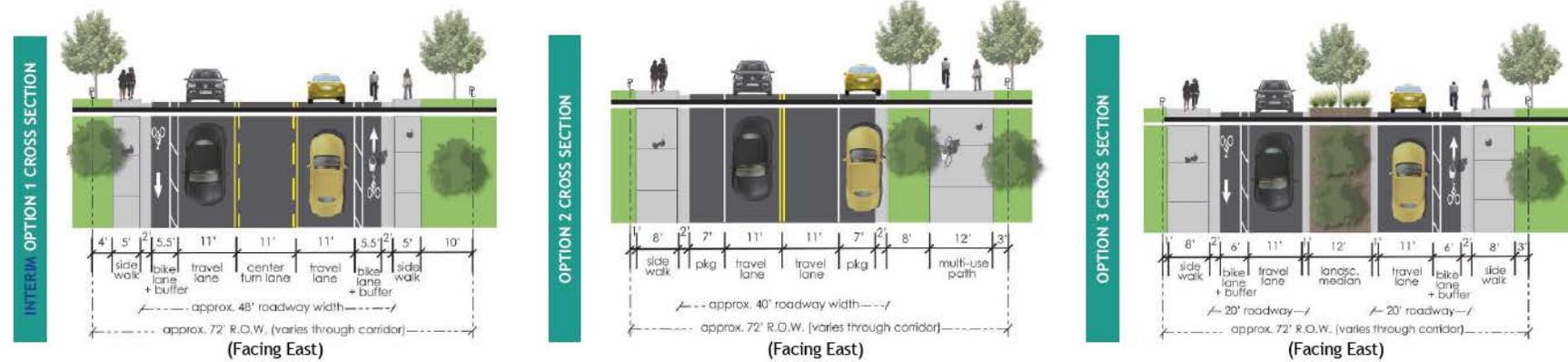
KEY DESIGN FEATURES	
1.	 WALKING
2.	 CYCLING
3.	 TRANSIT
4.	 DRIVING
5.	 LANDSCAPING

Figure 45: Key Design Features Legend

This process helped the project team compare each cross section to Broomfield's current and in-development standards. In addition to review of the alternatives in comparison with the standards, Broomfield staff (including public works) discussed and considered potential additional maintenance needs and costs associated with each alternative.



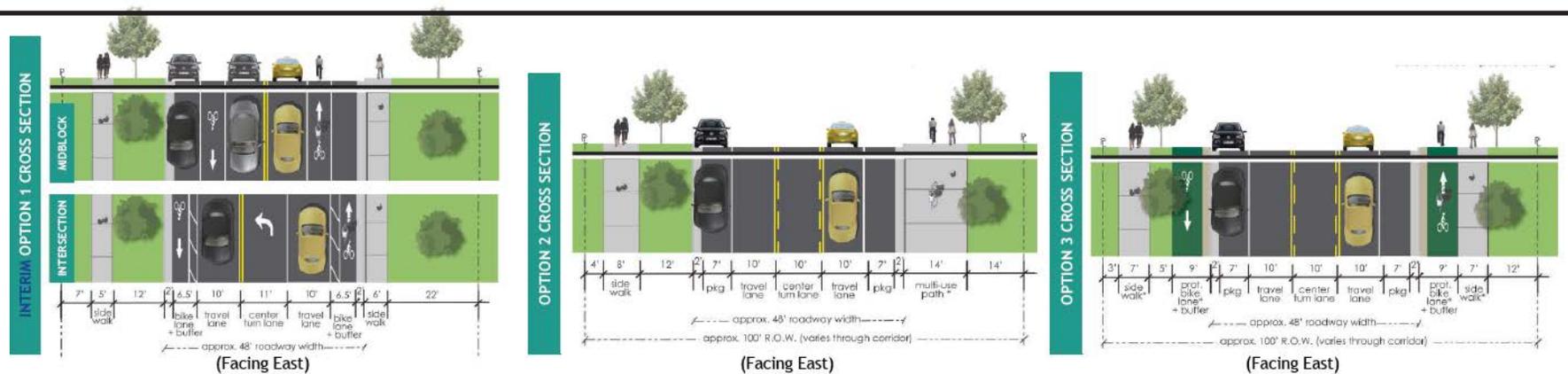
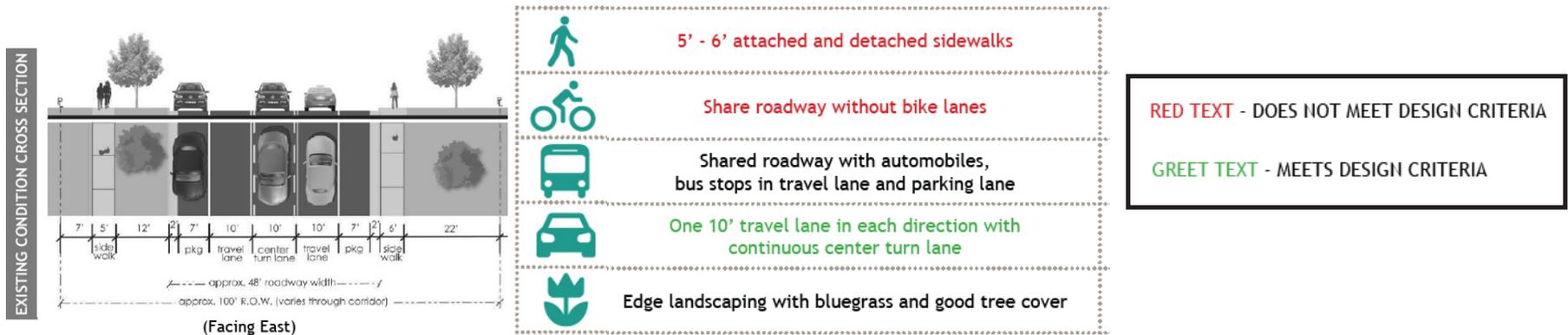
Key Design Features: (WEST) Lake Link Trail to US Highway 287



	Attached 5' sidewalks on both sides	8' attached sidewalk and 12' detached multi-use path	8' attached sidewalks on both sides
	5.5' (including buffer) buffered bike lane	12' multi-use path on one side	6' (including buffer) buffered bike lane
	Shared roadway with automobiles, bus stops in lane and bike lane	Shared roadway with automobiles, bus stops in lane	Shared roadway with automobiles, bus stops in lane and bike lane
	11' travel lanes in each direction with continuous center turn lane	11' travel lanes in each direction, 7' parking. Turn lanes at intersections in lieu of parking.	11' travel lanes in each direction with turn lanes at intersections
	Edge landscaping with bluegrass and limited tree cover	Edge landscaping with bluegrass and limited tree cover. Widening walk and path may eliminate some existing trees.	Edge landscaping with bluegrass and median with drought-tolerant landscaping.

Figure 46: Alternatives Key Design Features Lake Link Trail to US Highway 287

Key Design Features: (WEST CENTRAL) Laurel St to Main St



	5' - 6' attached and detached sidewalks	8' detached sidewalk and 14' attached or detached (to avoid most tree removal) multi-use path	7' detached sidewalks sometimes separate from bike lane (to avoid most tree removal)
	6' - 6.5' bike lane on each side	14' multi-use path on one side	9' (including buffer) protected bike lane on each side, sometimes separate from sidewalk (to avoid most tree removal)
	Shared roadway with automobiles, bus stops in travel lane and bike lane	Shared roadway with automobiles, bus stops in travel lane and parking lane	Shared roadway with automobiles, bus stops in travel lane and parking lane
	One 10' travel lane in each direction. Turn lanes at intersections in lieu of parking.	One 10' travel lane in each direction with continuous center turn lane	One 10' travel lane in each direction with continuous center turn lane
	Edge landscaping with bluegrass and good tree cover	Edge landscaping with bluegrass and good tree cover. Widening walk and path may eliminate some existing trees.	Edge landscaping with bluegrass and good tree cover. Widening walk and PBL may eliminate some existing trees

Figure 47: Alternatives Key Design Features Laurel St to Main St

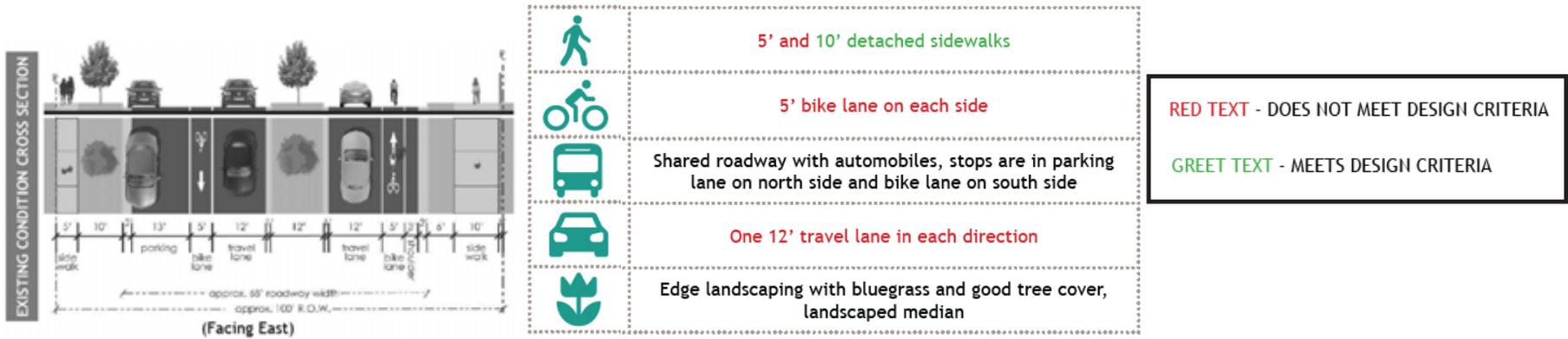
Key Design Features: (CENTRAL) Main St to Ash St



	8' detached walk on south side	12' detached multi-use path on each side	7'-8' detached sidewalks, sometimes separate from bike lane to avoid most tree removal
	8' (including buffer) buffered bike lane on each side	12' multi-use path on each side, 8' (including buffer) buffered bike lane on each side	9' (including buffer) protected bike lane on each side, sometimes separate from sidewalk to avoid most tree removal
	Shared roadway with automobiles, bus stops in parking and bike lane	Shared roadway with automobiles, bus stops in parking and bike lane	Shared roadway with automobiles, but stops in travel lane and parking lane
	One 10' travel lane in each direction with turn lanes at some intersections	One 10' travel lane in each direction with turn lanes at some intersections	One 10' travel lane in each direction with turn lanes at some intersections
	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping

Figure 48: Alternatives Key Design Features Main St to Ash St

Key Design Features: (EAST CENTRAL) Ash St to Sheridan Blvd



	5' and 10' detached sidewalks	11'-14' detached multi-use path on each side	5' detached sidewalk on north side, 14' multi-use path on south side
	10'-13' (including buffers) buffered bike lane on each side	11' multi-use path on north side, 10' (including buffer) buffered bike lane and 14' multi-use path on south side	9' (including buffer) protected bike lane on north side, 10' (including buffer) buffered bike lane and 14' multi-use path on south side
	Shared roadway with automobiles, stops are in parking and bike lane on north side and bike lane on south side	Shared roadway with automobiles, stops are in parking lane on north side and bike lane on south side	Shared roadway with automobiles, stops are in parking lane on north side and bike lane on south side
	One 10' travel lane in each direction	One 10' travel lane in each direction	One 10' travel lane in each direction
	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping

Figure 49: Alternatives Key Design Features Ash St to Sheridan Blvd

Key Design Features: (EAST) Sheridan Blvd to Zuni St



	6' and 8' detached sidewalks	12' detached multi-use path on each side	7' detached sidewalks, sometimes separate from bike lane (to avoid some tree removal)
	3' shoulder on each side	6' (including buffer) buffered bike lane and 12' detached multi-use path on each side	9' (including buffer) protected bike lane on each side, sometimes separate from sidewalk (to avoid some tree removal)
	Shared roadway with automobiles, stops are in shoulder and travel lane	Shared roadway with automobiles, stops are in bike lane and travel lane	Shared roadway with automobiles, stops are in travel lane
	Two 10' travel lanes in each direction	Two 10' travel lanes in each direction	Two 10' travel lanes in each direction
	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping. Widening path may eliminate some existing trees.	Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping. PBL and sidewalk may eliminate some existing trees.

Figure 50: Alternatives Key Design Features Sheridan Blvd to Zuni St

3. Technical Committee Evaluation

A Technical Committee, comprised of members from various departments of City and County of Broomfield and project team members, evaluated each of the Cross Section Alternatives and Key Design Features, comparing them to the project goals.

Each alternative option was assessed in regards to meeting the goal, partially meeting the goal, or not meeting the goal. Relative financial impact was also considered.

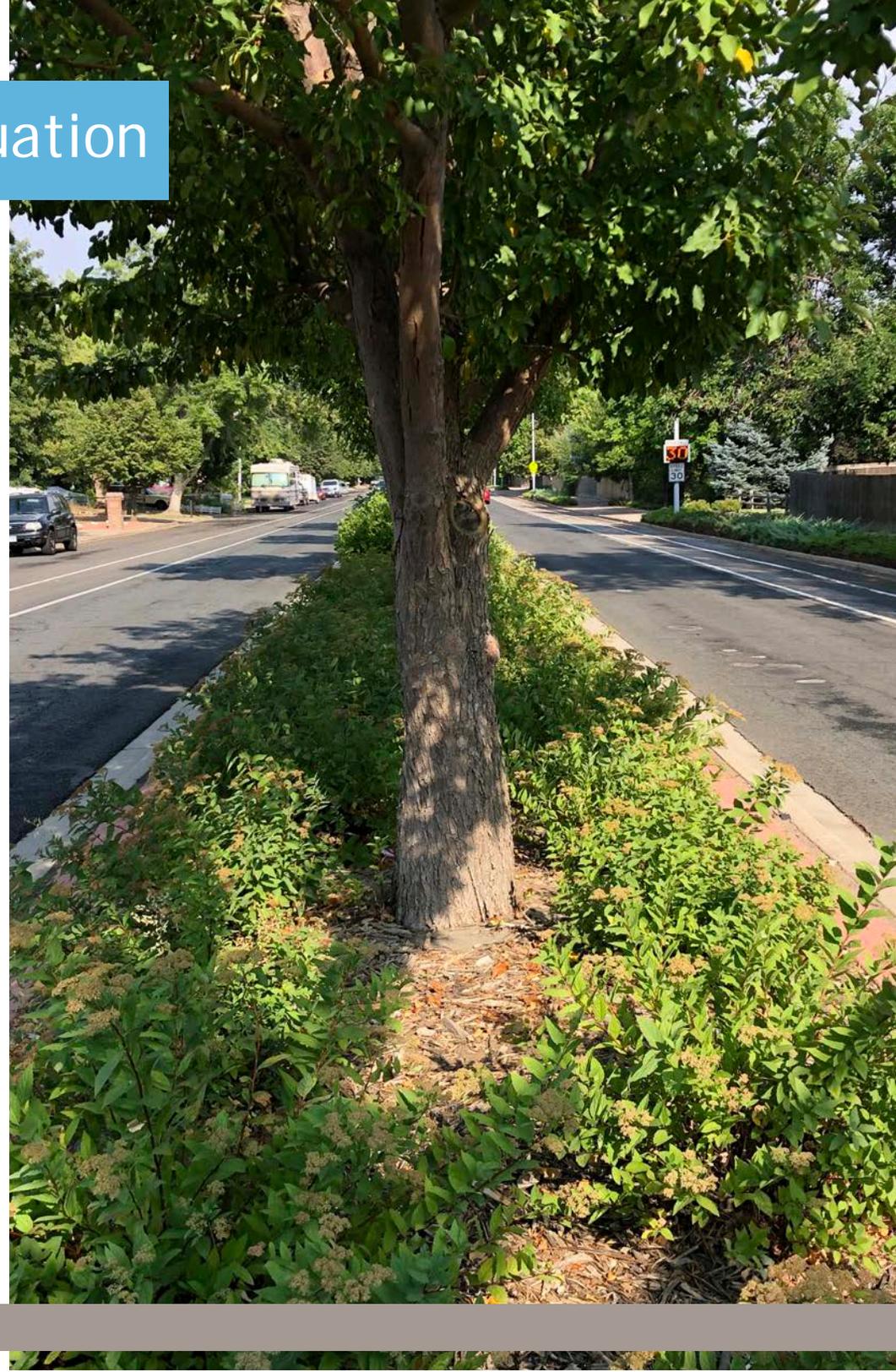
GOAL #1 Build low stress streets that accommodate more high-comfort walking and bicycling for all ages and abilities.

GOAL #2 Context sensitive designs to achieve greater compliance with posted speed limits.

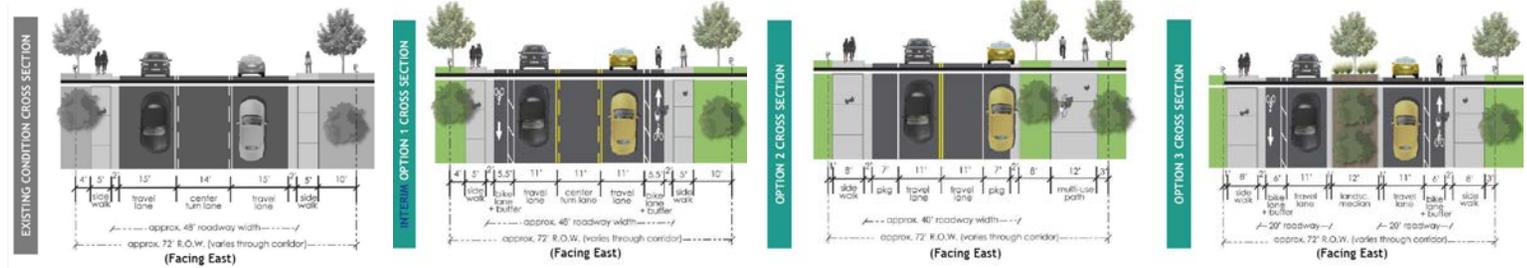
GOAL #3 Reduce the severity and total number of crashes for all modes of travel.

GOAL #4 Design streets that integrate into the adjacent neighborhood context.

GOAL #5 Preserve and enhance tree canopy and mature or establish landscaping for future generations.



Technical Committee Evaluation: (WEST) Lake Link Trail to US Highway 287



	EXISTING CONDITIONS	INTERIM OPTION 1	OPTION 2	OPTION 3
EVALUATION OF PROJECT GOALS				
Build low stress streets that accommodate high-comfort walking and bicycling for all ages and abilities	○	◐	●	●
Context sensitive designs to achieve greater compliance with posted speed limits	○	◐	◐	●
Reduce the severity and total number of crashes for all modes of travel	○	◐	◐	●
Design streets that integrate into the adjacent neighborhood context	◐	◐	◐	◐
Preserve and enhance tree canopy, mature or established landscaping for future generations	●	●	◐	◐
Relative planning and construction Cost	—	\$	\$\$	\$\$\$
Relative maintenance Costs	\$	\$	\$\$	\$\$\$

MEETS GOAL

 PARTIALLY MEETS GOAL
 DOES NOT MEET GOAL

LEAST EXPENSIVE \$ — \$\$\$ MOST EXPENSIVE

Figure 51: Technical Evaluation: Lake Link Trail to US Highway 287

Technical Committee Evaluation: (WEST CENTRAL) Laurel St to Main St

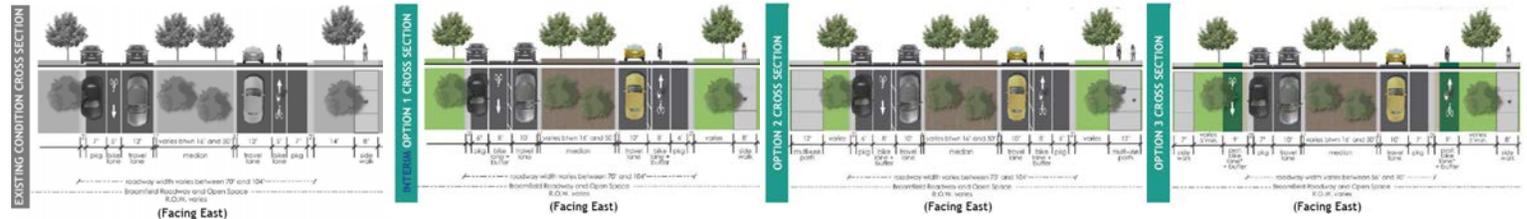


EVALUATION OF PROJECT GOALS	EXISTING CONDITIONS	INTERIM OPTION 1	OPTION 2	OPTION 3
Build low stress streets that accommodate high-comfort walking and bicycling for all ages and abilities	○	◐	◐	●
Context sensitive designs to achieve greater compliance with posted speed limits	◐	◐	◐	◐
Reduce the severity and total number of crashes for all modes of travel	○	◐	◐	●
Design streets that integrate into the adjacent neighborhood context	◐	◐	●	●
Preserve and enhance tree canopy, mature or established landscaping for future generations	●	●	◐	◐
Relative planning and construction Cost	—	\$	\$\$	\$\$\$
Relative maintenance Costs	\$	\$	\$\$	\$\$\$

● MEETS GOAL
 ◐ PARTIALLY MEETS GOAL
 ○ DOES NOT MEET GOAL
 LEAST EXPENSIVE
 \$ — \$\$\$
 MOST EXPENSIVE

Figure 52: Technical Evaluation: Laurel St to Main St

Technical Committee Evaluation: (CENTRAL) Main St to Ash St

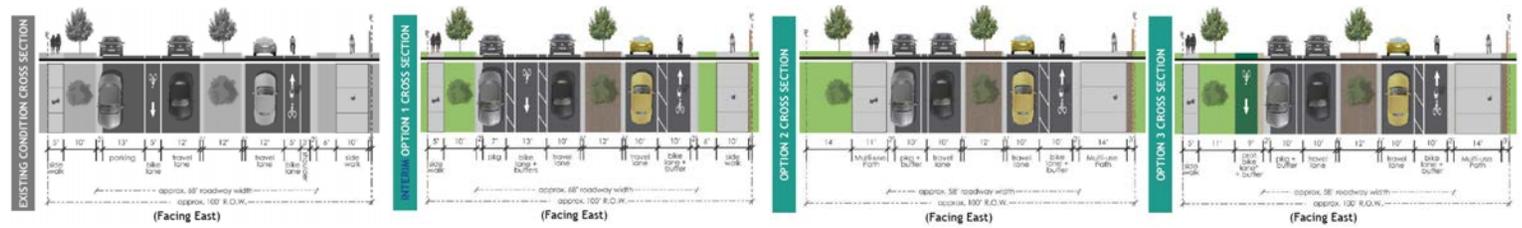


EVALUATION OF PROJECT GOALS	EXISTING CONDITIONS	INTERIM OPTION 1	OPTION 2	OPTION 3
Build low stress streets that accommodate high-comfort walking and bicycling for all ages and abilities	◐	◐	●	●
Context sensitive designs to achieve greater compliance with posted speed limits	○	◐	◐	●
Reduce the severity and total number of crashes for all modes of travel	○	◐	●	●
Design streets that integrate into the adjacent neighborhood context	◐	◐	●	●
Preserve and enhance tree canopy, mature or established landscaping for future generations	●	●	◐	◐
Relative planning and construction Cost	—	\$	\$\$	\$\$\$
Relative maintenance Costs	\$	\$	\$\$	\$\$\$

● MEETS GOAL
 ◐ PARTIALLY MEETS GOAL
 ○ DOES NOT MEET GOAL
 LEAST EXPENSIVE \$ — \$\$\$ MOST EXPENSIVE

Figure 53: Technical Evaluation: Main St to Ash St

Technical Committee Evaluation: (EAST CENTRAL) Ash St to Sheridan Blvd

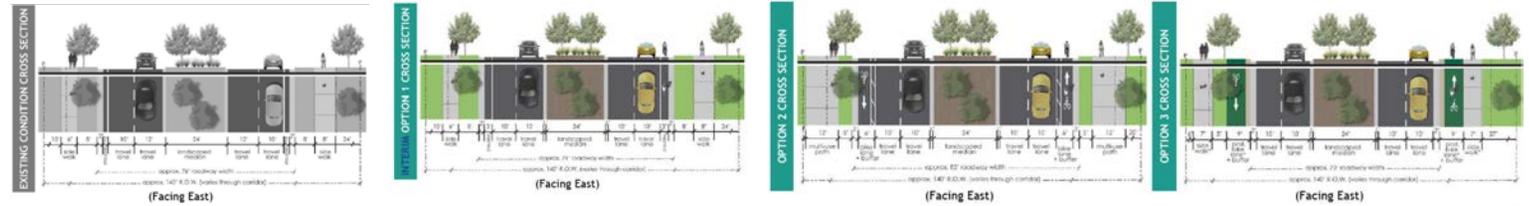


EVALUATION OF PROJECT GOALS	EXISTING CONDITIONS	INTERIM OPTION 1	OPTION 2	OPTION 3
Build low stress streets that accommodate high-comfort walking and bicycling for all ages and abilities	◐	◐	●	●
Context sensitive designs to achieve greater compliance with posted speed limits	○	◐	◐	◐
Reduce the severity and total number of crashes for all modes of travel	○	◐	●	●
Design streets that integrate into the adjacent neighborhood context	○	◐	●	●
Preserve and enhance tree canopy, mature or established landscaping for future generations	●	●	◐	◐
Relative planning and construction Cost	—	\$	\$\$	\$\$\$
Relative maintenance Costs	\$	\$	\$\$	\$\$\$

● MEETS GOAL
 ◐ PARTIALLY MEETS GOAL
 ○ DOES NOT MEET GOAL
 LEAST EXPENSIVE
 \$ — \$\$\$
 MOST EXPENSIVE

Figure 54: Technical Evaluation: Ash St to Sheridan Blvd

Technical Committee Evaluation: (WEST) Sheridan Blvd to Zuni St



	EXISTING CONDITIONS	INTERIM OPTION 1	OPTION 2	OPTION 3
EVALUATION OF PROJECT GOALS				
Build low stress streets that accommodate high-comfort walking and bicycling for all ages and abilities	○	○	◐	●
Context sensitive designs to achieve greater compliance with posted speed limits	○	◐	◐	●
Reduce the severity and total number of crashes for all modes of travel	○	○	◐	●
Design streets that integrate into the adjacent neighborhood context	○	○	●	●
Preserve and enhance tree canopy, mature or established landscaping for future generations	●	●	◐	◐
Relative planning and construction Cost	—	\$	\$\$\$	\$\$\$
Relative maintenance Costs	\$	\$	\$\$	\$\$\$

● MEETS GOAL
 ◐ PARTIALLY MEETS GOAL
 ○ DOES NOT MEET GOAL
 LEAST EXPENSIVE
 \$ — \$\$\$
 MOST EXPENSIVE

Figure 55: Technical Evaluation: Sheridan Blvd to Zuni St

4. Public Preferences of Each Alternative

As described in detail in the section above, **Phase 2 Design Alternatives Surveys** were presented to the public via the Broomfield Voice webpage in order to determine feedback on the proposed alternatives. The community responded to a series of short visual surveys, one of which applied to the whole corridor, and five of which applied to a specific section of the corridor. More than 700 total responses provided by the community assisted the project team in understanding the cross section concepts that are preferred in Broomfield.

PUBLIC OUTREACH KEY RESULTS SUMMARY

Approximately 90% of respondents think Midway needs minor to significant changes.

Top Concerns:

- Safety of people walking and on bicycles
- Intersection safety
- Crossing the road, whether at intersections or mid-block, especially near schools and parks
- Speeding
- Parking
- Long queues and traffic congestion

Interests:

- Strong preference for off-street protected bicycle lanes (PBLs) with Multi-Use Paths (MUPs).
- Interest in riding bicycles on the corridor, if safety improvements are completed.

Segment focus:

- US 287 - Laurel St
- Laurel St - Main St
- Sheridan Blvd - Lowell Blvd

Intersection focus:

- US 287
- Kohl St
- Willow Run Parkway

5. Evaluation of All Feedback to Select Preferred Alternative



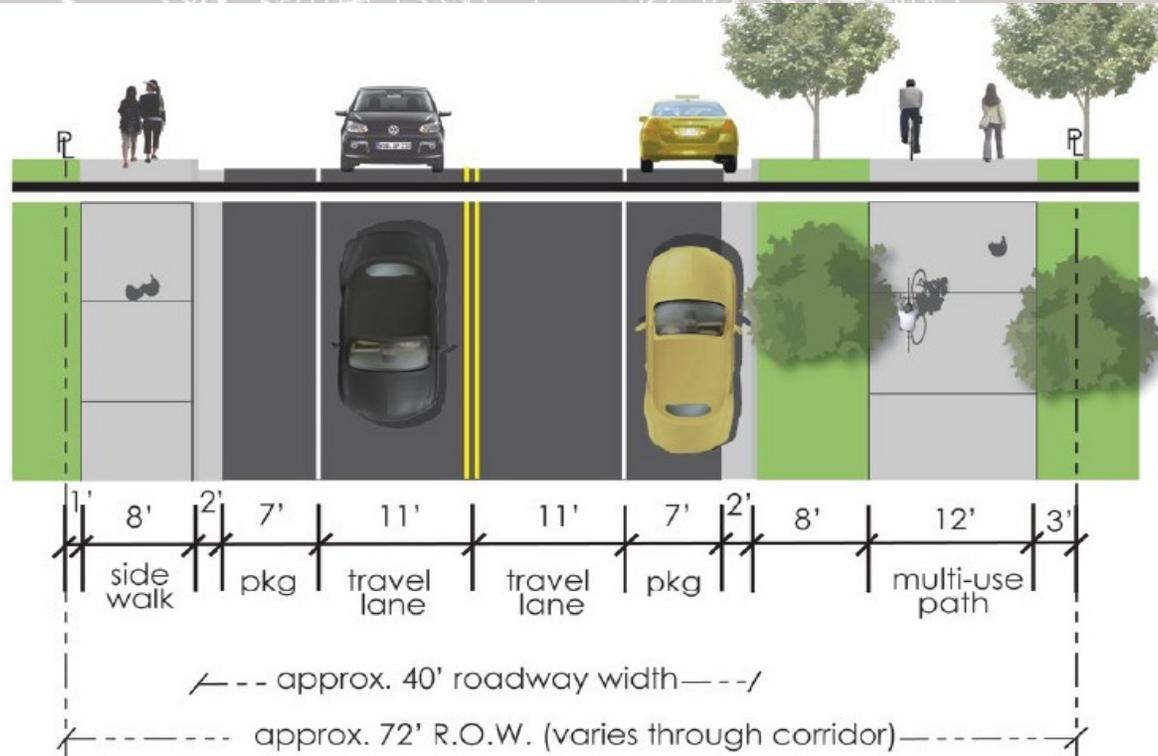
To select a Preferred Alternative, all feedback was carefully evaluated. Public input, Key Design Features, and the Technical Committee Evaluation were all considered.

In all cases, the Technical Committee Evaluation and the public opinion aligned. The following pages detail the selection for each segment.

Notes:

- In the segment from Lake Link Trailhead to US 287, Option 3 was not selected because a raised median is not the right fit and vision for this corridor at this time.
- Due to the inconsistent cross section between US 287 and Laurel St, this segment was not included in the cross section alternative development. Concept development for this segment occurred during draft concept design.
- In the segment from Ash St to Sheridan Blvd, public input was closely split between Option 2 and Option 3. Option 3 was selected to provide more consistency in corridor design by providing an off-street bicycle facility option.

Preferred Alternative: (WEST) Lake Link Trail to US Highway 287

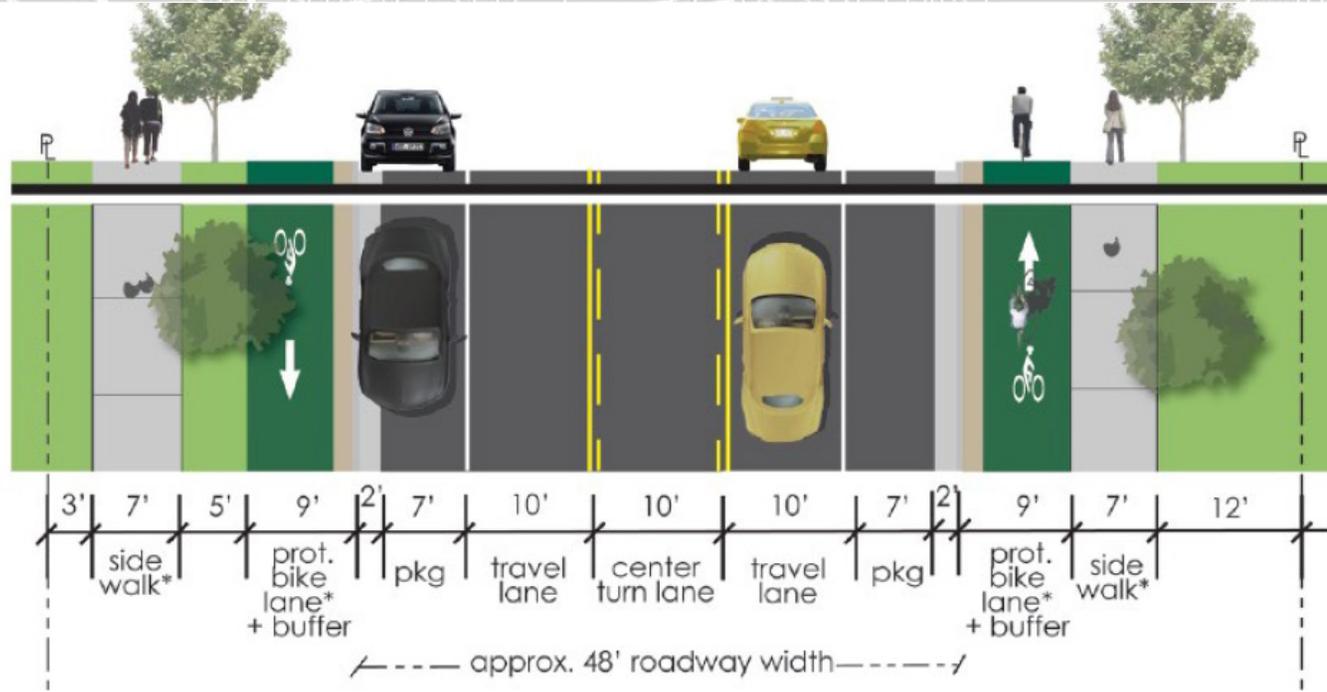
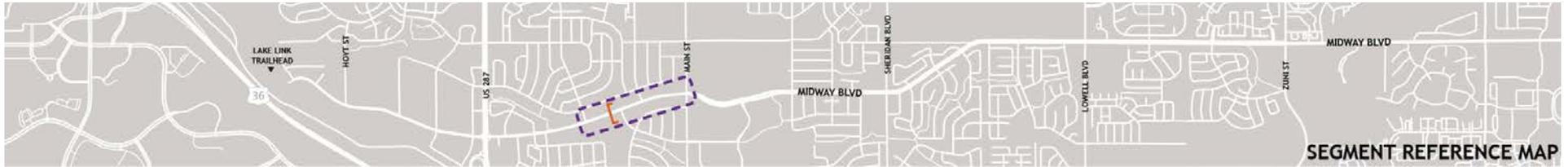


- 8' attached sidewalk on north side. Sidewalk sometimes separate from bicycle lane (to reduce tree conflicts).
- 12' Multi-Use Path (MUP) on south side. MUP may vary to reduce tree conflicts.
- Shared roadway with automobiles, bus stops in travel lane.
- 11' travel lanes in each direction, 7' parking.
- Turn lanes at intersections in lieu of parking.
- Edge landscaping with bluegrass and limited tree cover.
- Widening walk and path may eliminate some existing trees.

Note: Option 3 was not selected because a raised median is not the right fit and vision for this corridor at this time.

Figure 56: Preferred Alternative: Lake Link Trail to US Highway 287

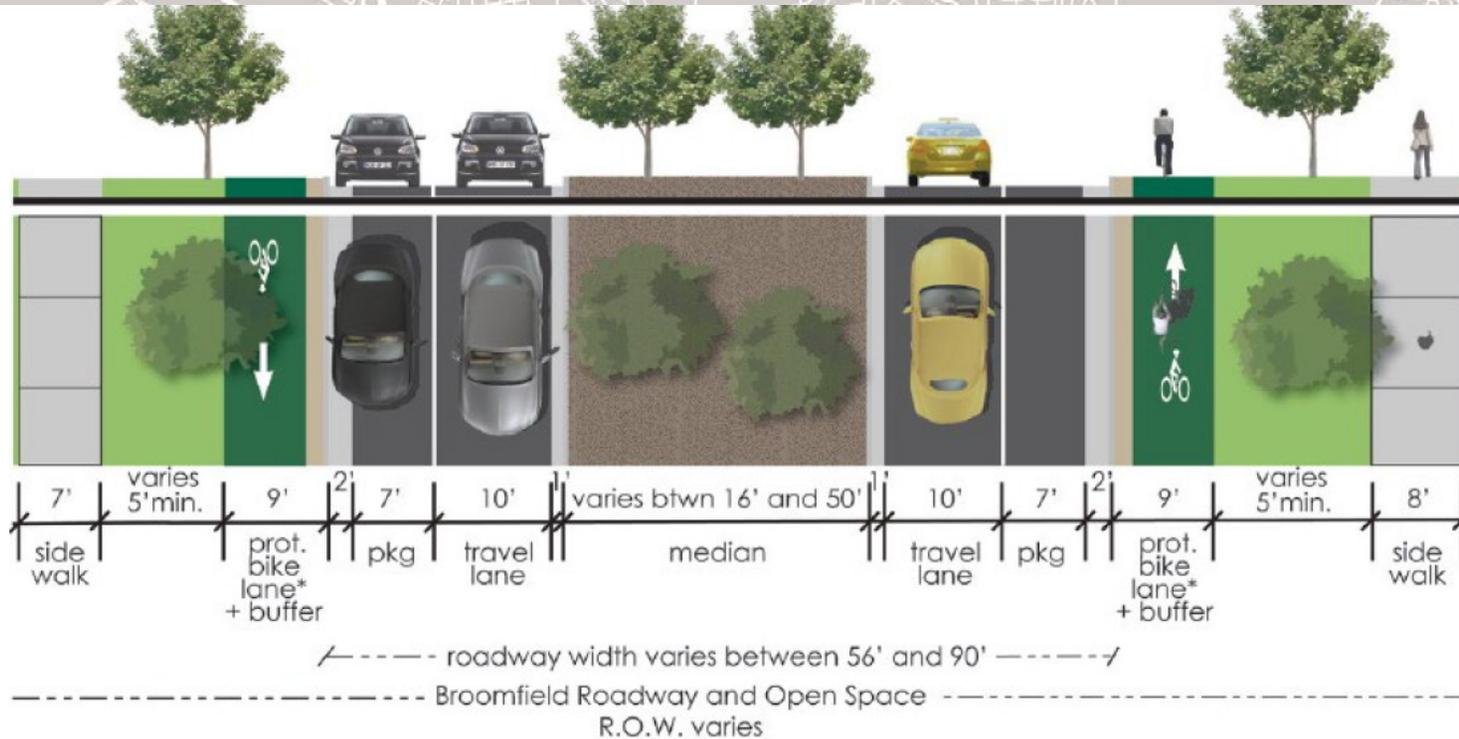
Preferred Alternative: (WEST CENTRAL) Laurel St to Main St



- 7' detached sidewalk sometimes separate from bicycle lane (to reduce tree conflicts).
- 9' (including buffer) protected bicycle lane on each side, sometimes separate from sidewalk (to reduce tree conflicts).
- Shared roadway with automobiles, bus stops in travel lane and parking lane.
- One 10' lane in each direction and continuous center turn lane.
- Edge landscaping with bluegrass and good tree cover.
- Widening sidewalk and protected bicycle lane may eliminate some existing trees.
- Received resident concerns about impacts to resident-maintained curb lawn and loss of parking. Additional outreach and study during design will be necessary to ensure design best addresses community needs.

Figure 57: Preferred Alternative: Laurel St to Main St

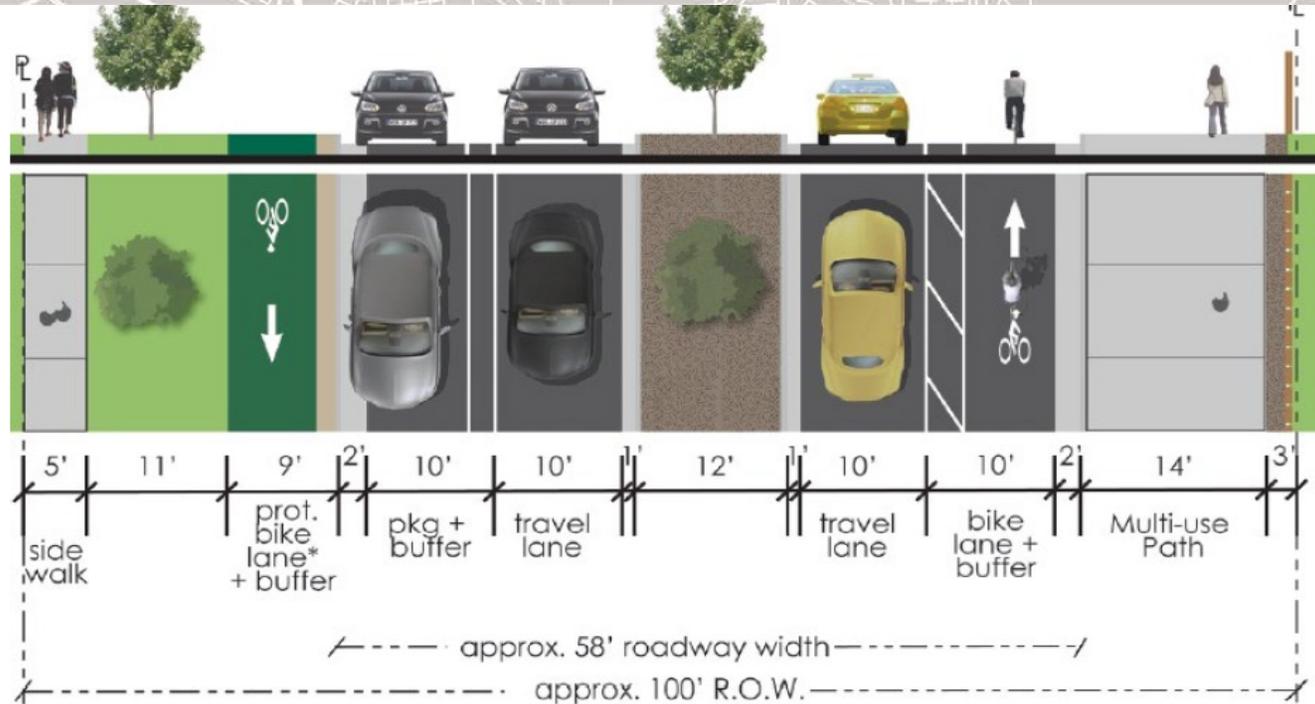
Preferred Alternative: (CENTRAL) Main St to Ash St



- 7' - 8' detached sidewalks, sometimes separate from bicycle lane (to avoid most tree removal).
- 9' (including buffer) protected bicycle lane on each side, sometimes separate from sidewalk (to avoid most tree removal).
- Shared roadway with automobiles, bus stops in travel lane and parking lane.
- One 10' travel lane in each direction with turn lanes at intersections.
- Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping.

Figure 58: Preferred Alternative: Main St to Ash St

Preferred Alternative: (EAST CENTRAL) Ash St to Sheridan Blvd



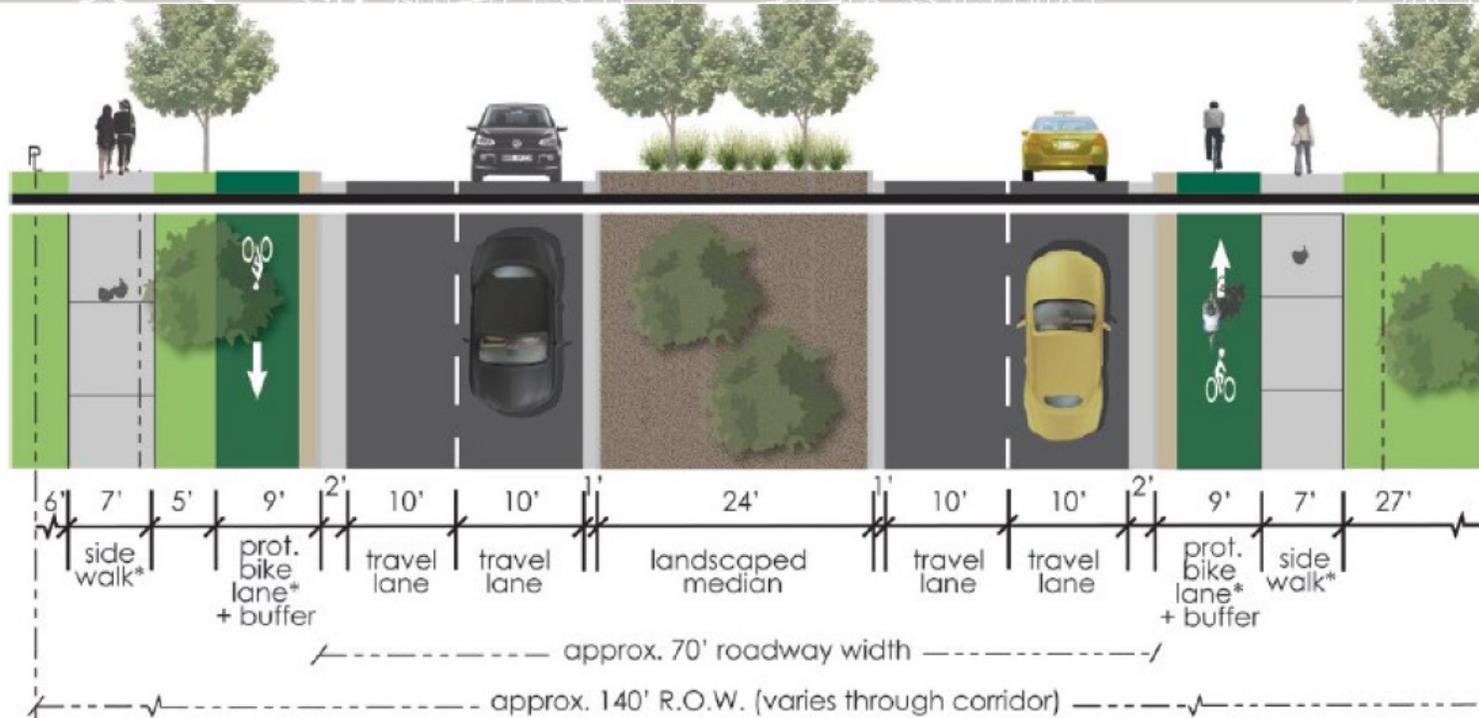
- 5' detached sidewalk on north side.
- 14' multi-use path on south side.
- 9' (including buffer) protected bicycle lane on north side.
- 10' (including buffer) protected bicycle lane on south side.
- Shared roadway with automobiles, bus stops are in parking lane on north side and bicycle lane on south side.
- One 10' travel lane in each direction.

- Edge landscaping with bluegrass and good tree cover, median with drought-tolerant landscaping.

Note: In the segment from Ash St to Sheridan Blvd, public input was closely split between Option 2 and Option 3. Option 3 was selected to provide more consistency in corridor design by providing an off-street bicycle facility option.

Figure 59: Preferred Alternative: Ash St to Sheridan Blvd

Preferred Alternative: (EAST) Sheridan Blvd to Zuni St



- 7' detached sidewalks, sometimes separate from bicycle lane (to avoid some tree removal).
- 9' (including buffer) protected bicycle lane on each side, sometimes separate from sidewalk (to avoid some tree removal).
- Shared roadway with automobiles, bus stops are in travel lane.
- Two 10' travel lanes in each direction.
- Edge landscaping with drought-tolerant landscaping.
- Protected bicycle lanes and sidewalk may eliminate some existing trees.

Figure 60: Preferred Alternative: Sheridan Blvd to Zuni St



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CHAPTER 6. CONCEPT DEVELOPMENT

In order to address the myriad challenges of this corridor, short-term and long-term recommendations were developed in the following areas:

- Low Stress Bicycle Facilities & Pedestrian Crossings
- Driveway and Intersection Crossing Treatments

The following reviews were developed for each alternative:

- Traffic Analysis
- Environmental Review
- Utility Review

In addition to technical reviews above, public comment and Broomfield staff input from outreach phases two and three were considered when developing and revising the concept plans.

These improvements are intended to encourage context- and speed limit-sensitive driving while maintaining reasonable motor vehicle efficiency at the intersections. These recommendations will also provide safe and comfortable pedestrian facilities along and across the Midway Blvd corridor. Finally, these recommendations have been evaluated to determine relative financial demands as well as maintenance feasibility by Broomfield staff.

Note: Concept plans are not engineering documents, and will require additional engineering design and review, as discussed in the next chapter.



Low Stress Bicycle Facilities & Pedestrian Crossings

To achieve Goal #1, "Build low stress streets that accommodate more high-comfort walking and bicycling for all ages and abilities," the Midway Blvd corridor necessitates a uniform, safe, and low-stress set of bicycle facilities along the entire length.

The Federal Highway Administration (FHWA) *Bikeway Selection Guide* recommends using the following chart to determine which bicycle facility is appropriate for a given urban roadway. As seen in the "Daily Vehicle Traffic" graphic in the Existing Conditions section of this report, vehicular traffic on Midway Blvd ranges from 7,500 to over 17,000 vehicles per day (except one quarter-mile west end segment), with 85th percentile speeds ranging from 32mph to 47mph. As such, bicycle facilities recommended for future/ultimate improvements include wide and well striped multi-use paths and protected off-street bicycle lanes.

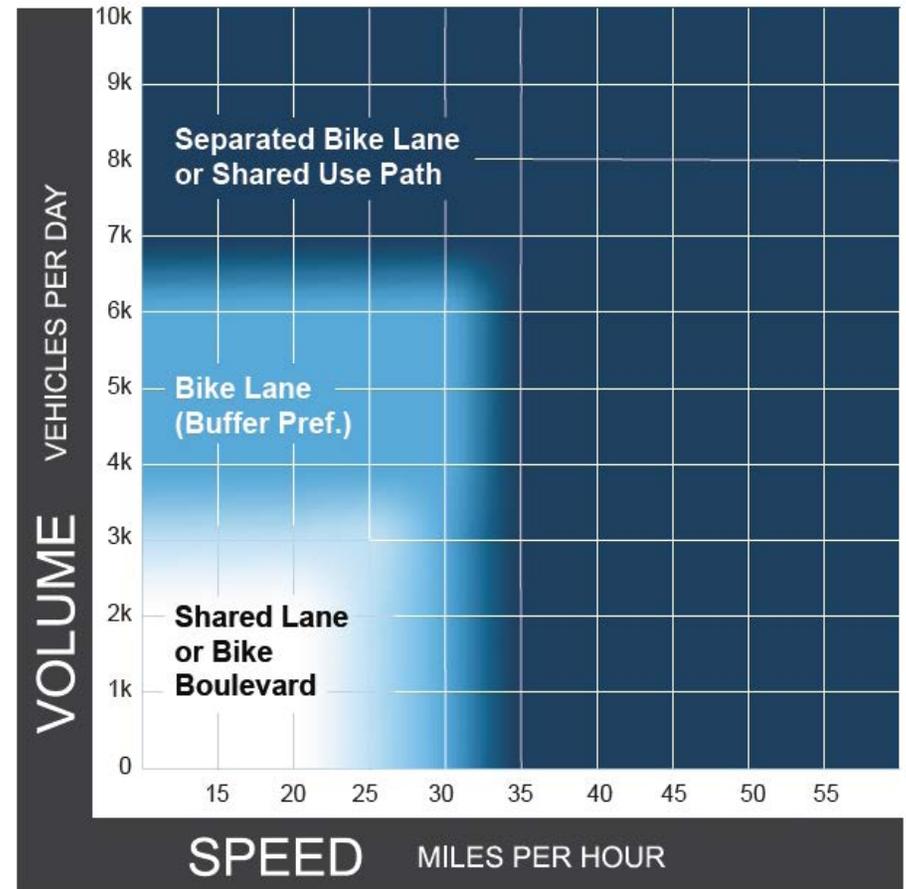


Figure 61: FHWA Bikeway Selection Guide Preferred Bikeway Type for Urban Contexts

At the intersections, a variety of treatments are recommended including curb extensions, and right turn bypass islands constructed to the “PEDSAFE” design practice, with protected raised crossings and clear pedestrian crossing signage, possibly including Rectangular Rapid Flash Beacons (RRFBs).

Each pedestrian crossing treatment along the Midway corridor has been reviewed and, where appropriate, additional treatments or changes to the current treatments have been recommended. Pedestrian crossing treatments were analyzed following FHWA recommendations, as well as reviewing guidelines currently in use by other Front Range communities in order to provide robust, consistent, and comfortable pedestrian safety features on this multimodal priority corridor.

Potential conflicts at intersections also may also be mitigated by changes as simple as traffic signal phasing, or as complex as constructing protected intersections. Design of all intersections were evaluated, from lower volume driveways to arterial roadways, with a focus on a safe and comfortable experience for people walking and biking.

Curb extensions into the corridor, as well as median refuge islands, are intended to both slow motor vehicle speed and facilitate safer and more comfortable pedestrian crossings.

Within the consideration of safety for all, a standardization of flashing crosswalk displays was recommended. In areas of low speed, rectangular rapid flash beacons are recommended at existing and additional locations, based on analysis of roadway

conditions. On the east end of the corridor, where the speeds increase to greater than 40 mph and volumes are above 15,000 vph, such treatments are not recommended, and safe pedestrian crossing must be provided through traffic signals or Pedestrian Hybrid Beacons (PHB, sometimes called HAWK) crossings.

PHBs are recommended at two locations along Midway Blvd, both near schools - offset from the Vrain St and Willow Run Pkwy intersections. While the FHWA-minimum 20 pedestrians per hour wasn’t observed at these two locations (one of which was formally counted), the project team believes there is a potential for 20 pedestrians in the peak hour once a safe and comfortable crossing is established, and the locations meet all other FHWA warrants. The offset location of the PHBs is due to limited sight distance, pedestrian desire lines, and the FHWA recommendation to install PHBs at least 100 feet from an intersection to eliminate potential for drivers to leave their vehicle to manually activate the PHB.



Example of PHB crossing

Driveway and Intersection Crossing Treatments

The greatest potential for conflict between motor vehicle traffic and people walking and biking along the Midway corridor is the driveways and intersections where drivers may be turning right or left across the path of active users. Recommended categories of driveway and intersection crossing designs are as follows:

Category A - Low Volume residential or commercial driveway: These conflict points should have mountable curbs and a short crossing width, allowing the sidewalk / path to stay at the same level and the motor vehicle traffic to slow down as they drive up to that level. Residential driveways should be wide enough for a vehicle to enter or exit. Low volume commercial driveways that are two-way should be wide enough to accommodate two passenger cars (one in each direction) but not larger vehicles passing. It is expected that larger vehicles will wait for the driveway to clear or swing wide to enter the driveway.

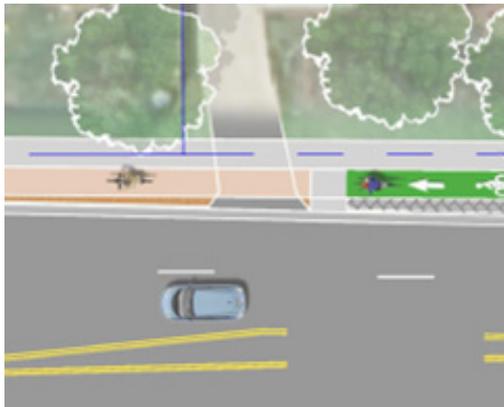


Figure 62: Category A Intersection

Category B - Higher Volume commercial driveways (significant truck traffic): These conflict points may have curb radii and pedestrian ADA ramp crossings, and remain at the same level as the street. They may be wide enough to accommodate trucks passing a passenger vehicle in or out of the driveway. The crossing treatment should be located as far away from the street as practical (16' of separation preferred) and, if possible, the crossing should be protected by a raised feature to slow turning traffic.

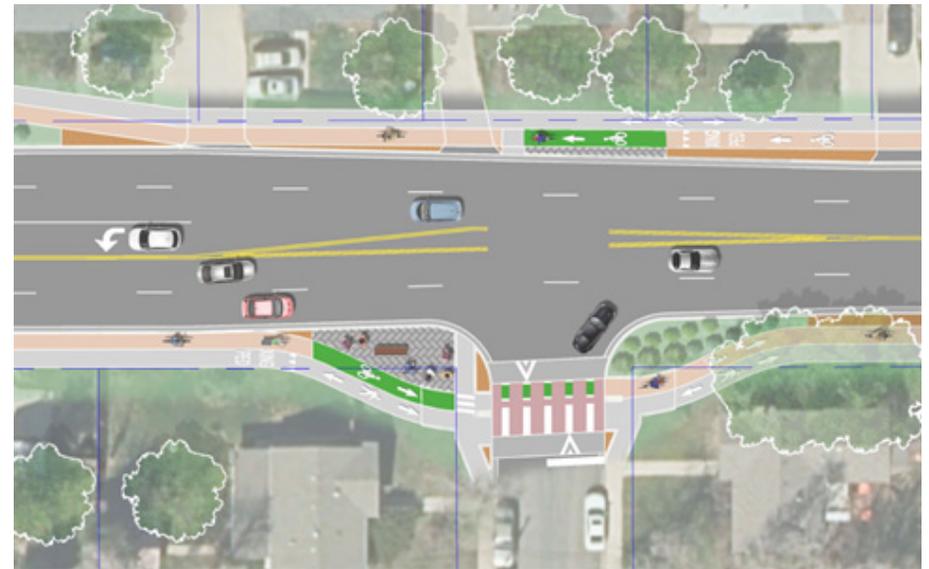


Figure 63: Category B Intersection

Category C - Unsignalized and lower-volume signalized local classification street intersection crossings: These conflict points should have curb radii and pedestrian ADA ramp crossings, and remain at the level of the street. Where possible, curb extensions should be used to shadow parking or extra roadway width and minimize the crossing distance. The crossing

treatment should be located as far away from the street as practical (16' of separation preferred). Trees and vegetation should be pulled back far enough from the intersection corners to allow adequate sight distance of and for turning motorists, people on bicycles and people on foot.



Figure 64: Category C Intersection

Category D - *Signalized local classification street intersection crossings*: These conflict points should have curb radii and pedestrian ADA ramp crossings, and remain at the level of the street. Where possible, curb extensions should be used to shadow parking or extra roadway width and minimize the crossing distance. If **traffic signal phasing** can be used to protect pedestrians and cyclists crossing (protected left and right turn phasing, leading pedestrian intervals, right turn on red restrictions) then the sidewalk and multi-use path can be placed closer to the roadway. Otherwise, the crossing treatment should be located as far away from the street as practical (16' of separation preferred).

Category E - *Signalized collector or arterial classification street intersection crossings*: These conflict points should have curb radii and pedestrian ADA ramp crossings, and remain at the level of the street. Because of the high volumes, the potential for conflict with vulnerable users in crosswalks is high at these locations. These conflicts should be mitigated through a combination of **traffic signal phasing** (protected left and right turn phasing, leading pedestrian intervals, right turn on red restrictions) and geometric improvements such as **right turn bypass islands** with raised crossings and enhanced pedestrian crossing treatments, and protected intersection designs. The crossing treatment should be located as far away from the street as practical (16' of separation preferred) unless the previously mentioned protections can be used to mitigate conflict.

Potential Intersection and Crossing Treatment Improvements

Each intersection along Midway was reviewed to determine appropriate geometric and operational change recommendations. Improvements proposed in the plan focused primarily on arterials, collectors, crossing locations with higher potential pedestrian and bicycle use, and locations with a high number of public comments. Recommendations for geometric and operational improvements are shown in the concept plans, and described in more detail in [APPENDIX C: Midway Intersection Improvements and Enhanced Pedestrian Crossing Treatments.](#)

Traffic Analysis Results

An analysis of intersection operations was completed for existing conditions and for proposed conditions shown in the Concept Plans, using Synchro software to determine intersection Level of Service (LOS). LOS's associated with each scenario at each intersection are shown in the table below. All proposed modifications resulted in acceptable LOS's (generally considered to be LOS D or better) except at US 287/Midway where the

existing LOS is already below LOS D. Note that intersection Level of Service is just one aspect of intersection operations reviewed when considering alternatives, as LOS is an estimated measure of how much delay vehicles may encounter at the most congested times of day, and doesn't analyze other operational and safety considerations such as pedestrian and bicycle exposure, delay, and safety, and potential impacts on vehicular speeds. Additional LOS and scenario details are in [Appendix D](#), and a summary of signal timing changes is in [Appendix C](#).

Intersection	Existing		w/ Proposed Modifications (1)		Additional Scenarios (2)		Additional Scenarios (3)		Additional Scenarios (4)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
US 287 & W. Midway Blvd.	E	F	F	F						
Nickel St. & W. Midway Blvd.	B	B	C	C	C	C				
Kohl St. & W. Midway Blvd.	B	B	B	B	B	B				
W. 3rd Dr. & W. Midway Blvd.	A	A	B	A						
Main St. & W. Midway Blvd.	C	C	C	C	C	C	C	C	C	C
Sheridan Blvd. & E. Midway Blvd.	C	C	D	D	D	C				
Perry St. & E. Midway Blvd.	A	B	A	B						
Lowell Blvd. & E. Midway Blvd.	C	C	C	C	C	C				
Hazel Way & E. Midway Blvd.	A	A	B	A						

- (1) Proposed Modifications scenario includes implementation of multimodal improvements as proposed
- (2) This Additional Scenario analyzed alternate signal phasing options at several intersections, including some selected turn lane removals and protected-only left turn movements
- (3) This Additional Scenario analyzed eastbound and westbound protected-only left-turn movements at Main & Midway
- (4) This Additional Scenario analyzed eastbound and westbound right-turn movements with only "overlap" operation at Main & Midway

Note: While Zuni St is a signalized intersection, it is not included in this analysis because lane geometry modifications are not yet determined due to coordination with Westmister projects at the intersection.

Figure 65: Intersection LOS

Additionally, because Willow Run Pkwy/Elm Ln was repeatedly brought up by community members with concerns about turning left onto Midway, a peak hour signal warrant analysis was completed. The warrant analysis showed that a traffic signal is not currently warranted, and will likely not meet warrants in the near future. Warrant worksheets are included in the appendix.

Roundabouts were another treatment discussed by the project team and mentioned by community members frequently. Given right-of-way goals of this project, roundabouts were only cursorily analyzed as part of this project. The project team did a brief volume analysis for roundabouts at Kohl, Vrain, and Willow Run; however, other locations (particularly on the east end of the corridor) may be considered in future phases.

Kohl would likely be configured as a single-lane roundabout due to roadway configuration and ROW constraints, likely requiring ROW from the park. Multimodal design complexities also exist at this location, particularly for on-street bicycles and some pedestrians. Based on nearby volume analysis, Vrain would likely operate well as a two-lane roundabout, but ROW constraints make this location a difficult location for a roundabout. A two-lane roundabout at Willow Run may work well given existing volumes and spacing, and this may be a good location for further investigation due to potential traffic calming effects and multimodal crossing opportunity. ROW impacts, multimodal crossing needs, and costs of roundabouts at locations such as Willow Run should be considered in the next phases of design.

The project team also reviewed **speed limits** and considered which segments should be further studied for future potential speed limit modification. The segment between US 287 and Main St is the most constrained, most urban, most residential, and most school-adjacent segment of the corridor. Given its context, proposed design, and history of having a lower speed limit, pursuing a speed study using modern methods for speed limit setting is recommended for this segment. Additional study in this segment is further supported by the volume of speed-limit related public input received for this segment as well.

Parking impacts occur with the interim and future concept designs, and are summarized below for the future concept Kohl St to Main St segment (interim concept parking reductions are significantly less than future concept reductions, shown below). As summarized in Existing Conditions, all houses fronting Midway have off street parking, and a parking study conducted at 5am on a weekday in April showed approximately 17% utilization.

Kohl to Daphne:

- 63 Existing On-Street Spaces
- 31 Proposed On-Street Spaces
- 32 Parking Space Reduction in Future condition (Interim

Daphne to Main:

- 85 Existing On-Street Spaces
- 44 Proposed On-Street Spaces
- 41 Parking Space Reduction in Future condition

Environmental Review

A review was completed of potential environmental impacts associated with the Midway Boulevard Multi-Use Open Path Concept Design. The proposed design improvements were analyzed in conjunction with publicly available information, such as aerial imagery and governmentally maintained databases, contained in the Initial Environmental Reconnaissance Report prepared by Wilson & Company. No site visits occurred as part of this review.

- 8 potential wetland areas were identified in the vicinity of Midway Blvd, and only 1 is likely to be impacted by the design.
- 11 parks, trails, and open space areas were identified and 4 are likely to be impacted by the design.
- Prairie dog colonies exist along Midway Blvd within the project limits. A formal survey of prairie dog colony limits is recommended.
- Tree removal should occur outside of the nesting season for migratory birds as to not disturb active nests. A survey will be required by a professional biologist to identify active nesting sites.
- Western Burrowing Owls are commonly found in prairie dog towns and a burrowing owl survey will be required due to the potential impacts to prairie dog colonies.

Based on the project Design and resources identified in the Recon Report, it is anticipated that several actions will need to

occur as the design progresses, including:

- A wetland delineation to determine impacts and potential Section 404 permitting requirements such as at the Community Ditch and other potential areas.
- Survey for migratory bird nesting activity in areas where tree impacts have been identified.
- A permit for prairie dog management with the City and County of Broomfield. The type of permit will depend on the proposed management action category (e.g., relocation or extermination).
- Survey for burrowing owl activity in identified prairie dog colonies.
- Coordination with the Officials with Jurisdiction (OWJ) for potential impacts to parks, trails and open space areas.
- Assessment of Community Ditch as a potential historic resource.

If federal and/or state funds are acquired for future project phases, the project may be subject to the National Environmental Policy Act (NEPA) requirements of the federal and/or state agencies with oversight.

Utility Review

Preliminary analysis of the utility impacts associated with the multimodal concepts for Midway Blvd indicate several areas throughout the corridor with potential to present schedule and/or cost challenges. The primary concerns are trail and/or grading

conflicts with several large Xcel transformers near Burbank St, Dexter Pl, and two between Perry St and Lowell Blvd, and communication cabinet groups between Dexter Pl and Lowell Blvd. For this study, it was assumed that all relocation costs for private utility owners will be the responsibility of the utility owner. However, an easement investigation should be completed prior to finalizing funding requirements for this project to confirm responsibility for relocation costs. While cost is not a primary concern with the impacts to power and communication facilities in the Midway Blvd right-of-way, there are currently lead times up to 12 months for large Xcel transformers, and it can be anticipated that the communications facilities within the project limits will also have lengthy relocation timelines due to the size and type of facilities present along the corridor.

Other potential utility impacts include water meters, fire hydrants, lighting, communication manholes, and smaller communication equipment. There is a potential for a large number of water meters to be impacted along the corridor which could add significant cost to the project. Additional potential cost risk for the project is the relocation of existing lighting along the corridor. While the relocation of the lighting is typically covered under a franchise agreement, if light poles and luminaries need to be replaced, that cost would not be covered under the franchise agreement and material costs for this equipment should be accounted for in the project budget. Lastly, there are multiple pedestals and handholes that will

need to be adjusted on this project. Additional time should be incorporated into the project schedule to account for the high number of these facilities impacted along the corridor.

- Xcel Gas main impacts are unknown at this time, but valve adjustments are anticipated throughout the corridor.
- Various Lumen / AT&T / Zayo / City of Broomfield handholes, vaults, and pedestals will need to be replaced or relocated throughout the corridor.
- Water facilities along the corridor are anticipated to need valve boxes and curb stop adjustments as well as hydrant and meter relocations.
- Storm and sanitary facilities along the corridor will require manhole rim elevation adjustments and several inlet relocations.
- Many Xcel streetlights and corresponding feeds will need to be relocated.
- West of US 287, three major lumen upright cabinets, a vault, and the associated line will require relocation outside of the proposed path.
- West of Compton Street, four or more Sanitary manhole lids will need to be rotated outside of the proposed curblines.
- Where proposed improvements encroach on private property, is anticipated that a number of low voltage facilities will be impacted.

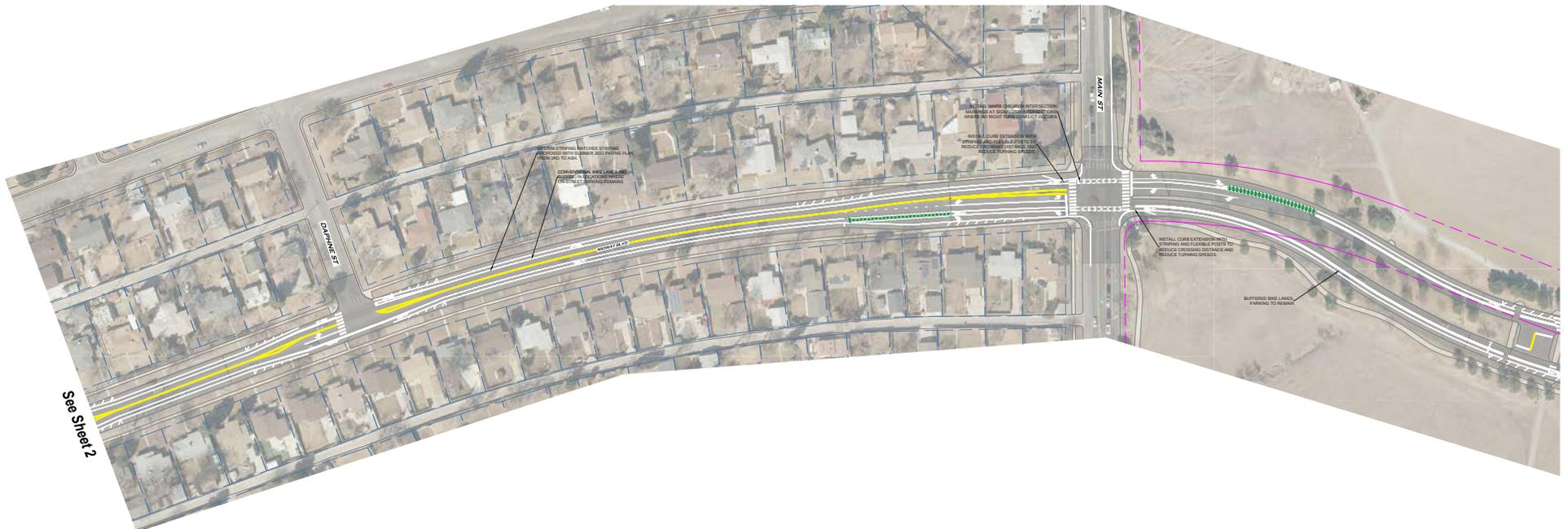
*Additional details of utility impacts can be found in **Appendix E: Preliminary Utility Impact Summary.***

Interim Concept

A portion of the Interim Concept Plan is shown below for reference. The full Interim Concept Plans can be found in [Appendix F: Interim Striping Concept](#)



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



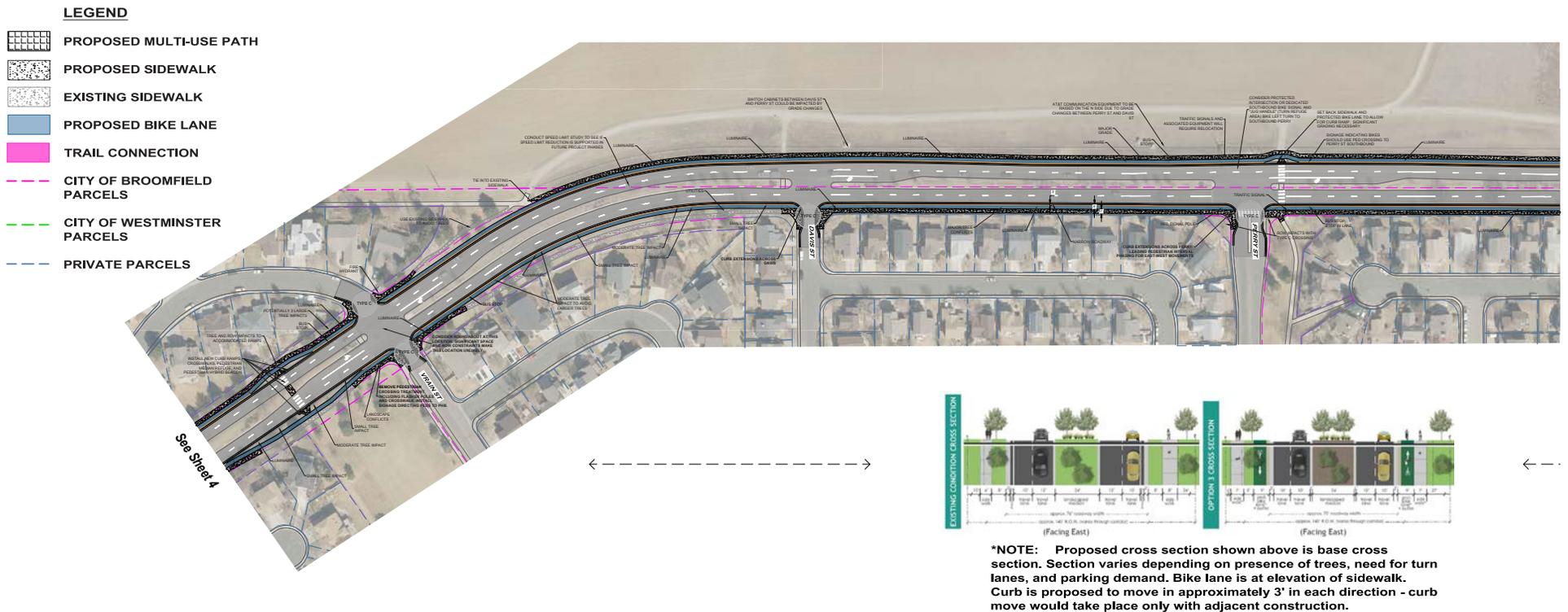
Interim Striping Concept

Revised December 2022

Figure 66: Interim Concept Sample

Future Concept

A portion of the Future Concept Plan is shown below for reference. The full Future Concept Plans can be found in **Appendix G: Future Off-Street Protected Bicycle Lane/Multi-Use Path Concept.**



Future Off-Street Protected Bike Lane/Multi-Use Path Concept

Revised December 2022

Figure 67: Future Concept Sample





CHAPTER 7. PRIORITIZATION & NEXT STEPS

Once the preferred alternative was selected and Concept Plan drafted, the draft Concept Plan was split into separate, smaller proposed “projects” in order to aid in prioritizing segments of the corridor to be designed and constructed first. Prioritization criteria were developed by the project team and reviewed by the technical committee, with the goal of creating a prioritized list with criteria that can be updated and re-analyzed at a later date if funding availability or public priority changes. The projects were then scored in the technical categories (safety, multimodal, location, complexity, financial) by the technical committee. To determine public priority, the draft concept plans were then presented to the community, along with the “projects” split out to determine the community’s top priority segments.

The results of this prioritization process and next steps for the project are described in the following pages.

Prioritization of Projects

This project prioritization table is intended as a “living document” that can be re-sorted, updated, and utilized by Broomfield staff to help determine which projects to implement given changing needs, funding availability, and “partner project” opportunities. Note that equity was discussed in length by the project team during the prioritization process. While a specific equity category is not shown here, equity considerations were noted within a number of categories, particularly the “Location within the corridor” category, as enhancements to multimodal transportation at higher density areas, closer to commercial uses, and near parks increase travel safety and comfort for individuals who travel by transit, bicycle, or foot by necessity. In the Midway Blvd corridor, the higher density, commercial, and park areas also serve the majority of low income housing and government services. See [APPENDIX I Project Prioritization](#) for prioritization criteria, scoring details, and additional notes.

Midway Boulevard Multimodal Project - Prioritization of Projects									
INTERIM			Category A			Category B	Category C	Category D	Subtotal
ID	Project Name and Limits	Primary Improvements	Benefit			Public Prioritization	Complexity	Financial	
			Safety	Multi-modal	Location	N/a	N/a	N/a	
13	Marble Street to Laurel Avenue striping and paint/post improvements	Stripe green conflict markings for WB right turn lane at Marble Street; Paint and post median to protect crosswalk on west leg of Laurel Avenue	3	3	3	1	2	3	15
18	Vrain Street intersection improvements	Paint and post curb extensions on all corners.	2	2	3	2	3	3	15
11	Stripe Buffered Bike Lanes on Midway between Lake Link Trail and SH-287	Stripe buffered bike lanes and center median with green conflict markings. Asphalt patching (multiple locations)	1	2	3	3	3	2	14
15	Main Street intersection improvements	Narrow lanes on WB approach to provide bike lane on approach and green conflict markings on right turn approaches. Paint and post curb extensions on SE and SW corners of intersection.	3	2	2	1	3	3	14
17	Sheridan Boulevard intersection improvements	Construct slip ramp on EB approach for bicycles to enter MU path. Stripe bike boxes, bike chevrons and conflict markings within intersection.	3	2	2	1	3	3	14
110	Lowell Street intersection improvements	Stripe two stage left turn boxes and bike chevron markings in intersection	3	3	1	1	3	3	14
14	Bike lane striping from Laurel Avenue to Main Street	Stripe bike lanes (where parking remains) and buffered bike lanes (where parking is removed) and restripe/narrow center median. Remove parking in select areas and sign the parking restrictions.	2	2	3	3	1	2	13
19	Perry Street intersection improvements	Stripe green conflict markings across south leg of intersection	3	2	1	1	3	3	13
12	Slip Ramps from sidewalk to bike lane at Nickel	Concrete work for slip ramps and restriping of bike lane connections. Signs about bikes using sidewalks from 287 to Nickel.	1	1	3	1	3	3	12
111	Hazel Street intersection improvements	Paint and post curb extensions on three corners (not SE corner).	2	1	1	1	3	3	11
16	Buffered bike lanes from Main Street to Sheridan Blvd	Stripe buffered bike lanes and green conflict markings along corridor. Paint and post curb extensions on all corners at Ash Street and Birch Street intersections.	1	2	2	2	1	2	10

Figure 68: Prioritization of Interim Projects Table

Midway Boulevard Multimodal Project - Prioritization of Projects									
FUTURE			Category A			Category B	Category C	Category D	Subtotal
ID	Project Name and Limits	Primary Improvements	Benefit			Public Prioritization	Complexity	Financial	
			Safety	Multi-modal	Location	N/a	N/a	N/a	
F5	Intersection improvements at Main Street and Midway	Construct 12' MU path / mixing zone on all EB and WB approach and departures, connecting to future protected bike lanes. Traffic signal modifications. Traffic signal timing and phasing changes to provide protected left turn and right turn phasing.	3	3	3	1	3	2	15
F2	Midway and US-287 intersection improvements	Reconstruct all four right turn bypass islands and corner radii including raised crossings. Widen to accommodate two SB left turn lanes and two EB receiving lanes. Traffic signal timing and phasing changes to provide protected WB left turn.	3	3	3	3	1	1	14
F4	Protected Bike Lane from Nickel Street to Main Street	Construct 9' wide Protected Bike Lane and 7' sidewalk on both sides of Midway from Nickel Street to Main Street. Reconstruct Kohl Street to be a protected intersection with green conflict markings. At the Daphne intersection, relocate crosswalk to east leg and provide RRFBs and paint and post median. Roadway narrowing east of Laurel (speed reduction and reduced tree impacts). Bumpouts and parking loss between Kohl and Main (speed reduction and reduced tree impacts).	3	3	3	3	1	1	14
F7	New Z Ped Crossing between Main Street and Spader Way	Close the break in median used for U-turns between Main Street and Spader Way. Install new MU path to create Z Ped Crossing with curb extensions. Relocate crosswalk for WB roadway to west side. Construct new ramp and path connection. Landscape or hardscape remaining median area.	3	2	1	2	3	3	14
F8	New Z Ped Crossing between Spader Way and Ash Street	Close the break in median used for U-turns between Spader Way and Ash Street. Install new MU path to create Z Ped Crossing with curb extensions. Relocate crosswalk for EB roadway to east side. Construct new ramp and create soft surface trail connection to south.	3	2	1	2	3	3	14
F3	South side MU path on Midway between SH 287 and Nickel Street	Remove sidewalk and construct 12' MU path from SH 287 to east side of Nickel Street. Traffic signal modifications. Traffic signal timing and phasing changes to provide protected left turn and right turn phasing. Close driveways where indicated.	3	2	3	1	2	1	12
F9	Protected Bike Facilities from Ash Street to Sheridan Boulevard (including Sheridan intersection)	Construct a 9' wide protected bike lane on the north side (westbound) and a 12' MU path with a buffered bike lane on the south side (eastbound) between Ash Street and Sheridan Boulevard, including WB roadway narrowing. Incorporate concrete curb extensions at Ash, Birch and Dexter. Sidewalk widening on north side where possible. Green conflict markings and bike chevrons in Sheridan intersection. Signal timing/phasing changes to protect left and right turn movements and NB no right turn on red restriction (blank out sign). RRFBs at Ash, Birch.	3	3	2	1	2	1	12

Figure 69: Prioritization of Future Projects Table, part 1

See [APPENDIX I Project Prioritization](#) for prioritization criteria, scoring details, and additional notes.

Prioritization of Projects

Midway Boulevard Multimodal Project - Prioritization of Projects									
FUTURE			Category A			Category B	Category C	Category D	Subtotal
ID	Project Name and Limits	Primary Improvements	Benefit			Public	Complexity	Financial	
			Safety	Multi-modal	Location	Prioritization	N/a	N/a	
F13	Pedestrian Hybrid Beacon crossing west of Willow Run Parkway	Remove existing signed and marked crosswalk on east leg of Willow Run Parkway and replace with new HAWK/PHB crossing west of Willow Run intersection, including curb ramps and median modification.	3	2	1	3	2	1	12
F1	South side MU path on Midway between Lake Link Trail and SH-287	Remove curb and gutter, narrow roadway and construct curb and gutter with new attached 12' MU path with 2' buffer next to parking. Curb extensions at Hoyt; New Ped Bridges and/or culvert extensions east of Compton; Close driveways where indicated; Geometric improvements at Alter; Reconstruct north side access to gas station SW corner of 287	1	3	3	3	1	1	12
F6	Protected Bike Lane from Main Street to Ash Street	Construct 9' Protected Bike Lane on both sides of Midway from Main Street to Ash Street including roadway narrowing in each direction, and 7' Sidewalk with crusher fines shoulder on north side. Sidewalk relocation as indicated. Spader way improvements including bike slip ramp.	2	3	2	2	1	1	11
F10	Protected Bike Lane from Sheridan Boulevard to Lowell Street (including Lowell intersection)	Construct 9' Protected Bike Lane between Sheridan Boulevard and Lowell Street including roadway narrowing. Incorporate curb extensions at Wolffe, Yates, Vrain, Davis, Perry, and Meade intersections. Green conflict markings and bike chevrons in Lowell intersection. Signal timing/phasing changes to protect left and right turn movements. Crossing enhancements at Perry, potential future crossing beacons at Wolff and Meade.	3	3	1	2	1	1	11
F11	Pedestrian Hybrid Beacon crossing west of Vrain Street	Remove existing RRFB crossing on west leg of Midway and Vrain Street and replace with new HAWK/PHB crossing west of Vrain Street intersection, including curb ramps and median modification.	3	2	1	2	2	1	11
F12	Protected Bike Lane from Lowell Street to Zuni Boulevard	Construct 9' Protected Bike Lane and sidewalk replacement/widening between Lowell Street and Zuni Boulevard, including roadway narrowing. Incorporate curb extensions at Alcott, Willow Run and Hazel intersections. Signal timing changes at Hazel	2	3	1	2	1	1	10
F14	Intersection improvements at Midway and Zuni	Improvements to be determined with joint project with Westminster, and may include curb changes and signal timing updates necessary to reduce pedestrian and bicycle exposure and shorten crossing distances, and reduce crashes.	TBD	TBD	TBD	1	TBD	TBD	TBD
F15	Path connection on north and south sides east of Zuni, connecting to Dry Creek Trail	Path routing and configuration to be determined with joint project with Westminster, but will include path connections on the north and south sides of 128th Ave to the Dry Creek Trail.	TBD	TBD	TBD	2	TBD	TBD	TBD

Figure 70: Prioritization of Future Projects Table, part 2

See [APPENDIX I Project Prioritization](#) for prioritization criteria, scoring details, and additional notes.



Cost Estimates

The project team developed a concept-level cost estimate for each interim and future project to supplement the prioritization process' order-of-magnitude cost comparison and aid Broomfield staff as projects are moved from concept into design and implementation. The cost estimate uses current (2022) pricing; however, pricing in recent years has varied significantly over short periods of time, so costs should be re-evaluated and adjusted as necessary when projects move into design and implementation.

INTERIM - PROJECT ID	INTERIM - PROJECT NAME AND LIMITS	Bicycle or Pedestrian Project	Hardscape/ Civil	Operational/ Signal Timing	Intersection Improvements	Signing and Striping	TOTAL CONSTRUCTION COST	TOTAL PROJECT COST
I1	Stripe Buffered Bike Lanes on Midway between Lake Link Trail and SH-287	X				X	\$ 198,300	\$ 257,800
I2	Slip Ramps from sidewalk to bike lane at Nickel	X	X			X	\$ 42,400	\$ 55,200
I3	Marble Street to Laurel Avenue striping and paint/post improvements	X				X	\$ 32,400	\$ 42,200
I4	Bike lane striping from Laurel Avenue to Main Street	X				X	\$ 165,100	\$ 214,700
I5	Main Street intersection improvements	X			X	X	\$ 65,000	\$ 84,500
I6	Buffered bike lanes from Main Street to Sheridan Blvd	X				X	\$ 251,700	\$ 327,300
I7	Sheridan Boulevard intersection improvements	X			X	X	\$ 63,500	\$ 82,600
I8	Vrain Street intersection improvements	X			X	X	\$ 13,700	\$ 17,900
I9	Perry Street intersection improvements	X			X	X	\$ 12,900	\$ 16,800
I10	Lowell Street intersection improvements	X			X	X	\$ 12,000	\$ 15,600
I11	Hazel Street intersection improvements	X			X	X	\$ 12,900	\$ 16,800

Note: interim projects are assumed to be installed with another planned project in the area (a paving project through the pavement maintenance program, for example); pavement parking removal is not included in the above cost.

Figure 71: Interim Projects Cost Estimate

See [APPENDIX J](#) and [APPENDIX K](#) for detailed concept-level cost estimates for each project.

FUTURE - PROJECT ID	FUTURE - PROJECT NAME AND LIMITS	Bicycle or Pedestrian Project	Hardscape/ Civil	Operational/ Signal Timing	Major Intersection Improvements	Signing and Striping	TOTAL CONSTRUCTION COST	TOTAL PROJECT COST
F1	South side MU path on Midway between Lake Link Trail and SH-287	X	X		X	X	\$ 3,954,900	\$ 5,279,100
F2	Midway and US-287 intersection improvements	X	X	X	X	X	\$ 847,500	\$ 1,252,700
F3	South side MU path on Midway between SH 287 and Nickel Street	X	X	X	X	X	\$ 469,000	\$ 616,500
F4	Protected Bike Lane from Nickel Street to Main Street	X	X	X		X	\$ 5,365,000	\$ 7,218,200
F5	Intersection improvements at Main Street and Midway	X	X	X	X	X	\$ 431,500	\$ 583,000
F6	Protected Bike Lane from Main Street to Ash Street	X	X			X	\$ 2,495,000	\$ 3,254,900
F7	New Z Ped Crossing between Main Street and Spader Way	X	X			X	\$ 92,200	\$ 119,900
F8	New Z Ped Crossing between Spader Way and Ash Street	X	X			X	\$ 100,400	\$ 130,600
F9	Protected Bike Facilities from Ash Street to Sheridan Boulevard (including Sheridan intersection)	X	X	X	X	X	\$ 2,696,500	\$ 3,546,500
F10	Protected Bike Lane from Sheridan Boulevard to Lowell Street (including Lowell intersection)	X	X	X	X	X	\$ 5,293,900	\$ 6,918,000
F11	Pedestrian Hybrid Beacon crossing west of Vrain Street	X	X			X	\$ 548,600	\$ 713,200
F12	Protected Bike Lane from Lowell Street to Zuni Boulevard	X	X	X		X	\$ 4,355,200	\$ 5,707,800
F13	Pedestrian Hybrid Beacon crossing west of Willow Run Parkway	X	X			X	\$ 534,000	\$ 694,200
F14	Intersection improvements at Midway and Zuni	X	X	X	X	X	TBD	TBD
F15	Path connection on north and south sides east of Zuni, connecting to Dry Creek Trail	X	X				TBD	TBD

Figure 72: Future Projects Cost Estimates

See **APPENDIX J** and **APPENDIX K** for detailed concept-level cost estimates for each project.

Next Steps

As described in the pages of this report, Midway Blvd is a critical connection through the heart of Broomfield for residents and visitors to the area whether in a car, truck, bus, on foot or on a bicycle. The City and County of Broomfield is poised to implement impactful projects quickly using the Interim Project List in the next 1 - 5 years pending funding availability and whenever improvements can be coordinated with other projects. The interim projects will be most cost-effectively implemented immediately after completion of other corridor projects, such as after repaving takes place under a pavement maintenance project. Broomfield should also consider implementing the highest priority interim projects regardless of whether there is an ongoing “partner project”, particularly when no other potential partner projects are planned for a segment in the next 3 years.

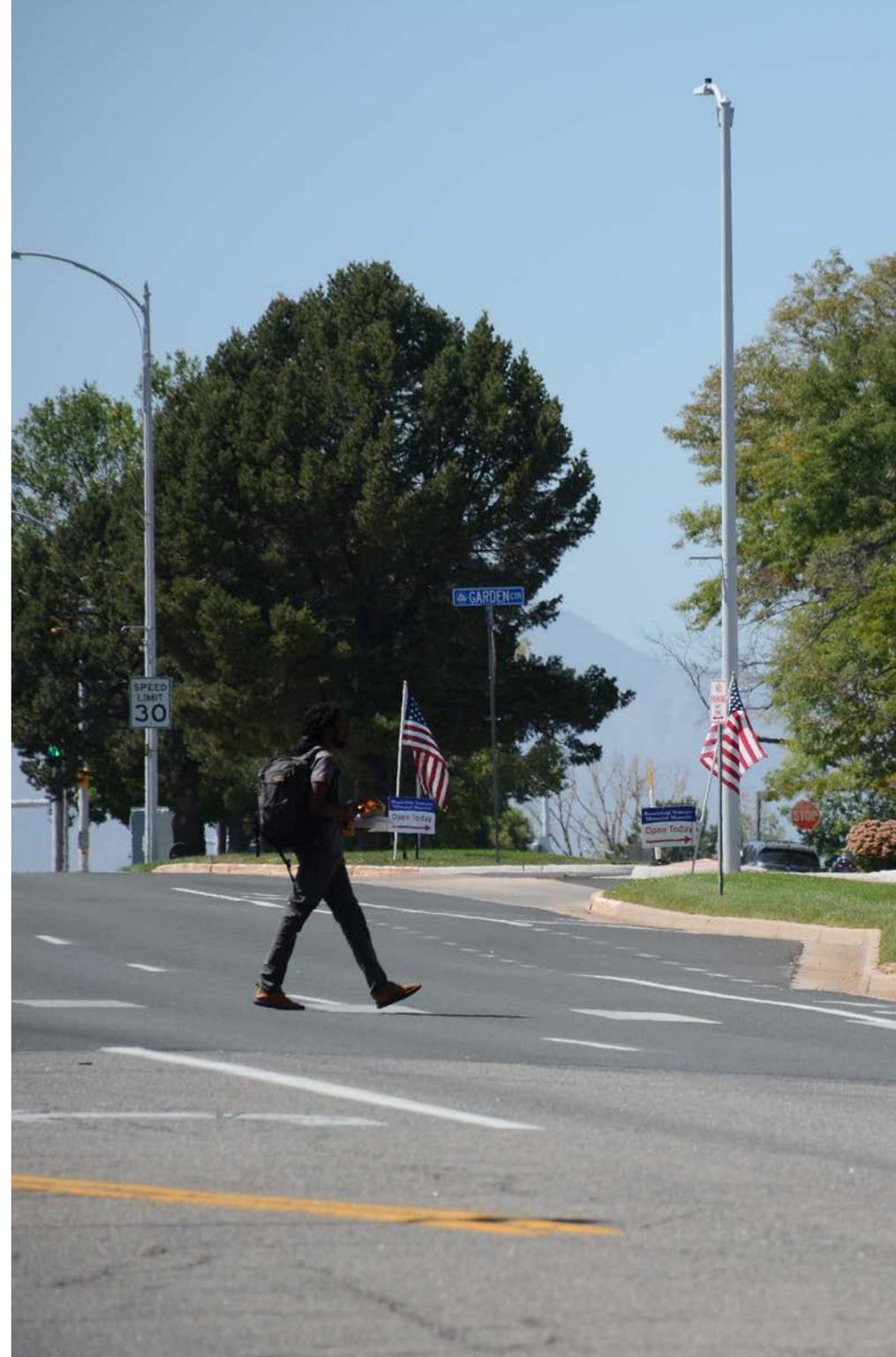
The future vision for the corridor is: *Midway Blvd becomes a well-connected and well-maintained multimodal transportation system that safely and effectively accommodates all modes. The corridor provides mobility for goods and people of all ages and abilities while supporting economic development, reducing dependence on the single occupant vehicle, and minimizing environmental impacts.* To accomplish this future vision, Broomfield should pursue local and grant funding, and

investigate potential partner projects to begin implementing the highest priority future projects. Partner projects considered during this study include the upcoming US 287/Midway Blvd CDOT improvements, the future 120th/US 287 CDOT Multimodal Study, the Boulder County US 287 Bus Rapid Transit Feasibility Study, and future coordination with Westminster at and east of the Zuni St/Midway Blvd intersection. Each of these projects will take 1 - 3 years to contract, design and receive environmental clearances, so pursuing a future project should not deter implementation of an interim project for the same segment. Broomfield may wish to begin design of the highest priority future projects immediately so that they can be “shovel ready”, making them more attractive to grant-selection committees.

In addition to project funding for design and construction, additional coordination, funding, staffing, and equipment needs will be necessary to maintain the proposed facilities once constructed. As such, refining the operations and maintenance needs and costs associated with the recommended concepts based on data, standards, and community input will be a key component during the design process prior to finalizing design.

Potential funding sources for interim or future projects:

- Multimodal Options Fund (MMOF state/federal)
- Transportation Alternatives Program (TAP state/federal)
- Highway Safety Improvement Program (HSIP state)
- Safe Streets 4 All (SS4A federal)
- Great Outdoors Colorado Community Impact (GOCO state)
- DRCOG Transportation Improvement Program (TIP)
- Safe Routes to School (SRTS)
- CDOT Revitalizing Main Street (CDOT RMS)
- Broomfield Capital Improvement Program (CIP)
- Broomfield street maintenance
- Broomfield parks/trails funding
- Broomfield utilities



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SPEED
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30



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APPENDIX A Existing Vehicle, Pedestrian, and Bicycle Volumes

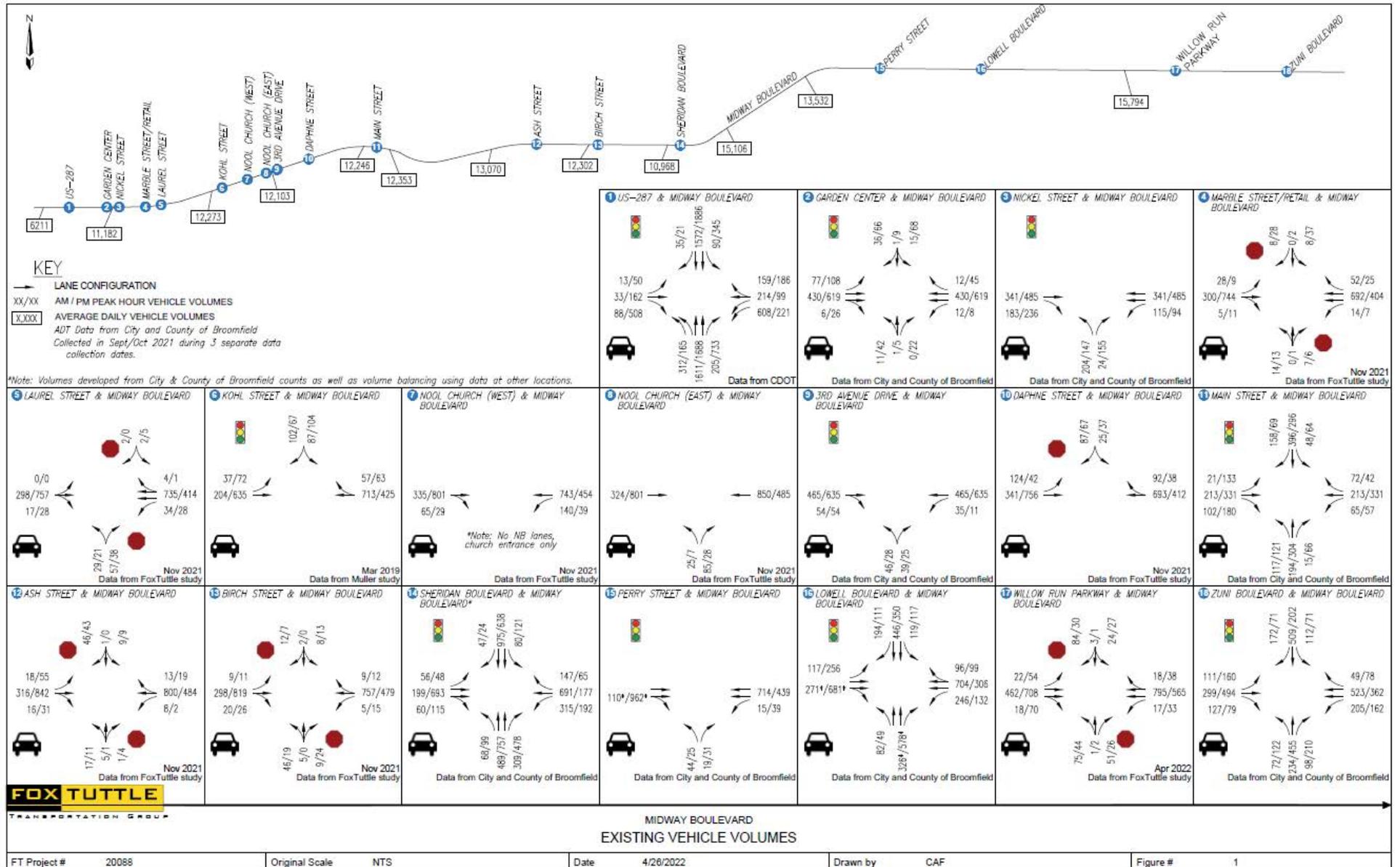


Figure A1: Existing Vehicle Volumes

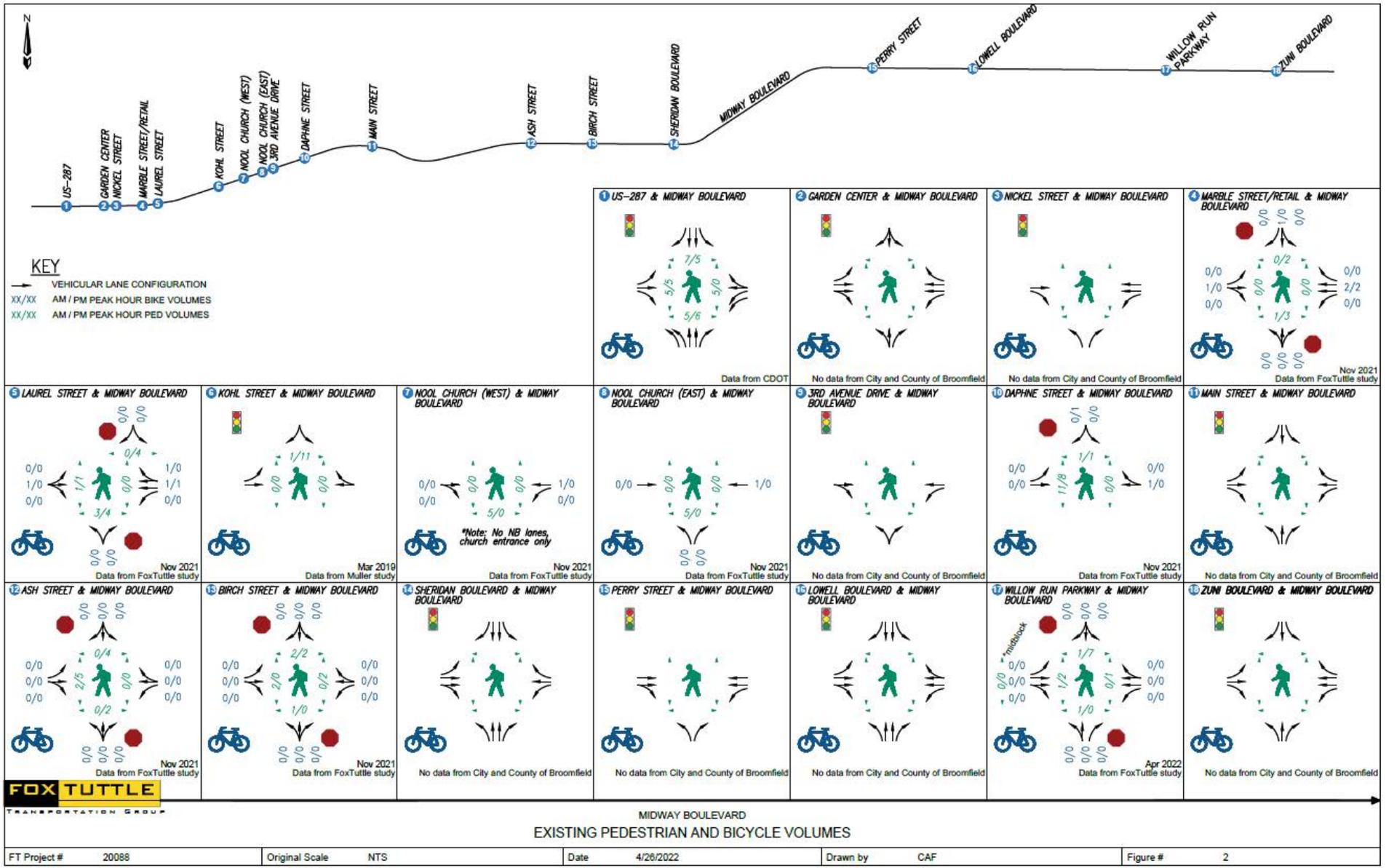


Figure A2: Existing Pedestrian and Bicycle Volumes

APPENDIX B Midway Blvd Outreach Summary Report



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MIDWAY BLVD MULTIMODAL PLAN

Map showing Midway Blvd corridor with various landmarks and street names.

MIDWAY BLVD MULTIMODAL PLAN

Map showing Midway Blvd corridor with various landmarks and street names.

MIDWAY BLVD MULTIMODAL PLAN

SHOW AND TELL: DROP A NUMBERED DOT ON THE MAP TO IDENTIFY/REVEAL YOUR EXPERIENCES ALONG THE MIDWAY BLVD CORRIDOR

Whether driving, walking or cycling, where have you experienced a crash or an incident, where injury or collision could have easily occurred? In the corridor, where do you have trouble making a turning, discouraging or challenging to walk or

MIDWAY BLVD MULTIMODAL PLAN

MOSTRAR Y CONTAR: PONGA UN PUNTO EN EL MAPA Y CUÉNTENOS UN POCO SOBRE SUS EXPERIENCIAS A LO LARGO DEL MIDWAY BLVD CORRIDOR.

- ¿Ha sido conduciendo, caminando o en bicicleta, ¿dónde se le ocurrió un choque o un incidente en el que una lesión o colisión podría haber ocurrido fácilmente a lo largo del corredor?
- ¿Al conducir por el corredor, ¿dónde tiene problemas para girar a la izquierda o para cruzar?
- ¿Qué parte del corredor es más desconcertante o desafiante para caminar o andar en bicicleta y por qué?
- ¿En qué parte del corredor se siente más cómodo caminando y conduciendo?
- ¿Qué intersecciones evita al caminar y conducir?
- ¿Dónde accede a las paradas de tránsito de RTD? ¿Dónde le gustaría ver el acceso de tránsito?
- ¿Otra información que le gustaría que el equipo de diseño supiera?

voice.com/MidwayPlan



COMMUNITY OUTREACH

Effective and inclusive community engagement is critical to the Midway Blvd Multimodal Action Plan. Understanding community perceptions and comfort with use of the corridor is a major component of analyzing existing conditions and use. Targeting inclusivity, Broomfield staff developed stakeholder lists and mailing lists for events with a focus on including previously under-served and under-represented populations. Each formal outreach event presentation included simultaneous Spanish interpretation and the opportunity to request additional accommodations, whatever the need.

This project included a number of public engagement opportunities for the entire community to discuss existing conditions, provide feedback on project goals, share their perspective and experience of the corridor, and explore possible future changes.

Outreach efforts throughout the project included:

- 6 “pop up” meetings at community events: National Night Out 2021, Broomfield Days 2021 & 2022, Broomfield Library, Paul Derda Rec Center, and 2022 Oktober Fest.
- Phase-specific emails to key public stakeholders.
- Direct mail post cards to residents (English and Spanish)
- Midway Multimodal Plan information posted on Broomfield Voice throughout project.
- 3 virtual workshops held in September 2021, with a recording posted to the Broomfield Voice website.
- Interactive Broomfield Voice Public Engagement Map produced location-specific public feedback, based on existing conditions
- Discussion Forum Question of the Week posted on Broomfield Voice and official Broomfield social media produced comments, shares, likes, and impressions.
- 6 online Design Alternative surveys were shared on Broomfield Voice: a 3-Minute Quick Input Survey covering the whole corridor, and 5 location-specific surveys.
- Interactive Draft Interim and Future Concept Plans on Broomfield Voice produced location-specific feedback on the draft concepts.
- The public was invited to contact project team via phone, Facebook, Twitter, LinkedIn, NextDoor, email, and phone hotline throughout the project.

Public Involvement Approach and Timeline

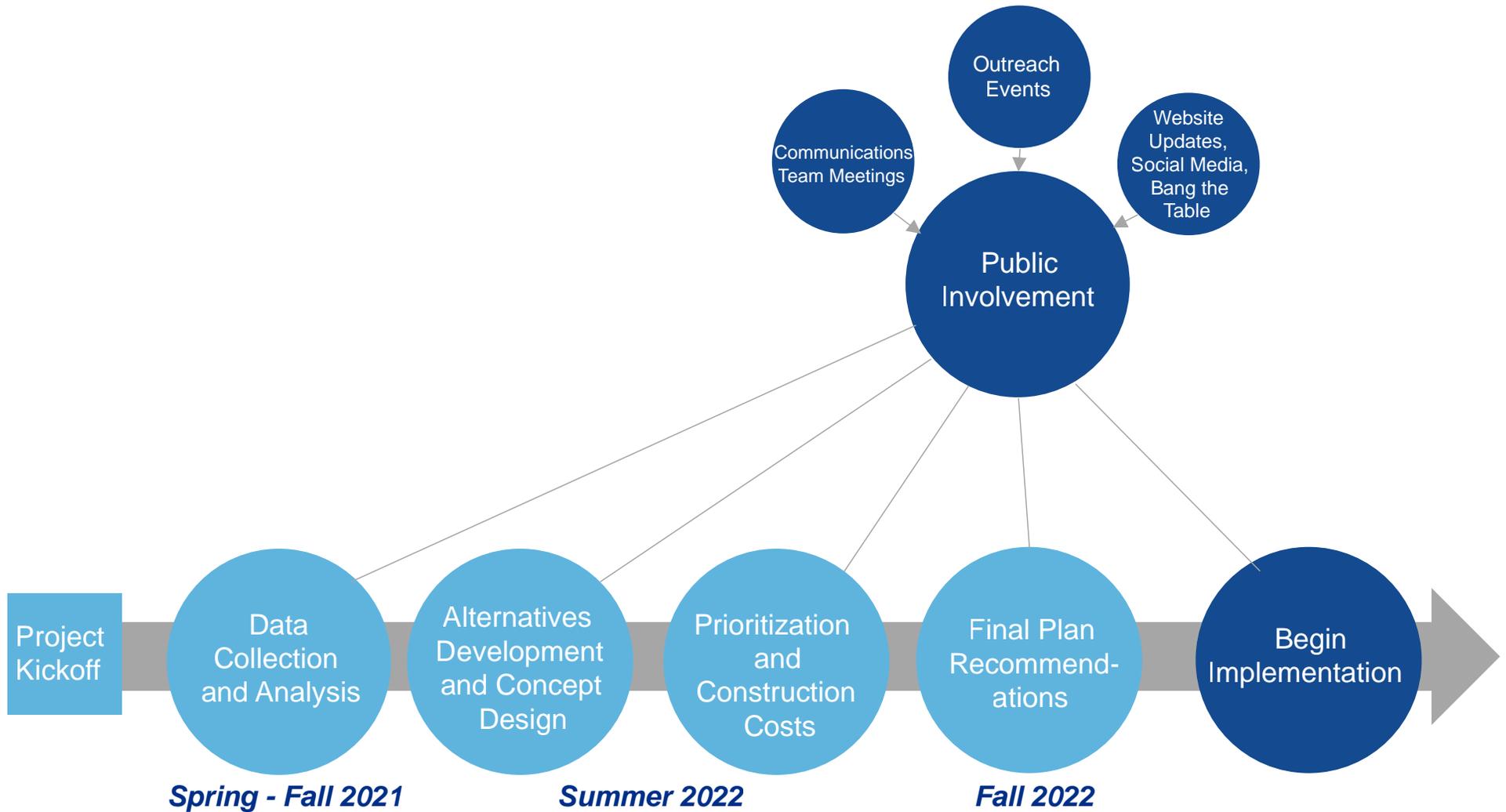


Figure B1: Public Outreach Approach and Timeline



Public Involvement Phased Campaigns

Three phases of public engagement have taken place.

Phase 1: Build Awareness and Confirm Action Plan Goals

From July 2021 through December 2021, multiple means of gathering public feedback were employed. A total of 569 comments were collected.

Phase 2: Explain Options and Defining Priorities

The second phase was focused on online surveys that invited input on the Design Alternatives. The surveys opened in Jan 2022, and closed in March 2022. A total of 721 responses were collected.

Phase 3: Input on Priorities and Actions

After the Alternatives Development process (described in Chapter 5), the proposed Concepts were presented to the public for feedback in August - September 2022. Approximately 500 comments were collected.

In total, approximately 1,800 comments were collected from July 2021 - October 2022.

Public Engagement: Phase 1

Outreach Phase 1: Building Awareness and Confirm Action Plan Goals.

Public Engagement for Phase 1 included:

- Midway Multimodal Project information and upcoming events posted on the Broomfield Voice website throughout the project.
- 21 Interactive Social Media Posts
- Interactive Broomfield Voice Public Engagement Map (English & Spanish) produced location-specific public comments based on existing conditions
- Discussion Forum Question of the Week posted on Broomfield Voice as well as official Broomfield social media.
- Information included in 3 newsletters, inviting the public to participate.
- Emails sent to key public stakeholders, informing them of upcoming events, and inviting them to share and participate.
- 3 Virtual Public Meetings, with a recording posted to the Broomfield Voice website.
 1. 9/20/2021
 2. 9/22/2021
 3. 9/23/2021
- 2 “pop up” meetings at community events:
 - National Night Out (2021)
 - Broomfield Days (2021)



Phase 1 Total Comments

Methods of Public Engagement: Phase 1

Significance:

66.1% of the comments were received virtually.

- The biggest virtual collector was the Broomfield Voice Public Engagement Map, contributing 45% of total Phase 1 comments.
- Public Meetings were virtual, and therefore included in this count.
- The virtual platforms were successful for English speakers. There were very few responses to outreach materials in languages other than English.

30.9% of the comments were received in-person.

- 22% of total comments were received during the in-person event, Broomfield Days 2021.

3% of comments were received via the Phone Hotline.

- Although not common, it is important to provide a means of contact for those who are unable or uncomfortable contributing online.

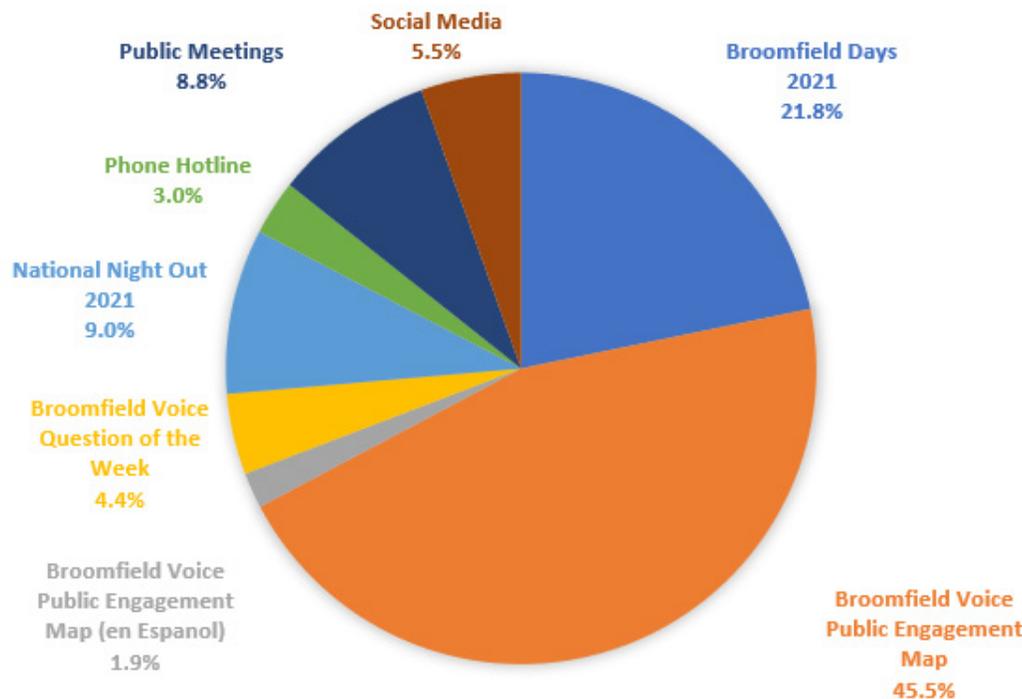
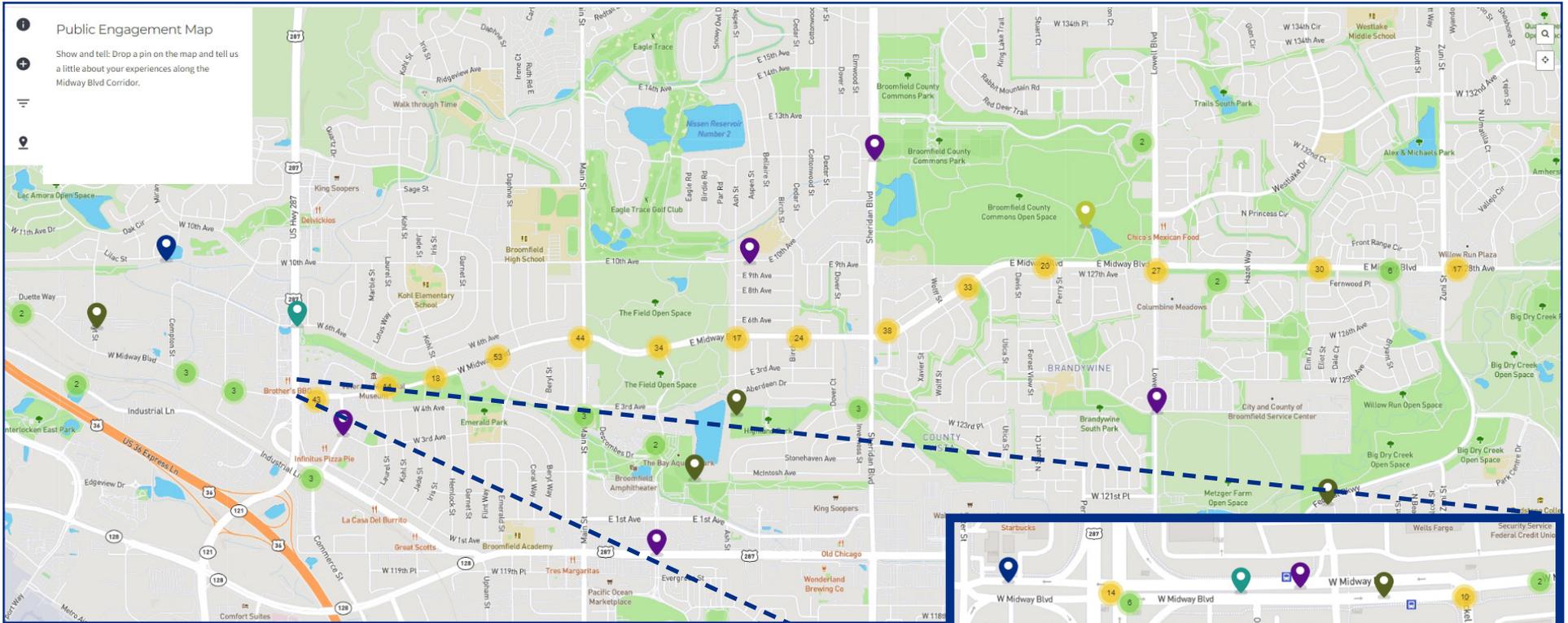


Figure B2: Phase 1 Outreach Methods

Public Engagement Map: Existing Conditions

The interactive Public Engagement Map hosted on the Broomfield Voice website displayed the community's location-specific comments about existing conditions along the Midway Blvd Corridor. Individuals shared comments on their support, experiences, concerns, and ideas for improvements.



Significance:

- A total of 569 comments were collected.
- Being able to zero-in on the exact location of public comments and concerns enabled the design team to create a solution that precisely meets the needs of the corridor.
- Participants submitted additional comments on locations that are not on the Midway corridor, providing additional insight and context.

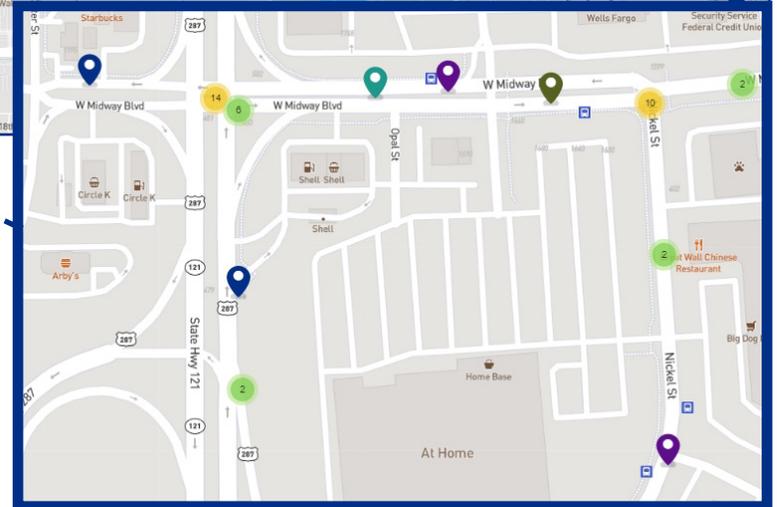


Figure B3: Phase 1 Public Engagement Map Sample

Public Engagement by Transportation Mode

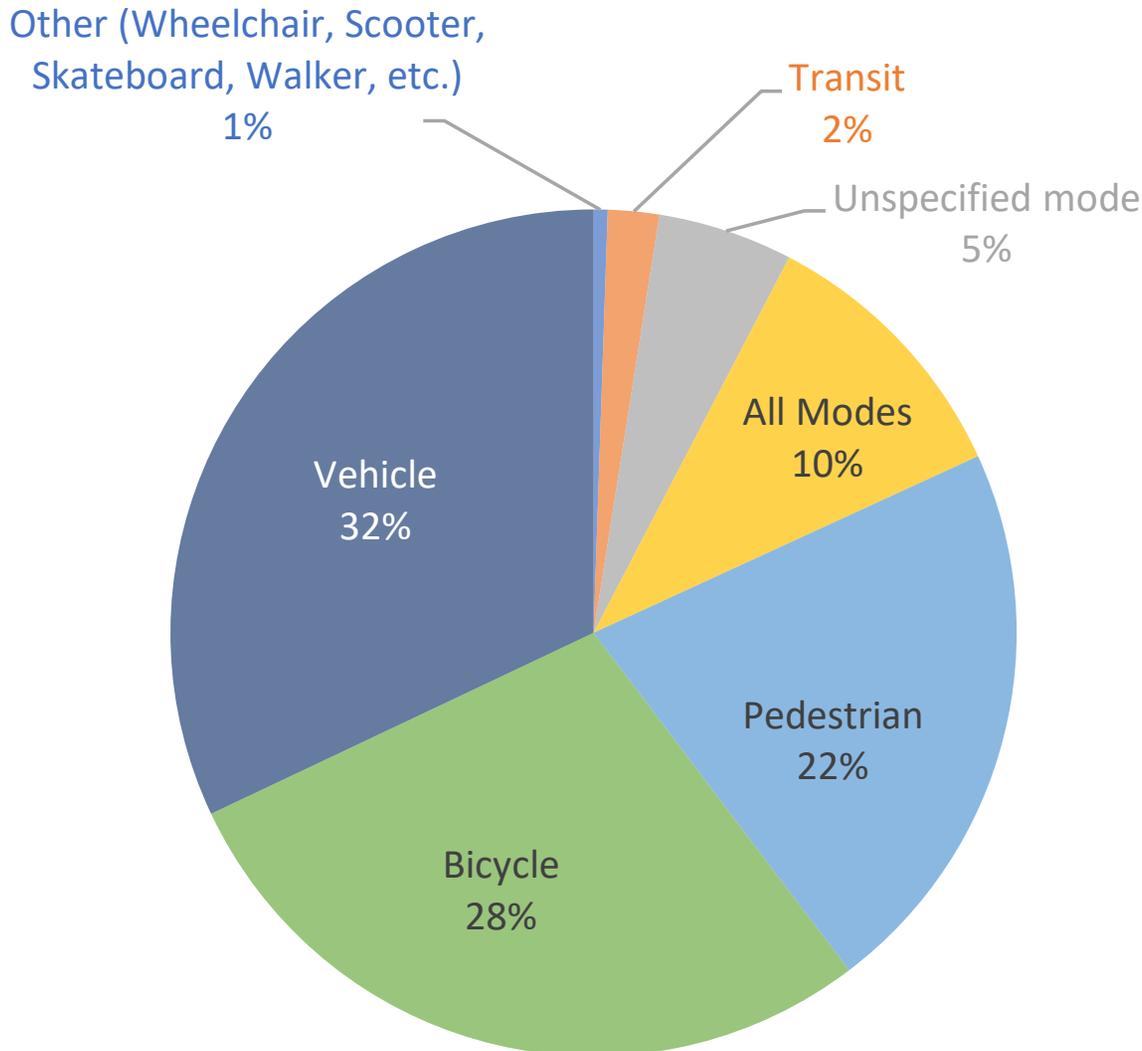


Figure B4: Existing Public Modes of Transportation

Significance:

- Public feedback on Midway Blvd has been uncommonly balanced between the three main transportation modes: vehicle, bicycle, and pedestrian.
- 51% of participants commented upon active modes of transportation, indicating that this corridor could have a high potential for mode-shift to more active forms of transportation.
- This community has diverse needs which require a balanced solution. Accessibility for all must be a priority.

Feedback by Location and Mode

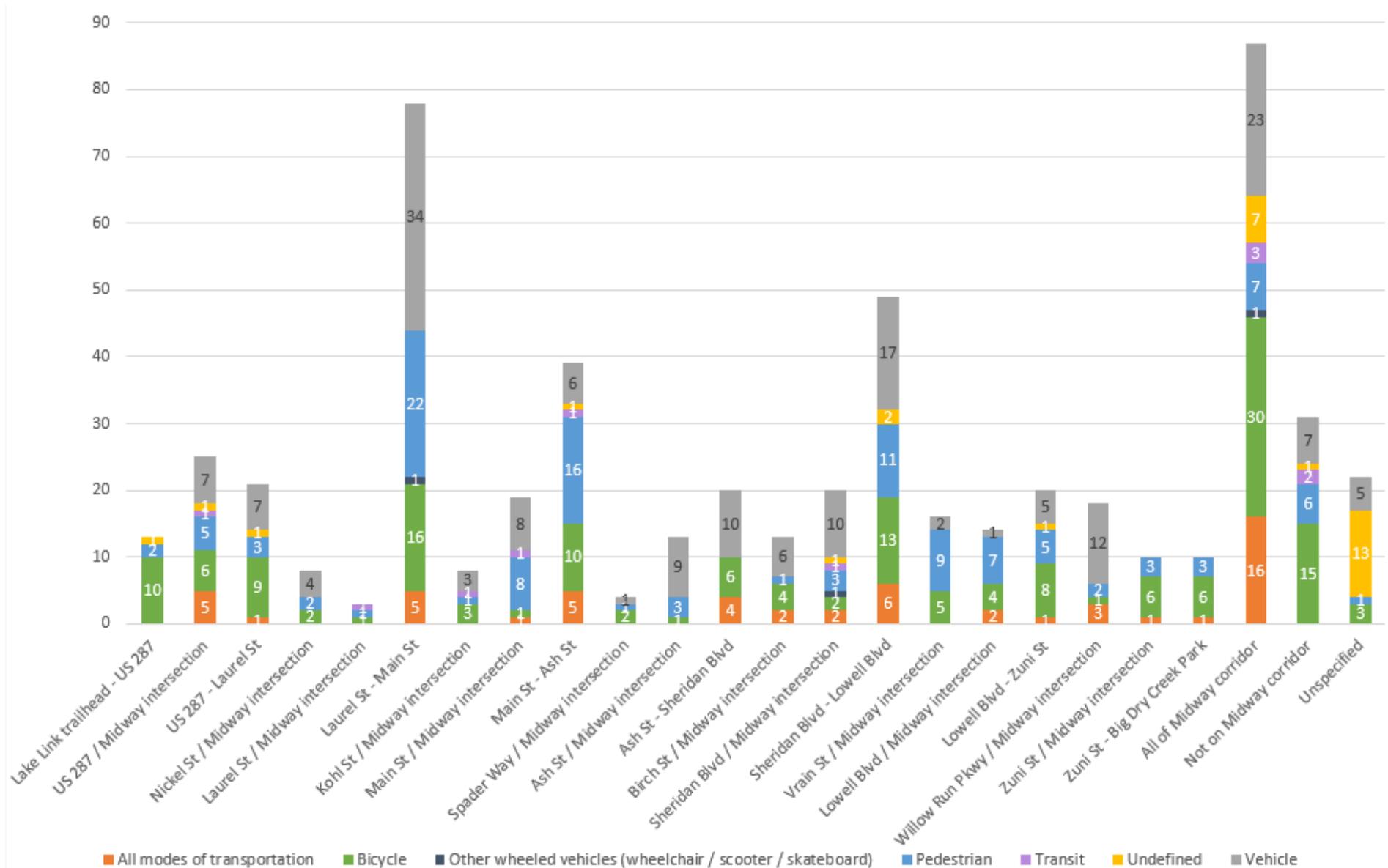


Figure B5: Phase 1 Public Feedback by Location



Feedback by Location and Mode

Significance:

- The intersection with the highest number of comments was US 287 and Midway Blvd. Anecdotally, many participants chose not to comment on this intersection due to its complexity and seeming unapproachability, despite noting it as a desirable path of travel.
- The segment between Laurel Street and Main Street received the highest number of comments, with the highest percentage related to vehicles, reflecting the current competing spacial needs between modes in this constrained segment.
- Comments made about the whole Midway corridor were most commonly about people on bicycles, indicating that a corridor-wide strategy for facilitating bicycle use is critical.

Phase 1 Public Input Significance

Detailed categorization of all of the Phase 1 comments reveal the top three public concerns, and provide guidance on where to focus efforts:

The significant number of comments on so many varied topics reflects a broad range of interests and usage of the corridor.

1. Safety - Crash Concern or Crash History
2. Safety - Crossing
3. Bicycle Facilities

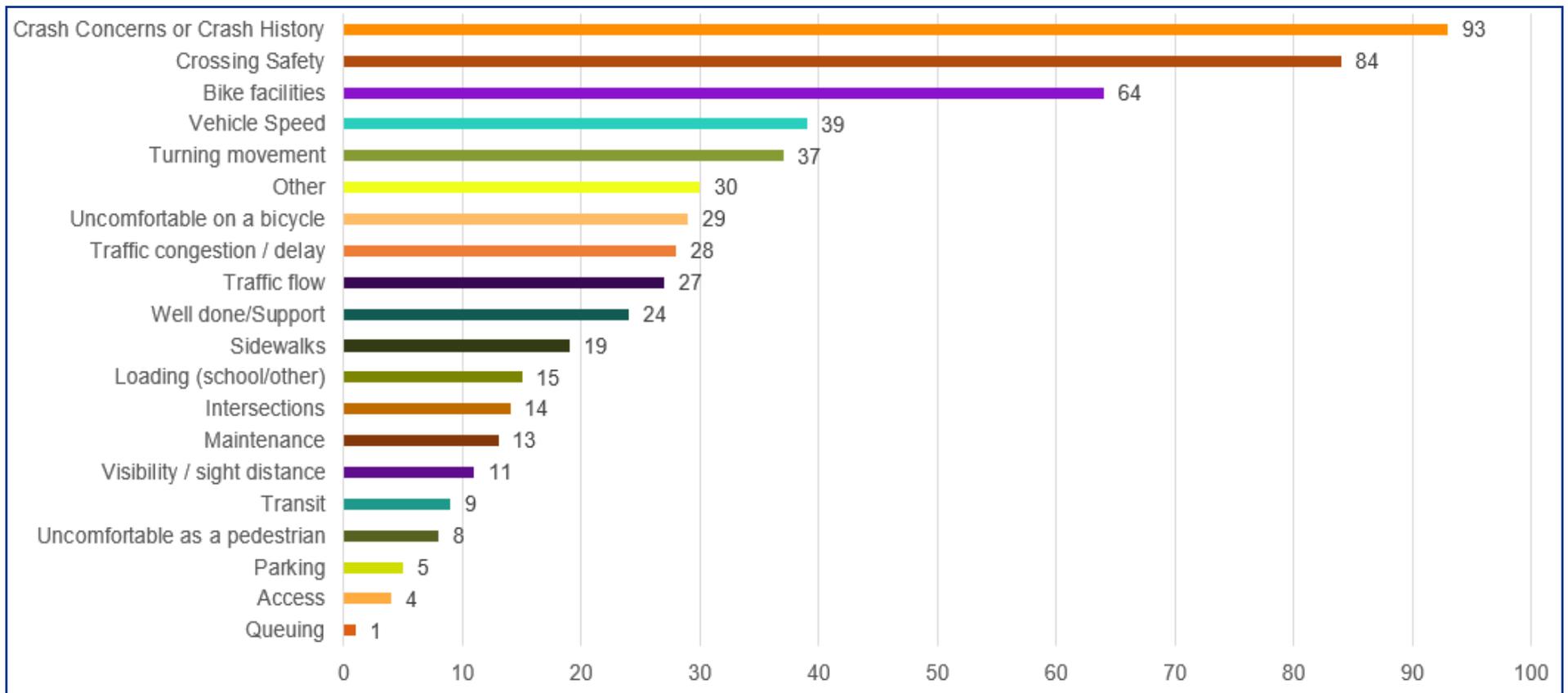


Figure B6: Phase 1 Top Public Concerns

Public Engagement: Phase 2

Outreach Phase 2: Explaining Options and Defining Priorities.

Public Engagement for Phase 2 included:

Design Alternatives Online Surveys on the Broomfield Voice webpage. The public surveys were open January 26, 2022 - March 31, 2022, and included:

Three Alternative Design options for each section of the corridor were developed. Details of this process is further discussed in Chapter 5.

- **1 Three-Minute Quick Input Survey**, to assess public prioritization of features within the project.
- **5 Segment-Specific Surveys**, each included 3 different design alternatives. The public was invited to rate their preferred choice and contribute comments.



Phase 2 Total Comments

The sections include:

West: Lake Link Trail to US-287

West-Central: Laurel St to Main St

Central: Main St to Ash St

East-Central: Ash St to Sheridan Blvd

East: Sheridan Blvd to Zuni St

Note: The US 287 to Laurel St segment varies significantly throughout, therefore this was addressed as a Plan View overhead diagram in Phase 3 (Concept) Engagement, instead of cross-sections.

Phase 2 Outreach Advertising:

- Project information and upcoming events posted on the Broomfield Voice website throughout the project.
- 3679 Postcards were mailed out, printed in English & Spanish, inviting the public to participate.
- Emails to key public stakeholders, regarding Design Alternatives.
- 6 weeks of social media pushes
- 2 newsletters

Design Alternatives Surveys: 3-Minute Quick Input Survey

3 MINUTE SURVEY RESPONDENT BACKGROUND:

504 responses

- 62% live in Broomfield and travel the Midway corridor
- 60% live near the Midway corridor
- 37% travel to parks near the Midway corridor
- 9% have participant homes front the Midway corridor
- 6% cross the Midway corridor to access a school
- 6% own / work at a business near the Midway corridor

- I live near the Midway corridor
- My home fronts the Midway corridor
- I live in Broomfield and travel in the Midway corridor
- I own/work at a business near the Midway corridor
- I travel to parks and open space near the Midway corridor
- I cross the Midway corridor to access a school

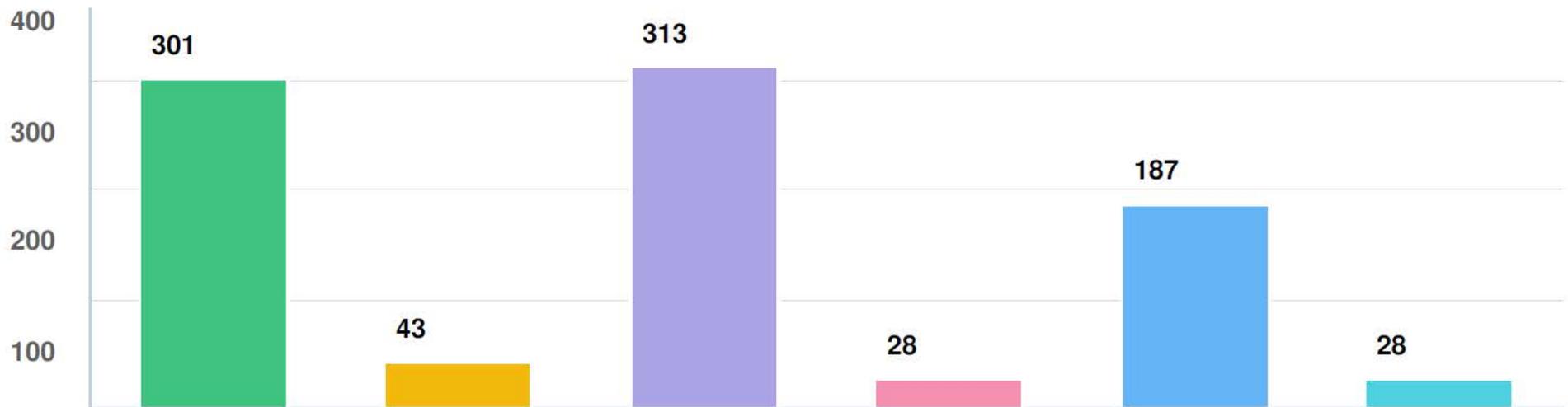


Figure B7: Phase 2 3-Minute Survey Demographics

Design Alternatives Surveys: 3-Minute Quick Input Survey

Survey Prompt: *What features should be a top priority for the project team to study in the coming months?*

- multi-use paths above the existing curbs
- bike lanes with painted buffers from moving traffic
- bike lanes with vertical protection from moving traffic
- intersection safety features
- mid-block crossings
- smart technologies with sustainable features
- none

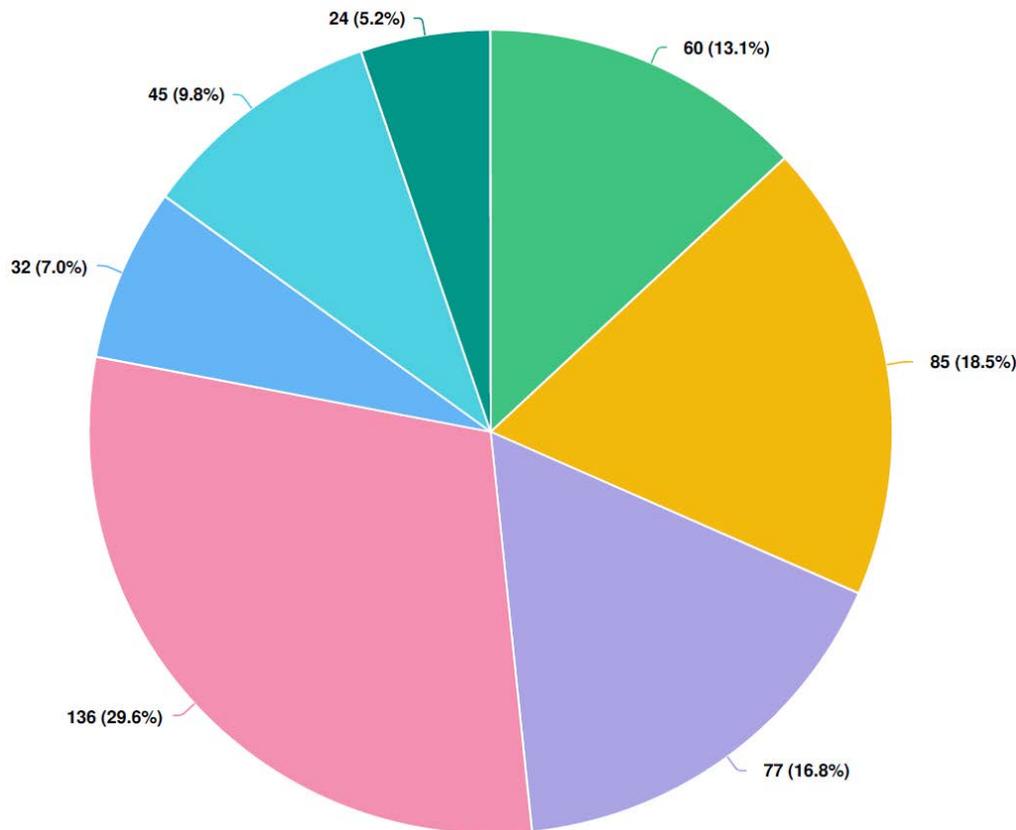


Figure B8: Phase 2 3-Minute Survey Public Top Priorities

Significance:

- The highest priority was additional protection for people on bicycles and pedestrians, roughly evenly split between Multi-Use Path (MUP), buffered bicycle lanes (BBL), and protected bicycle lanes (PBL).
- Intersection safety improvements, including crossing safety was the second highest priority
- Speeding throughout the corridor is a major safety concern.
- Traffic congestion is a concern in some areas.
- **Bicycle Facilities:**
 - Many comments indicated they wish to ride a bicycle along the corridor, but currently find it unsafe to do so.
 - Participants desire separation of bicycles and vehicles.
 - 80% would consider or want buffers.
 - 57% would consider or want raised bicycle lanes.
- **Intersection safety:**
 - A vast majority of participants desire improvements to safety at intersections, as well as mid-block crossings.
 - Sight-visibility was frequently cited as a concern.
 - 91% would consider or want additional safety features at intersections.
 - 69% would consider or want additional mid-block crossing locations (26% opposed).

Design Alternatives Surveys: WEST Lake Link to US 287

Survey Prompt: *Which of the west Midway Boulevard alternatives is your top priority?*

● Existing conditions (leave it as is) ● Alternative A (short term option) ● Alternative B (new multiuse pathway)
● Alternative C (full complete street treatment)

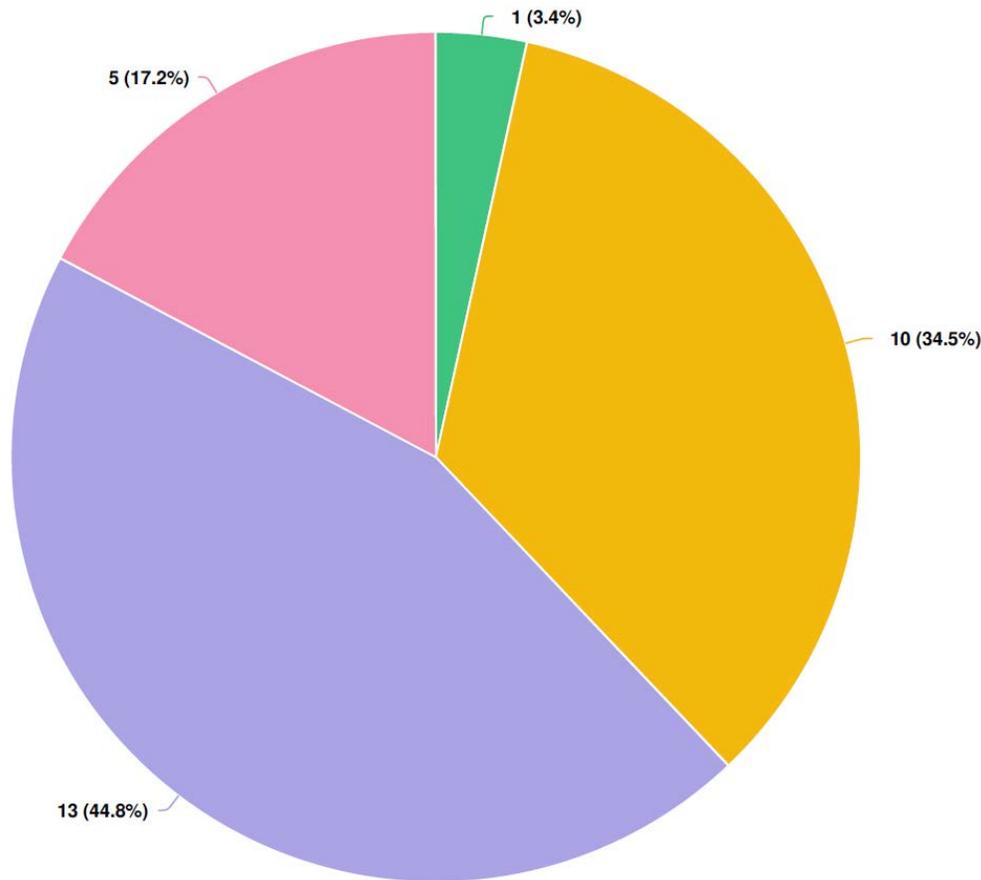


Figure B9: Phase 2 Lake Link to US 287 Survey Public Top Priorities

Significance:

- 96% think it needs minor to major changes.
- **Buffered bicycle lanes and Multi-Use Paths** option is highest priority.
- Almost 50% think the median option is not an acceptable option.
- Participants stressed that this section is an important bicycle and pedestrian link for the rest of Broomfield, and to the US-36 Bikeway.
- Crossing the US 287 intersection is a major safety concern for pedestrians and people on bicycles.

Design Alternatives Surveys: WEST CENTRAL Laurel St to Main St

Survey Prompt: *Which of the west central Midway Boulevard alternatives is your top priority?*

Existing conditions (leave it as is) Alternative A (reallocate parking or lanes) Alternative B (build multi-use path)
Alternative C (protected/raised bike lanes)

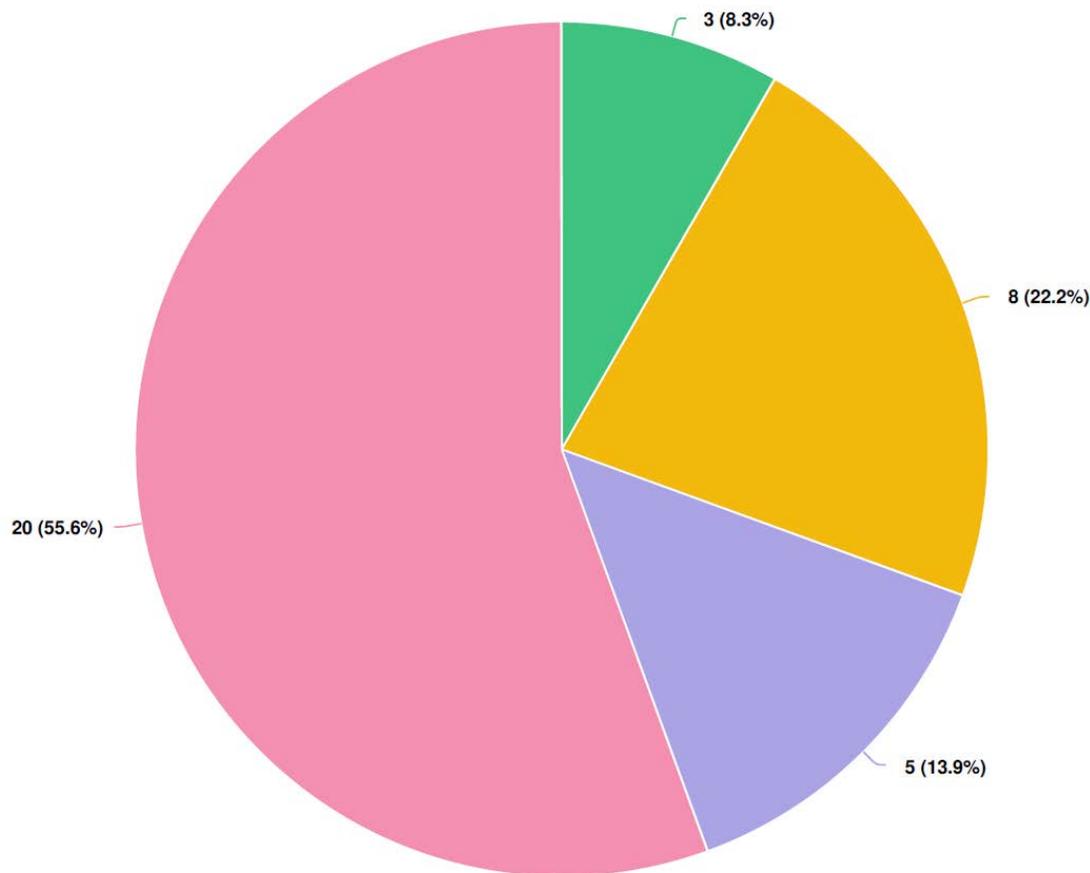


Figure B10: Phase 2 Laurel St to Main St Survey Public Top Priorities

Significance:

- 98% think it needs minor to major changes.
- 66% think this section needs MAJOR changes (*highest on corridor*).
- Protected / Raised Bicycle Lanes with Multi-Use Paths option is highest priority.
- Almost 50% think the interim buffered bicycle lane option is not acceptable, because it does not provide enough safety for people on bicycles and pedestrians, and because of concern for removing the turn lane at Nativity of Our Lord Catholic Church & School.
- Congestion and queuing is a concern near the church and school.
- Parking is a concern in this section.

Design Alternatives Surveys: CENTRAL Main St to Ash St

Survey Prompt: *Which of the central Midway Boulevard alternatives is your top priority?*

● Existing conditions (leave it as is) ● Alternative A (add buffer bike lanes) ● Alternative B (build multi-use path)
● Alternative C (protected/raised bike lanes)

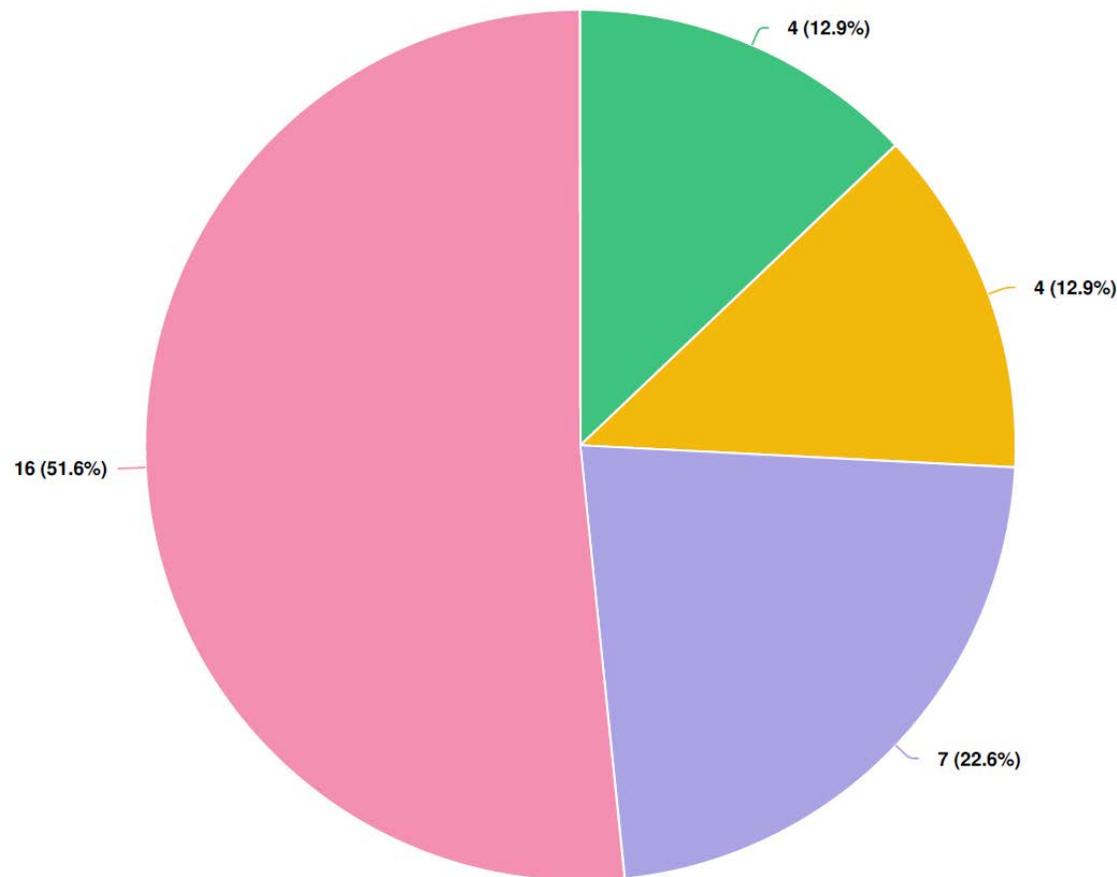


Figure B11: Phase 2 Main St to Ash St Survey Public Top Priorities

Significance:

- 83% think it needs minor to major changes.
- 21% think this section needs MAJOR changes (*lowest on corridor*).
- Protected / Raised Bicycle Lanes and off-street Multi-Use Paths option is highest priority.
- Crossing Safety is a major concern, especially with sight-distance impediments. However, many participants stated they enjoy the foliage for its aesthetic and noise-reduction advantages.
- Speeding is a major safety concern.
- Many residents stated that parking in this segment is unnecessary.

Design Alternatives Surveys: EAST CENTRAL Ash St to Sheridan Blvd

Survey Prompt: *Which of the east central Midway Boulevard alternatives is your top priority?*

- Existing conditions (leave it as is)
- Alternative A (add buffer bike lanes)
- Alternative B (build multi-use path)
- Alternative C (protected/raised bike lanes with multi-use path)

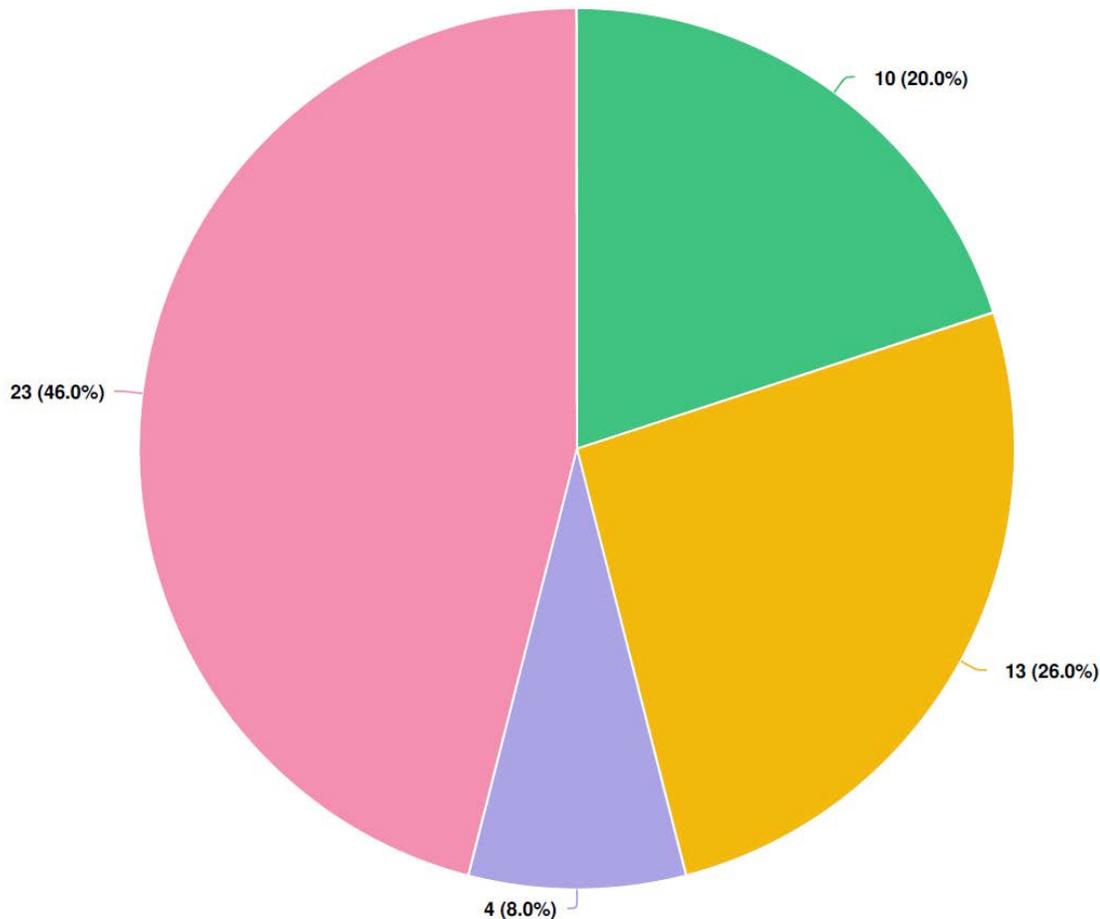


Figure B12: Phase 2 Ash St to Sheridan Blvd Survey Public Top Priorities

Significance:

- 88% think it needs minor to major changes.
- **East-bound buffered bicycle lane and west-bound protected bicycle lane with Multi-Use Paths (MUP) option is highest priority.**
- 54% don't think Option B (Multi-Use Path and moving north curb in) is acceptable for multiple reasons.
- Speeding is a major safety concern.
- **Traffic noise is a concern for residents.**

Design Alternatives Surveys: EAST Sheridan Blvd to Zuni St

Survey Prompt: *Which of the east Midway Boulevard alternatives is your top priority?*

- Existing conditions (leave it as is)
- Alternative A (add buffer bike lanes)
- Alternative B (build multi-use path)
- Alternative C (protected/raised bike lanes with multi-use path)

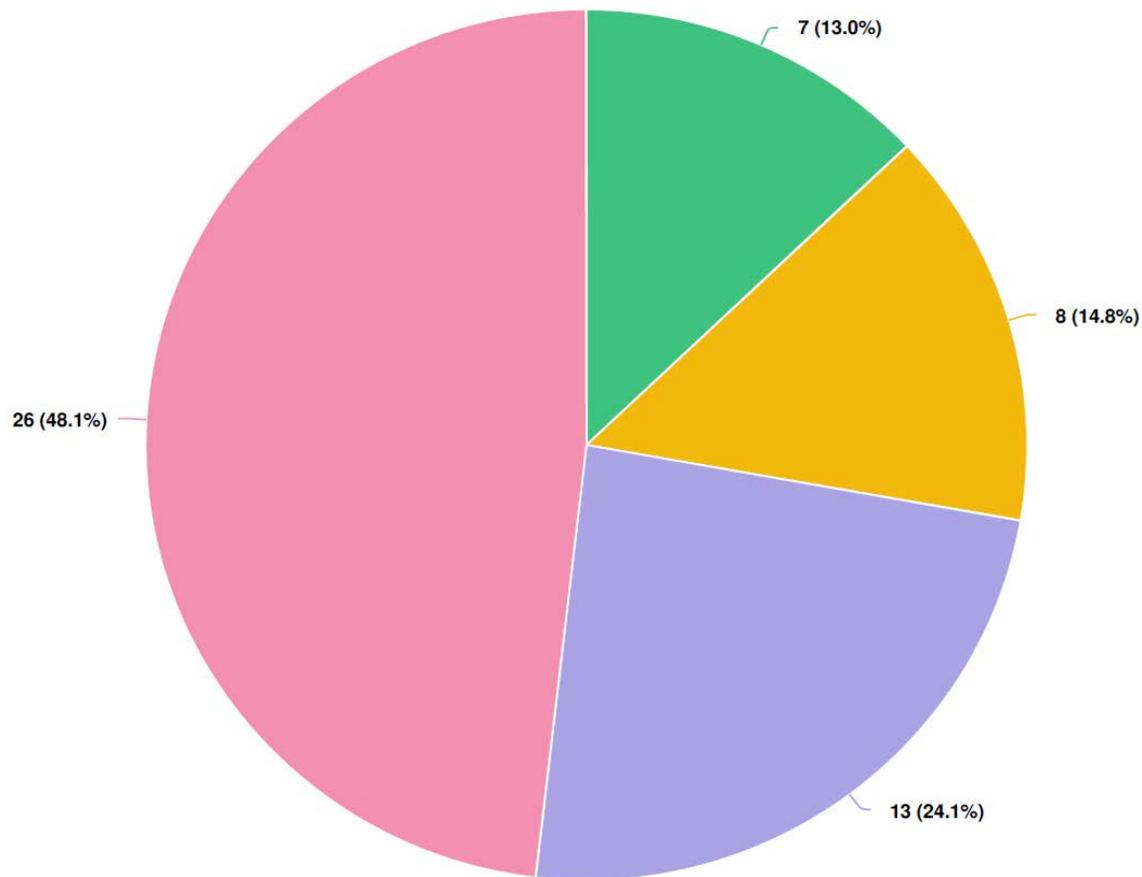


Figure B13: Phase 2 Sheridan Blvd to Zuni St Survey Public Top Priorities

Significance:

- 88% think it needs minor or major changes.
- Protected / Raised Bicycle Lanes and Multi-Use Paths option is highest priority.
- Pedestrian crossing concerns are high in this segment.
- Accessing Midway Blvd from the Willow Run Parkway intersection often feels unsafe.
- Speeding and aggressive driving is a major safety concern. Multiple comments suggested reducing travel lanes to one each direction.

Phase 2 Public Input Significance

- The more than 700 total responses provided by the community increased the project team's understanding of the preferred design concepts along the Midway Blvd corridor.
- Approximately 90% of respondents think the Midway Blvd corridor needs minor to significant changes
- People are most concerned about:
 - Speeding
 - People on bicycles / pedestrian safety
 - Intersection & Crossing safety
 - Congestion
- Speeding:
 - Speeding throughout the corridor is a major safety concern
- Additional protection for people on bicycles and pedestrians:
 - Off-street protected bicycle lanes with Multi-Use Paths are the stated preference
 - Many participants indicated they desire to bicycle along the corridor, and will do so if safety improvements are made
- Intersection crossing safety improvements. Areas most frequently focused on by participants:
 - Laurel St - Main St
 - Willow Run Pkwy/Elm Ln intersection
- Congestion:
 - The Midway Blvd corridor must be considered in context of surrounding traffic patterns
 - The safety and traffic-flow benefits of roundabouts were supported



Public Engagement: Phase 3

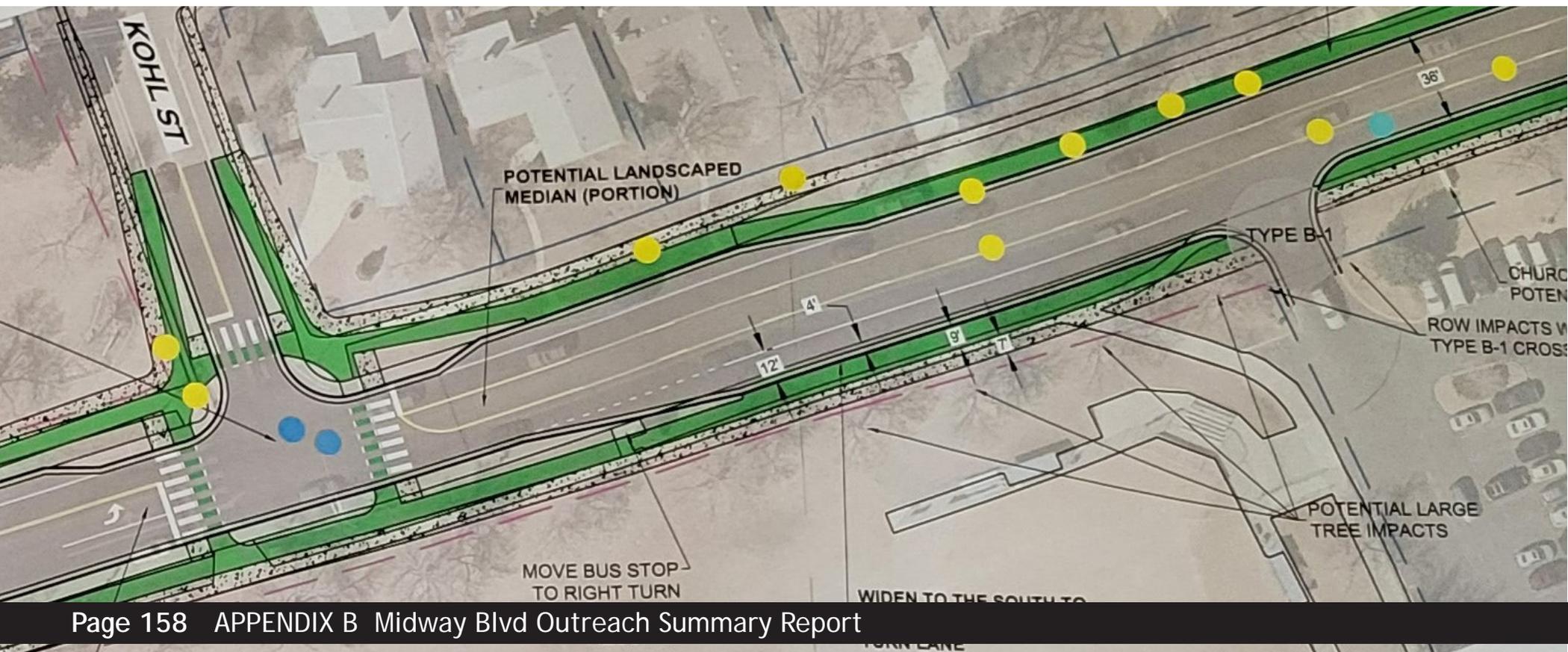
Outreach Phase 3: Input on Priorities and Actions.

Public Engagement Phase 3 included gathering public feedback on Draft Concept Diagrams (birds-eye-view diagrams) of alternative designs, and the proposed concept. The public were engaged in a variety of ways, including:

- **Interactive Broomfield Voice Public Engagement Map and Responses** produced location-specific public comments based on the Future and Interim Concept Designs.

- **Four in-person Public Events**
 1. Pop-Up at Broomfield Library, 9/10/22
 2. Pop-Up at Paul Derda Recreation Center, 9/15/22
 3. Broomfield Days 2022, 9/17/22
 4. Oktoberfest Senior Lunch, 9/23/22

Figure B14: Sample of Public Input on Phase 3 Proposed Concept





Phase 3 Outreach & Public Comment Sources

Receiving and inputting public input into the Proposed Concept recommendation has been a key focus of this project. Nearly 500 comments were collected in Phase 3. These came from a variety of sources, and the biggest contributor was Broomfield Days 2022.

Phase 3 Advertising:

- Project information and upcoming events posted on the Broomfield Voice website throughout the project.
- 4 in-person Public Events
- 10 social media posts, including Facebook, Instagram, Twitter, LinkedIn & NextDoor
- 3679 postcards mailed
- Emails to key public stakeholders, regarding draft concept plans.
- Information included in 16 newsletters:
 - 4 in Transportation (July, August, September, October)
 - 2 in Sustainability (August, September)
 - 10 in B in the Loop (Broomfield weekly newsletter)

- Broomfield Days 2022 (9/17/22)
- Oktoberfest (9/24/22)
- Online Public Engagement Map: FUTURE PLANS
- Online response Concern FUTURE PLANS
- Online response Priority FUTURE PLANS
- Other
- Pop-Up at Broomfield Library (9/10/22)
- Online Public Engagement Map: interim PLANS2
- Online response: Priority interim PLANS2
- Online response: Concern interim PLANS2
- Phone Hotline
- Stakeholder email

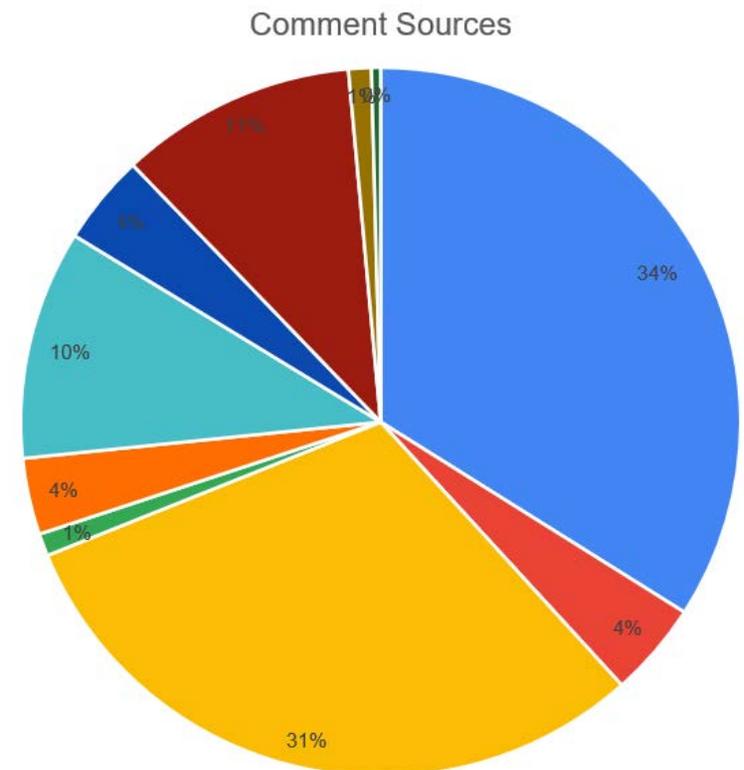


Figure B15: Phase 3 Outreach Methods

Fall 2022 In-Person Events

At the in-person events, the public was invited to review printouts of the Alternative Designs and the Proposed Concept, and provide their input.



MIDWAY BLVD MULTIMODAL PLAN *You Spoke WE LISTENED*

Concept Plans

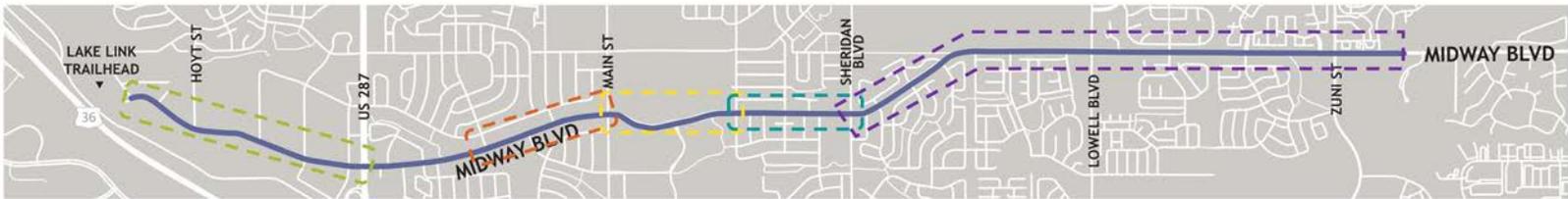


Figure B16: Sample Materials at Phase 3 In-Person Events



CROSS SECTION NOTE:
Proposed cross sections shown are base cross sections for each roadway segment. Cross section will vary depending on presence of trees, need for turn lanes, and existing demand (auto traffic). Bike lane is at elevation of sidewalk.

CROSS SECTION B

CROSS SECTION B - Existing and Proposed

Protected Bike Lane/Multi-Use Path Concept - Central

Public Engagement Map: Proposed Concepts

The interactive Public Engagement Map hosted on the Broomfield Voice webpage displayed details of the existing conditions, Proposed Interim Concepts, and the Proposed Future Concepts. (See [Appendix H: Project Descriptions for Proposed Concepts.](#)) The interactive maps opened August 4, 2022, and closed October 4th, 2022. Individuals shared location-specific comments on their support, experiences, concerns, and ideas for improvements.

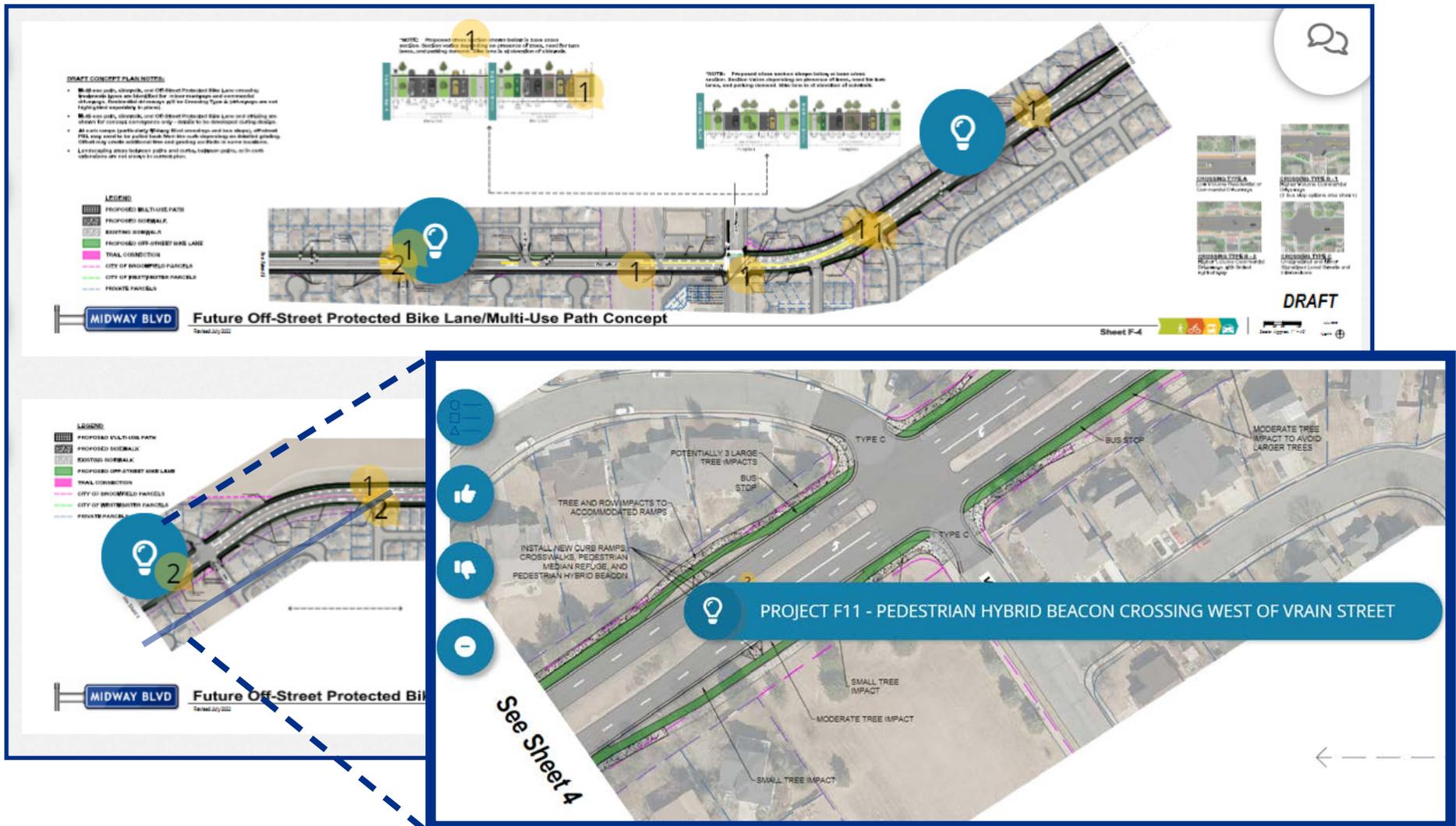


Figure B17: Sample of Phase 3 Public Engagement Map

Online Responses: Priorities & Concerns

The public was invited to review two sets of proposed concepts:

- Interim Concepts, which offer a lower-cost shorter-term option that could be implemented sooner.
- Future Concepts, which offer the most ideal designs, knowing they may take longer to implement.

In addition to the interactive map, participants were able to participate in surveys to share their project priorities and concerns for each project within the Interim Concepts and the Future Concepts.

There was a relatively low number of responses to the **Priority Surveys**.

- The highest priority for the Interim Concept projects was **Main St Intersection Improvements**.
- The highest priority for the Future Concept projects were:
 1. **Lowell Blvd Intersection Modifications and protected bicycle lanes from Sheridan Blvd to Lowell Blvd.**
 2. **Midway and US-287 Intersection Improvements.**
 3. **South-side Multi-Use Path on Midway between Lake Link Trail and US-287.**

There was also a low response to the **Concern Surveys**.

- There were no project-specific concerns shared the Interim Concept projects.
- The highest priority for the Future Concept projects was **protected bicycle lane from Nickel St to Main St.**



All Comments: Major Issues

Of the nearly 500 comments, a cascade of topics is important to the public.

The top 5 issues that emerged from Phase 3 are

1. Bicycle Facility design
2. Support for the project concepts
3. Parking
4. Crossing Safety concerns
5. Vehicle Speed

Major Issues Identified in Comments

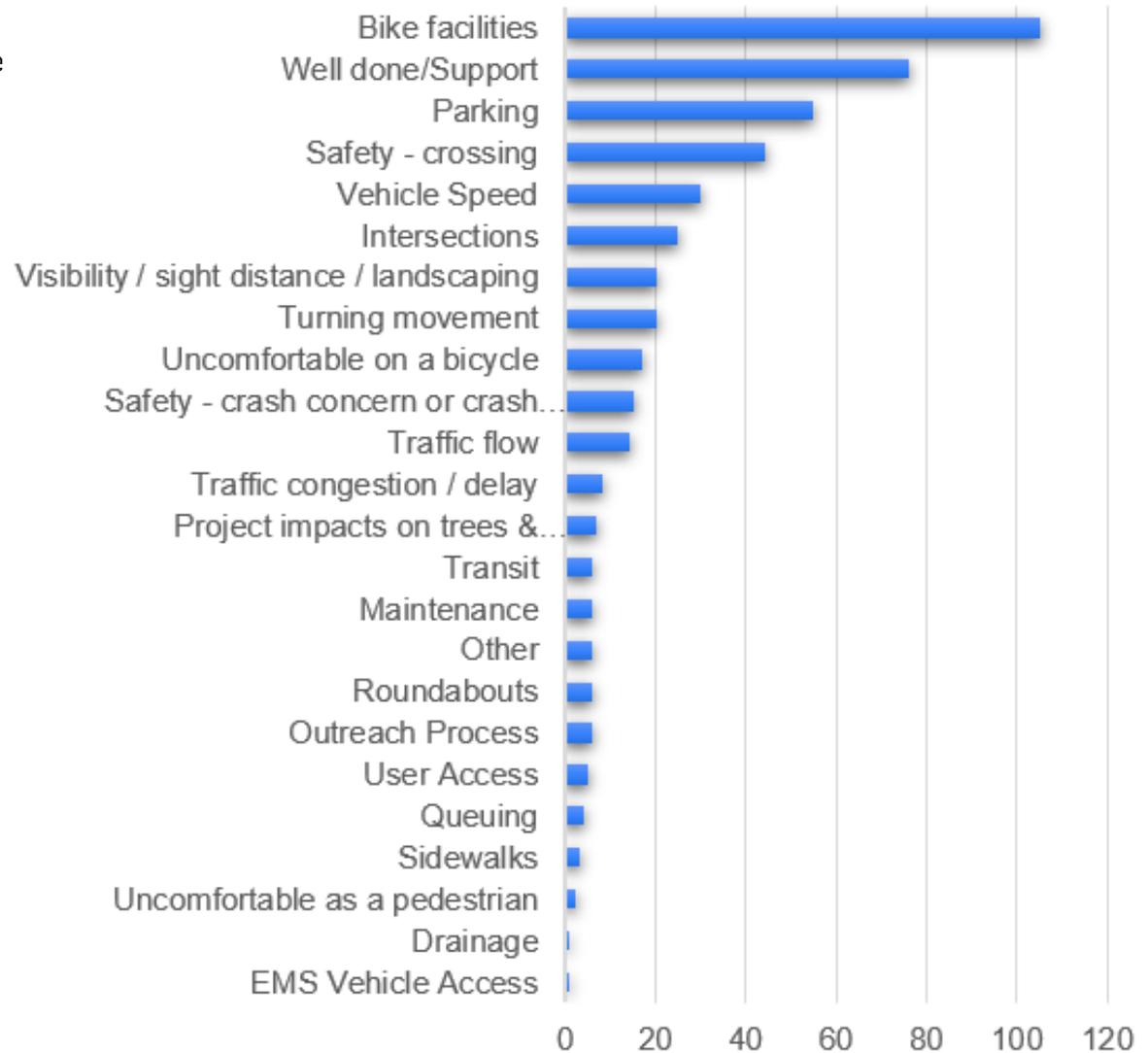


Figure B18: Phase 3 Top Public Concerns

All Comments: Location Focus

As has been consistently demonstrated throughout the project, the main areas of focus remain:

- US 287 - Laurel St
- Laurel St - Main St
- Sheridan Blvd - Lowell Blvd
- All of Midway Corridor

Location of Comments

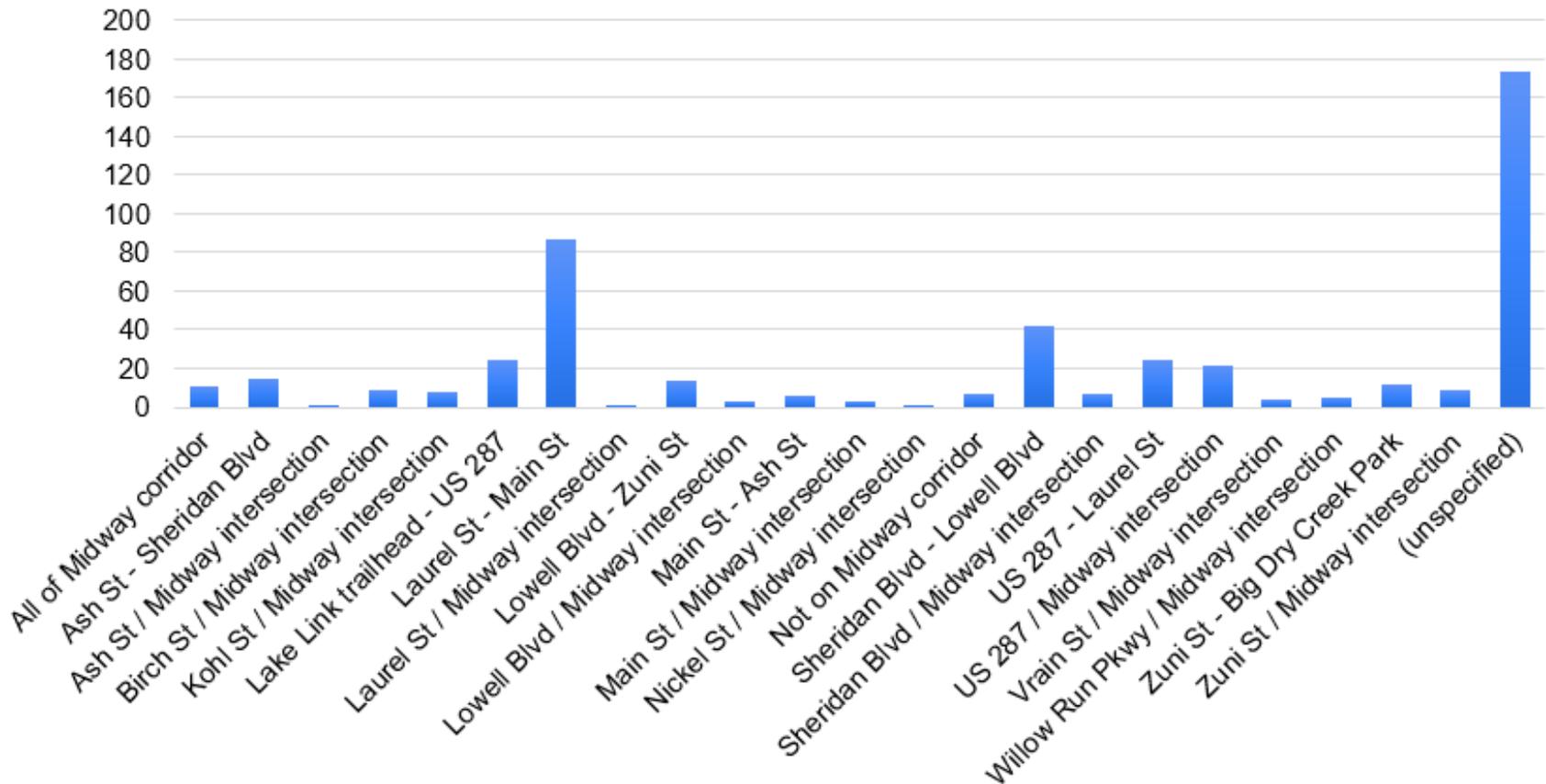


Figure B19: Phase 3 Public Feedback by Location

Phase 3 Public Input Significance

Interactive Broomfield Voice Public Engagement Maps:

DRAFT Interim Concept Plans:

- 4,030 views
- 59 comments and responses submitted

DRAFT Future Concept Plans

- 4,233 views
- 171 comments and responses submitted

In-Person Events*:

**The number of comments and individuals engaged at each In-Person Event is an approximation, as comments were collected in a busy environment where individuals shared a varying amount of ideas while speaking with Project Team members.*

1. Pop-Up at Broomfield Library, 9/10/22, 11:30 AM - 2:30 PM
Approximately 50 people engaged
2. Pop-Up at Paul Derda Rec Center, 9/15/22, 4:00 - 7:30 PM
Approximately 30 people engaged
3. Broomfield Days 2022, 9/17/22, 10:00 AM - 3:30 PM
Approximately 300 people engaged
4. Oktoberfest Senior Lunch, 9/23/22, 11:00 AM - 1:30 PM
Approximately 30 people engaged

The key issues from these online input and these conversations were captured, as follows:

- The public demonstrated they were very interested in this project, with the large majority of comments in support of the project.
- The largest number of comments and concern was in the Laurel St - Main St section.
- An interest in the speed, crossing, and safety benefits of roundabouts surfaced in discussions about intersection safety.
- Residents raised concerns regarding the possibility of losing parking near their property.



Phase 3 Total Comments

Public Engagement All Phases Cumulative Significance

Outreach Advertising for all 3 Phases of Public Engagement:

- Project information and upcoming events posted on the Broomfield Voice website throughout the project
- Ongoing forum topics and questions on Broomfield Voice
- Ongoing targeted social media posts, including Facebook, Instagram, Twitter, LinkedIn, & NextDoor
- 2 rounds of 3679 postcards mailed, for Phase 2 and Phase 3 (English & Spanish)
- Phase-specific emails to key public stakeholders.
- Information included in 21 newsletters
- 9 public events (3 virtual, 6 in-person)
- 2 online interactive map projects, 1 focused on existing conditions and 1 focused on concept plans
- 6 Design Alternative surveys



Total Input:

- Approximately 1,800 total comments

Total Comments

Significance:

Throughout all three phases of the Public Engagement, reoccurring themes have emerged:

- The public is interested, engaged, and invested in the Midway corridor, and travel the area for a variety of activities and purposes.
- People consistently express interest in how bikeways can serve the Midway Corridor, with strong preference to off-street protected bicycle lanes or multi-use paths.
- Concerns for safety of people walking and on bicycles is a major theme.
- Crossing the road, especially near schools and parks, raises legitimate concerns for pedestrian safety.
- Intersection safety is a major concern.
- Some residents are concerned about the possibility of losing parking near their property.
- Speeding is a major concern, especially on the eastern portions of the corridor.
- Long queues and traffic congestion is a concern.
- The options presented in this project have been met with a majority of positive feedback.

APPENDIX C Intersection Improvements and Enhanced Pedestrian Crossing Treatments

Color Key

Capital/Curbwork Project
Traffic Control (signal or signing)
Pedestrian Crossing Treatment

Location	Potential improvement	Purpose	Considerations	Low Cost Option	Capital Options
Hoyt St	Curb extensions on all corners. Crosswalks on north leg and west leg.	Shorten crossing distance, improve pedestrian visibility	Need throat to be wide enough for trucks to turn in and out as necessary. Drainage. NOTE: North leg throat width may need to be widened if bicycle facility connection to north is finalized on this roadway.	Paint/Post	Capital Project
Alter Street (south leg)	Create 3/4 access intersection using median island (allowing LTs off of Midway, but not onto Midway). Remove bypass island and tighten radius on SE corner. Remove accel lane between Alter and the gas station driveway, leaving approximately 100' of deceleration lane for the 287 intersection.	Make room for MU path on south side and tighten up the Alter and Midway intersection. Reduce conflicting movements, particularly in close proximity to US 287 intersection.	Truck turning and operations at the 287 and Midway EB approach	N/a	Capital Project
SH 287	Redesign right turn bypass islands on the SE, SW and NE corners and place "raised crossings" within the right turn bypass at all four corners.	Speed reduction and better yielding in crosswalk for right turning vehicles. Improved safety for right turning vehicles and improved safety and comfort for active users.	Truck turning	N/a	Capital Project
	Change the NB right turn from the bypass island from free flow to Yield condition.	Speed reduction and better yielding in crosswalk for right turning vehicles. Improved safety for right turning vehicles and improved safety and comfort for active users.		N/a	Capital Project
	Provide protected only left turn phasing for the WB left turn movement.	Avoid conflict between left turning vehicles and active users in the south crosswalk	Concern about operational impacts and queuing - study again closer to time of MU path construction	Signal Timing	N/a
Nickel Street	Operate with EB right having red arrow except when overlapping with NB left turn (only when actuated by path users if traffic signal system will support this flexibility); and provide protected only left turn phasing for the WB left turn movement. Leading Pedestrian Intervals.	Avoid conflict between left turning and right turning vehicles and active users in the south crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a

Location	Potential improvement	Purpose	Considerations	Low Cost Option	Capital Options
Laurel Avenue (west leg)	Add pedestrian refuge and gateposted RRFB signing on the west leg (painted median)	Enhanced pedestrian crossing treatment	Signage in striped median	N/a	Capital Project
	Restrict NB left turn movement to avoid conflict with crosswalk on west leg (fire trucks excepted)	Avoid conflict between left turn movement and active users crossing Midway in the west crosswalk.	Need to allow for fire station use - otherwise vehicles can turn left at Marble or Nickel Street	Signing	N/a
Midblock in front of South Midway Park	Construct new RRFB pedestrian crossing treatment at connection of existing and new pathway through park (future construction from Midway Park Masterplan) - Improvement to be studied and completed if warranted after new pathway is completed.	Enhanced pedestrian crossing treatment	Coordinate construction with future Parks project	N/a	Capital Project
Kohl Street	Curb extensions on the north side and into Midway on the northern corners. Add landscape island in the painted median on the east leg to slow traffic if RT traffic queues into Nativity church are mitigated.	Shorten crossing distance on the north leg and speed reduction in the Midway corridor	Maintenance for median. Drainage for curb extensions.	Paint/Post	Capital Project
	Consider protected intersection, and also consider roundabout.	Shorten crossing distances, provide setback crossings, provide clearer bicycle and pedestrian circulation, increase visual multimodal presence	Truck turning radii, ROW	N/a	Capital Project
	Remove existing pedestrian only phase (Ped scramble) and provide protected only left turn phasing for EB left turn movement.	Avoid conflict between left turning vehicles and active users in the north crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
W. 3rd Avenue	Curb extensions across Midway and 3rd on the south side. Curb extensions on the north side.	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Include Leading Pedestrian Interval phasing for EB/WB movements	Mitigate conflict between turning vehicles and active users in the north and south crosswalks	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
Daphne Street	Curb extensions across Midway and Daphne on the north side. Curb extensions into Midway on the south side.	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Relocate existing crossing treatment to the east leg and provide paint and post or hardened centerline median as feasible. Gatepost RRFB signing (change treatment to standard RRFB installation).	Enhanced pedestrian crossing treatment	Tighter turning radius for SB left vehicles	N/a	Capital Project

Location	Potential improvement	Purpose	Considerations	Low Cost Option	Capital Options
Main Street	Curb extensions on SW corner across both streets, and on SE and NW corners across Midway.	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Consider Protected Intersection or at least setback crossings.	Safer and more comfortable crossings for all active users	LOS evaluation suggests repurposing all four right turn lanes is feasible from operations	N/a	Capital Project
	Consider mixing zones (as shown)/multi-use path rather than protected bike lanes at intersection, if bicycle signal phase impacts would be significant.	Reduce bicycle wait time that would be created by a dedicated bicycle signal phase, and reduce overall intersection user delay and resulting emissions	ROW impacts	N/a	Capital Project
	Provide protected only left turn phasing for both the EB and WB left turn movement.	Avoid conflict between left turning vehicles and active users in the north and south crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
	Operate with both the EB and WB right having red arrow except when overlapping with NB and SB left turn phases (only when actuated by path users if traffic signal system will support this flexibility).	Avoid conflict between right turning vehicles and active users in the north and south crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
Midblock crossings between Main and Ash	Close U-turn roadway components. Leave space green or decorative hardscaped but open to improve sight visibility of pedestrian crossings of the existing RRFBs	Enhanced pedestrian crossing treatment.	U-turns would only be at Spader	N/a	Capital Project
	Close one crossing each to consolidate crossings. Make crossings "Z crossings".	Increases clarity of crossings to drivers, and directs multimodal users to cross on the far side of a "daylighted" area to reduce shade and occlusion concerns.		N/a	Capital Project
Spader Way	Potential curb extensions on north side, shadowing parking. Bike slip ramp on NB Spader where bike lane ends to allow bikes onto MUP. Signage and markings encouraging bikes at this crossing, and peds to use adjacent crossings.	Shorten crossing distance, clarify target user, give bikes clear crossing option.		Paint/Post	Capital Project
Ash Street	Curb extensions in both directions, shadowing parking.	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Either extend RRFB signing to protect east crosswalk OR remove east crosswalk. Provide advanced yield lines and signing.	Enhanced pedestrian crossing treatment			Capital Project
Birch Street	Curb extensions on all four corners in both directions, shadowing parking.	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Add RRFB treatment to existing school zone signing with advanced yield lines and signing.	Enhanced pedestrian crossing treatment			Capital Project
Dexter Place	Curb extensions on the north side in both directions, shadowing parking	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project

Location	Potential improvement	Purpose	Considerations	Low Cost Option	Capital Options
Sheridan Boulevard	Consider Protected Intersection or at least setback crossings.	Safer and more comfortable crossings for all active users	ROW	N/a	Capital Project
	Provide protected only left turn phasing for both the EB and WB left turn movement.	Avoid conflict between left turning vehicles and active users in the north and south crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
	Operate with WB right having red arrow except when overlapping with SB left (only when actuated by pedestrians on sidewalk and through bike detection in protected bike lane if traffic signal system will support this flexibility).	Avoid conflict between right turning vehicles and active users in the north crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
	NB right turn on Red restriction		Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
	Include Leading Pedestrian Interval phasing for EB movements only	Mitigate conflict between turning vehicles and active users in the south crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
Vrain Street/W.128th Place	Curb extensions across Vrain/128th (north and south sides)	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Remove existing RRFB crossing at intersection and replace with new PHB crossing approximately 150' west of intersection.	Enhanced pedestrian crossing treatment	N/a	N/a	Capital Project
Perry Street	Curb extensions across Perry Street	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Consider protected intersection, or "jug handle" and dedicated WB-to-SB bike signal phase.	Provides WB-SB bikes more direct crossing.	Grading for additional MUP/PBL setback at ramp or protected intersection. Additional mainline delay with bike signal option.		Capital Project
	Include Leading Pedestrian Interval phasing for EB/WB movements	Mitigate conflict between turning vehicles and active users in the south crosswalk.	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
Meade Street	Curb extensions across Meade Street	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	If existing bus stop is reinstated with regular service, install enhanced crossing treatment. Offset PHB recommended based on speeds in this segment, but re-evaluate for potential RRFB during design based on new pedestrian counts and speed study.	Enhanced pedestrian crossing treatment	N/a	N/A	Capital Project

Location	Potential improvement	Purpose	Considerations	Low Cost Option	Capital Options
Lowell Boulevard	Two Stage Left Turn Queue Boxes	More comfortable left turn movement for bicycles	N/a	Striping	N/a
	Provide protected only left turn phasing for both the EB and WB left turn movement.	Avoid conflict between left turning vehicles and active users in the north and south crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
	Implement NB and SB right turn on Red restriction through blank out signs that activate through pedestrian crosswalk actuation and through detection provided on the protected bike lane.	Avoid conflict between right turning vehicles and active users in the north and south crosswalk	Evaluation not possible but volumes suggest it would be reasonable	Signal Timing	N/a
	Include Leading Pedestrian Interval phasing for EB/WB movements	Mitigate conflict between turning vehicles and active users in the south crosswalk	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
Hazel Way	Curb extensions across Hazel (north and south sides) except not the SE corner to keep the right turn lane.	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Include Leading Pedestrian Interval phasing for EB/WB movements	Mitigate conflict between turning vehicles and active users in the north and south crosswalks	Signal changes evaluated and can occur with reasonable peak hour operations	Signal Timing	N/a
	Add Stop Bars to all four signalized approaches	Clear stopping direction for vehicles at signal		Paint/Post	N/a
Willow Run Parkway/Elm Lane	Curb extensions across the south side (across Willow Run) and across north side (across Elm Ln). Adjust Elm Ln median nose to provide refuge. Consider roundabout at this location.	Shorten crossing distance	Turning radius; Drainage	Paint/Post	Capital Project
	Remove existing crosswalk at intersection and install new PHB crossing approximately 650' west of the intersection.	Provide safe crossing treatment for high speed, multi-lane roadway	N/a	N/a	Capital Project
Zuni Street	Intersection to be reconstructed through joint project with Westminster in future		N/a	N/a	N/a
	Consider Protected Intersection or setback crossings.	Safer and more comfortable crossings for all active users	N/a	N/a	N/a

NOTES:

- Table above only shows intersections with widening into midway, operational changes, or crosswalk changes - other intersections have curb line and other changes to sidestreets and are shown on the plans.

- LPI modeling is not included in timing analysis due to variations in approach to LPIs - timing needs of LPIs should be analyzed during design. (Many locations showing LPI recommendations are already controlled by minimum pedestrian green times, so LPIs will likely have few impacts to intersection operations)

Figure C1: Intersection Improvements and Enhanced Pedestrian Crossing Treatments

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APPENDIX D Peak Hour Signalized Intersection Level of Service (LOS) Summary and Modification Scenario Analysis

Synchro reports available upon request.

Intersection and Lanes Groups	Existing				w/ Proposed Modifications (1)				Additional Scenarios (2)				Additional Scenarios (3)				Additional Scenarios (4)					
	AM Peak Delay	PM Peak Delay	95% Q	95% LOS	AM Peak Delay	PM Peak Delay	95% Q	95% LOS	AM Peak Delay	PM Peak Delay	95% Q	95% LOS	AM Peak Delay	PM Peak Delay	95% Q	95% LOS	AM Peak Delay	PM Peak Delay	95% Q	95% LOS		
US 287 & W. Midway Blvd.	58	E			118	F			86	F			123	F								
Eastbound Left	54	D	27'	58	E	84'	54	D	27'	58	E	84'	54	D	27'	58	E	84'	54	D	27'	
Eastbound Through	57	E	66'	95	F	325'	57	E	66'	103	F	325'	57	E	66'	103	F	325'	57	E	66'	
Eastbound Right	56	E	0'	> 120	F	828'	56	E	0'	> 120	F	833'	56	E	0'	> 120	F	833'	56	E	0'	
Westbound Left	52	D	352'	53	D	143'	> 120	F	581'	98	F	199'	<<< (1) impact wWB LT protected-only									
Westbound Through+Right	77	E	586'	> 120	F	502'	77	E	586'	> 120	F	502'										
Northbound Left	78	E	267'	72	E	126'	78	E	267'	72	E	126'										
Northbound Through	44	D	1068'	65	E	1108'	44	D	1068'	65	E	1108'										
Northbound Right	17	B	41'	43	D	737'	17	B	41'	43	D	737'										
Southbound Left	116	F	211'	> 120	F	675'	116	F	211'	> 120	F	675'										
Southbound Through	69	E	1108'	48	D	1226'	69	E	1108'	48	D	1226'										
Southbound Right	20	B	0'	13	B	0'	20	B	0'	13	B	0'										
Nickel St. & W. Midway Blvd.	15	B			13	B			23	C			22	C			26	C				
Eastbound Through	14	B	212'	9	A	147'	17	B	208'	14	B	190'	19	B	15	B						
Eastbound Right	9	A	6'	4	A	9'	47	D	84'	42	D	152'	41	D	69	E	<<< (2) impact w/EB RT overlap only					
Westbound Left	18	B	59'	3	A	12'	43	D	97'	64	E	102'	40	D	64	E	<<< (2) impact w/prot-only WB LT (addtl time needed to keep queue w/in 100' storage avail)					
Westbound Through	12	B	78'	2	A	28'	10	A	53'	3	A	33'	9	A	3	A						
Northbound Left	24	C	156'	45	D	150'	25	C	172'	37	D	140'	24	C	37	D						
Northbound Right	20	B	17'	35	C	21'	21	C	19'	31	C	20'	20	B	31	C						
Kohl St. & W. Midway Blvd.	13	B			13	B			17	B			16	B			16	B				
Eastbound Left	8	A	10'	8	A	22'	24	C	18'	62	E	92'	41	D	48	D	<<< (2) impact w/prot-only WB LT (addtl time needed to minimize queues)					
Eastbound Through	15	B	250'	9	A	216'	9	A	88'	6	A	109'	10	A	9	A						
Westbound Through+Right	12	B	174'	13	B	180'	25	C	248'	15	B	270'	22	C	16	B						
Southbound Left+Right	9	A	42'	28	C	129'	11	B	48'	28	C	129'	10	A	28	C						
W. 3rd Dr. & W. Midway Blvd.	10	A			4	A			14	B			6	A								
Eastbound Through+Right	10	A	261'	4	A	125'	17	B	302'	6	A	153'										
Westbound Left	7	A	15'	2	A	2'	8	A	15'	3	A	2'										
Westbound Through	6	A	150'	2	A	62'	8	A	176'	2	A	85'										
Northbound Left+Right	28	C	62'	43	D	56'	28	C	62'	43	D	56'										
Main St. & W. Midway Blvd.	21	C			22	C			28	C			27	C			29	C				
Eastbound Left	17	B	11'	14	B	65'	45	D	21'	64	E	184'	18	B	13	B	48	D	60	E	17	B
Eastbound Through	25	C	175'	22	C	247'	18	B	165'	21	C	244'	30	C	35	C	35	C	22	C	25	C
Eastbound Right	23	C	33'	10	A	13'	67	E	69'	69	E	95'								55	D	
Westbound Left	20	B	52'	20	B	46'	47	D	82'	75	E	97'	21	C	24	C	42	D	58	E	19	B
Westbound Through	25	C	174'	28	C	274'	24	C	177'	34	C	297'	27	C	30	C	27	C	28	C	24	C
Westbound Right	22	C	13'	22	C	0'	40	D	17'	44	D	0'								39	D	
Northbound Left	14	B	66'	18	B	82'	17	B	68'	18	B	82'	18	B	19	B	18	B	26	C	15	B
Northbound Through	17	B	137'	26	C	249'	19	B	141'	26	C	249'	17	B	28	C	17	B	38	D	18	B
Northbound Right	14	B	0'	20	B	18'	16	B	0'	20	B	0'								16	B	
Southbound Left	15	B	32'	19	B	49'	18	B	33'	19	B	43'	15	B	19	B	15	B	26	C	15	B
Southbound Through	24	C	293'	27	C	242'	33	C	323'	27	C	242'	35	C	30	C	35	C	42	D	25	C
Southbound Right	18	B	62'	21	C	19'	22	C	72'	21	C	1'								18	B	

Intersection and Lanes Groups	Existing						w/ Proposed Modifications (1)						Additional Scenarios (2)				Additional Scenarios (3)				Additional Scenarios (4)			
	AM Peak		95%	PM Peak		95%	AM Peak		95%	PM Peak		95%	AM Peak		PM Peak	AM Peak		PM Peak	AM Peak		PM Peak			
	Delay	LOS	Q	Delay	LOS	Q	Delay	LOS	Q	Delay	LOS	Q	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS		
Sheridan Blvd. & E. Midway Blvd.	34	C		31	C		45	D		45	D		42	D	27	C								
Eastbound Left	27	C	48'	21	C	39'	59	E	90'	49	D	69'	60	E	54	D	<<< (2) impact w/prot-only LT (addtl time needed to minimize queues, can be contained in avail storage)							
Eastbound Through+Right	31	C	116'	34	C	315'	38	D	127'	71	E	439'	32	C	38	D	<<< (2) impact w/prot-only LT (addtl time needed to minimize queues, can be contained in avail storage)							
Westbound Left	22	C	236'	68	E	219'	80	E	441'	66	E	250'	58	E	47	D	<<< (2) impact w/prot-only LT (addtl time needed to minimize queues, can be contained in avail storage)							
Westbound Through	28	C	294'	23	C	144'	27	C	298'	21	C	69'	39	D	24	C								
Westbound Right	22	C	43'	22	C	11'	52	D	35'	43	D	0'	18	B	21	C								
Northbound Left	32	C	63'	20	B	69'	33	C	65'	22	C	69'	24	C	17	B								
Northbound Through	32	C	218'	28	C	291'	34	C	224'	31	C	291'	32	C	23	C								
Northbound Right	29	C	63'	30	C	253'	42	D	328'	58	E	510'	0	A	24	C								
Southbound Left	24	C	71'	20	B	83'	26	C	74'	23	C	83'	28	C	17	B								
Southbound Through+Right	48	D	568'	26	C	248'	56	E	593'	28	C	248'	48	D	22	C								
Perry St. & E. Midway Blvd.	7	A		12	B		9	A		15	B													
Eastbound Through+Right	8	A	25'	14	B	229'	11	B	29'	18	B	265'												
Westbound Left	4	A	7'	6	A	14'	6	A	7'	7	A	14'												
Westbound Through	5	A	88'	5	A	54'	7	A	113'	7	A	69'												
Northbound Left	27	C	48'	28	C	33'	27	C	48'	28	C	33'												
Northbound Right	26	C	18'	28	C	23'	26	C	18'	28	C	23'												
Lowell Blvd. & E. Midway Blvd.	25	C		23	C		34	C		34	C		29	C	27	C								
Eastbound Left	20	B	65'	23	C	128'	49	D	145'	77	E	288'	41	D	38	D	<<< (2) impact w/prot-only LT (addtl time needed to minimize delays/queues) (extend EB LT stoage by ~100' to contain queue)							
Eastbound Through+Right	23	C	90'	28	C	218'	29	C	108'	32	C	242'	29	C	29	C	<<< (2) impact w/prot-only LT (addtl time needed to minimize queues, can be contained in avail storage)							
Westbound Left	19	B	130'	19	B	68'	68	E	293'	53	D	163'	42	D	37	D	<<< (2) impact w/prot-only LT (addtl time needed to minimize queues, can be contained in avail storage)							
Westbound Through+Right	30	C	277'	23	C	112'	35	C	305'	29	C	136'	31	C	30	C								
Northbound Left	20	B	63'	17	B	38'	22	C	63'	19	B	38'	21	C	18	B								
Northbound Through	25	C	128'	25	C	208'	27	C	128'	28	C	208'	26	C	25	C								
Northbound Right	0	A	0'	0	A	0'	0	A	0'	0	A	0'	0	A	0	A								
Southbound Left	18	B	86'	16	B	76'	20	B	86'	19	B	76'	19	B	17	B								
Southbound Through	25	C	175'	20	B	124'	28	C	175'	22	C	124'	25	C	20	B								
Southbound Right	22	C	53'	18	B	32'	29	C	174'	22	C	95'	22	C	18	B								
Hazel Way & E. Midway Blvd.	9	A		9	A		11	B		8	A													
Eastbound Left	6	A	8'	6	A	8'	8	A	10'	8	A	10'												
Eastbound Through+Right	8	A	132'	8	A	132'	10	A	156'	10	A	156'												
Westbound Left	6	A	8'	6	A	8'	8	A	10'	8	A	10'												
Westbound Through+Right	8	A	132'	8	A	132'	10	A	156'	10	A	156'												
Northbound Left+Through	28	C	40'	28	C	40'	28	C	40'	28	C	40'												
Northbound Right	28	C	19'	28	C	19'	28	C	0'	28	C	0'												
Southbound Left+Through+Right	29	C	53'	29	C	53'	29	C	53'	29	C	53'												

Note: Delay represented in average seconds per vehicle.

Note: Zuni St is a signalized intersection; however, it is not included in this analysis, as there are not planned modifications to the lane geometry.

Figure D1: Signalized Intersection LOS Summary & Modification Scenario Analysis

APPENDIX E Preliminary Utility Impact Study

Midway Boulevard Conceptual Design
Preliminary Utility Impact Summary
November 2, 2022

The following is a preliminary summary of the existing utilities impacts currently known for the Midway Boulevard Project.

Corridor Wide Utility Impacts

The following utility impacts are anticipated across all segments.

Xcel Lighting and Electrical

Electrical and lighting impacts have been evaluated on a segment-by-segment basis below.

Xcel Gas

Gas mains and services exist throughout the length of the corridor. Impacts to existing gas mains due to grade changes are unknown at this time, however, valve adjustment are anticipated throughout the corridor.

Communications (Lumen/AT&T/Zayo)

Underground communication facilities exist throughout the corridor. Various handholes, vaults and pedestals fall within the proposed sidewalk, trail, and/or bicycle lane and will need to be replaced with traffic rated vaults or relocated. Upright pedestals and equipment will need to be relocated or replaced with flush mount pedestals.

Water

Water facilities exist along the length of the corridor. Only hydrant relocations have been quantified as part of this study, however, the

following impacts are anticipated as part of the project within each segment.

- Adjust valve boxes and curb stops to final grade
- Relocate hydrants
- Relocate meters

Storm and Sanitary

Storm and Sanitary facilities exist throughout the length of this corridor. The majority of the impacts to these facilities will be minor adjustments to manhole rim elevations, however several inlets will require modification or relocation to accommodate the new curb locations, especially at intersections with the curb being pushed further into the road. These modifications have not been quantified as part of the utility impacts.

Highway 287 to the West

Xcel Lighting and Electrical

Underground Primary Electric

- Transformer between Alter St and Burbank on the north side will have to be relocated outside of the proposed sidewalk.

Underground Secondary Electric

- One light pole and the associated electric feed on the far east end will have to be relocated to accommodate the additional path to the trailhead on the south side on Midway.
- Approximately 11 streetlights and the corresponding feeds will have to be relocated outside of the proposed sidewalk on the north side of Midway between Compton St and Alter St.

Lumen

- Equipment on the Northwest Corner of Burbank St will need to be relocated outside of proposed sidewalk.
- Pullbox in the Southwest Corner of Alter St will have to be relocated outside of the proposed sidewalk or replaced with a traffic rated box and incorporated into the sidewalk.

- Three major upright cabinets, a vault, and the associated line will have to further investigated to find if the underground infrastructure is in conflict. Above grade infrastructure is south of the proposed sidewalk.

AT&T

Equipment on the Northwest Corner of Burbank St will need to be relocated outside of proposed sidewalk.

Water

On the north side of Midway between Alter St and 287 there is a water meter vault and irrigation service that will need to be modified outside of the proposed sidewalk or raised/lowered to grade and incorporated into the sidewalk.

Sanitary

Approximately 4 manholes lids from Compton to the west will have to be rotated outside of the outside of the proposed curb and gutter. The manhole in the Alter St intersection will have to rotated or modified to get it outside of the curb and gutter of the new proposed median. Further investigation is recommended to determine if additional modifications will be required to avoid conflict with the cur b and gutter.

Private Electric

More investigation is recommended at the intersection of Midway Blvd and 287 to find if the service to the Starbucks and Circle K signs will be in conflict. Starbucks sign is in closer proximity to the proposed work than the Shell sign.

Highway 287

Xcel Lighting and Electrical

Underground Secondary Electric

- One light pole and its feed on the Southeast corner will have to be relocated to the east to get closer to the road
- The pullbox in the northeast side will have to adjusted to the grade with the sidewalk moving to the towards the island

Traffic

The Traffic signals and associated equipment will have to be adjusted with proposed island/sidewalk changes.

Highway 287 to Laurel St

Xcel Lighting and Electrical

Underground Secondary Electric

- Four light pole and their feeds on the south side of Midway will have to be relocated to accommodate the proposed wider sidewalk.
- Approximately four streetlights and the corresponding feeds will have to be relocated outside of the proposed sidewalk on the north side of Midway.

Zayo

Pullbox on the Southwest corner of the Marble intersection will have to be replaced with a traffic rated box or relocated outside of proposed path/sidewalk.

Boxes on the Southwest corner of the Nickel intersection will have to be replaced with a traffic rated box or relocated outside of the proposed sidewalk.

AT&T

Pullboxes on the south side of Midway from Nickel to Laurel will have to be relocated to the south, outside of sidewalk, or they will have to be replaced with traffic rated manholes and incorporated into the sidewalk.

Traffic

Crosswalk signals east of Laurel will have to be relocated with to accommodate the proposed path and curb line adjustments

Signal equipment and associated feeds on the south side of the intersections of Garden Center and Nickel St will need to be relocated outside of the proposed sidewalk

COB Fiber

Boxes on the Southwest corner of the Nickel intersection will have to be replaced with a traffic rated box or relocated outside of the proposed sidewalk.

Water

On the north side of Midway between Nickel St and Marble St there is a water manhole and meter that will need to be modified outside of the proposed sidewalk or raised/lowered to grade and incorporated into the sidewalk.

Private Electric

More investigation is recommended at the intersection of Midway Blvd and 287 to find if the service to the Starbucks and Circle K signs will be in conflict. Starbucks sign is in closer proximity to the proposed work than the Shell sign.

Laurel St to Main St

Xcel Lighting and Electrical

Overhead Primary

- Overhead primary poles on the east side of Laurel and west of Main St will have to be relocated to the south side of the proposed sidewalk. When poles are moved existing telecom and secondary feed on the poles will have to be reattached to the new poles.

Underground Secondary

- Approximately 15 streetlights and associated feeds will have to be relocated outside of proposed bikeway to back of walk.

AT&T

Handholes near Laurel, Kohl, 3rd Ave, and Daphne St will need to be relocated outside of bicycle lane or changed to traffic rated boxes and adjusted to grade.

Zayo

Zayo facilities exist along the south side of Midway Blvd between Laurel St and Sheridan Blvd. Existing handholes or vaults that are in

the proposed sidewalk/bicycle path will have to be changed to traffic rated lids and be incorporated into the sidewalk.

Lumen

- Lumen facilities exist along the north side of Midway Blvd between Kohl St and Sheridan Blvd. Existing handholes or vaults that are in the proposed sidewalk/bicycle path will have to be changed to traffic rated lids and be incorporated into the sidewalk.

Traffic

Traffic signals and associated equipment will need to be relocated at all signalized intersections to outside of the proposed bicycle lanes and new conduit for traffic fiber will need to be installed.

Private Electric

More investigation is recommended at the church driveway between Kohl and 3rd Ave. The sign and private feed may have to be relocated with the proposed sidewalk.

Main St to Sheridan Blvd

Xcel Lighting and Electrical

Underground Secondary Electric

- Approximately 9 streetlights and associated feeds will have to be relocated outside of proposed bikeway to green space from Main St to Ash St. Further evaluation is needed to determine if there is enough room to meet clearance requirements on the bicycle path.
- Approximately 7 streetlights and associated feeds will have to be relocated outside of proposed bikeway to green space from Ash St to Sheridan on the north side of Midway. Further evaluation is needed to determine if there is enough room to meet clearance requirements on the bicycle path.
- All streetlights on the south side of Midway from Ash to Sheridan will have to be incorporated into the sidewalk and box will need to be replaced with traffic rated boxes.

Underground Primary Electric

- The existing switch cabinet between Dexter and Sheridan will have to be relocated due to proposed path.

Lumen

- Pedestal west of Ash will need to be turned into a flush mount or relocated outside of the proposed bicycle lane/sidewalk.
- Group of equipment between Dexter and Sheridan need to be relocated outside of sidewalk and refeed for metered service.

Traffic

Traffic signals at the Main St and Sheridan intersections as well as and crosswalk warning signals and associated equipment between Main and Ash will need to be relocated outside of the proposed bicycle lanes/sidewalk and to match proposed crosswalk locations.

Sheridan Blvd to Lowell

Xcel Lighting and Electrical

Underground Secondary Electric

- Approximately 26 streetlights and associated feeds will have to be relocated outside of proposed bikeway to the back of walk or in the green space. Further evaluation is needed to determine if there is enough room to meet ADA requirements, incorporate the existing lights into the sidewalk in certain areas.

Underground Primary Electric

- Two switch cabinets will need to be relocated outside of the proposed sidewalk between Perry and Lowell
- Grade changes associated with the addition of the bicycle lane from Perry to Davis have the potential to impact the switch cabinets between Perry and Davis.

Lumen

- The existing manholes between the Zenobia Vrain will need to be adjusted to match grade within the proposed bicycle lane.
- Pullboxes from Davis St to Sheridan will have to be relocated outside the sidewalk and bicycle path or changed to traffic rate boxes

and match the elevation of the proposed grade.

AT&T

Existing communication equipment outside of the proposed sidewalk on the north side of Midway between Perry and Davis will need to be raised due to grade changes required to accommodate the addition of the bicycle lane and sidewalk.

Traffic

Traffic signals and associated equipment at the north side of Perry will need to be relocated outside of the proposed sidewalk.

COB Fiber

Pullboxes from Perry St to Sheridan will have to be relocated outside the sidewalk and bicycle path or changed to traffic rate boxes and match the elevation of the proposed grade.

Water

The existing hydrant just east of Sheridan will need to move back the proposed sidewalk. An existing retaining wall will require this hydrant to be relocated west to avoid clearance issues with the adjacent planter retaining wall.

Lowell to the East

Xcel Lighting and Electrical

Underground Electric

- Approximately 27 Street lights and the associated underground feeds will require relocation in this segment. Further evaluation is needed to determine if there is enough room to meet ADA requirements, incorporate the existing lights into the sidewalk in certain areas.
- The transformer on the NW corner on Zuni will need to be relocated out of the bicycle lane to behind the walk.
- The transformer on the west side of Zuni will need to be relocated to the back of walk.
- The transformer between King and Hazel will need to be relocated to the back of walk along with corresponding conduit coming

in and out of it.

Water

Vent pipe on the southeast side of the willow run intersection will have to be relocated to the back of walk.

Lumen

- The existing manhole in the Lowell intersection will need to be adjusted to grade.
- Pedestals and boxes on the north side of Midway and south side at Willow Run will have to be relocated outside of the sidewalk/ bicycle path or change to flush mount traffic rate boxes and set at the proposed elevation.
- Pullbox west of 2602 Midway will have to be relocated outside of the bicycle path or changed to a traffic rate box and adjusted to the proposed grade.

Traffic

Traffic signals and equipment at the Northwest corner and Southwest corner of Zuni St will have to be relocated or incorporated into the sidewalk.

Traffic signals and equipment at the on south side of Hazel St will have to be relocated or incorporated into the sidewalk.

Assumptions/Exclusions:

- It is anticipated that roadway grades may be lowered up to 12" in localized areas along the project. The utility impacts associated with these changes have not been quantified as part of this alternative analysis. It is recommended that Quality Level A utility test holes or other means of depth verification be completed prior to final design.
- Utility impacts associated with drainage improvements and/or modifications have not been evaluated as part of this analysis.
- Private utility relocations within the public Right-of-Way are anticipated to be the responsibility of the utility owner.
- Existing private utility easements which may exist along the corridor have not been researched as part of this study. Further evaluation of existing easements along the corridor is recommended prior to finalizing a utility cost estimate for the project.
- All mapping and utility info is from early 2021 and is Quality level D. Note that utility owners could have installed new or made modifications to existing infrastructure after info had been gathered and mapping completed.

Recommendations:

- A complete subsurface utility engineering investigation, including Quality Level B designating, and Quality Level A utility test holes, is recommended as part of the 30% and 60% design development plans to effectively evaluate the utility impacts on the project.
- Additional coordination with both public and private utility owners is recommended to determine existing operating rights, cost responsibilities, and relocation scope and schedule.

APPENDIX F Interim Striping Concept

NOTES:

- THESE SHEETS SHOW INTERIM, STRIPING-ONLY ALTERNATIVE. SEE FUTURE SHEETS FOR LONG-TERM OFF STREET ALTERNATIVE.
- CROSSWALKS ACROSS SIDE STREETS ARE NOT SHOWN, BUT SHOULD BE INSTALLED ACROSS EACH ROADWAY.
- GREEN (RECTANGLE) BACKING SHOULD BE ADDED TO THE BIKE LANE MARKINGS AS CALLED OUT IN (FUTURE) BROOMFIELD BIKE LANE STANDARDS AT TIME OF DESIGN.

LEGEND

- - - - - CITY OF BROOMFIELD PARCELS
- - - - - CITY OF WESTMINSTER PARCELS
- - - - - PRIVATE PARCELS

SECTION APPLIES TO LIMITS OF PROJECT AT LAKE LINK TRAIL



Interim Striping Concept

Revised December 2022



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



Sheet I-1



December, 2022



Figure F1: Interim Concept, Lake Link Trail to Alter St



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



NOTES:

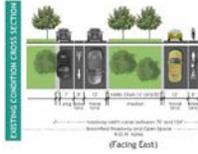
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Sheet I-2   December, 2022
 Scale: Approx. 1" = 40' North 

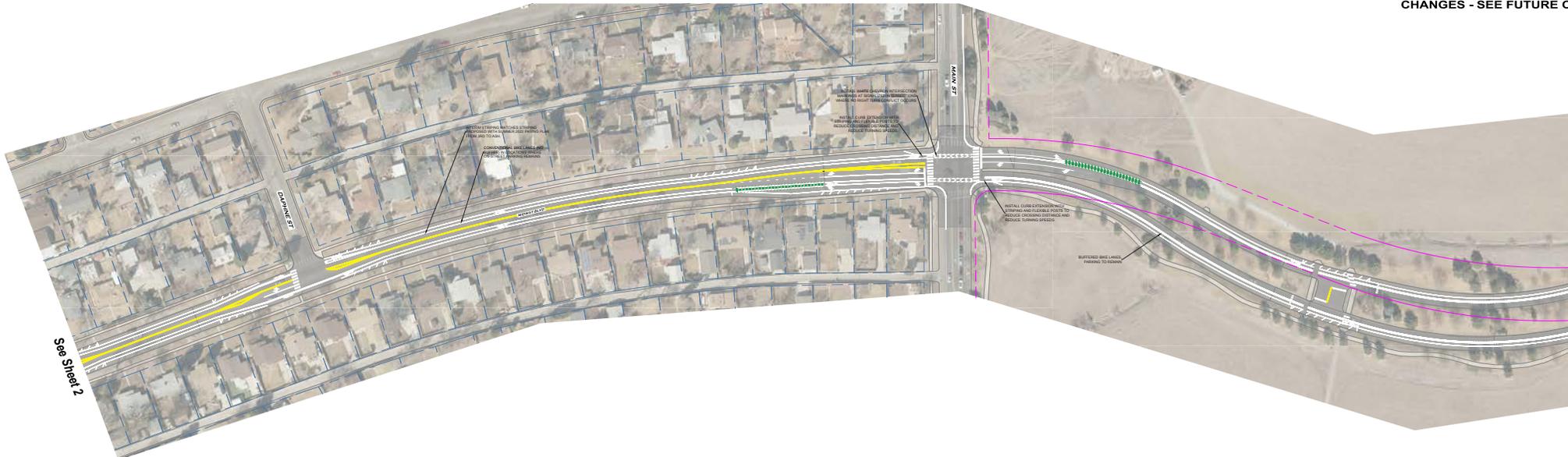
Figure F2: Interim Concept, Alter St to W 3rd Ave Dr



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



Interim Striping Concept

Revised December 2022

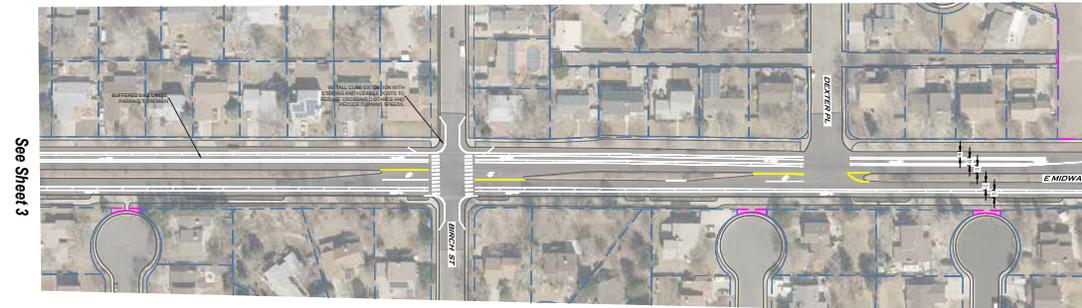


* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



LEGEND

- CITY OF BROOMFIELD PARCELS
- CITY OF WESTMINSTER PARCELS
- PRIVATE PARCELS



Interim Striping Concept

Revised December 2022



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



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- CROSSWALKS ACROSS SIDE STREETS ARE NOT SHOWN, BUT SHOULD BE INSTALLED ACROSS EACH ROADWAY.
- GREEN (RECTANGLE) BACKING SHOULD BE ADDED TO THE BIKE LANE MARKINGS AS CALLED OUT IN (FUTURE) BROOMFIELD BIKE LANE STANDARDS AT TIME OF DESIGN.

Sheet I-4



0 40 80 120
Scale: Approx. 1" = 40'

December, 2022
North

Figure F4: Interim Concept, Birch St to Wolff St

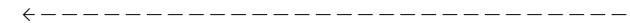
NOTES:

- THESE SHEETS SHOW INTERIM, STRIPING-ONLY ALTERNATIVE. SEE FUTURE SHEETS FOR LONG-TERM OFF STREET ALTERNATIVE.
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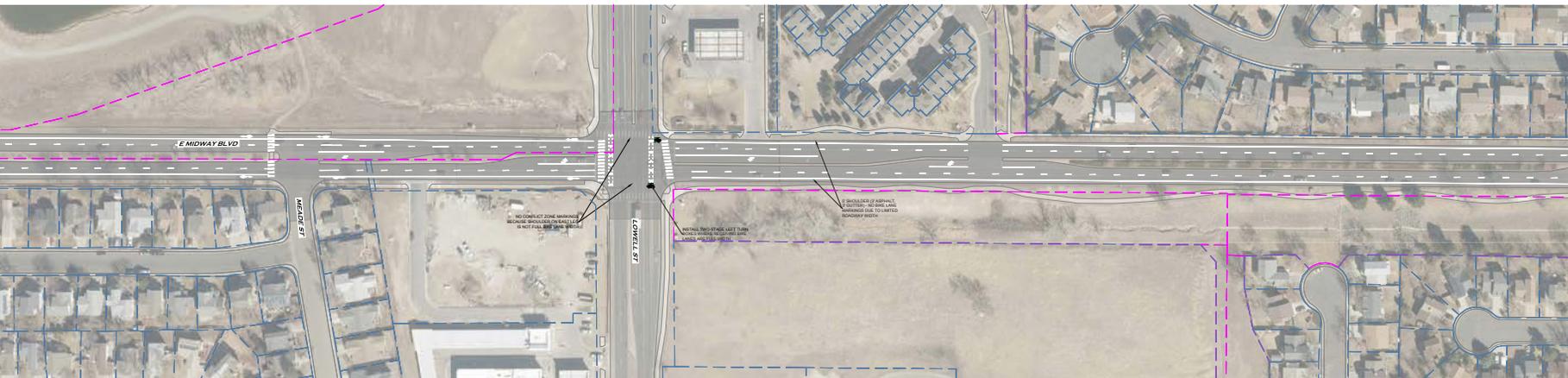
LEGEND

- CITY OF BROOMFIELD PARCELS
- CITY OF WESTMINSTER PARCELS
- PRIVATE PARCELS



Interim Striping Concept

Revised December 2022



See Sheet 6



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE

Sheet I-5



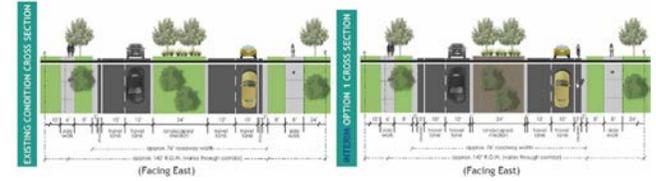
Scale: Approx. 1" = 40'

December, 2022
North

Figure F5: Interim Concept, Vrain St past Lowell Blvd

LEGEND

- CITY OF BROOMFIELD PARCELS
- CITY OF WESTMINSTER PARCELS
- PRIVATE PARCELS



* INTERIM CONCEPT SHOWN, INCLUDING ONLY SIGNING AND STRIPING CHANGES - SEE FUTURE CONCEPT SHEETS FOR LONG TERM ALTERNATIVE



Interim Striping Concept

Revised December 2022

NOTES:

- THESE SHEETS SHOW INTERIM, STRIPING-ONLY ALTERNATIVE. SEE FUTURE SHEETS FOR LONG-TERM OFF STREET ALTERNATIVE.
- CROSSWALKS ACROSS SIDE STREETS ARE NOT SHOWN, BUT SHOULD BE INSTALLED ACROSS EACH ROADWAY.
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Sheet I-6



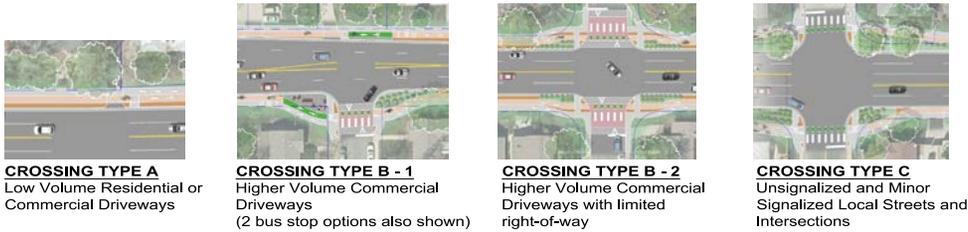
0 40 80 160
Scale: Approx. 1" = 40'

December, 2022



Figure F6: Interim Concept, Hazel St to Big Dry Creek

APPENDIX G Future Off-Street Protected Bicycle Lane / Multi-Use Path Concept



CROSSING TYPE A
Low Volume Residential or Commercial Driveways

CROSSING TYPE B - 1
Higher Volume Commercial Driveways
(2 bus stop options also shown)

CROSSING TYPE B - 2
Higher Volume Commercial Driveways with limited right-of-way

CROSSING TYPE C
Unsignalized and Minor Signalized Local Streets and Intersections

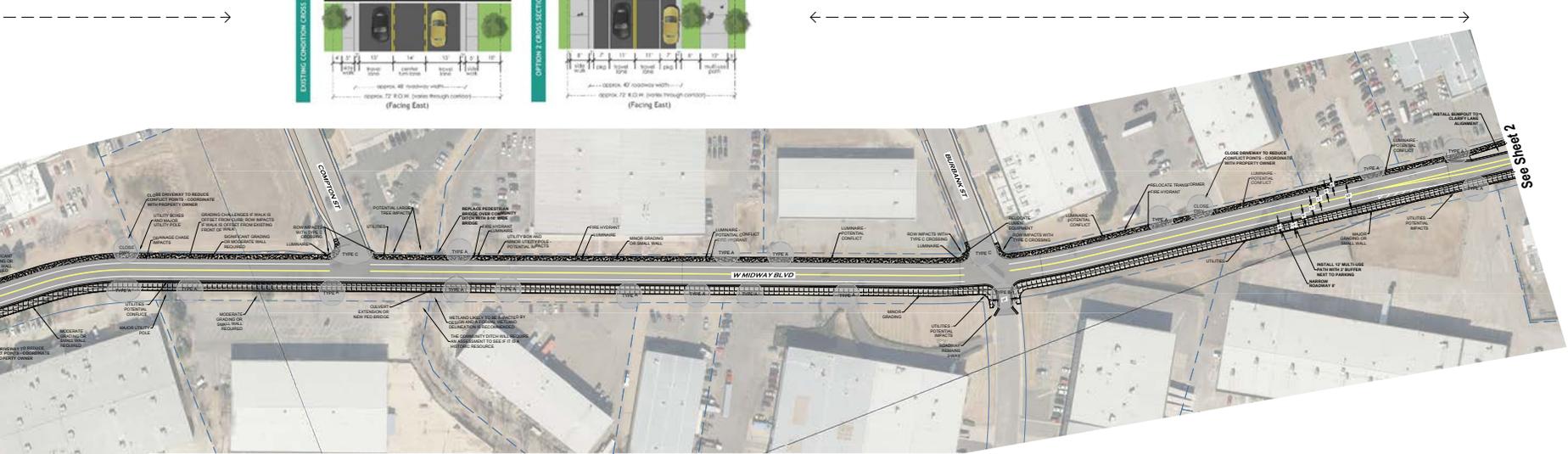
- LEGEND**
- PROPOSED MULTI-USE PATH
 - PROPOSED SIDEWALK
 - EXISTING SIDEWALK
 - PROPOSED BIKE LANE
 - TRAIL CONNECTION
 - CITY OF BROOMFIELD PARCELS
 - CITY OF WESTMINSTER PARCELS
 - PRIVATE PARCELS

SECTION APPLIES TO LIMITS OF PROJECT AT LAKE LINK TRAIL



Future Off-Street Protected Bike Lane/Multi-Use Path Concept

Revised December 2022



DRAFT CONCEPT PLAN NOTES:

- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE CROSSING TREATMENTS TYPES ARE IDENTIFIED FOR MINOR ROADWAYS AND COMMERCIAL DRIVEWAYS. RESIDENTIAL DRIVEWAYS WILL BE CROSSING TYPE A (DRIVEWAYS ARE NOT HIGHLIGHTED SEPARATELY IN PLANS).
- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE AND STRIPING ARE SHOWN FOR CONCEPT CONVEYANCE ONLY - DETAILS TO BE DEVELOPED DURING DESIGN, NOT FOR CONSTRUCTION.
- AT CURB RAMPS (PARTICULARLY MIDWAY BLVD CROSSINGS AND BUS STOPS), OFF-STREET PBL MAY NEED TO BE PULLED BACK FROM THE CURB DEPENDING ON DETAILED GRADING. OFFSET MAY CREATE ADDITIONAL TREE AND GRADING CONFLICTS IN SOME LOCATIONS.
- LANDSCAPING AREAS BETWEEN PATHS AND CURBS, BETWEEN PATHS, OR IN CURB EXTENSIONS ARE NOT SHOWN HERE, BUT SHOULD BE INCLUDED IN DESIGN PHASE.
- CURB RAMPS AND STOP BARS WILL BE REVIEWED AND IMPROVED TO DIRECTIONAL RAMPS WITH EACH ADJACENT PROJECT DURING DESIGN PHASE.
- PLANS SHOW PATH LOCATION AND WIDTH BASED ON TRADEOFF DECISIONS RELATING TO GRADING/ROW/TREE IMPACTS DURING CONCEPT DESIGN. ADDITIONAL DISCUSSION SHOULD TAKE PLACE DURING THE NEXT PHASE OF DESIGN, OUTREACH, AND CONSTRUCTION DOCUMENTS.
- CROSSWALKS ON SIDE STREETS SHOULD BE INSTALLED CONSISTENTLY ALONG THE CORRIDOR AS DETERMINED APPROPRIATE DURING DESIGN.
- IMPROVE VISIBILITY AT ALL SIDESTREETS ADJACENT TO LANDSCAPED MEDIAN BY ADJUSTING LANDSCAPING IN MEDIAN AND MAINTAINING/TRIMMING MORE OFTEN.
- WHERE CURB EXTENSIONS ARE SHOWN ACROSS SIDESTREETS, COLLECT NEW TURNING MOVEMENT COUNTS DURING DESIGN TO DETERMINE IF ADJUSTMENTS TO ALLOW LEFT OR RIGHT TURN LANE ARE NECESSARY, AND/OR USE PAINT AND POST FOR INITIAL INSTALLATION.
- DESIGN VEHICLE AND CONTROL VEHICLE DETERMINATION FOR THIS CORRIDOR STILL UNDER CONSIDERATION BY BROOMFIELD STAFF. TRUCK TURNS AND ADJUSTMENTS TO CORNER RADII AS NECESSARY DURING DESIGN PHASE.
- CONDUCT TREE AND IRRIGATION REMOVAL/REPLACEMENT STUDIES DURING DESIGN.

Sheet F-1



Scale: Approx. 1" = 40'

December, 2022
North

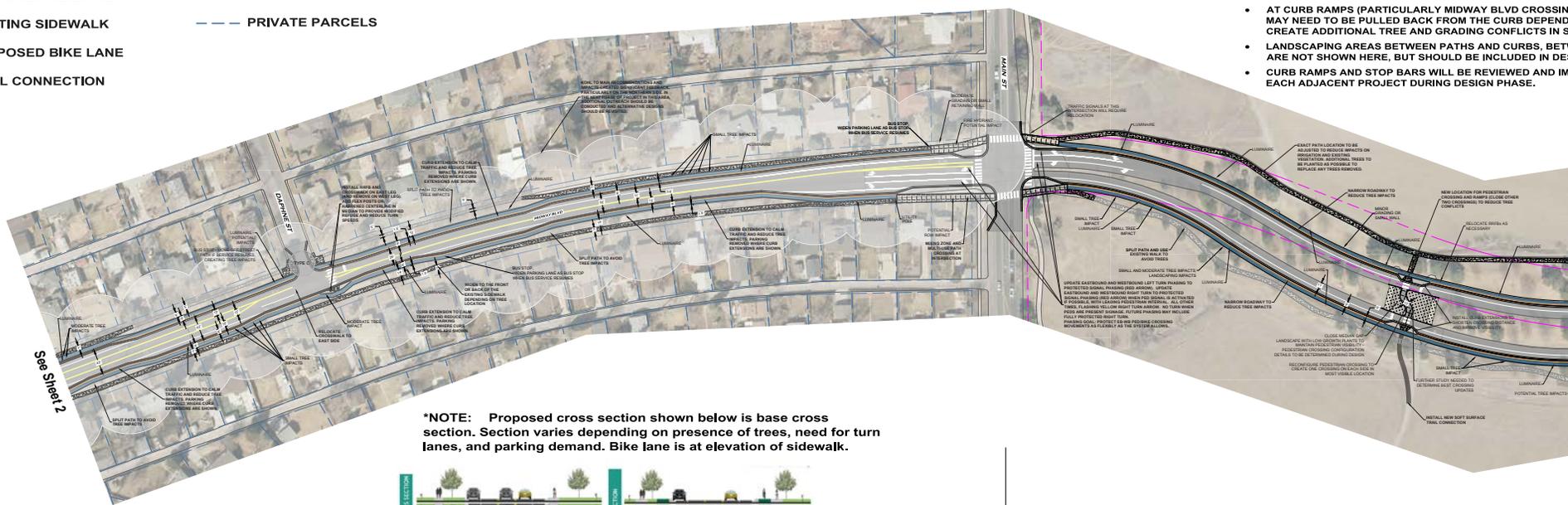
Figure G1: Future Concept, Lake Link Trail to Alter St

LEGEND

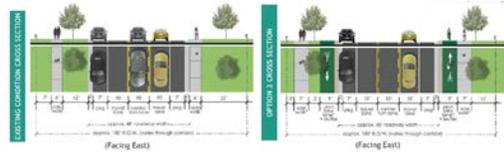
-  PROPOSED MULTI-USE PATH
-  PROPOSED SIDEWALK
-  EXISTING SIDEWALK
-  PROPOSED BIKE LANE
-  TRAIL CONNECTION
-  CITY OF BROOMFIELD PARCELS
-  CITY OF WESTMINSTER PARCELS
-  PRIVATE PARCELS

DRAFT CONCEPT PLAN NOTES:

- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE TYPES ARE IDENTIFIED FOR MINOR ROADWAYS AND COMING FROM DRIVEWAYS WILL BE CROSSING TYPE A (DRIVEWAYS ARE PLANS).
- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE FOR CONCEPT CONVEYANCE ONLY - DETAILS TO BE DEVELOPED DURING CONSTRUCTION.
- AT CURB RAMP (PARTICULARLY MIDWAY BLVD CROSSING) MAY NEED TO BE PULLED BACK FROM THE CURB DEPENDING ON CONDITIONS. CREATE ADDITIONAL TREE AND GRADING CONFLICTS IN SOME AREAS.
- LANDSCAPING AREAS BETWEEN PATHS AND CURBS, BETWEEN DRIVEWAYS AND CURBS, ARE NOT SHOWN HERE, BUT SHOULD BE INCLUDED IN THE CONCEPT PLAN.
- CURB RAMPS AND STOP BARS WILL BE REVIEWED AND IMPROVED AT EACH ADJACENT PROJECT DURING DESIGN PHASE.



***NOTE:** Proposed cross section shown below is base cross section. Section varies depending on presence of trees, need for turn lanes, and parking demand. Bike lane is at elevation of sidewalk.



Future Off-Street Protected Bike Lane/Multi-Use Path Concept

Revised December 2022

ED BIKE LANE CROSSING TREATMENTS
COMMERCIAL DRIVEWAYS, RESIDENTIAL
NOT HIGHLIGHTED SEPARATELY IN

ED BIKE LANE AND STRIPING ARE SHOWN
DEVELOPED DURING DESIGN, NOT FOR

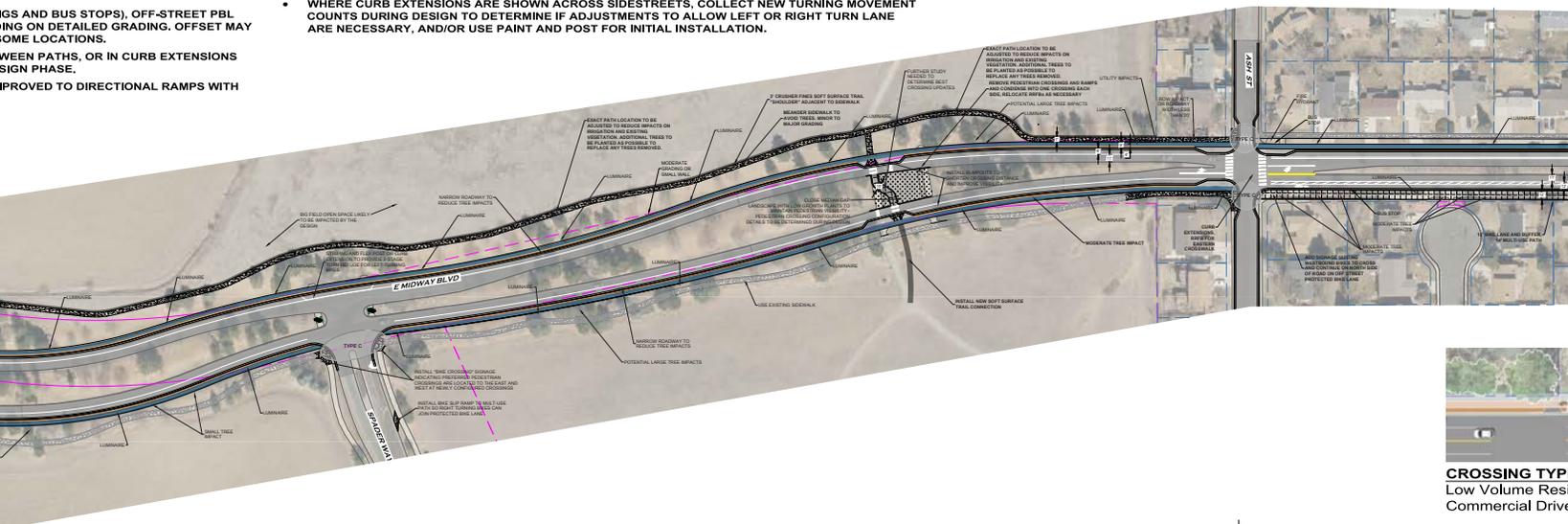
GS AND BUS STOPS), OFF-STREET PBL
ING ON DETAILED GRADING, OFFSET MAY
SOME LOCATIONS.

BETWEEN PATHS, OR IN CURB EXTENSIONS
SIGN PHASE.

IMPROVED TO DIRECTIONAL RAMPS WITH

- PLANS SHOW PATH LOCATION AND WIDTH BASED ON TRADEOFF DECISIONS RELATING TO GRADING/ROW/TREE IMPACTS DURING CONCEPT DESIGN. ADDITIONAL DISCUSSION SHOULD TAKE PLACE DURING THE NEXT PHASE OF DESIGN, OUTREACH, AND CONSTRUCTION DOCUMENTS.
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- WHERE CURB EXTENSIONS ARE SHOWN ACROSS SIDESTREETS, COLLECT NEW TURNING MOVEMENT COUNTS DURING DESIGN TO DETERMINE IF ADJUSTMENTS TO ALLOW LEFT OR RIGHT TURN LANE ARE NECESSARY, AND/OR USE PAINT AND POST FOR INITIAL INSTALLATION.

- DESIGN VEHICLE AND CONTROL VEHICLE DETERMINATION FOR THIS CORRIDOR STILL UNDER CONSIDERATION BY BROOMFIELD STAFF. TRUCK TURNS AND ADJUSTMENTS TO CORNER RADII AS NECESSARY DURING DESIGN PHASE.
- CONDUCT TREE AND IRRIGATION REMOVAL/REPLACEMENT STUDIES DURING DESIGN.



See Sheet 4



CROSSING TYPE B - 1
Higher Volume Commercial
Driveways
(2 bus stop options also shown)



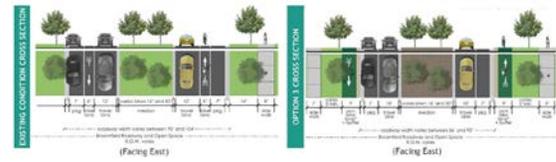
CROSSING TYPE B - 2
Higher Volume Commercial
Driveways with limited
right-of-way



CROSSING TYPE A
Low Volume Residential or
Commercial Driveways



CROSSING TYPE C
Signalized and Minor
Signalized Local Streets and
Intersections



*NOTE: Bike lane is at elevation of sidewalk. Curb is proposed to move in approximately 7' in each direction - curb move would take place only with adjacent construction.

SEE NEXT SHEET FOR CROSS SECTIONS EAST OF ASH ST

Sheet F-3



Scale: Approx. 1" = 40'

December, 2022
North

Figure G3: Future Concept, Daphne St to Ash St

DRAFT CONCEPT PLAN NOTES:

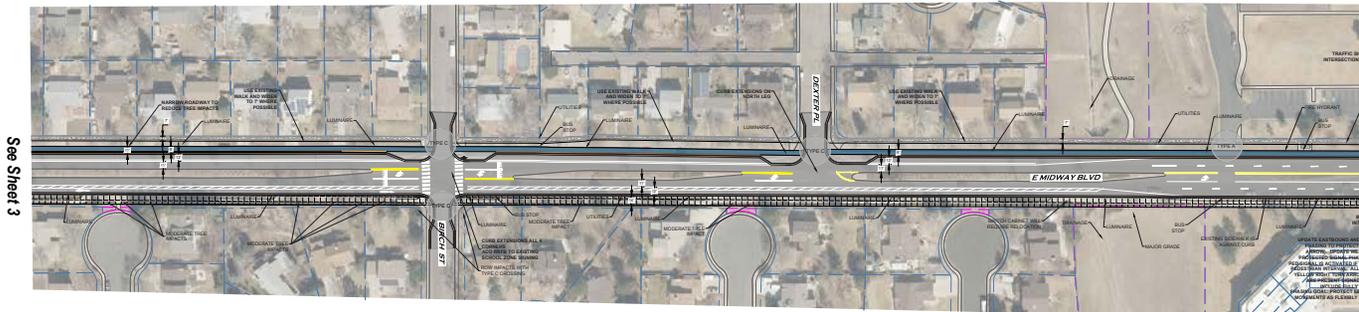
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- AT CURB RAMPS (PARTICULARLY MIDWAY BLVD CROSSINGS AND BUS STOPS), OFF-STREET PBL MAY NEED TO BE PULLED BACK FROM THE CURB DEPENDING ON DETAILED GRADING. OFFSET MAY CREATE ADDITIONAL TREE AND GRADING CONFLICTS IN SOME LOCATIONS.
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- CONDUCT TREE AND IRRIGATION REMOVAL/REPLACEMENT STUDIES DURING DESIGN.

***NOTE:** Proposed cross section shown below is base cross section. Section varies depending on presence of trees, need for turn lanes, and parking demand. Bike lane is at elevation of sidewalk. Curb of WB roadway is proposed to move in approximately 10' - curb move would take place only with adjacent construction.



LEGEND

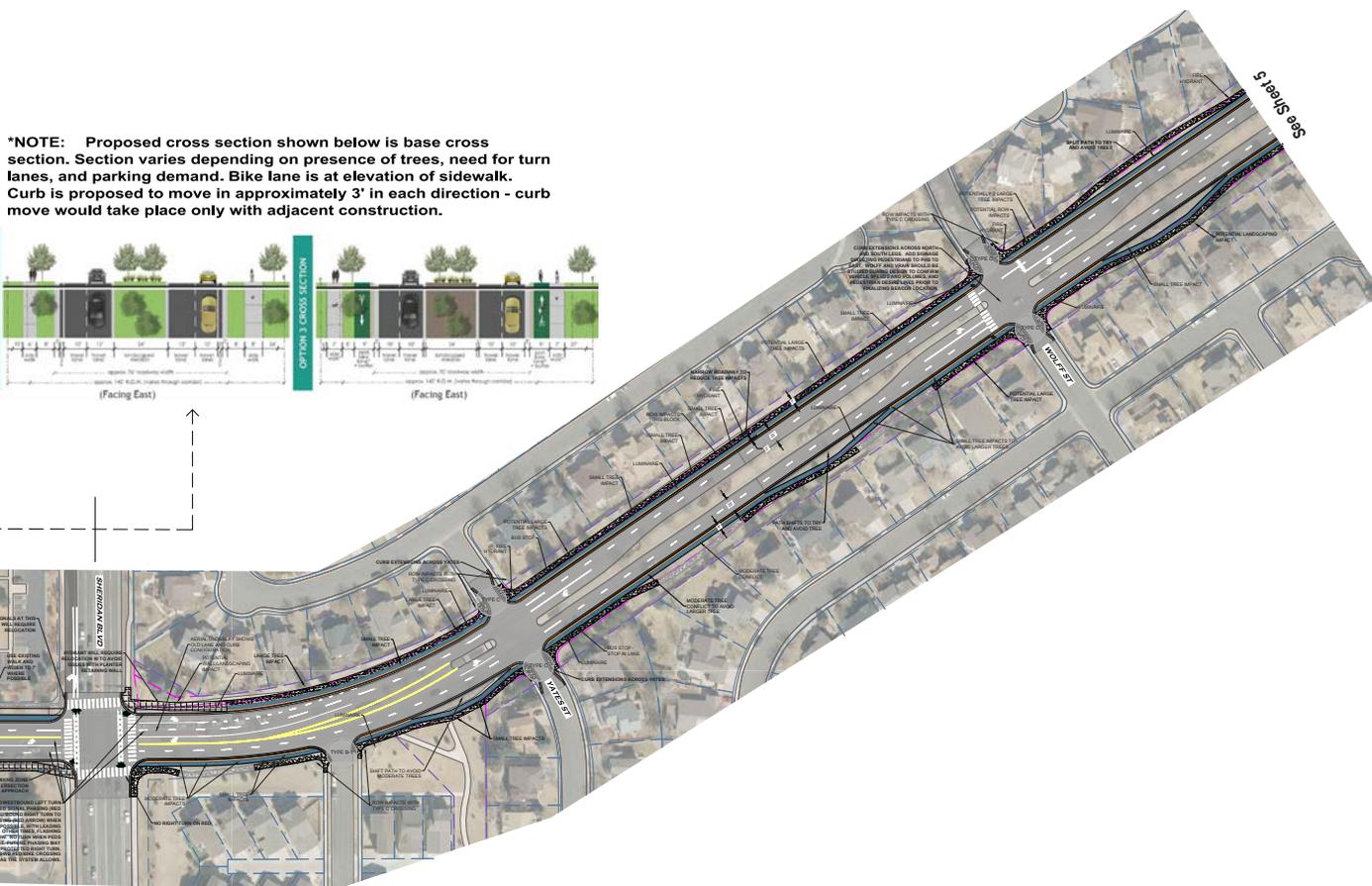
-  PROPOSED MULTI-USE PATH
-  PROPOSED SIDEWALK
-  EXISTING SIDEWALK
-  PROPOSED BIKE LANE
-  TRAIL CONNECTION
-  CITY OF BROOMFIELD PARCELS
-  CITY OF WESTMINSTER PARCELS
-  PRIVATE PARCELS



Future Off-Street Protected Bike Lane/Multi-Use Path Concept

Revised December 2022

***NOTE:** Proposed cross section shown below is base cross section. Section varies depending on presence of trees, need for turn lanes, and parking demand. Bike lane is at elevation of sidewalk. Curb is proposed to move in approximately 3' in each direction - curb move would take place only with adjacent construction.



CROSSING TYPE A
Low Volume Residential or Commercial Driveways



CROSSING TYPE B - 1
Higher Volume Commercial Driveways
(2 bus stop options also shown)



CROSSING TYPE B - 2
Higher Volume Commercial Driveways with limited right-of-way



CROSSING TYPE C
Unsignalized and Minor Signalized Local Streets and Intersections

Sheet F-4

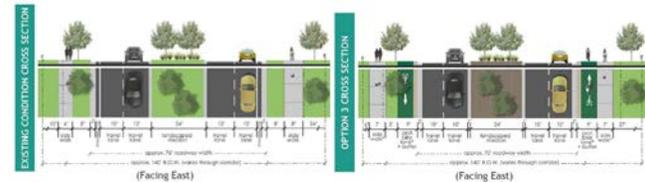
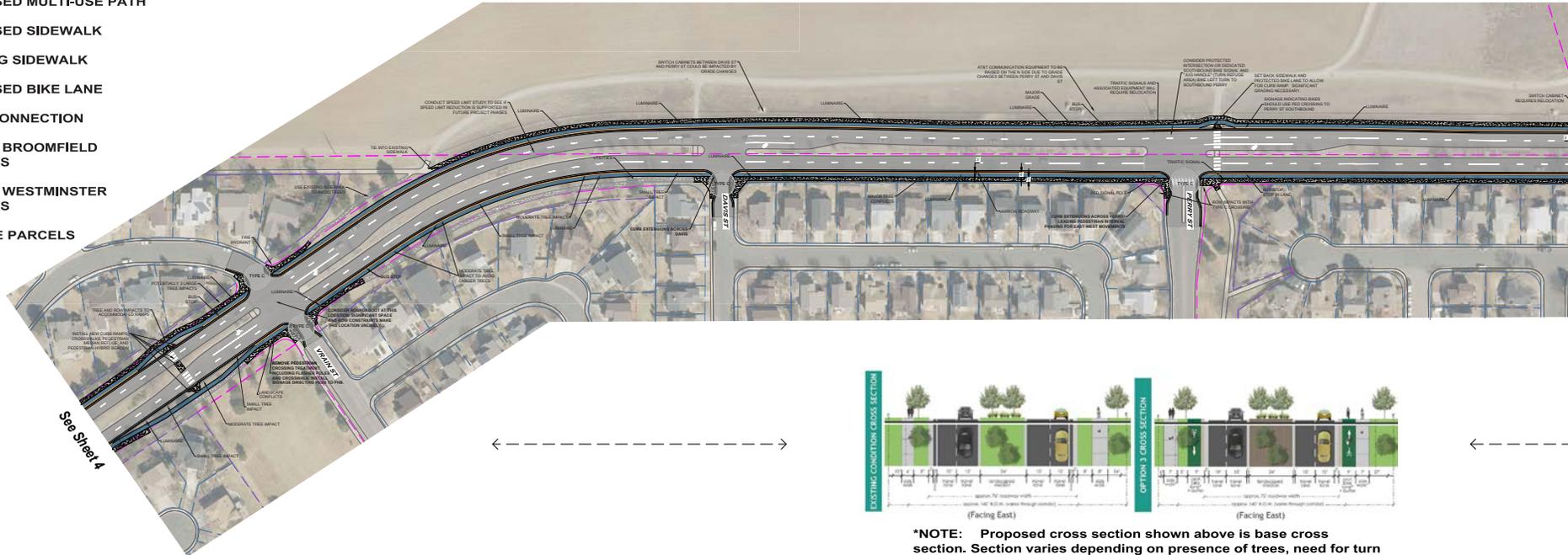


Scale: Approx. 1" = 40'

December, 2022
North

Figure G4: Future Concept, Birch St to Wolff St

- LEGEND**
-  PROPOSED MULTI-USE PATH
 -  PROPOSED SIDEWALK
 -  EXISTING SIDEWALK
 -  PROPOSED BIKE LANE
 -  TRAIL CONNECTION
 -  CITY OF BROOMFIELD PARCELS
 -  CITY OF WESTMINSTER PARCELS
 -  PRIVATE PARCELS

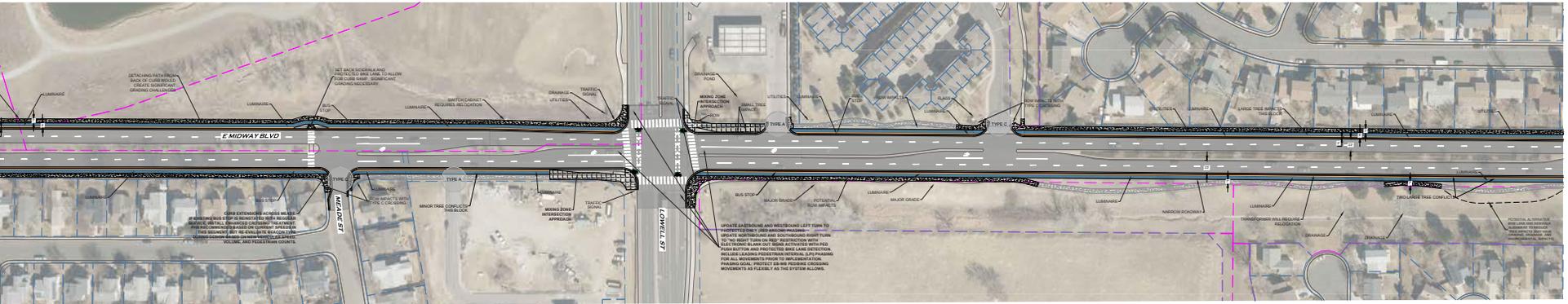


***NOTE:** Proposed cross section shown above is base cross section. Section varies depending on presence of trees, need for turn lanes, and parking demand. Bike lane is at elevation of sidewalk. Curb is proposed to move in approximately 3' in each direction - curb move would take place only with adjacent construction.



Future Off-Street Protected Bike Lane/Multi-Use Path Concept

Revised December 2022



DDRAFT CONCEPT PLAN NOTES:

- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE CROSSING TREATMENTS TYPES ARE IDENTIFIED FOR MINOR ROADWAYS AND COMMERCIAL DRIVEWAYS. RESIDENTIAL DRIVEWAYS WILL BE CROSSING TYPE A (DRIVEWAYS ARE NOT HIGHLIGHTED SEPARATELY IN PLANS).
- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE AND STRIPING ARE SHOWN FOR CONCEPT CONVEYANCE ONLY - DETAILS TO BE DEVELOPED DURING DESIGN. NOT FOR CONSTRUCTION.
- AT CURB RAMPS (PARTICULARLY MIDWAY BLVD CROSSINGS AND BUS STOPS), OFF-STREET PBL MAY NEED TO BE PULLED BACK FROM THE CURB DEPENDING ON DETAILED GRADING. OFFSET MAY CAUSE ADDITIONAL TREE AND GRADING CONFLICTS IN SOME LOCATIONS.
- LANDSCAPING AREAS BETWEEN PATHS AND CURBS, BETWEEN PATHS, OR IN CURB EXTENSIONS ARE NOT SHOWN HERE, BUT SHOULD BE INCLUDED IN DESIGN PHASE.
- CURB RAMPS AND STOP BARS WILL BE REVIEWED AND IMPROVED TO DIRECTIONAL RAMPS WITH EACH ADJACENT PROJECT DURING DESIGN PHASE.
- PLANS SHOW PATH LOCATION AND WIDTH BASED ON TRADEOFF DECISIONS RELATING TO GRADING/ROW/TREE IMPACTS DURING CONCEPT DESIGN. ADDITIONAL DISCUSSION SHOULD TAKE PLACE DURING THE NEXT PHASE OF DESIGN, OUTREACH, AND CONSTRUCTION DOCUMENTS.
- CROSSWALKS ON SIDE STREETS SHOULD BE INSTALLED CONSISTENTLY ALONG THE CORRIDOR AS DETERMINED APPROPRIATE DURING DESIGN.
- IMPROVE VISIBILITY AT ALL SIDESTREETS ADJACENT TO LANDSCAPED MEDIAN BY ADJUSTING LANDSCAPING IN MEDIAN AND MAINTAINING/TRIMMING MORE OFTEN.

- WHERE CURB EXTENSIONS ARE SHOWN ACROSS SIDESTREETS, COLLECT NEW TURNING MOVEMENT COUNTS DURING DESIGN TO DETERMINE IF ADJUSTMENTS TO ALLOW LEFT OR RIGHT TURN LANE ARE NECESSARY, AND/OR USE PAINT AND POST FOR INITIAL INSTALLATION.
- DESIGN VEHICLE AND CONTROL VEHICLE DETERMINATION FOR THIS CORRIDOR STILL UNDER CONSIDERATION BY BROOMFIELD STAFF. TRUCK TURNS AND ADJUSTMENTS TO CORNER RADII AS NECESSARY DURING DESIGN PHASE.
- CONDUCT TREE AND IRRIGATION REMOVAL/REPLACEMENT STUDIES DURING DESIGN.



CROSSING TYPE A
Low Volume Residential or Commercial Driveways



CROSSING TYPE B - 1
Higher Volume Commercial Driveways
(2 bus stop options also shown)



CROSSING TYPE B - 2
Higher Volume Commercial Driveways with limited right-of-way



CROSSING TYPE C
Unsignalized and Minor Signalized Local Streets and Intersections

Sheet F-5



0 40 80 160
Scale: Approx. 1" = 40'

December, 2022
North

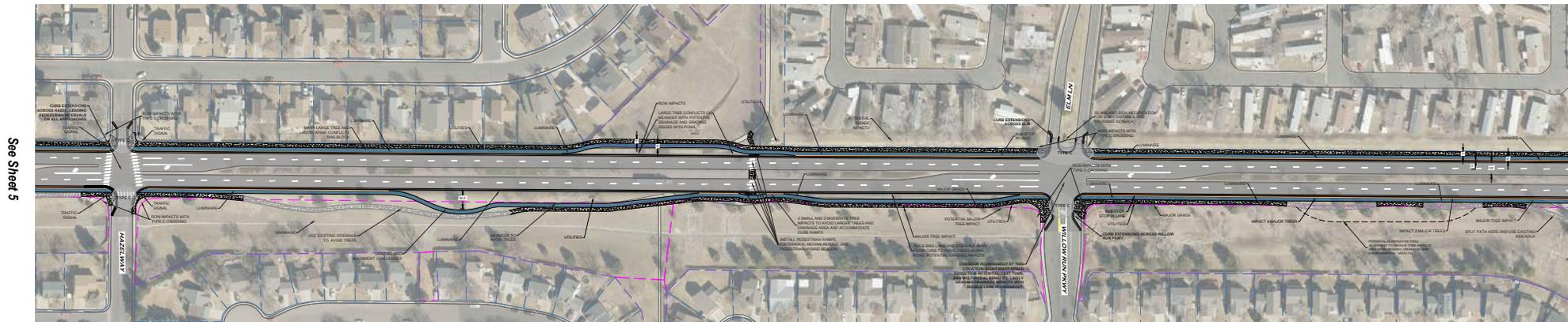
Figure G5: Future Concept, Vrain St past Lowell Blvd

- LEGEND**
-  PROPOSED MULTI-USE PATH
 -  PROPOSED SIDEWALK
 -  EXISTING SIDEWALK
 -  PROPOSED BIKE LANE
 -  TRAIL CONNECTION
 -  CITY OF BROOMFIELD PARCELS
 -  CITY OF WESTMINSTER PARCELS
 -  PRIVATE PARCELS

DRAFT CONCEPT PLAN NOTES:

- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE CROSSING TREATMENTS TYPES ARE IDENTIFIED FOR MINOR ROADWAYS AND COMMERCIAL DRIVEWAYS. RESIDENTIAL DRIVEWAYS WILL BE CROSSING TYPE A (DRIVEWAYS ARE NOT HIGHLIGHTED SEPARATELY IN PLANS).
- MULTI-USE PATH, SIDEWALK, AND OFF-STREET PROTECTED BIKE LANE AND STRIPING ARE SHOWN FOR CONCEPT CONVEYANCE ONLY - DETAILS TO BE DEVELOPED DURING DESIGN. NOT FOR CONSTRUCTION.
- AT CURB RAMPS (PARTICULARLY MIDWAY BLVD CROSSINGS AND BUS STOPS), OFF-STREET PBL MAY NEED TO BE PULLED BACK FROM THE CURB DEPENDING ON DETAILED GRADING. OFFSET MAY CREATE ADDITIONAL TREE AND GRADING CONFLICTS IN SOME LOCATIONS.
- LANDSCAPING AREAS BETWEEN PATHS AND CURBS, BETWEEN PATHS, OR IN CURB EXTENSIONS ARE NOT SHOWN HERE, BUT SHOULD BE INCLUDED IN DESIGN PHASE.
- CURB RAMPS AND STOP BARS WILL BE REVIEWED AND IMPROVED TO DIRECTIONAL RAMPS WITH EACH ADJACENT PROJECT DURING DESIGN PHASE.

- PLANS SHOW PATH LOCATION AND WIDTH. GRADING/ROW/TREE IMPACTS DURING CONSTRUCTION WILL BE DETERMINED DURING DESIGN PHASE.
- CROSSWALKS ON SIDE STREETS SHOULD BE DETERMINED APPROPRIATE DURING DESIGN PHASE.
- IMPROVE VISIBILITY AT ALL SIDE STREETS THROUGH LANDSCAPING IN MEDIAN AND MAINTAINMENT AREAS.
- WHERE CURB EXTENSIONS ARE SHOWN, TREE COUNTS DURING DESIGN TO DETERMINE IF MORE ARE NECESSARY, AND/OR USE PAINT AND SIGNAGE.
- DESIGN VEHICLE AND CONTROL VEHICLE SHOULD BE CONSIDERED BY BROOMFIELD STAFF. THIS IS NECESSARY DURING DESIGN PHASE.
- CONDUCT TREE AND IRRIGATION REMOVAL AND REPLANTING AS NECESSARY.



Future Off-Street Protected Bike Lane/Multi-Use Path Concept

Revised December 2022

BASED ON TRADEOFF DECISIONS RELATING TO CONCEPT DESIGN. ADDITIONAL DISCUSSION SHOULD TAKE PLACE DURING DESIGN, OUTREACH, AND CONSTRUCTION DOCUMENTS.

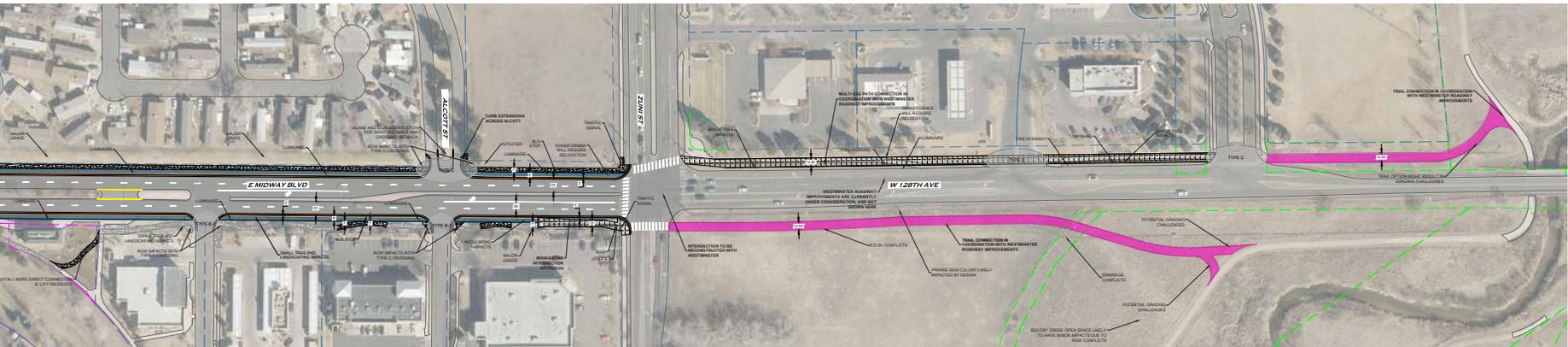
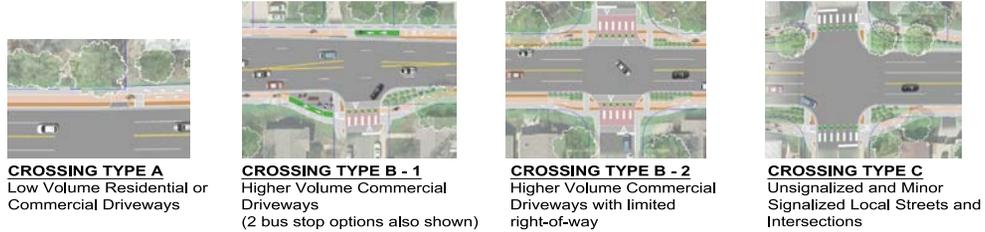
BE INSTALLED CONSISTENTLY ALONG THE CORRIDOR AS SHOWN.

ADJACENT TO LANDSCAPED MEDIAN BY ADJUSTING CURB AND TRIMMING MORE OFTEN.

CROSS SIDESTREETS, COLLECT NEW TURNING MOVEMENT LANE MARKINGS AND ADJUSTMENTS TO ALLOW LEFT OR RIGHT TURN LANE MARKINGS TO POST FOR INITIAL INSTALLATION.

DETERMINATION FOR THIS CORRIDOR STILL UNDER REVIEW. TRUCK TURNS AND ADJUSTMENTS TO CORNER RADII AS SHOWN.

REPLACEMENT STUDIES DURING DESIGN.



Proposed cross section shown to the left is base cross section. Section shown is dependent on presence of trees, need for turn lanes, and parking demand. Bike lane elevation of sidewalk. Curb is proposed to move in approximately 3' in each direction. Curb move would take place only with adjacent construction.

Sheet F-6



December, 2022
North

Figure G6: Future Concept, Hazel St to Big Dry Creek

APPENDIX H Project Descriptions for Proposed Concepts

To aid in informing the public, the following project descriptions were posted online (Broomfield Voice) with the Proposed Concepts.

Future:

F1: This project would install a concrete multi-use path on the south side of Midway Blvd between Lake Link Trailhead and US 287. It would include:

- Remove curb and gutter, narrow roadway and construct curb and gutter with new attached 12' multi-use path with 2' buffer next to parking
- Curb extensions at Hoyt
- New Ped Bridges and/or culvert extensions east of Compton
- Close driveways where indicated
- Geometric improvements at Alter
- Reconstruct north side access to gas station SW corner of 287

F2: This project would reconstruct components of the Midway Blvd/US-287 intersection to better serve people walking, biking, and driving. It would include:

- Reconstruct all four right turn bypass islands and corner radii including raised crossings
- Widen to accommodate two SB left turn lanes and two EB receiving lanes per CDOT plans
- Traffic signal timing and phasing changes to provide protected WB left turn
- Pedestrian marking and wayfinding enhancements to improve the southern crossing and accommodate the Multi-Use Path connection to the east and west

F3: This project would install a concrete multi-use path on the south side of Midway Blvd between US 287 and Nickel Street. It would include:

- Remove sidewalk and construct 12' MU path from SH 287 to the east of Nickel Street
- Traffic signal equipment, timing and phasing changes at Garden Center and Nickel Street to separate pedestrian crossing and vehicular turning movements in time
- Close driveways where indicated to reduce conflict points and increase vehicle, bicycle, and pedestrian movement predictability

F4: This project would install an off-street protected bicycle lane on Midway from Nickel Street to Main Street. It would include:

- Construct 7' (+2' buffer adj to road) protected bicycle lane on both sides of Midway from Nickel St to Main St
- Widen sidewalks to 7' as possible
- Install striped median with flexible delineators to restrict turning movements and reduce crossing distance at existing Laurel St rectangular rapid flashing beacon (RRFB)
- Reconstruct the Midway Blvd/Kohl Street intersection to be a protected intersection with green conflict markings
- At the Daphne intersection, relocate crosswalk to the east leg and provide RRFB and a striped median with flexible delineators
- Narrow roadway east of Laurel to reduce tree impacts and improve speed compliance, including periodic curb extensions between Kohl St and Main St (resulting in some parking loss)

F5: This project would construct a concrete multi-use path/mixing zone approaching and departing this intersection in both directions. It would include:

- Construct 12-foot multi-use path/mixing zone along Midway approaching and departing the intersection in both directions
- Traffic signal pole/mast arm relocation
- Traffic signal timing and phasing changes to provide protected left turn and right turn phasing

F6: This project would install an off-street protected bicycle lane on Midway from Main Street to Ash Street. It would include:

- Construct a 7' (+2' buffer adj to road) protected bicycle lane on both sides of Midway from Main Street to Ash Street
- Construct 7' sidewalk with crusher fines shoulder on north side of road
- Narrow roadway between Main Street and Ash Street to remove on-street bicycle lane, reduce tree impacts and improve speed compliance from parking friction

F7: This project would reconstruct the break in the center median to create an improved multi-use path crossing. It would include:

- Closure of the asphalt break in the median currently used for U-turning in this section of roadway and installation of curb extensions
- Reconstruct the area to be a landscaped area or hardscaped area with a diagonal multi-use path
- Relocate the north crossing of westbound traffic to provide additional sight distance

F8: This project would reconstruct the break in the center median to create an improved multi-use path crossing. It would include:

- Closure of the asphalt break in the median currently used for U-turning in this section of roadway and installation of curb extensions
- Reconstruct the area to be a landscaped or hardscaped area with a diagonal multi-use path
- Relocate the south crossing of eastbound traffic to provide additional sight distance
- Connect soft surface trail to the south

F9: This project would install an off-street protected bicycle lane on Midway from Ash Street to and through the Sheridan Boulevard intersection. It would include:

- Construct a 7' (+2' buffer adj to road) off-street protected bicycle lane on the north side of Midway and a 12' (+2' buffer adj to road) multi-use path and buffered bicycle lane on the south side of Midway with sidewalk widening on north side where possible between Ash Street and Sheridan Boulevard.
- Narrow roadway in WB direction to reduce tree impacts, accommodate multi-use path and increase speed compliance
- Curb extensions at Ash Street, Birch Street and Dexter Place
- Traffic Signal Pole/Mast Arm relocation
- Bicycle conflict markings and signing in the Sheridan and Midway intersection
- Traffic signal timing and phasing changes to provide protected left turn and right turn phasing
- No Right Turn on Red restriction for northbound right (blank out sign)

F10: This project would install an off-street protected bicycle lane between Sheridan and Lowell. It would include:

- Construct a 7' (+2' buffer adj to road) off-street protected bicycle lane on both sides of Midway between Sheridan and Lowell
- Narrow roadway during bikeway construction to reduce tree impacts and improve speed compliance
- Curb extensions at Wolffe, Yates, Vrain, Davis, Perry and Meade intersections
- Bicycle conflict markings and signing in the Lowell and Midway intersection
- Traffic signal timing and phasing changes to provide protected left turn and right turn phasing
- Crossing enhancements at Perry, potential future crossing beacons at Wolff and Meade

F11: This project constructs a new Pedestrian Hybrid Beacon (PHB, sometimes called a HAWK) crossing west of the Vrain Street intersection. It would include:

- Remove existing rectangular rapid flash beacon crossing at the Vrain Street intersection
- Install new Pedestrian Hybrid Beacon crossing at least 100' west of the Vrain Street intersection

F12: This project would install an off-street protected bicycle lane between Lowell and Zuni. It would include:

- Construct a 7' (+2' buffer adj to road) off-street protected bicycle lane on Midway Lowell and Zuni
- Narrow roadway during bikeway construction to reduce tree impacts and improve speed compliance
- Curb extensions at Alcott, Willow Run and Hazel intersections, with signal timing changes at Hazel

F13: This project constructs a new Pedestrian Hybrid Beacon (PHB) crossing west of Willow Run. It would include:

- Remove existing signed and marked crosswalk at the Willow Run intersection
- Install new Pedestrian Hybrid Beacon crossing at the path connection west of the Willow Run Pkwy/Elm Ln intersection

F14: This project includes improvements to the Zuni/Midway intersection. Project will be in coordination with Westminster, and additional coordination is necessary to further define improvements and locations

F15: This project adds a multi-use path connection to the Big Dry Creek trail. This project will be in coordination with Westminster, and additional coordination is necessary to further define improvements and locations

Interim:

I1: This project stripes buffered bicycle lanes on Midway between the Lake Link Trailhead and State Highway 287. It would include:

- Removal of most parking on both sides of Midway (except for some at the west end trail head) and repurposing this space to be buffered bicycle lanes from the Lake Link Trailhead to State Highway 287 intersection
- Green bicycle conflict markings and signing at the trailhead, and at the Hoyt Street, Compton Street, Burbank Street and Alter Street intersections
- Asphalt patching at multiple locations along the corridor

I2: This project constructs a slip ramp connecting the existing sidewalk to the bicycle lane on Midway and provides signing which allows bicycles to use the sidewalk from SH 287 to Nickel.

I3: This project constructs striping and paint/post improvements on Midway from Marble Street to Laurel Avenue. It would include:

- Green bicycle conflict markings and signing at intersections and driveways
- Construct paint and post median refuge at crosswalk on the west leg of the Laurel Avenue intersection
- Restrict northbound left turn movements at the Laurel and Midway intersection to avoid conflict with the crosswalk

I4: This project stripes a combination of standard bicycle lanes and buffered bicycle lanes on Midway between Laurel Avenue and Main Street. It would include:

- Striping of a standard bicycle lane in sections where parking remained on the street
- Striping of a buffered bicycle lane in sections where parking was removed from the street
- Signing of parking restrictions in those areas where buffered bicycle lanes were to be striped
- Restripe narrow center median

I5: This project provides bicycle lanes and paint/post curb extensions at the Main Street and Midway intersection. It would include:

- Narrow westbound lanes to provide bicycle lanes on the approach
- Green bicycle conflict markings at the intersection
- Paint and post curb extensions on southeast and southwest corners of the intersection

I6: This project provides buffered bicycle lanes on Midway between Main Street and Sheridan Boulevard. It would include:

- The striping of buffered bicycle lanes on Midway from Main Street to Sheridan Boulevard
- Green bicycle conflict markings at the intersections of Spader Way, Ash Street, Birch Street and Dexter Place
- Paint/post curb extensions on all four corners of the Ash Street and Birch Street intersections

I7: This project would construct a slip ramp to connect an eastbound bicycle lane to the existing multi-use path and would provide bicycle enhancement pavement markings within the intersection of Sheridan Boulevard and Midway. It would include:

- Construction of a slip ramp on the eastbound approach from a bicycle lane to the existing multi-use path, approaching the Sheridan Boulevard and Midway intersection
- Signing which tells people on bikes to use shared use path/sidewalk
- Green bicycle conflict markings at the intersection
- Green bicycle boxes for bicycle left turn enhancement

I8: This project would install paint and post curb extensions on all four corners of the Vrain Street and Midway intersection

I9: This project would install paint and post curb extensions across the south leg of the Perry Street and Midway intersection

I10: This project would stripe two stage left turn boxes bicycle chevron markings in the Lowell Street and Midway intersection

I11: This project would install paint and post curb extensions on all corners except the southeast corner of the Hazel Street and Midway intersection

APPENDIX I Project Prioritization

Midway Boulevard Multimodal Project - Prioritization of Projects										Notes
INTERIM		Category A			Category B	Category C	Category D	Subtotal		
ID	Project Name and Limits	Primary Improvements	Safety	Multi-modal	Location	Public Prioritization	Complexity			
						N/a	N/a	N/a		
13	Marble Street to Laurel Avenue striping and paint/post improvements	Stripe green conflict markings for WB right turn lane at Marble Street; Paint and post median to protect crosswalk on west leg of Laurel Avenue	3	3	3	1	2	3	15	An enhanced pedestrian crossing treatment will provide safety benefit and will make it more comfortable to cross the roadway. Complexity may be increased if there is community concern about the northbound left turn restriction and there will be increased maintenance with the bollards. These are low cost improvements and they are in the core trip generation area of the corridor.
18	Vrain Street intersection improvements	Paint and post curb extensions on all corners.	2	2	3	2	3	3	15	Curb extensions provide some benefit at low cost. Bollards provide added maintenance. Improvements are distant from main trip generators in the corridor.
11	Stripe Buffered Bike Lanes on Midway between Lake Link Trail and SH-287	Stripe buffered bike lanes and center median with green conflict markings. Asphalt patching (multiple locations)	1	2	3	3	3	2	14	Midway in this section is a wide street with lower traffic volumes and very little on-street parking. There is a lot of room for on-street cycling and the striping of a bike lane, while better than what exists today, provides limited added benefit. The bike lane and green conflict marking will highlight the bikes place on the roadway. These facilities make a direct connection between the Lake Link Trail and the commercial facilities east of SH 287 (with only the intersection of SH 287 remaining a challenge). The amount of new pavement marking will require additional funding.
15	Main Street intersection improvements	Narrow lanes on WB approach to provide bike lane on approach and green conflict markings on right turn approaches. Paint and post curb extensions on SE and SW corners of intersection.	3	2	2	1	3	3	14	Intersection improvements will improve safety and enhance multi-modal experience. Not a low-stress facility but still better than what is there currently. Bollards will increase maintenance (complexity). These are low cost improvements. Part of the connection between Main Street and the commercial area/park.
17	Sheridan Boulevard intersection improvements	Construct slip ramp on EB approach for bicycles to enter MU path. Stripe bike boxes, bike chevrons and conflict markings within intersection.	3	2	2	1	3	3	14	Eastbound slip ramp is helpful for safety at the intersection. Intersection improvements will improve safety and enhance multi-modal experience. Little complexity and low cost. Improvements are distant from main trip generators.
110	Lowell Street intersection improvements	Stripe two stage left turn boxes and bike chevron markings in intersection	3	3	1	1	3	3	14	Intersection improvements will improve safety and enhance multi-modal experience. Not a low-stress facility but still better than what is there currently. Improvements are low cost. Distant from main trip generators.
14	Bike lane striping from Laurel Avenue to Main Street	Stripe bike lanes (where parking remains) and buffered bike lanes (where parking is removed) and restripe/narrow center median. Remove parking in select areas and sign the parking restrictions.	2	2	3	3	1	2	13	Current bike facilities are shared space with high volume traffic and heavy parking. While a bike lane is not a low-stress facility, it is a substantial improvement from the lack of facilities that exist today. The added space from the bike lane and the removal of some parking should mitigate potential conflict between bikes and parked cars. The removal of parking in a residential area has the potential for significant complexity and a need for a robust public process. The amount of new pavement marking and the cost of the public process will exceed operational funding and will require additional funding. These improvements connect Main Street to the commercial area and the park.
19	Perry Street intersection improvements	Stripe green conflict markings across south leg of intersection	3	2	1	1	3	3	13	Intersection improvements will improve safety and enhance multi-modal experience. Not a low-stress facility but still better than what is there currently. Improvements are low cost. Distant from main trip generators.
12	Slip Ramps from sidewalk to bike lane at Nickel	Concrete work for slip ramps and restriping of bike lane connections. Signs about bikes using sidewalks from 287 to Nickel.	1	1	3	1	3	3	12	The providing a slip ramps connecting bike lanes to sidewalk does have some value, but cyclists could use access ramps in the interim. These improvements have little complexity and low cost. Improvements close to high trip generators.
111	Hazel Street intersection improvements	Paint and post curb extensions on three corners (not SE corner).	2	1	1	1	3	3	11	Curb extensions provide some benefit at low cost. Bollards provide added maintenance. Improvements are distant from main trip generators in the corridor.
16	Buffered bike lanes from Main Street to Sheridan Blvd	Stripe buffered bike lanes and green conflict markings along corridor. Paint and post curb extensions on all corners at Ash Street and Birch Street intersections.	1	2	2	2	1	2	10	There is already a striped bike lane for almost all of this corridor, so the differential of a buffered bike lane (not low stress) is limited benefit. The improvements are mid-block or at lower volume intersections so safety enhancement is limited. There is significant complexity potential from residential parking impacts plus increased maintenance with the added bollards. The amount of new pavement marking and the cost of the public process will likely exceed operational funding and will require additional funding. These improvements are between approximately a mile or more away from the commercial area and park to the west. They have value in completing the corridor but are less beneficial on their own as they only connect Main Street to Sheridan and the open space between.

Figure 11: Prioritization of Interim Projects Table

Midway Boulevard Multimodal Project - Prioritization of Projects										Notes
FUTURE										
ID	Project Name and Limits	Primary Improvements	Category A			Category B	Category C	Category D	Subtotal	
			Benefit			Public Prioritization	Complexity	Financial		
			Safety	Multi-modal	Location	N/a	N/a	N/a		
F5	Intersection improvements at Main Street and Midway	Construct 12' MU path / mixing zone on all EB and WB approach and departures, connecting to future protected bike lanes. Traffic signal modifications. Traffic signal timing and phasing changes to provide protected left turn and right turn phasing.	3	3	3	1	3	2	15	Improvements to the intersection have significant safety benefit and significantly improved multi-modal comfort. Improvements important in making the connection between Main Street and high trip generation centers to the west. Operational changes to the signal may meet with community resistance and increase complexity. Cost may be less than \$200K and not require grant funding.
F2	Midway and US-287 intersection improvements	Reconstruct all four right turn bypass islands and corner radii including raised crossings. Widen to accommodate two SB left turn lanes and two EB receiving lanes. Traffic signal timing and phasing changes to provide protected WB left turn.	3	3	3	3	1	1	14	Improvements to the intersection have significant safety benefit and significantly improve multi-modal comfort. Improvements are essential to connecting Lake Link Trail to the commercial center and the park to the east. These improvements will require significant coordination with both CDOT and Boulder County which will increase the complexity. Operational changes to signal timing may meet with community resistance, increasing complexity. Project is only feasible if supported by grant funding.
F4	Protected Bike Lane from Nickel Street to Main Street	Construct 9' wide Protected Bike Lane and 7' sidewalk on both sides of Midway from Nickel Street to Main Street. Reconstruct Kohl Street to be a protected intersection with green conflict markings. At the Daphne intersection, relocate crosswalk to east leg and provide RRFs and paint and post median. Roadway narrowing east of Laurel (speed reduction and reduced tree impacts). Bumpouts and parking loss between Kohl and Main (speed reduction and reduced tree impacts).	3	3	3	3	1	1	14	Protected bike lanes and protected intersection at Kohl, as well as enhanced pedestrian crossing treatment at Laurel will substantially improve safety. Protected bike lanes will substantially improve multi-modal comfort. Improvements important to connect Main Street bike lanes west to the commercial area and the park. Substantial impacts to trees and on-street parking will add complexity to the project. Project is only feasible if supported by grant funding.
F7	New Z Ped Crossing between Main Street and Spader Way	Close the break in median used for U-turns between Main Street and Spader Way. Install new MU path to create Z Ped Crossing with curb extensions. Relocate crosswalk for WB roadway to west side. Construct new ramp and path connection. Landscape or hardscape remaining median area.	3	2	1	2	3	3	14	Enhanced pedestrian crossing treatment will provide significant safety benefit and somewhat increase multi-modal comfort. Highly beneficial at it's currently location. Interdepartment coordination needed about use of this space currently. The cost of these improvements will likely exceed operational funding and will require additional funding.
F8	New Z Ped Crossing between Spader Way and Ash Street	Close the break in median used for U-turns between Spader Way and Ash Street. Install new MU path to create Z Ped Crossing with curb extensions. Relocate crosswalk for EB roadway to east side. Construct new ramp and create soft surface trail connection to south.	3	2	1	2	3	3	14	Enhanced pedestrian crossing treatment will provide significant safety benefit and somewhat increase multi-modal comfort. Highly beneficial at it's currently location. Interdepartment coordination needed about use of this space currently. The cost of these improvements will likely exceed operational funding and will require additional funding.
F3	South side MU path on Midway between SH 287 and Nickel Street	Remove sidewalk and construct 12' MU path from SH 287 to east side of Nickel Street. Traffic signal modifications. Traffic signal timing and phasing changes to provide protected left turn and right turn phasing. Close driveways where indicated.	3	2	3	1	2	1	12	Replacing sidewalk with a MU path is important but not very different from the existing facilities from a safety perspective, but operational changes to signal timing significantly improve safety. Will somewhat increase multi-modal comfort with wider facility. Improvements valueable to connect Lake Link trailhead to commercial area and the park. Operational changes to signal timing may meet with community resistance, increasing complexity. Cost may be less than \$200K and not require grant funding.
F9	Protected Bike Facilities from Ash Street to Sheridan Boulevard (including Sheridan intersection)	Construct a 9' wide protected bike lane on the north side (westbound) and a 12' MU path with a buffered bike lane on the south side (eastbound) between Ash Street and Sheridan Boulevard, including WB roadway narrowing. Incorporate concrete curb extensions at Ash, Birch and Dexter. Sidewalk widening on north side where possible. Green conflict markings and bike chevrons in Sheridan intersection. Signal timing/phasing changes to protect left and right turn movements and NB no right turn on red restriction (blank out sign). RRFs at Ash, Birch.	3	3	2	1	2	1	12	Protected bike lanes and protected intersection at Sheridan, as well as operational changes to the traffic signal significantly improve safety and multi-modal comfort. Limited ROW requires tree removal, which will increase complexity for the project. These improvements are more than a mile away from the commercial area and park to the west. They have value in completing the corridor but are less beneficial on their own as they only connect Sheridan Avenue to the adjacent open space. Project is feasible only if supported by grant funding.

Figure 12: Prioritization of Future Projects Table, part 1

Midway Boulevard Multimodal Project - Prioritization of Projects										Notes
FUTURE										
ID	Project Name and Limits	Primary Improvements	Category A			Category B	Category C	Category D	Subtotal	
			Benefit			Public Prioritization	Complexity	Financial		
			Safety	Multi-modal	Location	N/a	N/a	N/a		
F13	Pedestrian Hybrid Beacon crossing west of Willow Run Parkway	Remove existing signed and marked crosswalk on east leg of Willow Run Parkway and replace with new HAWK/PHB crossing west of Willow Run intersection, including curb ramps and median modification.	3	2	1	3	2	1	12	Enhanced pedestrian crossing treatment will provide significant safety benefit and somewhat increase multi-modal comfort. Highly beneficial at it's currently location. Relocation of crossing location may be controversial with nearby community, increasing complexity. The cost of these improvements will likely exceed operational funding and will require additional funding.
F1	South side MU path on Midway between Lake Link Trail and SH-287	Remove curb and gutter, narrow roadway and construct curb and gutter with new attached 12' MU path with 2' buffer next to parking. Curb extensions at Hoyt; New Ped Bridges and/or culvert extensions east of Compton; Close driveways where indicated; Geometric improvements at Alter; Reconstruct north side access to gas station SW corner of 287	1	3	3	3	1	1	12	Removing and replacing a mile of curb and gutter plus constructing a mile of 14' of new concrete path has a cost expected to require external funding support. The multi-use path will provide a low stress bike facility but the wide street and low traffic volume in this section minimizes motor vehicle impact to on-street cyclists currently. In addition, it is expected that interim bike lanes will be striped prior to the implementation of this project. The design minimizes environmental, operational and maintenance impacts and is not expected to be controversial with adjacent property owners. The design, constructing the path into the roadway, minimizes impacts to existing trees. The project's benefit is impacted by two linked projects (construction of a new culvert or attached pedestrian bridge at facility east of Compton Street; and the reconstruction of the south side of Midway between Alter Street and SH 287). These projects should be constructed prior to or concurrent with this project. A third project (the construction of wider sidewalk on the north side of the street) could be added to this project. Moving curb means chasing grade for driveways and adjacent property which is higher complexity. Any driveways which are intended to be closed increase complexity.
F6	Protected Bike Lane from Main Street to Ash Street	Construct 9' Protected Bike Lane on both sides of Midway from Main Street to Ash Street including roadway narrowing in each direction, and 7' Sidewalk with crusher fines shoulder on north side. Sidewalk relocation as indicated. Spader way improvements including bike slip ramp.	2	3	2	2	1	1	11	Midblock protected bike lanes will somewhat increase safety but will greatly enhance multi-modal comfort. These improvements are between approximately a mile or more away from the commercial area and park to the west. They have value in completing the corridor but are less beneficial on their own as they only connect Main Street to the adjacent open space. Improvements occur adjacent to Open space and coordination with the Open Space Department will be required. Project is feasible only if supported by grant funding.
F10	Protected Bike Lane from Sheridan Boulevard to Lowell Street (including Lowell intersection)	Construct 9' Protected Bike Lane between Sheridan Boulevard and Lowell Street including roadway narrowing. Incorporate curb extensions at Wolffe, Yates, Vrain, Davis, Perry, and Meade intersections. Green conflict markings and bike chevrons in Lowell intersection. Signal timing/phasing changes to protect left and right turn movements. Crossing enhancements at Perry, potential future crossing beacons at Wolff and Meade.	3	3	1	2	1	1	11	Protected bike lanes and protected intersection at Sheridan, as well as operational changes to the traffic signal significantly improve safety and multi modal comfort. Tree removal adjacent to Open Space will increase complexity for the project. Improvements are distant from main traffic generators. Project is feasible only if supported by grant funding.
F11	Pedestrian Hybrid Beacon crossing west of Vrain Street	Remove existing RRFB crossing on west leg of Midway and Vrain Street and replace with new HAWK/PHB crossing west of Vrain Street intersection, including curb ramps and median modification.	3	2	1	2	2	1	11	Enhanced pedestrian crossing treatment will provide significant safety benefit and somewhat increase multi-modal comfort. Highly beneficial at it's currently location. Relocation of crossing location may be controversial with nearby community, increasing complexity. The cost of these improvements will likely exceed operational funding and will require additional funding.
F12	Protected Bike Lane from Lowell Street to Zuni Boulevard	Construct 9' Protected Bike Lane and sidewalk replacement/widening between Lowell Street and Zuni Boulevard, including roadway narrowing. Incorporate curb extensions at Alcott, Willow Run and Hazel intersections. Signal timing changes at Hazel	2	3	1	2	1	1	10	Protected bike lane provides somewhat enhanced mid-block safety but significantly increase multi-modal comfort. Substantial tree removal or related trade-offs adjacent to Open Space expected to significantly increase complexity of project. Improvements are distant from main traffic generators. Project is feasible only if supported by grant funding.
F14	Intersection improvements at Midway and Zuni	Improvements to be determined with joint project with Westminster, and may include curb changes and signal timing updates necessary to reduce pedestrian and bicycle exposure and shorten crossing distances, and reduce crashes.	TBD	TBD	TBD	1	TBD	TBD	TBD	This project is not being defined as part of the Midway project, as additional coordination with Westminster is necessary to determine future cross section east of the intersection.
F15	Path connection on north and south sides east of Zuni, connecting to Dry Creek Trail	Path routing and configuration to be determined with joint project with Westminster, but will include path connections on the north and south sides of 128th Ave to the Dry Creek Trail.	TBD	TBD	TBD	2	TBD	TBD	TBD	This project is not being defined as part of the Midway project, as additional coordination with Westminster is necessary to determine future cross section east of the intersection.

Figure I3: Prioritization of Future Projects Table, part 2

Evaluation Criteria and Scoring Guide

Benefit Category	This category represents both achieving project goals as well as comparative value of the project to the community considering it's surroundings. Project goals focused on in this Category include safety, multi-modal comfort and efficiency, speed reduction and likely volume of use. Comparative benefit factors such as what facilities exist currently and how much increased value there is as well as whether the improvement makes a significant connection to existing facilities or high demand destinations. The scale will be from 1 to 3 with a high number equaling strong stand alone benefit of the project.		
Benefit Category - Improved Safety	This sub-category of Benefit represents the presence of improvements which will enhance safety in the corridor, such as changes in signal timing, motor vehicle speed reduction, better protected crossing treatments and intersection improvements. It favors improvements at intersections (where most crashes occur) over mid-block/corridor improvements.		
	3	2	1
	High benefit - Presence of significant safety improvements. High likelihood of improved safety after implementation of this project.	Modest benefit - Presence of potentially beneficial safety improvement (no more than one in the project area). Some possibility of improved safety after implementation of this project.	Low benefit - Low presence of safety improvements in the project. Less likelihood of improved safety after implementation of this project.
Benefit Category - Multi-modal enhancement	This sub-category of Benefit represents the likelihood that the specific improvements will create conditions which will enhance the multi-modal experience and encourage people to walk and bike on the Midway corridor. It favors improvements which create horizontal and vertical separation from motor vehicles and which encourage drivers to yield to people walking and biking when they cross the street.		
	3	2	1
	High benefit - Substantial site specific or systemic Improvements which significantly improve multi-modal facilities.	Modest benefit - Somewhat enhanced multi-modal facilities. Noticably better than prior facilities.	Low benefit - Improvements will marginally enhance the multi-modal experience
Benefit Category - Location within the corridor	This sub-category of Benefit represents the location of these improvements compared to the highest density of trip making in the corridor. It favors improvements close to the commercial center and the city park.		
	3	2	1
	High benefit - Location is at or close to the commercial center and/or city park	Modest benefit - Within walking distance to the commercial center and/or city park.	Low benefit - Relatively far away from the commercial center and/or city park.

Figure 14: Prioritization Table Evaluation Criteria and Scoring Guide, part 1

Evaluation Criteria and Scoring Guide

Public Prioritization Category	This category will be a direct reflection of the community feedback with a scale of 3 to 1 representing high, medium and low priority, respectively. Public prioritization information came from the public review of the project list.		
	3	2	1
	Highly prioritized by Public	Some prioritization by Public	Little prioritization by Public
Complexity Category	This category represents the complexity of the project, which is a proxy value for how difficult, time consuming and staff intensive it will be to implement the project. Political factors such as needing to coordinate with another agency will be considered. Environmental impacts such as impacts to trees, drainage factors and construction near residences will be considered. Projects likely to require high amounts of public process such as those involving parking removal, tree removal, changes to travel lanes, or construction in ROW perceived as a resident's front yard will also be considered. Also, additional long-term costs such as improvements that require additional equipment and/or staffing will be considered in this category. Scale will be from 1 to 3 with low number equaling less complexity.		
	3	2	1
	Low Complexity for project completion. No significant public tradeoff issues. Little public process expected. Few if any additional long-term costs.	Moderate Complexity for project completion. No more than one significant public trade off issue. Some public process expected but unlikely to require substantial policy maker involvement. Possibility of some additional long-term costs.	High Complexity for project completion. These projects are expected to be contentious and require substantial public process and policy maker decision making. Potential significant long-term costs.
Financial Category	This category represents the construction cost of the project and falls into three categories: (1) Can be funded through operational funds. (2) Requires capital funding but does not require external matching funds. (3) Requires external funding (DRCOG, CDOT, etc...)		
	3	2	1
	Low Cost - less than approximately \$100K and can be accomplished using operational funding	Moderate Cost - Will require some capital funding and will be between approximately \$100K and \$500K in cost. Likely to be paired with other local funding sources (maintenance, etc...) to accomplish joint goals	High Cost - Projects that will only be designed and constructed through a combination of City Capital Funding and external grant funding. Costs in excess of approximately \$500K.

Figure 15: Prioritization Table Evaluation Criteria and Scoring Guide, part 2

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APPENDIX J Cost Estimates, Interim Projects

INTERIM - PROJECT ID	INTERIM - PROJECT NAME AND LIMITS	Bicycle or Pedestrian Project	Hardscape/ Civil	Operational/ Signal Timing	Intersection Improvements	Signing and Striping	TOTAL CONSTRUCTION COST	TOTAL PROJECT COST
I1	Stripe Buffered Bike Lanes on Midway between Lake Link Trail and SH-287	X				X	\$ 198,300	\$ 257,800
I2	Slip Ramps from sidewalk to bike lane at Nickel	X	X			X	\$ 42,400	\$ 55,200
I3	Marble Street to Laurel Avenue striping and paint/post improvements	X				X	\$ 32,400	\$ 42,200
I4	Bike lane striping from Laurel Avenue to Main Street	X				X	\$ 165,100	\$ 214,700
I5	Main Street intersection improvements	X			X	X	\$ 65,000	\$ 84,500
I6	Buffered bike lanes from Main Street to Sheridan Blvd	X				X	\$ 251,700	\$ 327,300
I7	Sheridan Boulevard intersection improvements	X			X	X	\$ 63,500	\$ 82,600
I8	Vrain Street intersection improvements	X			X	X	\$ 13,700	\$ 17,900
I9	Perry Street intersection improvements	X			X	X	\$ 12,900	\$ 16,800
I10	Lowell Street intersection improvements	X			X	X	\$ 12,000	\$ 15,600
I11	Hazel Street intersection improvements	X			X	X	\$ 12,900	\$ 16,800

Figure J1: Interim Projects Cost Estimate Summary

City of Broomfield - Midway Corridor

Cost Estimate: Project I1 (Stripe Buffered Bike Lanes on Midway between Lake Link Trail and SH-287-1 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Asphalt Mat	SY	14	\$ 85.00	\$ 1,190
Hot Mix Asphalt (Patching)(Asphalt)	SY	14	\$ 120.00	\$ 1,680
Modified Epoxy Pavement Marking	GAL	211	\$ 300.00	\$ 63,300
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	730	\$ 25.00	\$ 18,250
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	460	\$ 20.00	\$ 9,200
Erosion Control	LS	1	\$ 10,000.00	\$ 10,000
Traffic Control	LS	1	\$ 50,000.00	\$ 50,000
Total Construction Items				\$ 152,500
Contingency (30%)	30%			\$ 45,750
Total Construction Cost				\$ 198,300
Engineering (10%)	10%			\$ 19,830
Construction Mgmt (20%)	20%			\$ 39,660
Total Project Cost				\$ 257,800

Figure J2: Interim Project 1 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I2 (Slip Ramps from sidewalk to bike lane at Nickel-.08 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	46	\$ 15.00	\$ 690
Removal of Asphalt Mat	SY	11	\$ 85.00	\$ 935
Reset Ground Sign	EA	1	\$ 400.00	\$ 400
Removal of Landscaping	AC	0.01	\$ 5,000.00	\$ 50
Curb Type 2 (Section B)	LF	75	\$ 45.00	\$ 3,375
Concrete Slip Ramps	SY	29	\$ 200.00	\$ 5,800
Hot Mix Asphalt (Patching)(Asphalt)	SY	11	\$ 120.00	\$ 1,320
Delineator (Flexible)(Surface Mounted)	EA	29	\$ 60.00	\$ 1,740
Modified Epoxy Pavement Marking	GAL	13	\$ 300.00	\$ 3,900
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	100	\$ 25.00	\$ 2,500
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	220	\$ 20.00	\$ 4,400
Signs	EA	4	\$ 370.00	\$ 1,480
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
Total Construction Items				\$ 32,600
Contingency (30%)	30%			\$ 9,780
Total Construction Cost				\$ 42,400
Engineering (10%)	10%			\$ 4,240
Construction Mgmt (20%)	20%			\$ 8,480
Total Project Cost				\$ 55,200

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Figure J3: Interim Project 2 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I3 (Marble Street to Laurel Avenue striping and paint/post improvements-0.08 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Delineator (Flexible)(Surface Mounted)	EA	74	\$ 60.00	\$ 4,440
Modified Epoxy Pavement Marking	GAL	14	\$ 300.00	\$ 4,200
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	232	\$ 25.00	\$ 5,800
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	220	\$ 20.00	\$ 4,400
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
Total Construction Items				\$ 24,900
Contingency (30%)	30%			\$ 7,470
Total Construction Cost				\$ 32,400
Engineering (10%)	10%			\$ 3,240
Construction Mgmt (20%)	20%			\$ 6,480
Total Project Cost				\$ 42,200

Figure J4: Interim Project 3 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I4 (Bike lane striping from Laurel Avenue to Main Street-0.8 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Modified Epoxy Pavement Marking	GAL	155	\$ 300.00	\$ 46,500
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	675	\$ 25.00	\$ 16,875
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	778	\$ 20.00	\$ 15,560
Erosion Control	LS	1	\$ 8,000.00	\$ 8,000
Traffic Control	LS	1	\$ 40,000.00	\$ 40,000
Total Construction Items				\$ 127,000
Contingency (30%)	30%			\$ 38,100
Total Construction Cost				\$ 165,100
Engineering (10%)	10%			\$ 16,510
Construction Mgmt (20%)	20%			\$ 33,020
Total Project Cost				\$ 214,700

Figure J5: Interim Project 4 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I5 (Main Street intersection improvements)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Delineator (Flexible)(Surface Mounted)	EA	69	\$ 60.00	\$ 4,140
Modified Epoxy Pavement Marking	GAL	23	\$ 300.00	\$ 6,900
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	831	\$ 25.00	\$ 20,775
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	608	\$ 20.00	\$ 12,160
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
Total Construction Items				\$ 50,000
Contingency (30%)	30%			\$ 15,000
Total Construction Cost				\$ 65,000
Engineering (10%)	10%			\$ 6,500
Construction Mgmt (20%)	20%			\$ 13,000
Total Project Cost				\$ 84,500

Figure J6: Interim Project 5 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I6 (Buffered bike lanes from Main Street to Sheridan Blvd-1 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Delineator (Flexible)(Surface Mounted)	EA	132	\$ 60.00	\$ 7,920
Modified Epoxy Pavement Marking	GAL	237	\$ 300.00	\$ 71,100
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	1041	\$ 25.00	\$ 26,025
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	1424	\$ 20.00	\$ 28,480
Erosion Control	LS	1	\$ 10,000.00	\$ 10,000
Traffic Control	LS	1	\$ 50,000.00	\$ 50,000
Total Construction Items				\$ 193,600
Contingency (30%)	30%			\$ 58,080
Total Construction Cost				\$ 251,700
Engineering (10%)	10%			\$ 25,170
Construction Mgmt (20%)	20%			\$ 50,340
Total Project Cost				\$ 327,300

Figure J7: Interim Project 6 Cost Estimate

City of Broomfield - Midway Corridor
Cost Estimate: I7 (Sheridan Boulevard intersection improvements)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	21	\$ 15.00	\$ 315
Removal of Asphalt Mat	SY	5	\$ 85.00	\$ 425
Removal of Sidewalk	SY	26	\$ 100.00	\$ 2,600
Concrete Slip Ramps	SY	26	\$ 200.00	\$ 5,200
Hot Mix Asphalt (Patching)(Asphalt)	SY	5	\$ 120.00	\$ 600
Modified Epoxy Pavement Marking	GAL	1	\$ 300.00	\$ 300
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	421	\$ 25.00	\$ 10,525
Preformed Thermoplastic Pavement Marking (Xwalk-Stop Line)	SF	1140	\$ 20.00	\$ 22,800
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
Total Construction Items				\$ 48,800
Contingency (30%)	30%			\$ 14,640
Total Construction Cost				\$ 63,500
Engineering (10%)	10%			\$ 6,350
Construction Mgmt (20%)	20%			\$ 12,700
Total Project Cost				\$ 82,600

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Figure J8: Interim Project 7 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I8 (Vrain Street intersection improvements)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Delineator (Flexible)(Surface Mounted)	EA	59	\$ 60.00	\$ 3,540.00
Modified Epoxy Pavement Marking	GAL	3	\$ 300.00	\$ 900.00
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000.00
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000.00
Total Construction Items				\$ 10,500.00
Contingency (30%)	30%			\$ 3,150.00
Total Construction Cost				\$ 13,700.00
Engineering (10%)	10%			\$ 1,370.00
Construction Mgmt (20%)	20%			\$ 2,740.00
Total Project Cost				\$ 17,900.00

Figure J9: Interim Project 8 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I9 (Perry Street intersection improvements)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	156	\$ 25.00	\$ 3,900
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
Total Construction Items				\$ 9,900
Contingency (30%)	30%			\$ 2,970
Total Construction Cost				\$ 12,900
Engineering (10%)	10%			\$ 1,290
Construction Mgmt (20%)	20%			\$ 2,580
Total Project Cost				\$ 16,800

Figure J10: Interim Project 9 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: I10 (Lowell Street intersection improvements)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Modified Epoxy Pavement Marking	GAL	1	\$ 300.00	\$ 300
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	116	\$ 25.00	\$ 2,900
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
Total Construction Items				\$ 9,200
Contingency (30%)	30%			\$ 2,760
Total Construction Cost				\$ 12,000
Engineering (10%)	10%			\$ 1,200
Construction Mgmt (20%)	20%			\$ 2,400
Total Project Cost				\$ 15,600

Figure J11: Interim Project 10 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate - I 11 (Vrain Street intersection improvements)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Delineator (Flexible)(Surface Mounted)	EA	49	\$ 60.00	\$ 2,940
Modified Epoxy Pavement Marking	GAL	3	\$ 300.00	\$ 900
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 5,000.00	\$ 5,000
Total Construction Items				\$ 9,900
Contingency (30%)	30%			\$ 2,970
Total Construction Cost				\$ 12,900
Engineering (10%)	10%			\$ 1,290
Construction Mgmt (20%)	20%			\$ 2,580
Total Project Cost				\$ 16,800

Figure J12: Interim Project 11 Cost Estimate

APPENDIX K Cost Estimates, Future Projects

FUTURE - PROJECT ID	FUTURE - PROJECT NAME AND LIMITS	Bicycle or Pedestrian Project	Hardscape/ Civil	Operational/ Signal Timing	Major Intersection Improvements	Signing and Striping	TOTAL CONSTRUCTION COST	TOTAL PROJECT COST
F1	South side MU path on Midway between Lake Link Trail and SH-287	X	X		X	X	\$ 3,954,900	\$ 5,279,100
F2	Midway and US-287 intersection improvements	X	X	X	X	X	\$ 847,500	\$ 1,252,700
F3	South side MU path on Midway between SH 287 and Nickel Street	X	X	X	X	X	\$ 469,000	\$ 616,500
F4	Protected Bike Lane from Nickel Street to Main Street	X	X	X		X	\$ 5,365,000	\$ 7,218,200
F5	Intersection improvements at Main Street and Midway	X	X	X	X	X	\$ 431,500	\$ 583,000
F6	Protected Bike Lane from Main Street to Ash Street	X	X			X	\$ 2,495,000	\$ 3,254,900
F7	New Z Ped Crossing between Main Street and Spader Way	X	X			X	\$ 92,200	\$ 119,900
F8	New Z Ped Crossing between Spader Way and Ash Street	X	X			X	\$ 100,400	\$ 130,600
F9	Protected Bike Facilities from Ash Street to Sheridan Boulevard (including Sheridan intersection)	X	X	X	X	X	\$ 2,696,500	\$ 3,546,500
F10	Protected Bike Lane from Sheridan Boulevard to Lowell Street (including Lowell intersection)	X	X	X	X	X	\$ 5,293,900	\$ 6,918,000
F11	Pedestrian Hybrid Beacon crossing west of Vrain Street	X	X			X	\$ 548,600	\$ 713,200
F12	Protected Bike Lane from Lowell Street to Zuni Boulevard	X	X	X		X	\$ 4,355,200	\$ 5,707,800
F13	Pedestrian Hybrid Beacon crossing west of Willow Run Parkway	X	X			X	\$ 534,000	\$ 694,200
F14	Intersection improvements at Midway and Zuni	X	X	X	X	X	TBD	TBD
F15	Path connection on north and south sides east of Zuni, connecting to Dry Creek Trail	X	X				TBD	TBD

Figure K1: Future Projects Cost Estimate Summary

City of Broomfield - Midway Corridor

Cost Estimate : Project F1 (South side MU path on Midway between Lake Link Trail and SH-287 -1 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	5694	\$ 20.00	\$ 113,880
Removal of Concrete Sidewalk/Trail	SY	5367	\$ 26.00	\$ 139,542
Removal of Asphalt Pavement	SY	8455	\$ 11.00	\$ 93,005
Removal of Concrete Pavement	SY	4956	\$ 25.00	\$ 123,900
Removal of Asphalt Driveway	SY	334	\$ 15.00	\$ 5,010
Removal fo Concrete Driveway	SY	357	\$ 17.00	\$ 6,069
Removal of Inlet and Pipe	EA	12	\$ 2,000.00	\$ 24,000
Removal of Landscaping	AC	0.26	\$ 5,000.00	\$ 1,300
Removal of Large Trees	EA	19	\$ 1,200.00	\$ 22,800
Removal of Street Light	EA	9	\$ 2,000.00	\$ 18,000
Removal of Bridge	LS	1	\$ 3,000.00	\$ 3,000
Curb and Gutter Type 2 (Section II-B)	LF	5913	\$ 37.00	\$ 218,781
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	11498	\$ 87.00	\$ 1,000,326
Hot Mix Asphalt Pavement (8")	TON	2077	\$ 100.00	\$ 207,700
Concrete Pavement (8")	SY	3144	\$ 85.00	\$ 267,240
Asphalt Driveway	SY	233	\$ 75.00	\$ 17,475
Concrete Driveway	SY	185	\$ 90.00	\$ 16,650
Median Cover Material (4" Patterned Concrete)	SF	571	\$ 25.00	\$ 14,275
Bridge	EA	1	\$ 10,000.00	\$ 10,000
Modified Epoxy Pavement Marking	GAL	112	\$ 300.00	\$ 33,600
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	16	\$ 25.00	\$ 400
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	140	\$ 20.00	\$ 2,800
Signs	EA	40	\$ 370.00	\$ 14,800
Inlet and Pipe	EA	12	\$ 10,000.00	\$ 120,000
Landscaping (Sod)	SF	4806	\$ 4.00	\$ 19,224
Tree	EA	19	\$ 1,500.00	\$ 28,500
Light Standard Steel (30 ft)	EA	9	\$ 6,000.00	\$ 54,000
Retaining Wall	SF	3318	\$ 50.00	\$ 165,900
Erosion Control	LS	1	\$ 100,000.00	\$ 100,000
Traffic Control	LS	1	\$ 200,000.00	\$ 200,000
Total Construction Items				\$ 3,042,200
Contingency (30%)	30%			\$ 912,660
Total Construction Cost				\$ 3,954,900
Engineering (10%)	10%			\$ 395,490
Construction Mgmt (20%)	20%			\$ 790,980
ROW	SF	2754	\$ 50.00	\$ 137,700
Total Project Cost				\$ 5,279,100

Notes

Assumes impacted private utilities in ROW relocated at utility company cost
 Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency
 1:1 replacement of trees big or small

Figure K2: Future Project 1 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F2 (Midway and US-287 intersection improvements)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	1739	\$ 20.00	\$ 34,780
Removal of Concrete Sidewalk/Trail	SY	301	\$ 26.00	\$ 7,826
Removal of Asphalt Pavement	SY	3548	\$ 11.00	\$ 39,028
Removal of Median Cover	SF	480	\$ 30.00	\$ 14,400
Removal of Landscaping	AC	0.19	\$ 5,000.00	\$ 950
Removal of Large Tree	EA	3	\$ 1,200.00	\$ 3,600
Removal of Traffic Signal Pole	EA	3	\$ 2,500.00	\$ 7,500
Curb and Gutter (Type I-B)	LF	619	\$ 50.00	\$ 30,950
Curb and Gutter Type 2 (Section II-B)	LF	1142	\$ 37.00	\$ 42,254
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	1234	\$ 87.00	\$ 107,358
Hot Mix Asphalt Pavement (8")	TON	988	\$ 100.00	\$ 98,800
Median Cover Material (4" Patterned Concrete)	SF	3805	\$ 25.00	\$ 95,125
Modified Epoxy Pavement Marking	GAL	11	\$ 300.00	\$ 3,300
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	97	\$ 25.00	\$ 2,425
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	1500	\$ 20.00	\$ 30,000
Signs	EA	20	\$ 370.00	\$ 7,400
Landscaping (Sod)	SF	5674	\$ 4.00	\$ 22,696
Tree	EA	3	\$ 1,500.00	\$ 4,500
Traffic Signal Light Pole Steel (1-35ft)	EA	3	\$ 22,000.00	\$ 66,000
Erosion Control	LS	1	\$ 11,000.00	\$ 11,000
Traffic Control	LS	1	\$ 22,000.00	\$ 22,000
Total Construction Items				\$ 651,900
Contingency (30%)	30%			195570
Total Construction Cost				\$ 847,500
Engineering (10%)	10%			84750
Construction Mgmt (20%)	20%			169500
ROW	SF	3019	\$ 50.00	\$ 150,950.00
Total Project Cost				\$ 1,252,700

Notes

Assumes impacted private utilities in ROW relocated at utility company cost
 Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency
 1:1 replacement of trees big or small

Figure K3: Future Project 2 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F3 (South side MU path on Midway between SH 287 and Nickel Street-0.1 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	719	\$ 20.00	\$ 14,380
Removal of Concrete Sidewalk/Trail	SY	463	\$ 26.00	\$ 12,038
Removal of Asphalt Pavement	SY	684	\$ 11.00	\$ 7,524
Removal of Landscaping	AC	0.08	\$ 5,000.00	\$ 400
Removal of Large Tree	EA	3	\$ 1,200.00	\$ 3,600
Removal of Small Tree	EA	6	FIA	
Removal of Traffic Signal Pole	EA	3	\$ 2,500.00	\$ 7,500
Removal of Traffic Signal Pedestal Pole	EA	1	\$ 1,200.00	\$ 1,200
Removal of Street Light	EA	2	\$ 2,000.00	\$ 4,000
Curb and Gutter Type 2 (Section II-B)	LF	731	\$ 37.00	\$ 27,047
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	1264	\$ 87.00	\$ 109,968
Hot Mix Asphalt Pavement (8")	TON	209	\$ 100.00	\$ 20,900
Modified Epoxy Pavement Marking	GAL	5	\$ 300.00	\$ 1,500
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	64	\$ 25.00	\$ 1,600
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	608	\$ 20.00	\$ 12,160
Signs	EA	20	\$ 370.00	\$ 7,400
Landscaping (Sod)	SF	730	\$ 4.00	\$ 2,920
Tree	EA	9	\$ 1,500.00	\$ 13,500
Signal Light Pole Steel (1-35ft)	EA	3	\$ 22,000.00	\$ 66,000
Traffic Signal Pedestal Pole	EA	1	\$ 5,000.00	\$ 5,000
Light Standard Steel (30 ft)	EA	2	\$ 6,000.00	\$ 12,000
Erosion Control	LS	1	\$ 10,000.00	\$ 10,000
Traffic Control	LS	1	\$ 20,000.00	\$ 20,000
Total Construction Items				\$ 360,700
Contingency (30%)	30%			\$ 108,210
Total Construction Cost				\$ 469,000
Engineering (10%)	10%			\$ 46,900
Construction Mgmt (20%)	20%			\$ 93,800
ROW	SF	135	\$ 50.00	\$ 6,750
Total Project Cost				\$ 616,500

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K4: Future Project 3 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F4 (Protected Bike Lane from Nickel Street to Main Street-0.9 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	9266	\$ 20.00	\$ 185,320
Removal of Concrete Sidewalk/Trail	SY	5136	\$ 26.00	\$ 133,536
Removal of Asphalt Pavement	SY	23028	\$ 11.00	\$ 253,308
Removal of Asphalt Driveway	SY	68	\$ 15.00	\$ 1,020
Removal of Concrete Driveway	SY	464	\$ 17.00	\$ 7,888
Removal of Inlet and Pipe	EA	7	\$ 2,000.00	\$ 14,000
Removal of Landscaping	AC	1.14	\$ 5,000.00	\$ 5,700
Removal of Large Tree	EA	20	\$ 1,200.00	\$ 24,000
Removal of Small Tree	EA	10	FIA	
Removal of Traffic Signal Pole	EA	7	\$ 2,500.00	\$ 17,500
Removal of Traffic Signal Pedestal Pole	EA	4	\$ 1,200.00	\$ 4,800
Removal of Pedestal Pole	EA	1	\$ 1,200	\$ 1,200
Removal of RRFB	EA	4	\$ 2,500.00	\$ 10,000
Reset School Beacon Assembly	EA	2	\$ 1,500.00	\$ 3,000
Removal of Street Light	EA	21	\$ 2,000.00	\$ 42,000
Curb and Gutter Type 2 (Section II-B)	LF	9363	\$ 37.00	\$ 346,431
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	14129	\$ 87.00	\$ 1,229,223
Hot Mix Asphalt Pavement (8")	TON	7560	\$ 100.00	\$ 756,000
Asphalt Driveway	SY	68	\$ 75.00	\$ 5,100
Concrete Driveway	SY	195	\$ 90.00	\$ 17,550
Modified Epoxy Pavement Marking	GAL	82	\$ 300.00	\$ 24,600
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	385	\$ 25.00	\$ 9,625
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	1790	\$ 20.00	\$ 35,800
Signs	EA	60	\$ 370.00	\$ 22,200
Inlet and Pipe	EA	7	\$ 10,000.00	\$ 70,000
Landscaping (Sod)	SF	20929	\$ 4.00	\$ 83,716
Tree	EA	30	\$ 1,500.00	\$ 45,000
Signal Light Pole Steel (1-35ft)	EA	7	\$ 22,000.00	\$ 154,000
Traffic Signal Pedestal Pole	EA	4	\$ 5,000.00	\$ 20,000
Pedestal Pole	EA	1	\$ 3,000.00	\$ 3,000
RRFB	EA	4	\$ 50,000.00	\$ 200,000
Light Standard Steel (30 ft)	EA	21	\$ 6,000.00	\$ 126,000
Retaining Wall	SF	106	\$ 50.00	\$ 5,300
Erosion Control	LS	1	\$ 90,000.00	\$ 90,000
Traffic Control	LS	1	\$ 180,000.00	\$ 180,000
Total Construction Items				\$ 4,126,900
Contingency (30%)	30%			\$ 1,238,070
Total Construction Cost				\$ 5,365,000
Engineering (10%)	10%			\$ 536,500
Construction Mgmt (20%)	20%			\$ 1,073,000
ROW	SF	4874	\$ 50.00	\$ 243,700
Total Project Cost				\$ 7,218,200

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K5: Future Project 4 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F5 (Intersection improvements at Main Street and Midway)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	518	\$ 20.00	\$ 10,360
Removal of Concrete Sidewalk/Trail	SY	209	\$ 26.00	\$ 5,434
Removal of Asphalt Pavement	SY	1287	\$ 11.00	\$ 14,157
Removal of Inlet and Pipe	EA	2	\$ 2,000.00	\$ 4,000
Removal of Landscaping	AC	0.05	\$ 5,000.00	\$ 250
Removal of Large Tree	EA	1	\$ 1,200.00	\$ 1,200
Removal of Traffic Signal Pole	EA	4	\$ 2,500.00	\$ 10,000
Curb and Gutter Type 2 (Section II-B)	LF	587	\$ 37.00	\$ 21,719
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	614	\$ 87.00	\$ 53,418
Hot Mix Asphalt Pavement (8")	TON	331	\$ 100.00	\$ 33,100
Modified Epoxy Pavement Marking	GAL	12	\$ 300.00	\$ 3,600
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	129	\$ 25.00	\$ 3,225
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	988	\$ 20.00	\$ 19,760
Signs	EA	20	\$ 370.00	\$ 7,400
Inlet and Pipe	EA	2	\$ 10,000.00	\$ 20,000
Landscaping (Sod)	SF	3898	\$ 4.00	\$ 15,592
Tree	EA	1	\$ 1,500.00	\$ 1,500
Signal Light Pole Steel (1-35ft)	EA	4	\$ 22,000.00	\$ 88,000
Retaining Wall	SF	142	\$ 50.00	\$ 7,100
Erosion Control	LS	1	\$ 4,000.00	\$ 4,000
Traffic Control	LS	1	\$ 8,000.00	\$ 8,000
Total Construction Items				\$ 331,900
Contingency (30%)	30%			\$ 99,570
Total Construction Cost				\$ 431,500
Engineering (10%)	10%			\$ 43,150
Construction Mgmt (20%)	20%			\$ 86,300
ROW	SF	440	\$ 50.00	\$ 22,000
Total Project Cost				\$ 583,000

Notes

Assumes impacted private utilities in ROW relocated at utility company cost
 Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency
 1:1 replacement of trees big or small

Figure K6: Future Project 5 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F6 (Protected Bike Lane from Main Street to Ash Street-0.5 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	5404	\$ 20.00	\$ 108,080
Removal of Concrete Sidewalk/Trail	SY	1684	\$ 26.00	\$ 43,784
Removal of Asphalt Pavement	SY	8891	\$ 11.00	\$ 97,801
Removal of Inlet and Pipe	EA	6	\$ 2,000.00	\$ 12,000
Removal of Landscaping	AC	0.81	\$ 5,000.00	\$ 4,050
Removal of Large Tree	EA	26	\$ 1,200.00	\$ 31,200
Removal of Small Tree	EA	14	FIA	
Removal of Street Light	EA	27	\$ 2,000.00	\$ 54,000
Curb and Gutter Type 2 (Section II-B)	LF	5432	\$ 37.00	\$ 200,984
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	7474	\$ 87.00	\$ 650,238
Hot Mix Asphalt Pavement (8")	TON	2451	\$ 100.00	\$ 245,100
Modified Epoxy Pavement Marking	GAL	40	\$ 300.00	\$ 12,000
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	72	\$ 25.00	\$ 1,800
Signs	EA	20	\$ 370.00	\$ 7,400
Inlet and Pipe	EA	6	\$ 10,000.00	\$ 60,000
Tree	EA	40	\$ 1,500.00	\$ 60,000
Light Standard Steel (30 ft)	EA	27	\$ 6,000.00	\$ 162,000
Retaining Wall	SF	374	\$ 50.00	\$ 18,700
Erosion Control	LS	1	\$ 50,000.00	\$ 50,000
Traffic Control	LS	1	\$ 100,000.00	\$ 100,000
Total Construction Items				\$ 1,919,200
Contingency (30%)	30%			575760
Total Construction Cost				\$ 2,495,000
Engineering (10%)	10%			249500
Construction Mgmt (20%)	20%			499000
ROW	SF	228	\$ 50.00	\$ 11,400
Total Project Cost				\$ 3,254,900

Notes

Assumes impacted private utilities in ROW relocated at utility company cost
 Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency
 1:1 replacement of trees big or small

Figure K7: Future Project 6 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F7 (New Z Ped Crossing between Main Street and Spader Way)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	149	\$ 20.00	\$ 2,980
Removal of Concrete Sidewalk/Trail	SY	44	\$ 26.00	\$ 1,144
Removal of Asphalt Pavement	SY	615	\$ 11.00	\$ 6,765
Removal of Landscaping	AC	0.01	\$ 5,000.00	\$ 50
Reset RRFB	EA	4	\$ 2,500.00	\$ 10,000
Curb and Gutter (Type I-B)	LF	261	\$ 50.00	\$ 13,050
Curb and Gutter Type 2 (Section II-B)	LF	123	\$ 37.00	\$ 4,551
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	59	\$ 87.00	\$ 5,133
Hot Mix Asphalt Pavement (8")	TON	71	\$ 100.00	\$ 7,100
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	24	\$ 25.00	\$ 600
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	80	\$ 20.00	\$ 1,600
Signs	EA	5	\$ 370.00	\$ 1,850
Landscaping (Sod)	SF	3251	\$ 4.00	\$ 13,004
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 2,000.00	\$ 2,000
Total Construction Items				\$ 70,900
Contingency (30%)	30%			\$ 21,270
Total Construction Cost				\$ 92,200
Engineering (10%)	10%			\$ 9,220
Construction Mgmt (20%)	20%			\$ 18,440
Total Project Cost				\$ 119,900

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K8: Future Project 7 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F8 (New Z Ped Crossing between Spader Way and Ash Street)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	159	\$ 20.00	\$ 3,180
Removal of Concrete Sidewalk/Trail	SY	51	\$ 26.00	\$ 1,326
Removal of Asphalt Pavement	SY	730	\$ 11.00	\$ 8,030
Removal of Landscaping	AC	0.01	\$ 5,000.00	\$ 50
Reset RRFB	EA	4	\$ 2,500.00	\$ 10,000
Curb and Gutter (Type I-B)	LF	280	\$ 50.00	\$ 14,000
Curb and Gutter Type 2 (Section II-B)	LF	157	\$ 37.00	\$ 5,809
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	65	\$ 87.00	\$ 5,655
Hot Mix Asphalt Pavement (8")	TON	90	\$ 100.00	\$ 9,000
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	24	\$ 25.00	\$ 600
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	80	\$ 20.00	\$ 1,600
Signs	EA	5	\$ 370.00	\$ 1,850
Landscaping (Sod)	SF	3253	\$ 4.00	\$ 13,012
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 2,000.00	\$ 2,000
Total Construction Items				\$ 77,200
Contingency (30%)	30%			\$ 23,160
Total Construction Cost				\$ 100,400
Engineering (10%)	10%			\$ 10,040
Construction Mgmt (20%)	20%			\$ 20,080
Total Project Cost				\$ 130,600

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K9: Future Project 8 Cost Estimate

City of Broomfield - Midway Corridor

**Cost Estimate: F9 (Protected Bike Facilities from Ash Street to Sheridan Boulevard (including Sheridan intersection)-
0.5 mile)**

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	5501	\$ 20.00	\$ 110,020
Removal of Concrete Sidewalk/Trail	SY	3067	\$ 26.00	\$ 79,742
Removal of Asphalt Pavement	SY	6692	\$ 11.00	\$ 73,612
Removal of Concrete Driveway	SY	24	\$ 17.00	\$ 408
Removal of RRFB	EA	3	\$ 2,500.00	\$ 7,500
Removal of Inlet and Pipe	EA	3	\$ 2,000.00	\$ 6,000
Removal of Landscaping	AC	0.21	\$ 5,000.00	\$ 1,050
Removal of Large Tree	EA	23	\$ 1,200.00	\$ 27,600
Removal of Traffic Signal Pole	EA	4	\$ 2,500.00	\$ 10,000
Removal of Street Light	EA	11	\$ 2,000.00	\$ 22,000
Curb and Gutter Type 2 (Section II-B)	LF	5639	\$ 37.00	\$ 208,643
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	6203	\$ 87.00	\$ 539,661
Hot Mix Asphalt Pavement (8")	TON	1664	\$ 100.00	\$ 166,400
Concrete Driveway	SY	18	\$ 90.00	\$ 1,620
Modified Epoxy Pavement Marking	GAL	84	\$ 300.00	\$ 25,200
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	545	\$ 25.00	\$ 13,625
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	1820	\$ 20.00	\$ 36,400
Signs	EA	30	\$ 370.00	\$ 11,100
Inlet and Pipe	EA	3	\$ 10,000.00	\$ 30,000
Landscaping (Sod)	SF	3766	\$ 4.00	\$ 15,064
Tree	EA	23	\$ 1,500.00	\$ 34,500
Signal Light Pole Steel (1-35ft)	EA	4	\$ 22,000.00	\$ 88,000
RRFB	EA	7	\$ 50,000.00	\$ 350,000
Light Standard Steel (30 ft)	EA	11	\$ 6,000.00	\$ 66,000
Erosion Control	LS	1	\$ 50,000.00	\$ 50,000
Traffic Control	LS	1	\$ 100,000.00	\$ 100,000
Total Construction Items				\$ 2,074,200
Contingency (30%)	30%			\$ 622,260
Total Construction Cost				\$ 2,696,500
Engineering (10%)	10%			\$ 269,650
Construction Mgmt (20%)	20%			\$ 539,300
ROW	SF	821	\$ 50.00	\$ 41,050
Total Project Cost				\$ 3,546,500

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K10: Future Project 9 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F10 (Protected Bike Lane from Sheridan Boulevard to Lowell Street (including Lowell intersection)-1.1 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	11661	\$ 20.00	\$ 233,220
Removal of Concrete Sidewalk/Trail	SY	4889	\$ 26.00	\$ 127,114
Removal of Asphalt Pavement	SY	10626	\$ 11.00	\$ 116,886
Removal of Inlet and Pipe	EA	10	\$ 2,000.00	\$ 20,000
Removal of Landscaping	AC	2.12	\$ 5,000.00	\$ 10,600
Removal of Large Tree	EA	24	\$ 1,200.00	\$ 28,800
Removal of Small Tree	EA	16	FIA	
Removal of Traffic Signal Pole	EA	4	\$ 2,500.00	\$ 10,000
Removal of Traffic Signal Pedestal Pole	EA	3	\$ 1,200.00	\$ 3,600
Removal of Pedestal Pole	EA	2	\$ 1,200.00	\$ 2,400
Removal of Street Light	EA	25	\$ 2,000.00	\$ 50,000
Curb and Gutter Type 2 (Section II-B)	LF	11779	\$ 37.00	\$ 435,823
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	18048	\$ 87.00	\$ 1,570,176
Hot Mix Asphalt Pavement (8")	TON	3013	\$ 100.00	\$ 301,300
Modified Epoxy Pavement Marking	GAL	29	\$ 300.00	\$ 8,700
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	487	\$ 25.00	\$ 12,175
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	1940	\$ 20.00	\$ 38,800
Signs	EA	80	\$ 370.00	\$ 29,600
Inlet and Pipe	EA	10	\$ 10,000.00	\$ 100,000
Landscaping (Sod)	SF	5979	\$ 4.00	\$ 23,916
Tree	EA	40	\$ 1,500.00	\$ 60,000
Signal Light Pole Steel (1-35ft)	EA	4	\$ 22,000.00	\$ 88,000
Traffic Signal Pedestal Pole	EA	3	\$ 5,000.00	\$ 15,000
Pedestal Pole	EA	2	\$ 3,000.00	\$ 6,000
RRFB	EA	6	\$ 50,000.00	\$ 300,000
Light Standard Steel (30 ft)	EA	25	\$ 6,000.00	\$ 150,000
Erosion Control	LS	1	\$ 110,000.00	\$ 110,000
Traffic Control	LS	1	\$ 220,000.00	\$ 220,000
Total Construction Items				\$ 4,072,200
Contingency (30%)	30%			\$ 1,221,660
Total Construction Cost				\$ 5,293,900
Engineering (10%)	10%			\$ 529,390
Construction Mgmt (20%)	20%			\$ 1,058,780
ROW	SF	717	\$ 50.00	\$ 35,850
Total Project Cost				\$ 6,918,000

Notes

Assumes impacted private utilities in ROW relocated at utility company cost
 Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency
 1:1 replacement of trees big or small

Figure K11: Future Project 10 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F11 (Pedestrian Hybrid Beacon crossing west of Vrain Street)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	66	\$ 20.00	\$ 1,320
Removal of RRFB	EA	3	\$ 2,500.00	\$ 7,500
Removal of Landscaping	AC	0.01	\$ 5,000.00	\$ 50
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	53	\$ 87.00	\$ 4,611
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	180	\$ 20.00	\$ 3,600
Signs	EA	5	\$ 370.00	\$ 1,850
Pedestrian Hybrid Beacon	EA	2	\$ 200,000.00	\$ 400,000
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 2,000.00	\$ 2,000
Total Construction Items				\$ 422,000
Contingency (30%)	30%			\$ 126,600
Total Construction Cost				\$ 548,600
Engineering (10%)	10%			\$ 54,860
Construction Mgmt (20%)	20%			\$ 109,720
Total Project Cost				\$ 713,200

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K12: Future Project 11 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F12 (Protected Bike Lane from Lowell Street to Zuni Boulevard- 1 mile)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	10549	\$ 20.00	\$ 210,980
Removal of Concrete Sidewalk/Trail	SY	5555	\$ 26.00	\$ 144,430
Removal of Asphalt Pavement	SY	7994	\$ 11.00	\$ 87,934
Removal of Inlet and Pipe	EA	6	\$ 2,000.00	\$ 12,000
Removal of Landscaping	AC	1.7	\$ 5,000.00	\$ 8,500
Removal of Large Tree	EA	37	\$ 1,200.00	\$ 44,400
Removal of Small Tree	EA	18	FIA	
Removal of Traffic Signal Pole	EA	6	\$ 2,500.00	\$ 15,000
Removal of Street Light	EA	24	\$ 2,000.00	\$ 48,000
Curb and Gutter (Type I-B)	LF	157		\$ -
Curb and Gutter Type 2 (Section II-B)	LF	10599	\$ 37.00	\$ 392,163
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	15889	\$ 87.00	\$ 1,382,343
Hot Mix Asphalt Pavement (8")	TON	2313	\$ 100.00	\$ 231,300
Modified Epoxy Pavement Marking	GAL	23	\$ 300.00	\$ 6,900
Preformed Thermoplastic Pavement Marking (Word-Symbol)	SF	145	\$ 25.00	\$ 3,625
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	1340	\$ 20.00	\$ 26,800
Signs	EA	40	\$ 370.00	\$ 14,800
Inlet and Pipe	EA	6	\$ 10,000.00	\$ 60,000
Landscaping (Sod)	SF	600	\$ 4.00	\$ 2,400
Tree	EA	55	\$ 1,500.00	\$ 82,500
Signal Light Pole Steel (1-35ft)	EA	6	\$ 22,000.00	\$ 132,000
Light Standard Steel (30 ft)	EA	24	\$ 6,000.00	\$ 144,000
Erosion Control	LS	1	\$ 100,000.00	\$ 100,000
Traffic Control	LS	1	\$ 200,000.00	\$ 200,000
Total Construction Items				\$ 3,350,100
Contingency (30%)	30%			\$ 1,005,030
Total Construction Cost				\$ 4,355,200
Engineering (10%)	10%			\$ 435,520
Construction Mgmt (20%)	20%			\$ 871,040
ROW	SF	920	\$ 50.00	\$ 46,000
Total Project Cost				\$ 5,707,800

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K13: Future Project 12 Cost Estimate

City of Broomfield - Midway Corridor

Cost Estimate: F13 (Pedestrian Hybrid Beacon crossing west of Willow Run Parkway)

<u>Construction Items</u>	<u>Unit</u>	<u>Qty</u>	<u>Unit Cost</u>	<u>Cost</u>
Removal of Curb and Gutter	LF	51	\$ 20.00	\$ 1,020
Removal of Landscaping	AC	0.01	\$ 5,000.00	\$ 50
Concrete Sidewalk/Bike/MUP/Bulb Outs (6")	SY	29	\$ 87.00	\$ 2,523
Preformed Thermoplastic Pavement Marking (Xwalk-Stopline)	SF	160	\$ 20.00	\$ 3,200
Signs	EA	5	\$ 370.00	\$ 1,850
Pedestrian Hybrid Beacon	EA	2	\$ 200,000.00	\$ 400,000
Erosion Control	LS	1	\$ 1,000.00	\$ 1,000
Traffic Control	LS	1	\$ 2,000.00	\$ 2,000
Total Construction Items				\$ 410,700
Contingency (30%)	30%			\$ 123,210
Total Construction Cost				\$ 534,000
Engineering (10%)	10%			\$ 53,400
Construction Mgmt (20%)	20%			\$ 106,800
Total Project Cost				\$ 694,200

Notes

Assumes impacted private utilities in ROW relocated at utility company cost

Assuming 5 signs per side per block; assuming all new ground signs and removals included in contingency

1:1 replacement of trees big or small

Figure K14: Future Project 13 Cost Estimate