

Canyon Boulevard

Complete Streets



Existing Conditions Summary

City of Boulder

March 2016

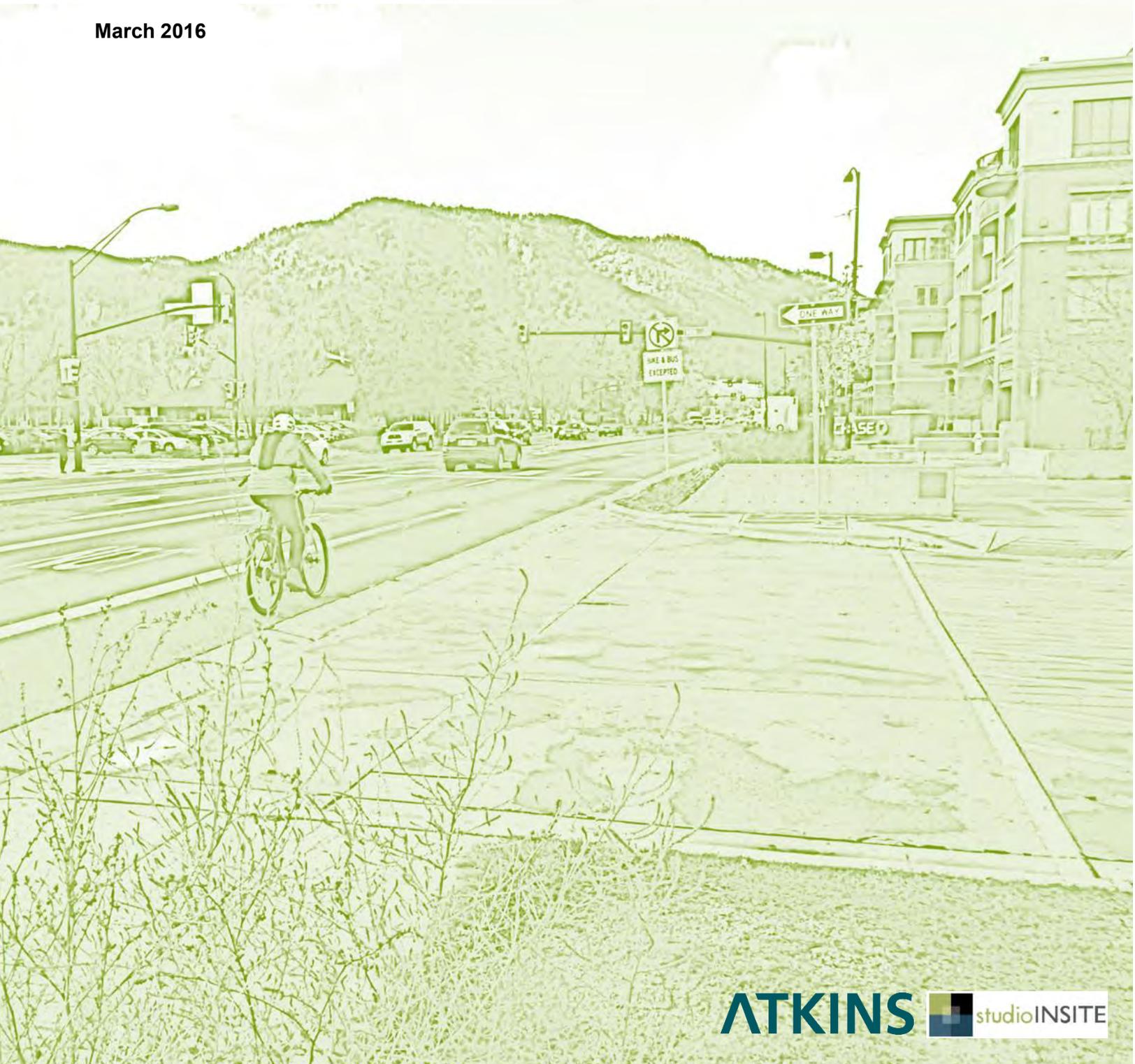


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1. Overview

Canyon Boulevard, also designated as State Highway 119 (SH 119), is a major east-west roadway connection through the City of Boulder, Colorado (City). Regionally, it links the City to the Town of Nederland to the west and is a major facility for moving people between the downtown area and other parts of the Boulder area via cars, trucks, and transit. Locally, the corridor serves people traveling to and through the City by foot, bike, bus, and car. The land uses directly surrounding the corridor consist of urban development with a mix of residential and service-oriented businesses to the north, and the 27-acre Civic Area to the south. As a result of the recently completed Civic Area Master Plan (June 2015), Canyon Boulevard was identified as a key improvement project for the area.

The primary focus of the Canyon Boulevard Complete Streets Study is to develop design options that complement and support existing and planned improvements in the area, incorporating Complete Streets concepts into the design of the corridor stretching from 9th Street to 17th Street in downtown Boulder. This means ensuring adequate space for all users and modes of transportation, including pedestrians, bicyclists, transit vehicles and cars in a way that creates a meaningful environment and sense of place. This Existing Conditions Summary discusses the current state of several aspects of Canyon Boulevard, including the range of issues identified by key stakeholders through a strengths, weaknesses, opportunities, and threats (SWOT) analysis; the historic, current, and planned urban design context of the area; transportation elements, including an analysis of all modes of travel; and the environmental considerations in the area. This report will be used as a baseline to understand the impacts (both positive and negative) of design options developed for the corridor in the future.

1.1. Relevant Planning Context

Several current planning studies impact the decisions that are made throughout the Canyon Boulevard study area. These planning studies are described in more detail below. Although many City-wide plans generally support the development of Complete Streets, several plans are directly related to the study area for Canyon Boulevard or have direct design and functional implications for the ultimate design of the corridor. The study area for Canyon Boulevard, as well as the study areas for each of the related plans, are shown in Figure 1.

1.1.1. Transportation Master Plan

The City of Boulder's *2014 Transportation Master Plan* (TMP) outlines the City's goals and objectives for future travel demand. This document calls for the reduction in single-occupancy vehicle trips; increases in walking, bicycling, and transit use; and improved safety for all travelers. The five focus areas, as laid out in the master plan, are Complete Streets, regional travel, transportation demand management, funding, and integration with sustainability initiatives.

The TMP defines Complete Streets as facilities that "accommodate all modes of transportation by planning, designing, and building facilities for pedestrians, bicyclists, transit riders, and vehicle drivers." Through the TMP, the City expresses a goal to increase the demographic of people riding bicycles to include everyone from ages 8 to 80 and especially women, older adults, and families with children. Additionally, the TMP calls for a renewed vision for transit. The City envisions increases to both local and regional transit service to include more routes serving a larger area, as well as increased frequency of service for those routes.

1.1.2. Civic Area Master Plan

The Civic Area Master Plan created a new vision for the area south of, and including, Canyon Boulevard. Stretching from 9th Street to 14th Street, this land is envisioned as an active public space with a variety of civic buildings, natural environments, and displays of art interconnected by a modern downtown park. Canyon Boulevard is expected to play a major part in this vision. As the northern edge of the Civic Area, the Master Plan calls for a new, continuous greenway promenade along Canyon Boulevard between 9th Street and 14th Street.

To complement this promenade, the Master Plan calls for improving connections across Canyon Boulevard to downtown Boulder and the Pearl Street Mall. On the west end of the Civic Area, a new pedestrian corridor is planned to connect 11th Street through the Civic Area, bridging the gap between Pearl Street and University Hill. A gateway into the Civic Area is planned at 11th Street and Canyon Boulevard. On the east side of the Civic Area, between 13th Street and 14th Street, new high-density development is envisioned. Along Canyon Boulevard, the plan calls for buildings up to four stories, creating a more urban character, compared to the existing low-density development.

Additionally, the plan describes removing the existing surface parking from its current location in front of the Boulder Public Library between Arapahoe Road and Canyon Boulevard, and replacing it with parking structures at either end of the Civic Area. These new, underground structures would be located near Arapahoe Road and 9th Street on the west end of the Civic Area, and near or along 14th Street on the east end of the Civic Area.

Figure 1. Study Area Map



This study identifies the transit needs detailed in the East Arapahoe Transportation Plan, including additional bus service to and along Canyon Boulevard with the potential for new amenities, such as transit-only lanes and transit signal priority.

1.1.3. East Arapahoe Transportation Plan

The East Arapahoe Transportation Plan is currently in the preliminary phases of development. It is a collaboration between the City of Boulder, the Colorado Department of Transportation (CDOT), and the RTD. The plan calls for the addition of BRT service along Arapahoe Road between downtown Boulder and I-25. The west end of this project is intended to connect into the Downtown Boulder Station located at 14th Street and Canyon Boulevard. Preliminary plans suggest that East Arapahoe BRT service could use Canyon Boulevard to access the Downtown Boulder Station. During peak periods, bus service is expected to run between six- and seven-minute headways, with off-peak headways of 15 minutes. Consideration should be given to the design of Canyon Boulevard to ensure potential future BRT uses are not precluded.

1.1.3.1. Northwest Area Mobility Study

In 2014, the Regional Transportation District (RTD), as the local transit agency, released the final report of the Northwest Area Mobility Study (NAMS). This document studies future transportation options for the area between the City and County of Denver, Interstate 25 (I-25), the City of Longmont, and the City of Boulder. Included in this plan was the identification of bus rapid transit (BRT) to travel to and from the Downtown Boulder Station.

1.1.4. Downtown Boulder Station Plan

As part of the FasTracks Local Optimization (FLO) program, the City of Boulder is partnering with Boulder County and RTD to improve transit access across Boulder. This has resulted in a plan to expand the Downtown Boulder Station. The final report, *FasTracks Local Optimization Facilities Study*, was published in June 2007 and identifies three alternatives. Each of these options calls for at least some new bus bays along Canyon Boulevard and would affect the bus circulation around the station. Additionally, the most dramatic alternative would move the station from its current location at 14th Street and Walnut Street to a new facility on the south side of Canyon Boulevard between 14th Street and 15th Street. The ultimate goal of the expansion is to increase capacity at the station, which is currently over capacity during the peak hours.

2. SWOT Analysis

To better understand the existing conditions of the corridor and help create a vision for the future of Canyon Boulevard, SWOT analysis was conducted. Data were collected from key stakeholders involved in the project, including:

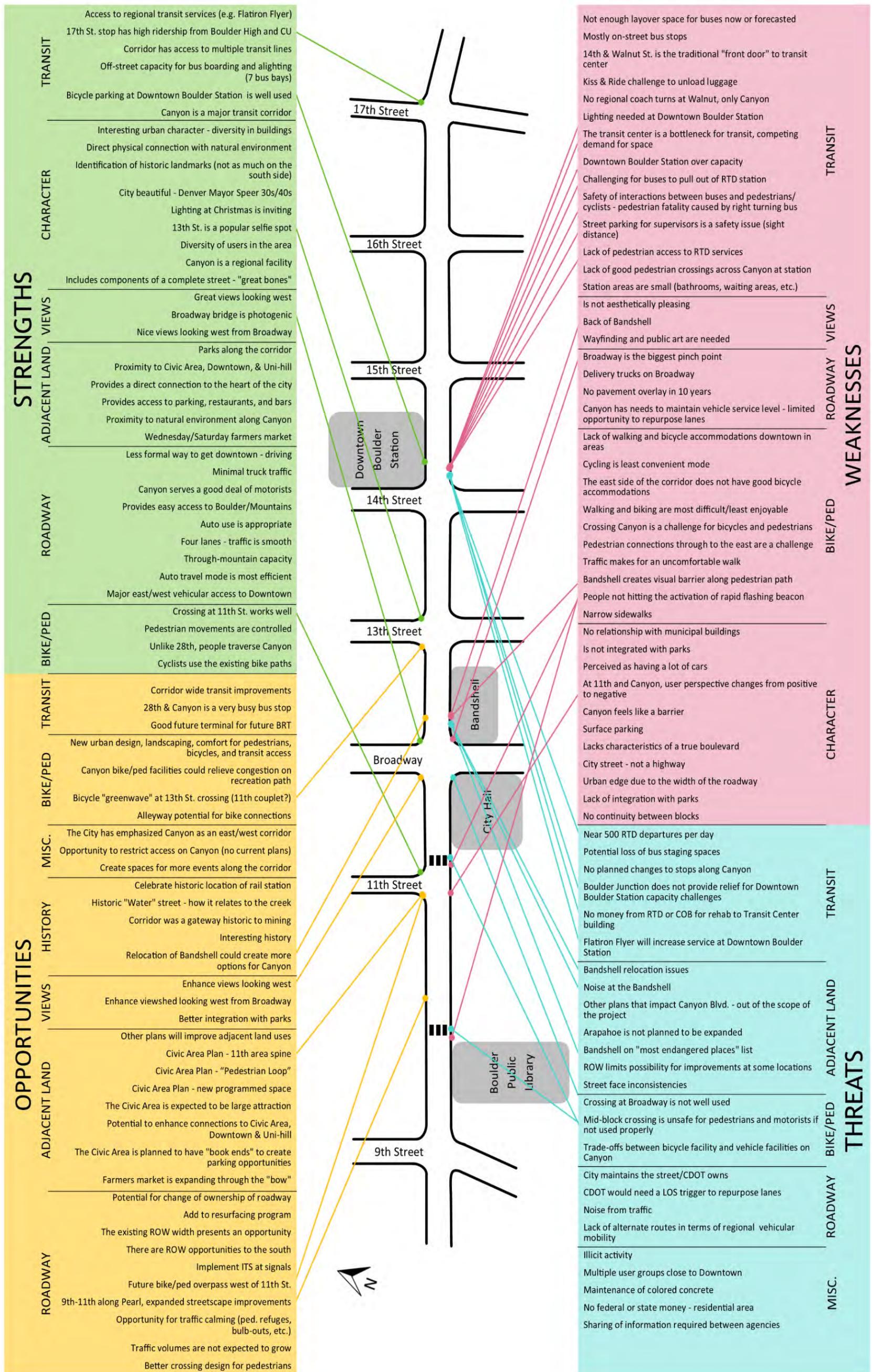
- City of Boulder Department of Parks and Recreation
- City of Boulder Department of Community Sustainability and Planning
- City of Boulder Department of Public Works, Transportation Division
- CDOT
- RTD

The SWOT analysis resulted in a variety of comments and concerns about the existing corridor, as well as potential needs and opportunities. Some of the most commented-on features of the corridor were the mid-block pedestrian crossings between 9th Street and Broadway Street, the historic band shell at the corner of Broadway Street and Canyon Boulevard, and the Downtown Boulder Station. The specific concerns are discussed in greater detail below. Figure 2 shows all of the comments received during the SWOT analysis and the related location of that comment, if applicable.

2.1. Mid-Block Crossings

The two mid-block pedestrian crossings at 10th Street and 11th Street were brought up during multiple SWOT meetings. They received both positive and negative comments. Some of the positive comments concerned the perceived effectiveness of the signing and striping on the roadway at the crossings. Agency comments lauded the crossings' success in effectively reducing the pedestrian barrier created by Canyon Boulevard. Conversely, some comments also noted the safety concerns with the unsignalized crossings, and the increased possibility of drivers not properly yielding to crosswalk users.

Figure 2. SWOT Analysis Summary



2.2. Glen Huntington Band Shell

Located along Canyon Boulevard between Broadway Street and 13th Street, the Glen Huntington Band Shell was designated as a local landmark in 1995. The structure and its site is important for its association with Glen Huntington and Saco R. DeBoer, noted architect and landscape architect, and for its role in the social and cultural life of the city. The band shell was completed in 1938 and is a rare and prominent example of the Art Deco style. While many band shells were built across the country in the 1930s, the Glen Huntington Band Shell in Boulder and the Mineral Park Band Shell in Pueblo are the only band shells located in Colorado from this period.

The primary concern with the band shell, as it currently exists today, is that it faces into the park, creating a blank wall along Canyon Boulevard. This was noted both as being unsightly and as reflecting the noise of the street, creating an uncomfortably loud environment. The band shell also encroaches into the 65-foot setback from the street centerline envisioned as part of Canyon Boulevard's future footprint.

2.3. Downtown Boulder Station

Currently over capacity, the Downtown Boulder Station was listed multiple times as both a weakness, threat, and opportunity for the project. Major concerns include the limited space to expand capacity within the existing station footprint, safety and access concerns for pedestrians and bicyclists traveling to and from the station, and bus circulation around the station. Stakeholders involved in the SWOT process noted the desire to improve the station and allow it to keep up with the increasing transit demand within the City of Boulder.

3. Urban Design Context

3.1. Historic Context

The Canyon Boulevard corridor has a long history dating back to the City of Boulder's founding in 1871. Originally known as Water Street and sometimes Railroad Street, it was subject to periodic flooding from Boulder Creek and served as the major rail corridor to downtown for passengers and freight, as well as being a starting point for narrow-gauge rail traveling west up Boulder Canyon. The creation of Central Park was a result of Frederick Law Olmsted, Jr.'s 1910 plan for improvements to Boulder, which proposed removing industrial uses from the creek downtown and dedicating the space for public use, seen as a dual solution for both flood control and providing a place where "the children can play and over which the wonderful views of the foothills can be at their best from the shaded paths and roads along the embankment edge." The park continued to develop over the course of the twentieth century, becoming the civic heart of Boulder, through the construction of the Glen Huntington Band Shell, the Municipal Building, and the Public Library, along with city offices, senior center, museum, tea house and farmers' market. The Union Pacific Depot (built in 1890), now at Boulder Junction, was originally located at 14th Street and Canyon Boulevard, roughly the site of the Downtown Boulder Station. In 1962, the City Council officially changed the name of Water Street to Canyon Boulevard at the request of the Chamber of Commerce. Today, the corridor includes multiple buildings and neighborhoods that have received, or potentially could receive, historic designation. Historic properties are further identified in Section 5.3.

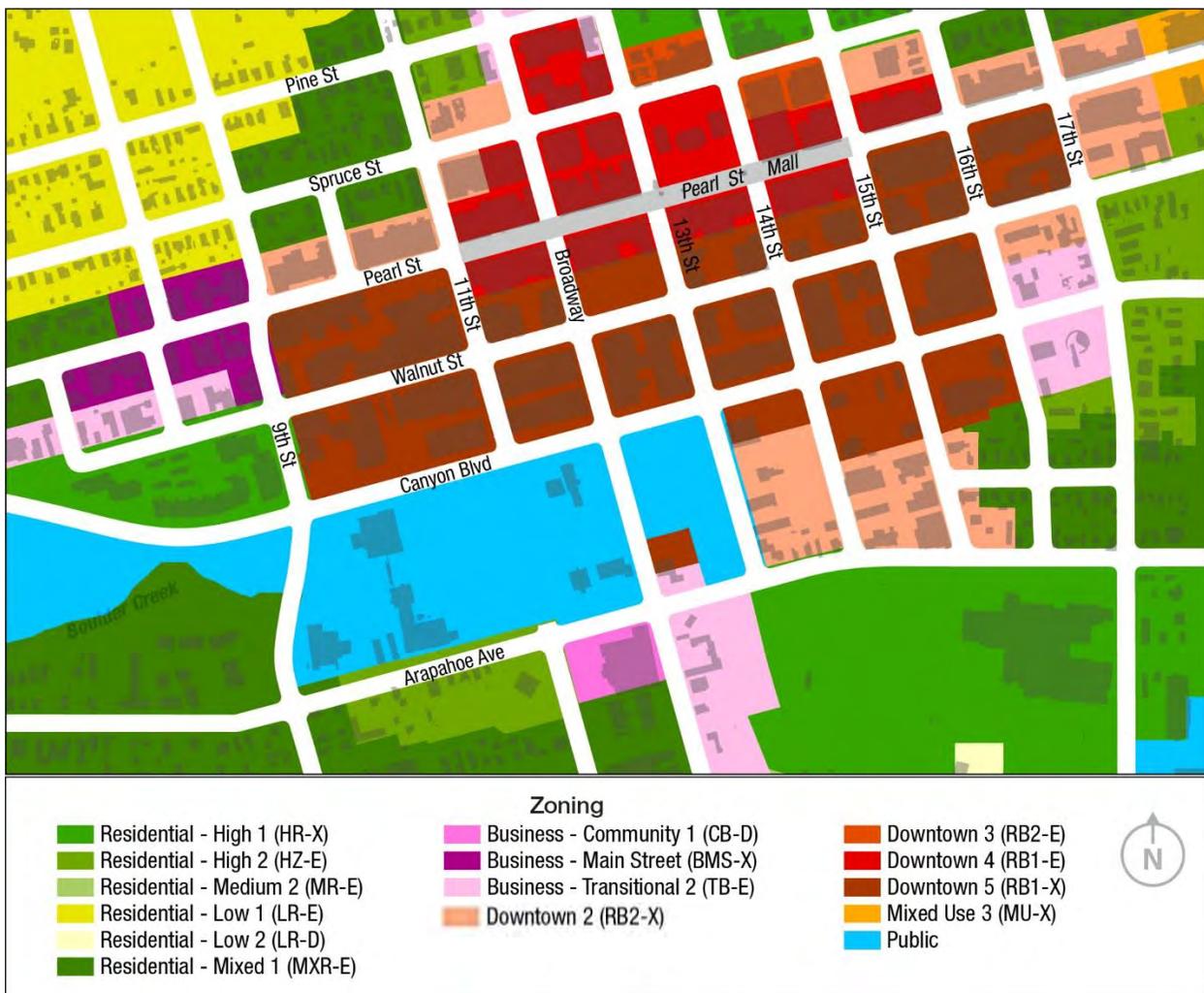
3.2. Current Conditions

Existing conditions surveyed include land use and zoning, "street wall" massing and character, hardscape design and site furnishings, and landscape design. Generally, from north to south, the street is defined by an urban character on the north side of the street transitioning to downtown, and a park-like setting on the southern side leading to Boulder Creek. From 17th Street headed west, the street begins to gain its urban form, transitioning from smaller lot, single-family residential, and office uses to larger urban and municipal uses and forms.

Within the study area, land use is mixed. The north side of Canyon Boulevard is populated with urban office, residential, hospitality, and religious uses. The Downtown Boulder Station, between 14th Street and 15th Street, is a major activity center on the corridor. The south side of Canyon has a significant number of government uses within and around Central Park such as the library, the municipal building, and the atrium. Light commercial uses (banks, a gas station, a liquor store, etc.) line the eastern portion of the southern right of way. Figure 3 shows the existing zoning districts surrounding Canyon Boulevard.

The corridor is primarily surrounded by public land to the southwest and “Downtown 5” to the north and southeast. Downtown 5 is described in the City code as a higher-intensity land use and as having the greatest potential for new development and redevelopment within the downtown core. In 2011, this district code was amended to include a 65-foot setback from the centerline of Canyon Boulevard from 9th Street to 16th Street. This setback serves the urban design vision for Canyon Boulevard, as stated in the City of Boulder Downtown Urban Design Guidelines, to create better separation from traffic for pedestrians and improved streetscaping. The area of Business Transitional 2, at the east end of the study area, allows commercial and complimentary residential uses, generally serving as a buffer for residential uses.

Figure 3. Current Zoning



The corridor has generous setbacks ranging from 78 feet from the right-of-way centerline to 25 feet from a property’s lot line adjoining the right of way, whichever is greater. Current conditions exhibit curb-to-building-face setbacks ranging from 25 feet to 60 feet. The north side of Canyon Boulevard generally is lined by an

urban wall, with buildings ranging from one to four stories. Buildings constructed after 2000 are characterized by a significant amount of articulation and architectural detail and step back in a “wedding cake” manner at the third or fourth floor. The south side is characterized by a park-like or suburban setting with one- to two-story buildings sited within Central Park or in a more suburban manner with large setbacks and landscaped buffers. Many surface parking lots line the southern right of way.

The cross-section of the corridor changes from block to block. Figure 4 shows typical dimensions for blocks along Canyon Boulevard. Pedestrian zone conditions vary from five- to six-foot-wide, curb-attached sidewalks to nine-foot-wide paths with six- to eight-foot tree lawns and larger expanses of hardscape at newer developments. Hardscape treatment changes from block to block in layout and materiality. The pedestrian realm is mostly poured-in-place concrete, with interludes of brick and stone paving at entrances to newer buildings. The north side exhibits a formal, urban character while the south side is more informal with a meandering path at times. Multiple vertical design details exist within and out of the right-of-way line on the northern side of the street: picket fences within the Chamberlain neighborhood, a wooden fence with brick piers at the First Presbyterian Church, raw cast-in-place (CIP) concrete retaining walls at the Downtown Boulder Station, painted CIP planter walls with stone caps from 14th Street to Broadway Street, and large, round planter pots between Broadway Street and 11th Street. In addition, various corner markers appear at major intersections (sandstone markers at Broadway Street and brick markers at 13th Street) and monument signage is located at multiple commercial sites and institutions. Street lighting shows consistency throughout the corridor, with a typical “hockey puck” style roadway light. Pedestrian-scale lighting, where present, is a typical 12-foot-tall globe fixture. Site furniture varies by property owner with a consistent use of wood slat and steel tube, steel strap and tube, and recycled plastic benches.

Landscape conditions, too, vary from block to block with the blocks between 9th Street and Broadway Street showing the most consistency. The north side of Canyon Boulevard has, for the most part, regularly spaced street trees in fair to good condition. The tree lawn, or street tree planting zone, is a largely consistent six- to eight-foot width with slightly narrower dimensions east of 15th Street. The south side of the street houses many mature large-canopy trees within the park and eastern commercial properties planted in an informal manner on both sides of the meandering sidewalk. Tree species within the corridor are diverse and, based on meetings with city foresters, generally show good health, though a number of ash trees are in danger because of the oncoming emerald ash borer epidemic. Understory planting is mixed, with perennials, groundcover, evergreen and deciduous shrubs, though the majority of understory along the corridor is lawn or mulch. The center median is planted with a variety of shade and ornamental flowering trees, perennials, and shrubs in a legible rhythm highlighting key pedestrian and vehicular crossing points. Two trees west of 11th Street show signs of struggle. A more detailed assessment of the trees will be completed by the City as the project develops.

3.3. Planned Improvements

As mentioned in Section 1.1.2, major planned improvements along the corridor include a renovation and redevelopment of the Civic Area. The Master Plan calls for a new park design with increased access, public gathering spaces and plazas, visual and performance art restoration, food vendors, and other amenities, as well as increased visual and physical access to Boulder Creek and maintaining riparian vegetation along the Creek. Along Canyon Boulevard, the Master Plan calls for a pedestrian promenade with an allée of trees similar to the Champs-Élysées in Paris with multimodal, non-vehicular paths. The plan also calls for the redevelopment of the southern block between 13th Street and 14th Street into a series of new buildings ranging from two to four stories with an expanded farmers market and possible development of the Civic Use Pad to the east of the Hotel St. Julien into a civic use building (conference space or event center) with a better formal relation in mass and scale to the hotel.

Figure 4. Canyon Boulevard Typical Cross Sections (shown West to East)

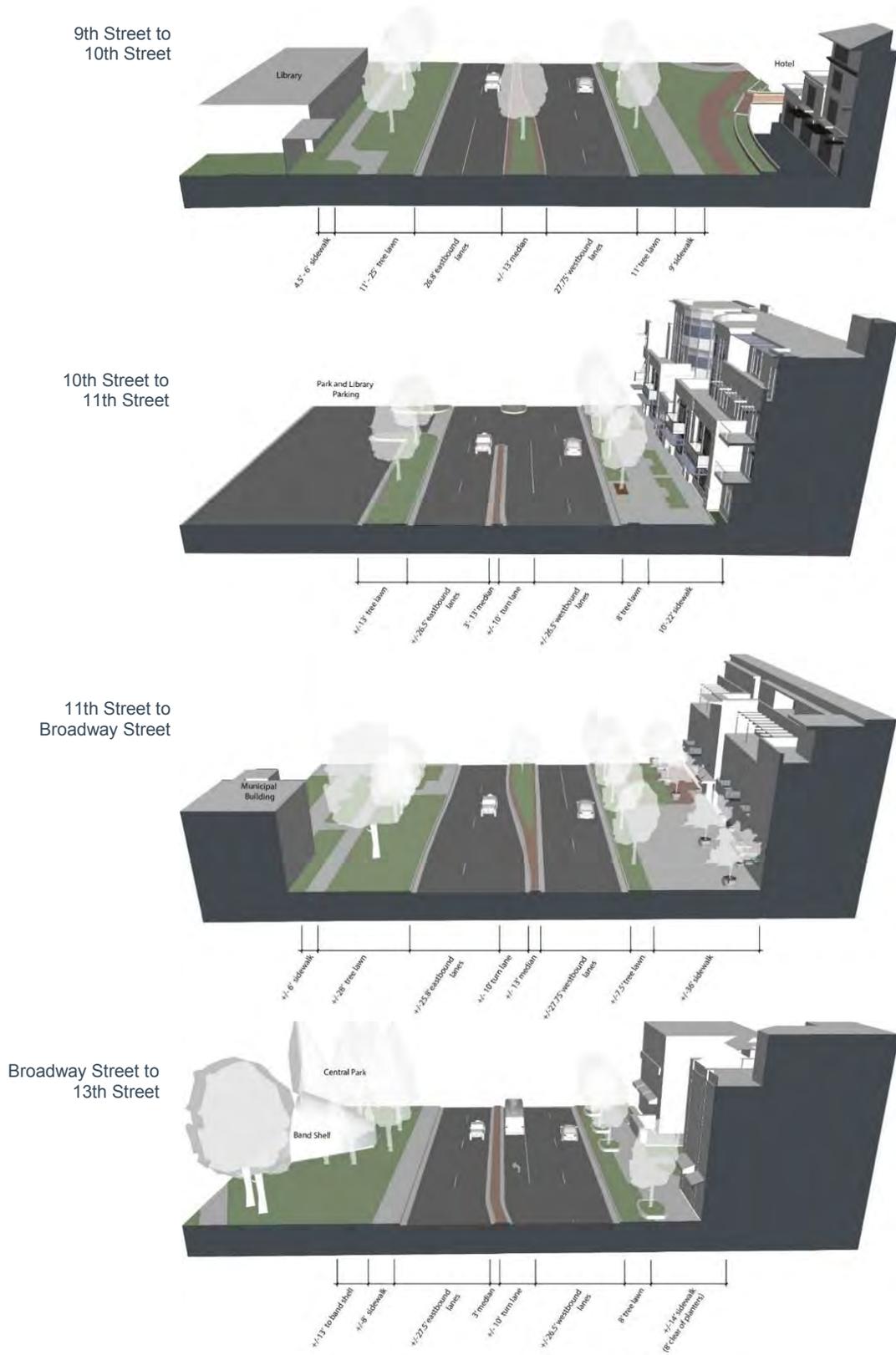
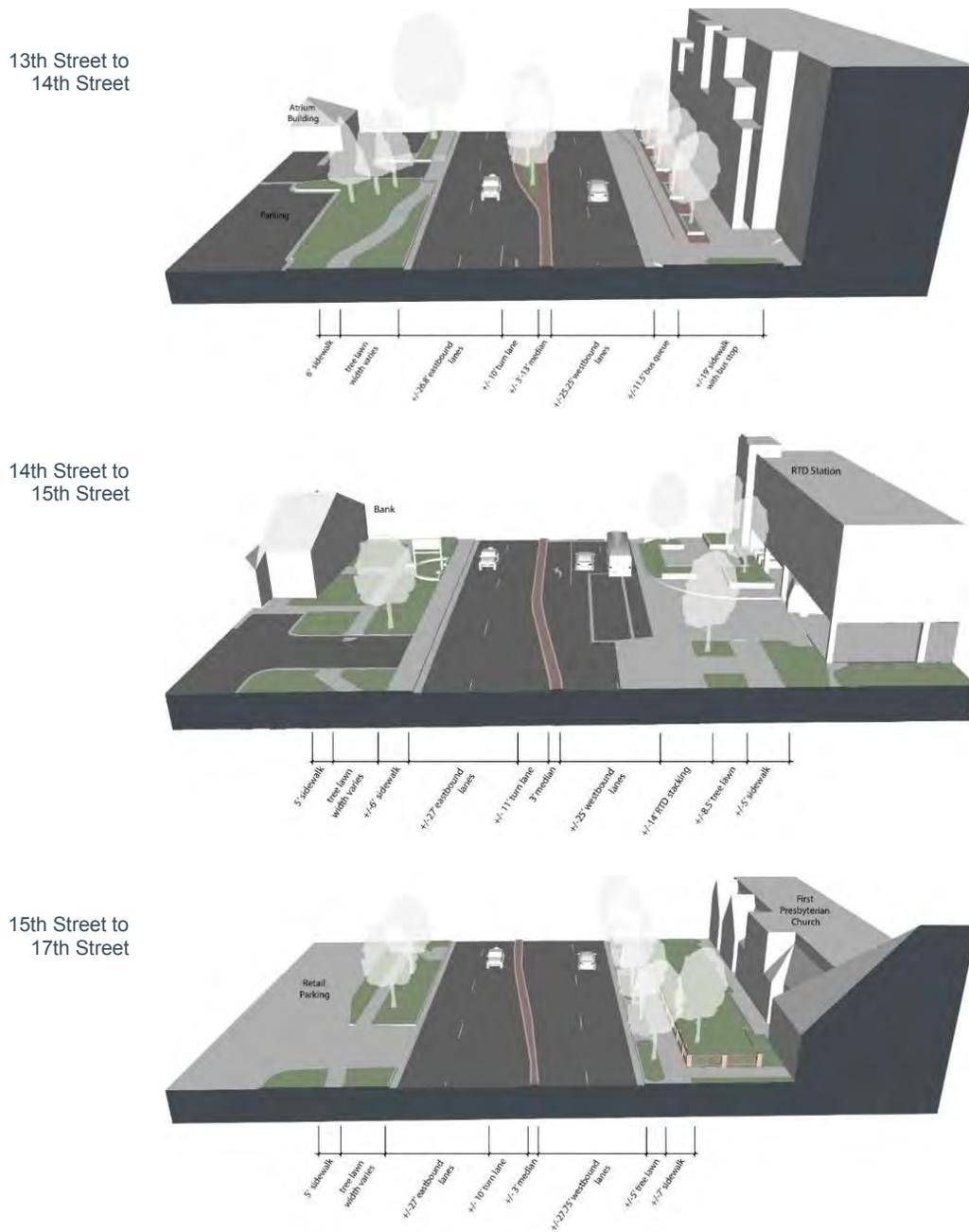


Figure 4 (continued). Canyon Boulevard Typical Cross Sections (shown West to East)



4. Transportation Elements

Canyon Boulevard, designated as SH 119 by CDOT, currently functions as a major east-west arterial connecting the City of Boulder to the nearby mountains. The roadway is a four-lane, divided arterial with two lanes of traffic in both the eastbound and westbound directions. Within the study area, the roadway has a consistent posted speed limit of 35 miles per hour (mph). Every intersection along the corridor has left-turn storage bays, but lacks right-turn lanes. Currently, there are no on-street parking areas or dedicated bicycle facilities along Canyon Boulevard.

Within the study area there are six signalized intersections; one two-way, stop-controlled intersection; and two mid-block crossings along Canyon Boulevard within the study area. The busiest intersection within the study area is at Canyon Boulevard and Broadway Street. Also designated as SH 93, Broadway Street has an ADT of approximately 25,000 vpd where it crosses Canyon Boulevard. Each intersection within the study area is listed in Table 1.

Table 1. Study Area Intersections

Intersection	Control Type
9th Street	Signalized
10th Street Pedestrian Crossing	Yield (mid-block)
11th Street Pedestrian Crossing	Stop controlled (side-street only), pedestrian crossing is yield controlled
Broadway Street	Signalized
13th Street	Signalized
14th Street	Signalized (north side is restricted to RTD vehicles only)
15th Street	Signalized
16th Street	Two-way, stop-controlled
17th Street	Signalized

Source: Google Earth/Google Maps (2015)

Information about traffic, facilities, and safety presented in this section were provided by numerous sources. Tables showing information about each data source are provided in Appendix A.

4.1. Pedestrian Facilities

There is an extensive existing pedestrian network within the study corridor. Canyon Boulevard has sidewalks in both the eastbound and westbound directions and all intersecting streets have sidewalks. Additionally, there is an existing network of off-street pedestrian facilities within the Civic Area and along Boulder Creek. Sidewalks on the north side of Canyon Boulevard generally are about 10 feet in width, with the narrowest section being four feet near 17th Street. Along the south side of Canyon Boulevard, the pedestrian facilities are considerably narrower, ranging between four feet and eight feet.

For a majority of the corridor, the sidewalks have a buffer between the vehicle travel lanes and the pedestrian walkway. This buffer varies, from a simple three-and-a-half-foot grass strip to larger raised planters. However, some sections of sidewalk are not detached from the street and do not have a significant barrier between cars

and pedestrians. This occurs in multiple places on the south side of the street, including sections between Broadway Street and 14th Street, as well as on the north side near 17th Street.

Each intersection, with the exclusion of 16th Street, has existing pedestrian facilities across Canyon Boulevard, including crosswalk striping and ramps. 16th Street has ramps, but does not have a formal, striped crosswalk. Based on a visual inspection, all ramps within the study area appear to meet the most recent Americans with Disabilities Act (ADA) design standards. Additionally, there are two mid-block pedestrian crossings located between Broadway Street and 9th Street. Both share similar designs with rapid flashing beacons, painted markings, and vehicle yield signs.

4.1.1. Pedestrian Counts

Pedestrian counts were gathered from the turning movement count data collected at each intersection. For the two mid-block crossings—at 10th Street and 11th Street—data were provided by the City of Boulder from counts taken in February 2016. These counts are shown in Table 2. The largest number of pedestrian movements take place between Broadway Street and 14th Street and range from around 130 to 400 pedestrian crossings during a peak period. The high number of crossings at these locations, as compared to the eastern or western ends of the study area, is likely a result of the intersections' proximity to the Downtown Boulder Station and Broadway Street and Canyon Boulevard bus stops.

Table 2. Pedestrian Volumes

Location	Morning Peak	Mid-Day Period	Evening Peak
9th Street and Canyon Boulevard	75	60	113
10th Street mid-block crossing ¹	18	60	113
11th Street and Canyon Boulevard ¹	40	105	153
Broadway Street and Canyon Boulevard	255	308	361
13th Street and Canyon Boulevard	126	252	230
14th Street and Canyon Boulevard	147	215	412
15th Street and Canyon Boulevard	116	181	254
17th Street and Canyon Boulevard	120	93	107

Source: Data provided by City of Boulder Turning Movement Counts (May 2013- August 2014). [¹Data for 10th and 11th Streets provided by Fox Tuttle Hernandez Transportation Group counts (February 2016). This data was collected between 7:45 and 8:45, 11:30 and 12:30, and 4:15 and 5:15. These correspond to the pedestrian peak periods and not the vehicle peak periods used for all other intersections.]

4.1.2. Pedestrian Level of Service

To better understand the existing pedestrian facilities, the Pedestrian Performance Measures (PPM) model methodology was used to score each sidewalk segment. This points-based-model assigns a score for certain features of the pedestrian infrastructure and, based on the total score, assigns a pedestrian level of service to the facility. The main criteria evaluated include:

- Continuity of facility
- Width of facility
- Conflicts with motor vehicles
- Amenities and user comfort
- Maintenance
- Support of alternative transportation options, such as bicycling and public transit

Originally developed for the City of Gainesville, Florida, by the University of Florida, this methodology was chosen over others, such as the Highway Capacity Manual’s Pedestrian Level of Service model, because of its ability to evaluate the corridor on a block-by-block basis and capture elements of the pedestrian experience beyond a simple point-to-point travel evaluation. The points-based methodology of the PPM model was reviewed by the Sacramento Area Council of Governments’ study entitled, *Application of New Pedestrian Level of Service Measures*. The study compared the PPM model to the HCM’s Pedestrian Level of Service (PLOS) model and determined them to be equally useful in their ability to evaluate pedestrian facilities. Additionally, the criteria evaluated in the PPM model, summarized above, are very similar to those evaluated by many civic pedestrian planning documents, including the City of Seattle, Washington’s *Pedestrian Master Plan*, and the City of San Francisco, California’s *Better Streets Plan*. Although neither of these documents specifically utilizes the PPM scoring model, they place importance on the same aspects the model evaluates. The PPM model simply gives the ability to consistently measure the features and amenities that are widely accepted to be a necessary part of a vibrant pedestrian facility.

To fully capture the pedestrian experience across the corridor, two pedestrian level of service analyses were conducted. The first analysis, using the standard PPM methodology, was applied to a corridor-wide evaluation. This resulted in an overall pedestrian LOS B for the corridor. The second analysis modified the PPM methodology then was applied to individual segments of the roadway. A modification was required to the original PPM model because it does not traditionally distinguish between the different conditions on each side of a street. Because of the variability in sidewalk characteristics between the north and south side of Canyon Boulevard, the PPM model was modified to supplement the analysis. It was determined that this modification would be applicable for use on this project as long as the modification was applied consistently to both existing conditions and any future considered alternatives. The results of the modified segment analysis are shown in Figure 5. The individual scoring tables, included as Appendix B, show the points each segment received for each criterion evaluated. The appendix also shows the original and modified scoring tables used for this analysis.

Figure 5. Pedestrian LOS



In general, the existing pedestrian facilities are adequate for transportation purposes, but do not always provide a comfortable experience. The best-scoring pedestrian facilities are those located around 13th Street and near the Downtown Boulder Station. These segments scored better than the others due to the increased separation from vehicle traffic and presence of human-scaled amenities. The worst-performing pedestrian facility is the southbound 14th Street sidewalk south of Canyon Boulevard. This section scored poorly due to the narrow sidewalk, lack of amenities, and high volume of driveways.

4.2. Bicycle Facilities

Along Canyon Boulevard—and for many of the surrounding streets to the north—bicyclist are not allowed to ride on the sidewalk. Currently, there are shared-use bicycle facilities along Canyon Boulevard within the study area.

The roadway network surrounding Canyon Boulevard includes roads with and without designated bicycle facilities. East-west bicycle facilities are provided one block north and south of Canyon Boulevard along Walnut Street, and along the Boulder Creek Greenway. The Boulder Creek Greenway also provides regional bicycle connections to the Boulder Foothills and the Denver metropolitan region. North-south bicycle facilities exist along 9th Street, 13th Street, 15th Street, and 17th Street. Table 3 lists each bicycle facility by type, and Figure 6 shows a map of existing bicycle facilities within the study area. It should be noted that Walnut Street, 15th Street, Spruce Street, and 11th Street are one way, and, therefore, only provide a directional connection for bicycles as well as vehicles. This is discussed further in Section 0.

4.2.1. Bicycle Parking

Bicycle parking is provided on and near to the corridor, with most parking associated with businesses, the Downtown Boulder Station, the 13th Street cycle track, and near to public building entrances in the Civic Area. Rack types range from ground-mounted U-racks to serpentine racks to large-scale parking shelters, such as the “Bus Then Bike” parking at the Downtown Boulder Station. Additional bicycle parking options at the Downtown Boulder Station include 140 secure spots available for registered users, several bike lockers, and outdoor covered parking.

4.2.2. Bicycle Sharing

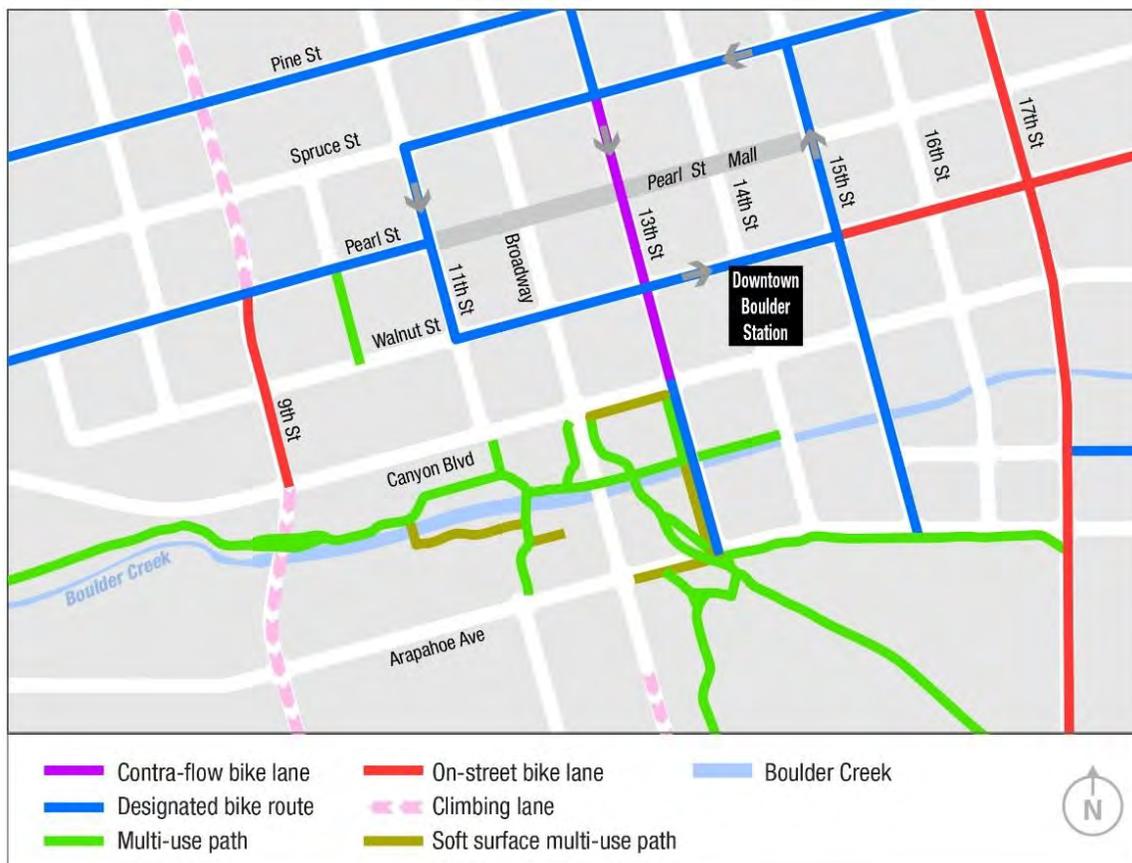
Boulder B-Cycle has six active stations within one-quarter mile of the study area; three locations north of Canyon Boulevard surrounding the Pearl Street Mall and three locations within Central Park. There is one station located on Canyon Boulevard within the study area at the Downtown Boulder Station.

Table 3. Bicycle Facilities within the Study Area

Road	Facility Type	Direction
9th Street	Designated bike route	Northbound
9th Street	On-street bike lane	Southbound
13th Street	Designated bike route	Northbound
13th Street	Contra-flow bike lane	Southbound
15th Street	Designated bike route	Northbound/Southbound
17th Street	On-street bike lane	Northbound/Southbound
Walnut Street	Designated bike route	Eastbound/Westbound
Boulder Creek Greenway	Multi-use path	Eastbound/Westbound

Source: City of Boulder geographic information database.

Figure 6. Existing Bicycle Network



4.2.3. Bicycle Counts

Bicycle counts were collected from the turning movement count data at intersections, provided by the City of Boulder, and ADT data collected along Canyon Boulevard. Bicycle volumes, where available, are summarized in Table 4. This table shows a compilation of data collected over multiple days representing a large temperature range from winter months to summer months. Therefore, the volumes cannot be directly compared to each other because temperature is known to affect the volumes of bicyclists on any given day. Additional data along the Boulder Creek Greenway were collected from a permanent bike counter located along the pathway near 13th Street. This counter recorded the Boulder Creek Greenway’s bicycle volume as being between 100 and 1,300 bicycles per day, depending on the time of the year. Most intersections along Canyon Boulevard experience lower volumes compared to this facility. This is likely a reflection of the facilities provided at each location.

Table 4. Bicycle Volumes on Canyon Boulevard

Location	Morning Peak	Mid-Day Period	Evening Peak
West of 9th Street along Canyon Boulevard ¹	3	8	8
9th Street and Canyon Boulevard	56	37	38
Between 9th Street and Broadway Street ¹	1	1	5
10th Street mid-block crossing ²	4	2	6
11th Street and Canyon Boulevard ²	16	12	21
Broadway Street and Canyon Boulevard	27	33	41
Between 13th Street and 14th Street along Canyon Boulevard ¹	5	6	7
13th Street and Canyon Boulevard	112	68	137
14th Street and Canyon Boulevard	14	28	43
15th Street and Canyon Boulevard	26	22	10
17th Street and Canyon Boulevard	42	18	48
East of 17th Street along Canyon Boulevard ¹	2	8	8

Source: Counts at intersections provided by City of Boulder turning movement counts (May 2013-August 2014).

¹Counts between intersections collected from All Traffic Data counts (January 2016).

²Counts at the mid-block crossings were provided by City of Boulder (February 2016). These counts were taken between 7:45 and 8:45, 11:30 and 12:30, and 4:15 and 5:15. These times correspond to the pedestrian peak periods and not the vehicle peak periods used for all other counts.

4.2.4. Bicycle Network Service Level

To determine the existing user experience for bicyclists traveling along Canyon Boulevard, it is important to not only understand the existing service provided directly along the corridor, but also the service provided by the surrounding roadway and bicycle facility network. This analysis will determine the function of the surrounding network in accommodating a variety of bicycling abilities. The Level of Traffic Stress (LTS) was used for this analysis because it determines cycling comfort for a particular user group.

The LTS approach recognizes that traffic stress—a combination of several negative-experience traffic stressors, such as exhaust fumes, noise, and perceived danger—is the greatest deterrent to bicyclists. The LTS approach to evaluating bicycle facilities focuses on the segment of the population that would likely ride bicycles if they were separated from automobile traffic. LTS is defined as:

LTS 1: A level of traffic stress tolerable by most children

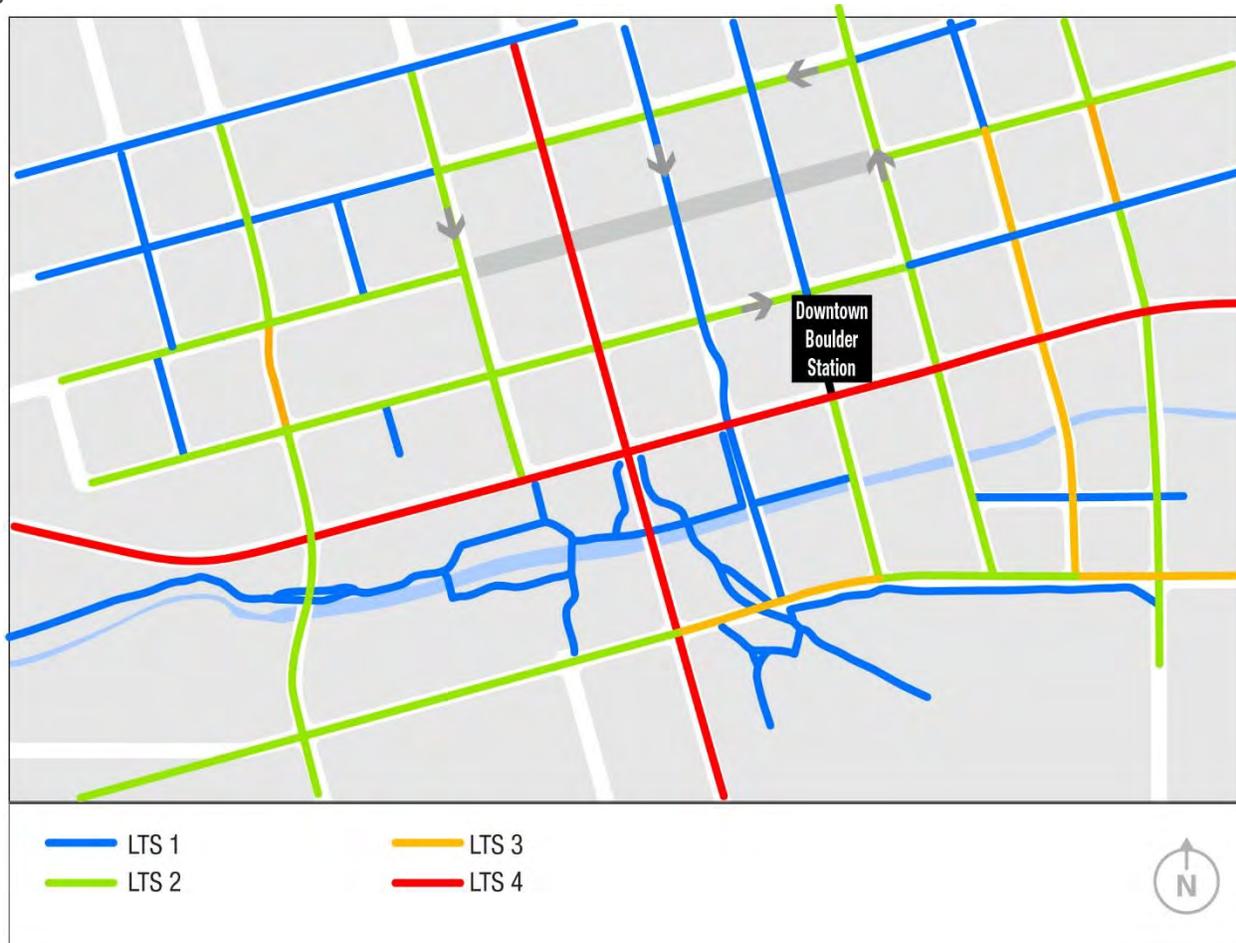
LTS 2: A level of traffic stress tolerable by the mainstream adult population

LTS 3: A level of traffic stress tolerable by a smaller portion of the adult population who are confident in their abilities, but who would prefer separation from traffic

LTS 4: A level of traffic stress tolerable by the most confident riders; these riders are comfortable mixing with heavy traffic and at higher speeds

Figure 7 shows the LTS for the network surrounding Canyon Boulevard. Several blocks north of Canyon Boulevard also were included in this analysis to understand the function of the one-way loop formed by Walnut Street, 15th Street, Spruce Street, and 11th Streets. Also, for the purposes of this study, the Boulder Creek Greenway was included as a connection in the bicycle network.

Figure 7. Level of Traffic Stress



Because of the lack of dedicated bicycle facilities, speeds of 35 mph and greater, and four lanes of traffic, Canyon Boulevard received an LTS 4, only providing a connection for the most experienced bicyclist. A majority of the network received an LTS 2, with speeds on many of the roads between 20 mph and 25 mph, no more than two lanes of vehicular traffic, and varying accommodations for bicyclists provided. The cycle track on 13th Street and the Boulder Creek Trail received an LTS 1 because of the separation from traffic provided by those facilities.

4.3. Transit Service

Transit service within this corridor is provided by RTD in the form of extensive bus service throughout the corridor, including operating the Downtown Boulder Station, a regional bus depot. Handling both local and regional buses, Canyon Boulevard is the primary access road into and out of the Downtown Boulder Station. Additionally, there are currently two bus storage bays along Canyon Boulevard. Located between 13th Street and 15th Street, these bays are used by RTD for bus storage during off-peak times. Figure 8 shows the local, regional, and SkyRide routes around the study area, as well as the combined boardings and alightings at each station. The highest ridership activities are concentrated along Broadway Street and the Downtown Boulder

Station. The most-used transit stop along Canyon Boulevard is the Downtown Boulder Station, which services more than 5,200 users per day.

Correlated with the high ridership, the highest concentration of bus routes are along Broadway Street and Canyon Boulevard. Figure 9 shows the individual bus routes near the study corridor, as well as which routes service each stop. Although local, regional, and SkyRide routes travel along Canyon Boulevard, the street-side bus stops on Canyon Boulevard primarily are serviced only by the local routes.

In January 2016, RTD service was altered in the study area due to the addition of the Flatiron Flyer BRT service. This replaced some existing regional bus service in the area and added additional bus trips to the Downtown Boulder Station. The most current service is shown in the maps; however, boarding and alighting data were collected before the service changes. The only significant change in ridership patterns within the corridor is expected to occur at the stops along Broadway Street at Canyon Boulevard. Due to the changes in bus service, ridership is expected to shift away from these stops and move to the Downtown Boulder Station. There are not enough data available at this time to determine the exact shift in these patterns.

Figure 8. Existing Transit Network

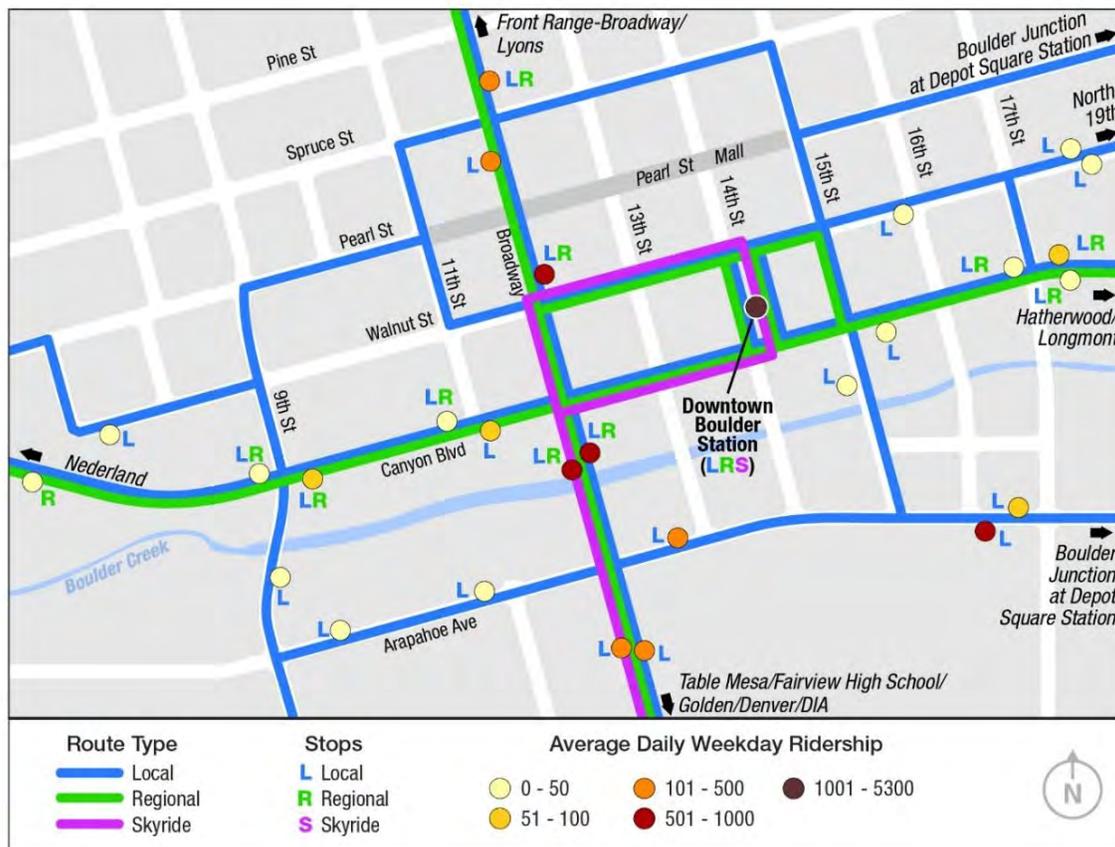
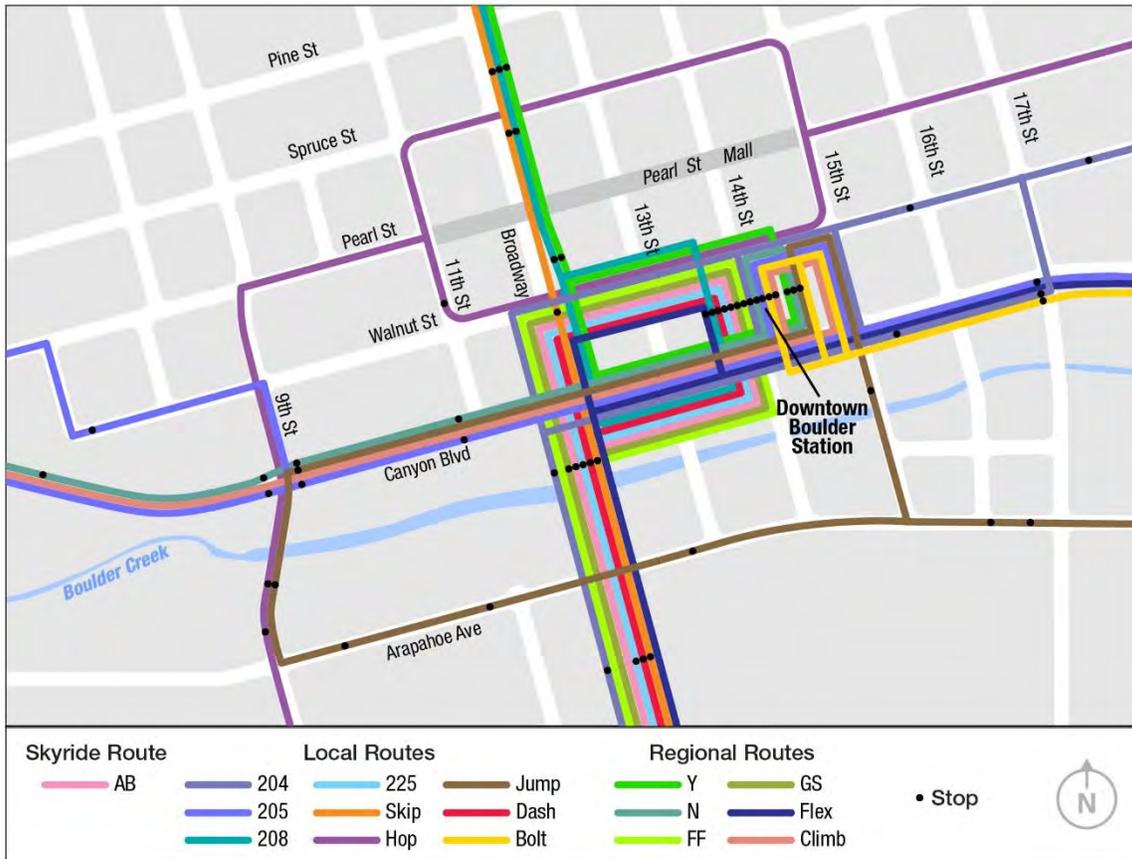


Figure 9. Individual Bus Routes Within the Study Area



Typical street-side transit stops in the area include a posted sign and bench, although in a few cases, such as at the Broadway Street and Canyon Boulevard stop, transit facilities include a shelter as well. Bus stops along Canyon Boulevard do not have pull-outs. The only place where buses stop outside the travel lanes are the two bus layover spaces near the Downtown Boulder Station.

4.4. Vehicular Traffic

The latest traffic count data collected within the study area, taken in January 2016, shows the average daily traffic (ADT) ranging from around 11,000 vehicles per day (vpd) at 9th Street to almost 20,500 vpd at 17th Street. Heavy vehicles, which includes any vehicle with three or more axles, comprise between 2 percent and 3.5 percent of the average daily traffic volume. Table 5 shows the ADT and percent of heavy vehicles for each data collection location.

Table 5. Average Daily Traffic

Location	ADT	Percent Heavy Vehicles
West of 9th Street	11,025	3.53%
East of 11th Street	14,596	1.79%
East of 13th Street	15,574	2.69%
East of 17th Street	20,468	2.10%

Source: All Traffic Data tube counts collected on January 20-21, 2016.

The daily traffic pattern shows a morning peak between 7:00 a.m. and 8:00 a.m., and an evening peak between 5:00 p.m. and 6:00 p.m. West of Broadway Street, traffic volume decreases after the morning peak through the mid-day period and rises again during the evening peak period before tapering off over night. East of Broadway Street, traffic drops after the morning peak period, but then rises steadily again through the mid-day and evening periods. These locations show a much greater difference between the morning and evening peak periods than the locations west of Broadway Street. There is not a strong directional peak flow along the corridor. The daily directional traffic data at the count locations are shown in Figure 10 through Figure 13.

Figure 10. Canyon Boulevard ADT West of 9th Street

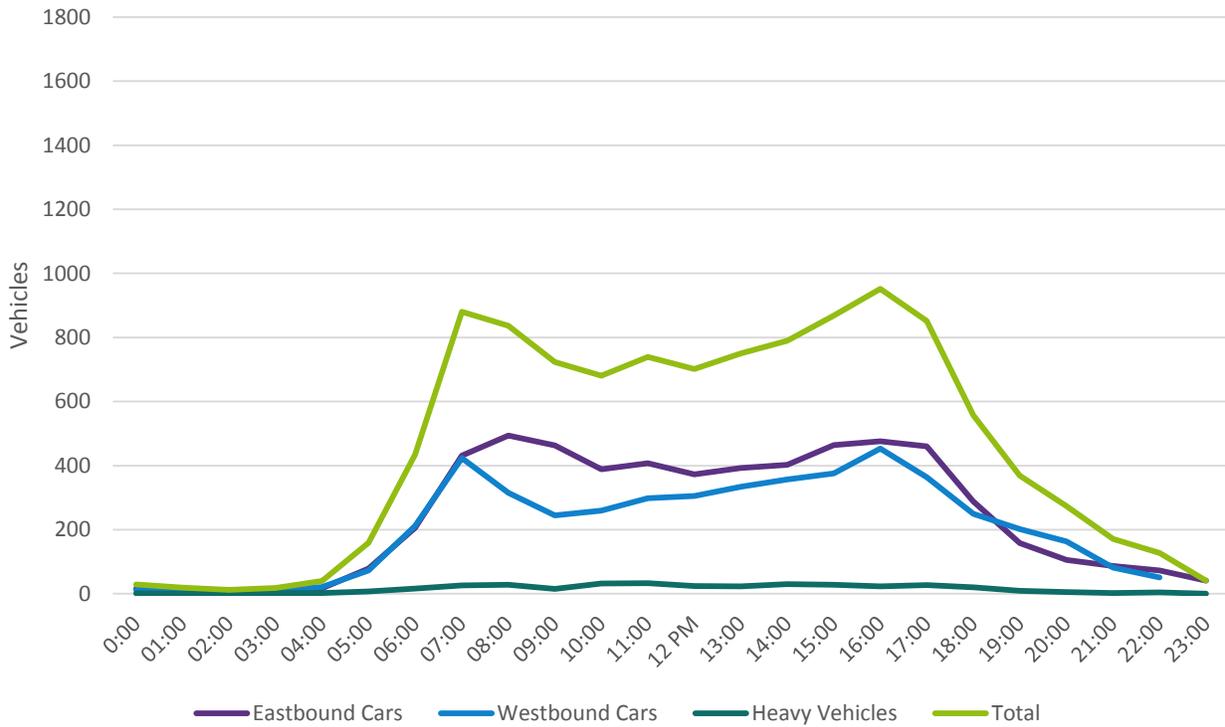


Figure 11. Canyon Boulevard ADT East of 11th Street

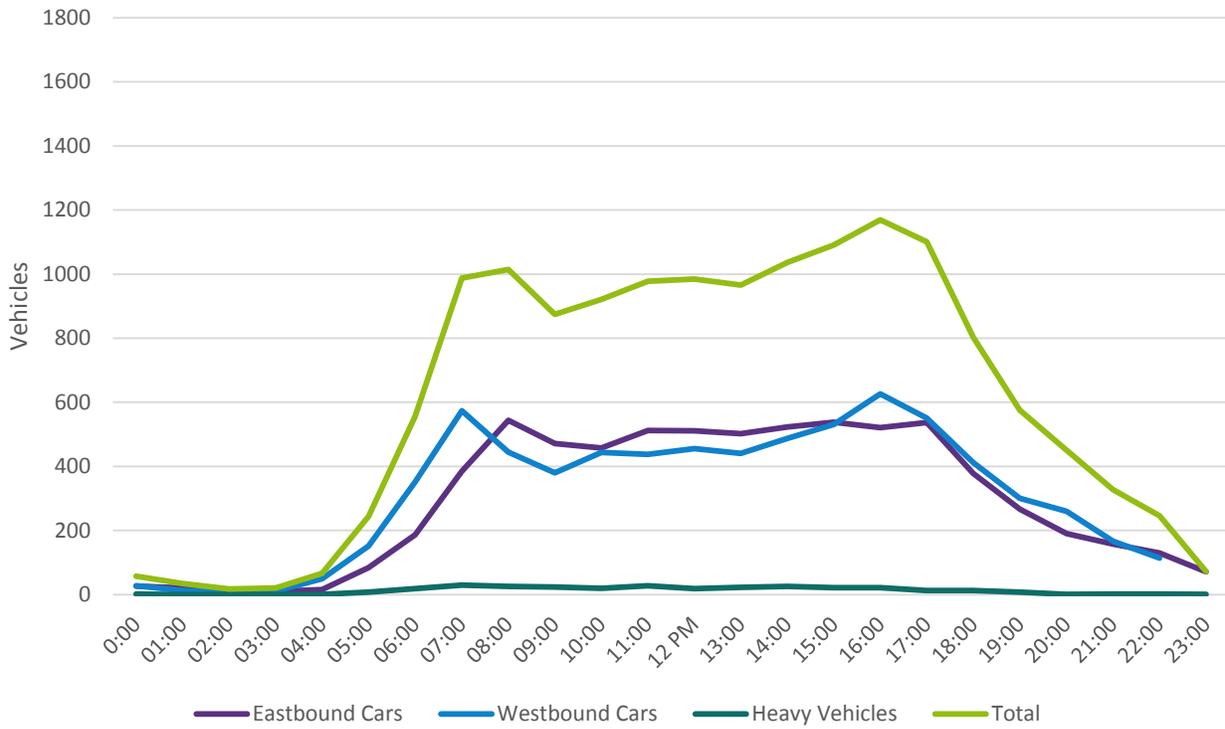


Figure 12. Canyon Boulevard ADT East of 13th Street

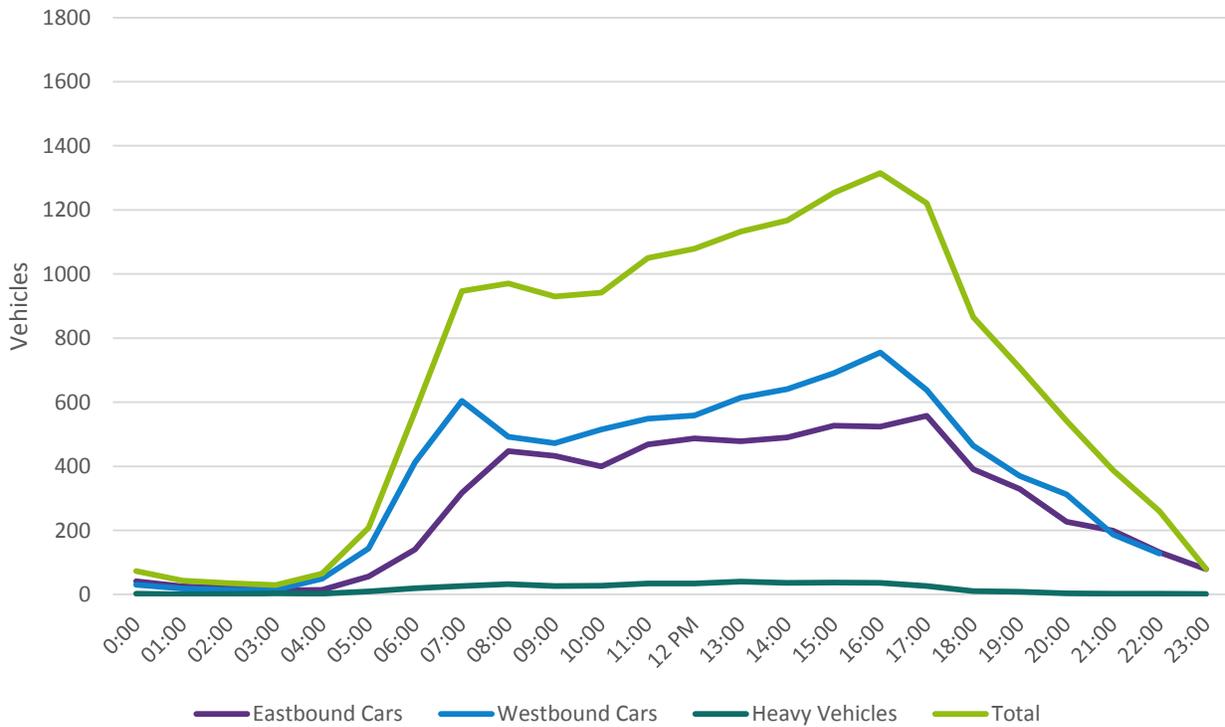
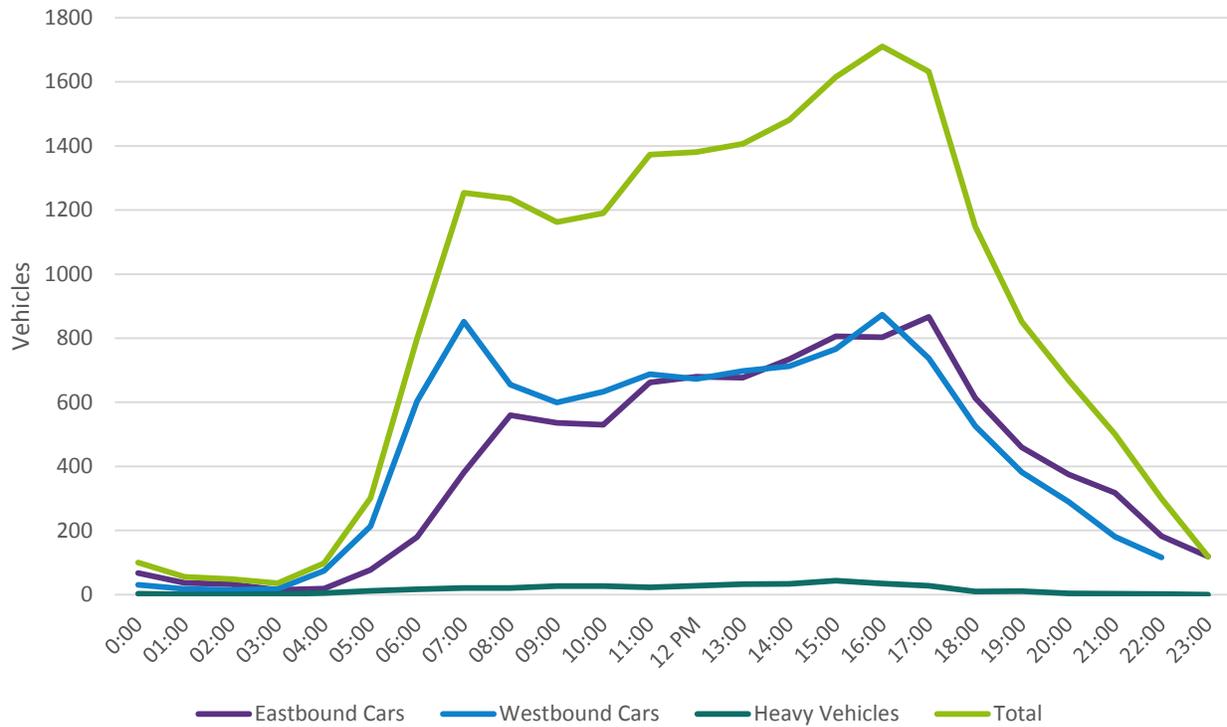


Figure 13. Canyon Boulevard ADT East of 17th Street



4.4.1. Existing Vehicle Level of Service

To evaluate the vehicle travel conditions along Canyon Boulevard, the Highway Capacity Manual (HCM) Level of Service (LOS) methodology was used. The LOS is a measurement of the average delay per vehicle at an intersection. Based on this delay, a score of A through F is assigned, with A representing the best conditions, or smallest delay, and F reflecting the worst conditions, or greatest delay.

Synchro 9 software was used to analyze the existing congestion along the corridor. Synchro models were provided by the City of Boulder and were updated and used to evaluate the morning peak period (7:00 a.m. to 8:00 a.m.), the mid-day period (12:00 p.m. to 1:00 p.m.), and the evening peak period (5:00 p.m. to 6:00 p.m.). The *2010 Highway Capacity Manual* (2010 HCM) methodology was used to calculate the LOS for the 9th Street and Broadway Street intersections. This methodology was unable to produce LOS for the other intersections due to its limited ability to analyze non National Electrical Manufacturers Association (NEMA) standard signal phasing; therefore, the *2000 Highway Capacity Manual* (2000 HCM) methodology was used to evaluate all other intersections. The results of this analysis are shown in Figure 14 through Figure 16 and in Table 6.

During the morning peak period, all intersections operate at LOS C or better. The intersection with Broadway Street experiences the most congestion, with some approaches operating at LOS D. During the mid-day period, the corridor operates slightly better than the morning peak, with all intersections operating at LOS C or better. The evening peak period is the most congested time for the corridor. During this period, the intersection at Broadway Street degrades to LOS E, with all approaches operating at LOS D or worse. The individual movements for Broadway Street indicate that all movements along Canyon Boulevard operate at LOS D in the PM peak, but the movements on Broadway operate at LOS E and F with the exception of the northbound left-turn movement. Because of this delay, both the northbound and southbound approaches queue to the adjacent streets. On the northbound approach, the queue was observed at 550 feet, south to Arapahoe Road. Similarly, on the southbound approach, the queue extends north past Walnut Street to Pearl Street. The eastbound and westbound approaches along Canyon Boulevard do not experience the same queue length as the northbound and southbound approaches. On the westbound approach, queues reach back to 13th Street and, on the

eastbound approach, they reach 11th Street. These queues, however, do not cause 11th Street or 13th Street to queue significantly.

Other movements of note include the southbound left-turn movement at 14th Street and the northbound movements at 16th Street. During the PM peak, the southbound left-turn movement at 14th Street operates at LOS F. At 16th Street, because this intersections operates with TWSC, has a one-lane northbound approach, and the lack of gaps during the PM peak, the northbound movements at 16th Street operate at LOS F in the PM peak. All other movements at the study intersections with the exceptions of those discussed previously, all operate at LOS D or better during the AM, mid-day, and PM peak periods.

Figure 14. AM Peak Period LOS



Figure 15. Mid-Day LOS



Figure 16. PM Peak Period LOS



Table 6. Intersection LOS by Movement

Intersection		Morning		Mid-Day		Evening		
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	
9th Street	Eastbound	Left	C	20.9	C	25.9	B	18.6
		Through	B	10.9	B	14.6	A	6.4
		Right	B	10.9	B	14.6	A	6.4
		Approach	B	12.2	B	16.1	A	7.8
	Westbound	Left	C	25.1	C	24.4	C	26.4
		Through	C	26.0	C	21.7	C	25.9
		Right	C	26.7	C	22.6	C	26.9
		Approach	C	26.3	C	22.4	C	26.4
	Northbound	Left	A	9.4	A	9.8	B	13.6
		Through	B	10.7	B	12.0	B	18.7
		Right	A	8.7	B	10.4	B	13.6
		Approach	B	10.3	B	11.4	B	17.2
	Southbound	Left	A	3.1	A	3.2	B	12.8
		Through	A	2.3	A	2.5	A	6.5
		Right	A	2.3	A	2.5	A	6.5
		Approach	A	2.5	A	2.7	A	8.1
Intersection		B	14.6	B	14.4	B	15.9	
11th Street*	Southbound	Right	A	9.5	A	9.3	B	10.0
		Approach	A	9.5	A	9.3	B	10.0

Canyon Boulevard Complete Streets
Existing Conditions Summary

Intersection		Morning		Mid-Day		Evening			
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)		
Broadway Street	Eastbound	Left	C	25.2	C	22.5	D	41.0	
		Through	D	49.7	D	48.6	D	47.8	
		Right	D	53.8	D	53.8	D	51.4	
		Approach	D	48.2	D	47.4	D	48.2	
	Westbound	Left	C	23.3	C	20.5	D	49.4	
		Through	D	37.0	D	39.9	D	50.5	
		Right	D	40.8	D	42.6	D	51.2	
		Approach	D	36.3	D	37.7	D	50.5	
	Northbound	Left	C	30.3	C	27.8	C	34.2	
		Through	B	17.0	B	19.5	E	68.0	
		Right	B	17.2	C	20.1	E	68.9	
		Approach	B	19.7	C	21.4	E	62.5	
	Southbound	Left	D	50.2	C	24.4	F	82.2	
		Through	B	19.7	C	25.2	F	141.0	
		Right	C	20.6	C	25.9	F	142.1	
		Approach	C	25.0	C	25.3	F	131.2	
	Intersection		C	31.1	C	32.1	E	75.0	
	13th Street	Eastbound	Left	A	1.8	A	5.9	B	11.5
			Through	A	1.9	A	5.5	B	14.6
			Approach	A	1.9	A	5.5	B	14.5
Westbound		Through	A	7.2	A	3.9	A	6.4	
		Right	A	7.2	A	3.9	A	6.4	
		Approach	A	7.2	A	3.9	A	6.4	
Northbound		Left	C	25.6	C	20.9	C	30.7	
		Through	C	25.6	C	20.9	C	30.7	
		Right	C	25.0	C	20.6	C	29.9	
		Approach	C	25.4	C	20.7	C	30.3	
Intersection		A	5.2	A	5.2	B	10.4		

Canyon Boulevard Complete Streets
Existing Conditions Summary

Intersection		Morning		Mid-Day		Evening			
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)		
14th Street	Eastbound	Left	A	5.8	A	4.0	A	6.5	
		Through	A	2.4	A	1.7	A	1.7	
		Right	A	2.4	A	1.7	A	1.7	
		Approach	A	2.6	A	1.8	A	1.8	
	Westbound	Left	A	4.9	A	4.7	A	5.4	
		Through	A	6.1	A	6.5	A	5.8	
		Right	A	6.1	A	6.5	A	5.8	
		Approach	A	6.0	A	6.5	A	5.8	
	Northbound	Left	C	28.0	C	23.8	C	31.4	
		Through	C	28.3	C	23.6	C	30.4	
		Right	C	28.3	C	23.6	C	30.4	
		Approach	C	28.2	C	23.6	C	30.7	
	Southbound	Left	C	28.8	C	30.4	F	137.2	
		Through	C	28.8	C	30.4	D	36.9	
		Right	C	28.0	C	24.0	D	36.9	
		Approach	C	28.4	C	27.4	F	80.1	
	Intersection		A	6.1	A	6.9	B	14.2	
	15th Street	Eastbound	Left	A	3.0	A	4.6	A	3.1
			Through	A	3.5	A	4.7	A	2.5
			Right	A	3.5	A	4.7	A	2.5
Approach			A	3.5	A	4.7	A	2.6	
Westbound		Left	A	9.4	B	15.9	A	8.6	
		Through	A	8.4	B	18.9	A	7.9	
		Right	A	8.4	B	18.9	A	7.9	
		Approach	A	8.5	B	18.7	A	8.0	
Northbound		Left	C	26.9	C	24.0	D	54.4	
		Through	C	26.9	C	24.0	D	54.4	
		Right	C	23.6	C	26.9	C	29.6	
		Approach	C	25.8	C	25.1	D	46.4	
Southbound		Left	B	15.4	A	5.2	C	28.3	
		Through	B	15.4	A	5.2	C	28.3	
		Right	A	2.9	A	1.5	C	33.0	
		Approach	B	13.2	A	3.9	C	30.2	
Intersection		A	8.6	B	12.6	B	11.5		

Intersection		Morning		Mid-Day		Evening			
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)		
16th Street*	Northbound	Left	C	22.5	D	25.6	F	72.8	
		Through	C	22.5	D	25.6	F	72.8	
		Right	C	22.5	D	25.6	F	72.8	
		Approach	C	22.5	D	25.6	F	72.8	
	Southbound	Left	D	25.9	C	20.8	D	29.5	
		Through	D	25.9	C	20.8	D	29.5	
		Right	D	25.9	C	20.8	D	29.5	
		Approach	D	25.9	C	20.8	D	29.5	
17th Street	Eastbound	Left	A	4.6	A	5.8	A	5.1	
		Through	A	4.9	A	7.6	A	7.4	
		Right	A	4.9	A	7.6	A	7.4	
		Approach	A	4.9	A	7.6	A	7.4	
	Westbound	Left	B	10.6	B	12.2	A	8.0	
		Through	A	9.7	B	11.6	A	8.6	
		Right	A	9.7	B	11.6	A	8.6	
		Approach	A	9.8	B	11.7	A	8.6	
	Northbound	Left	C	31.0	C	22.2	D	41.4	
		Through	C	33.6	C	24.9	D	48.7	
		Right	C	33.6	C	24.9	D	48.7	
		Approach	C	32.8	C	24.4	D	47.9	
		Southbound	Left	C	25.7	B	16.7	D	35.1
			Through	C	27.9	B	16.0	C	30.7
			Right	C	27.9	B	16.0	C	30.7
			Approach	C	27.6	B	16.1	C	32.6
Intersection		B	13.3	B	11.4	B	13.3		

*Intersection is TWSC and LOS is not reported for the intersection

4.4.2. Vehicular Travel Time

In addition to the LOS, SimTraffic 9 simulation software was used to model the corridor travel times during the morning peak, mid-day, and evening peak periods. The results are shown in Table 7. The longest travel time is experienced in the evening westbound direction, with a trip from 17th Street to 9th Street taking nearly three minutes to travel the 0.6-mile corridor. This translates to an average travel speed of 12 mph. The primary delay occurs on the western portion of the corridor between 9th Street and 13th Street. This represents half of the travel distance, but accounts for nearly 70 percent of the travel time delay. This is due to the congestion at the Broadway Street intersection and the delay at the mid-block pedestrian crossings. Additionally, the westbound direction experiences longer travel times by about 30 seconds per vehicle compared to the eastbound direction during all three time periods.

Table 7. Corridor Travel Times

Time of Day	Direction	Travel Time (min)	Total Delay (sec/veh)
Morning Peak Period	Eastbound	1.91	56
	Westbound	2.44	89
Mid-Day Period	Eastbound	2.07	67
	Westbound	2.51	94
Evening Peak Period	Eastbound	2.53	94
	Westbound	2.97	120

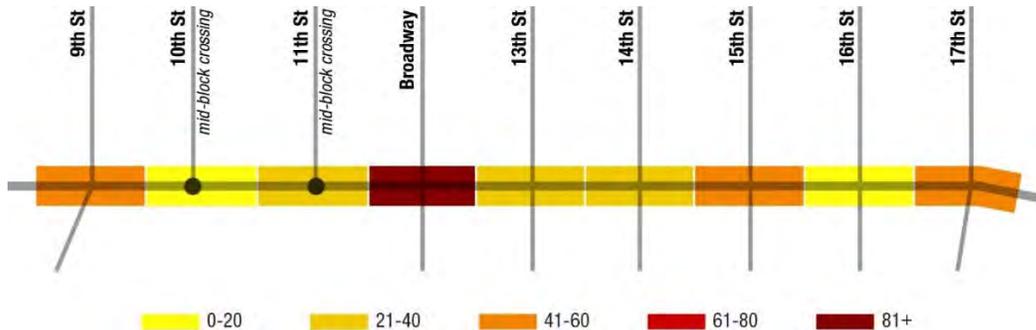
Source: SimTraffic 9 corridor simulation model

4.5. Transportation Safety

Five years of crash data (January 2010 to December 2014) were collected from crash reports maintained by CDOT, the City of Boulder, and the Federal Highway Administration’s (FHWA) Pedestrian and Bicycle Crash Analysis Tool (PBCAT). It was necessary to rectify information from all sources to ensure completeness and avoid duplication of the information, since none of the sources was deemed to be complete on its own. Self-reported crash records were not included in the analysis.

Because most crashes were reported in conjunction with an intersection, vehicle crashes were identified by roadway segment in the study area and aggregated around each intersection. Figure 17 shows the number of crashes for each segment of roadway within the study area. There were a total of 411 crashes within the corridor during the five-year data collection period. The highest number of vehicular crashes were located at Broadway Street, which had 125 crashes recorded. This is more than twice as many crashes as recorded at any other intersection and represents more than one-third of all crashes within the study area. Of the remaining intersections, the crashes are more evenly spread across the corridor, with 9th Street, 15th Street, and 17th Street intersections experiencing the next highest volume of crashes, ranging between 40 and 60.

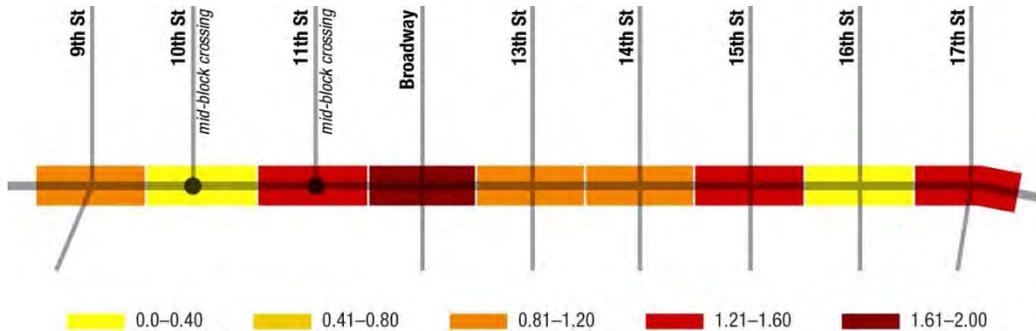
Figure 17. Total Crashes (January 2010–December 2014)



To normalize the crash data for comparative analysis between intersections, the crash rate per million entering vehicles (MEV) at each intersection was calculated. The PM peak hour TMC data were used to calculate daily volume through the intersection. It is assumed that 10 percent of the daily traffic occurs during the PM peak hour. The results of this normalization yielded an average crash rate for the corridor of 0.98 crashes per MEV and an average injury crash rate for the corridor of 0.23 crashes per MEV. Additional injury crash data were gathered from CDOT for other, similar roadways within the state that have similar characteristics to Canyon Boulevard.

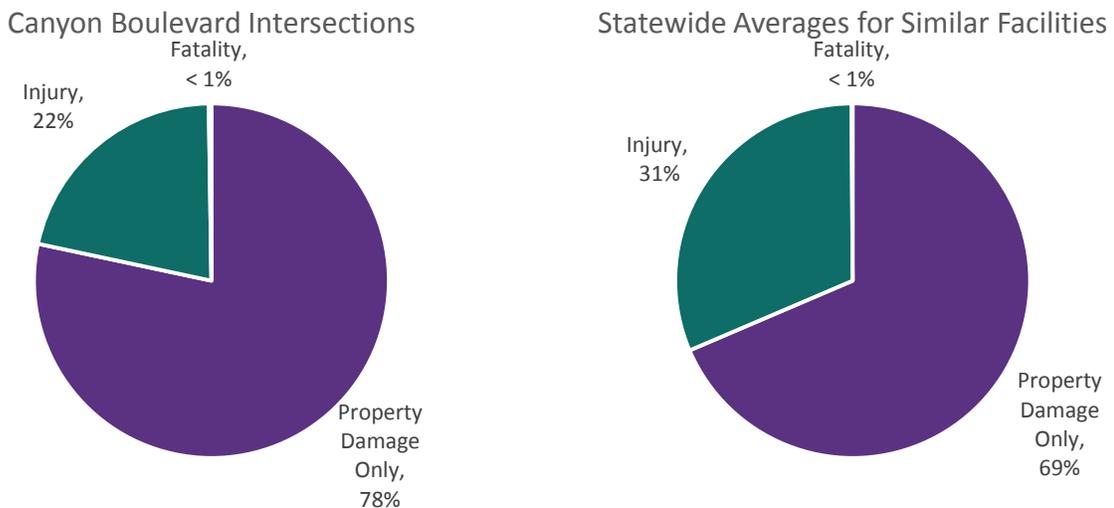
The highest crash rate was at Broadway Street, which had a rate of 1.80 crashes per MEV (+83.67 percent¹) with the lowest crash rates being at 10th Street (0.04 crashes per MEV, -85.71 percent) and 16th Street (0.25 crashes per MEV, -74.49 percent). The range of crash rates within the corridor per MEV at each intersection is shown in Figure 18.

Figure 18. Normalized Crash Rates



Most crashes along the corridor were minor and did not result in injuries. Crashes involving injuries represent 22 percent of all crashes in the corridor. There was one fatality in the corridor. This fatality occurred near the 14th Street intersection. Non-injury and injury crashes were evenly spread across the corridor, with each intersection having about the same percentage of non-injury and injury crashes. Figure 19 shows the number of all crashes by severity within the corridor as compared to the statewide average for similar facilities. Based on the statewide average of crash severity for facilities similar to Canyon Boulevard, the study corridor shows a slightly lower injury crash rate than the statewide average (CDOT, 2010-2014).

Figure 19. Severity of Crashes

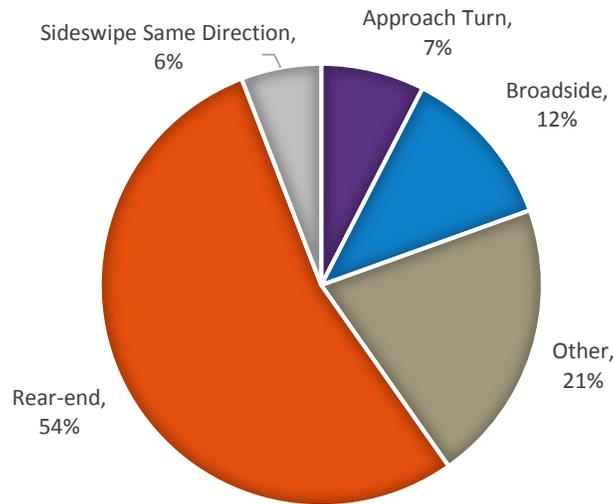


The largest number of crashes within the study area were rear-end collisions. These types of crashes represent more than half of all crashes on the corridor, which is typical for signalized intersections. Sideswipes, approach turns, and broadsides represent an additional 30 percent of the crashes, with the remaining crashes being a

¹ This represents the percent difference between the stated crash rate and the average crash rate for the corridor. A positive value means the stated crash rate is greater than the corridor average and a negative value shows that the given crash rate is lower than the corridor average.

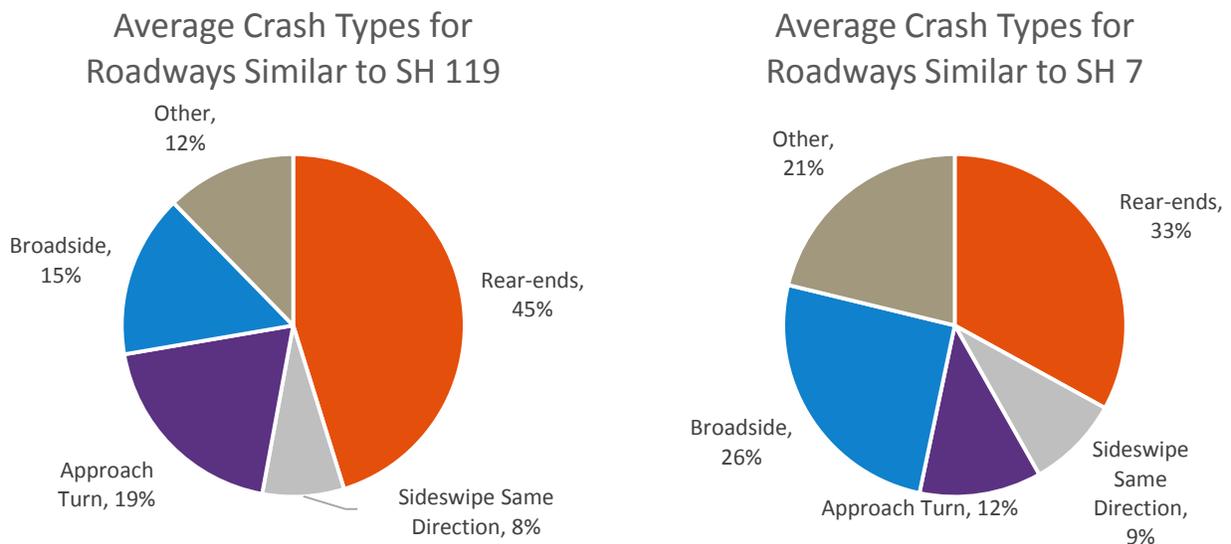
combination of other crash types, including fixed object collisions and collisions with parked cars. Figure 20 shows the percentage of all crashes along Canyon Boulevard by type.

Figure 20. All Crashes by Type



Based on the statewide average crash types, the study corridor has a higher percentage of rear-end crashes than the typical distribution for similar facilities (CDOT, 2010-2014). CDOT designates the study area as two separate state highways. West of Broadway Street, Canyon Boulevard is designated as SH 119 and to the east of Broadway Street it is designated as State Highway 7 (SH 7). Figure 12 shows the typical crash types for facilities similar to both SH 119 and SH 7. In general, Canyon Boulevard has a smaller percentage of crash types that tend to be more severe, such as broadside and approach turn crashes.

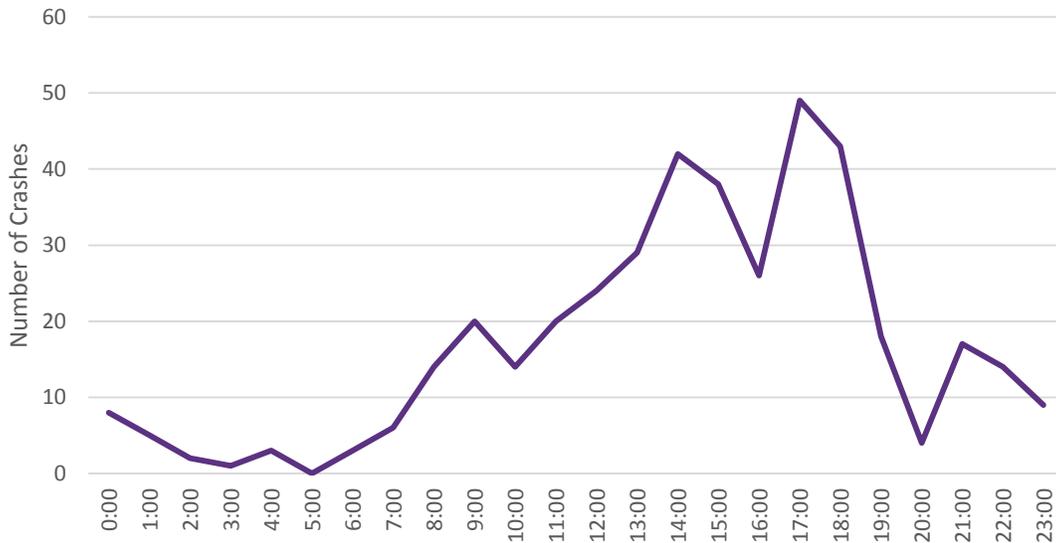
Figure 21. Statewide Crash Type Distribution



Most crashes in the study area occurred in the afternoon and early evening hours of the day. Of the 411 total crashes that occurred during the data collection period, 198 (48 percent) occurred between 2:00 p.m. and 7:00

p.m. This time period corresponds to the highest traffic volumes and congestion within the corridor. Figure 22 summarizes the crashes by the time of day in which they occurred.

Figure 22. Crashes by Time of Day

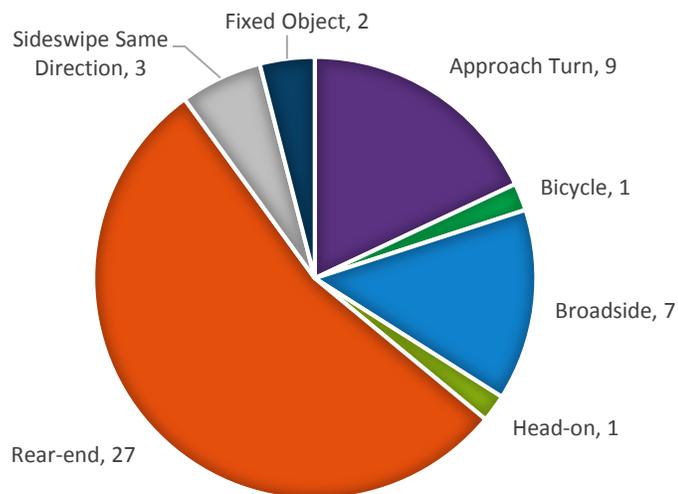


4.5.1. Intersection Safety by Location

4.5.1.1. 9th Street and Canyon Boulevard

The crash types by percentage at this intersection are similar to the standard pattern observed at similar signalized intersections within the state. Figure 23 shows the breakdown of crashes by type at this intersection. The crash rate for the intersection was 1.03 crashes per MEV (+5.10 percent) with the injury crash rate being 0.29 crashes per MEV (+26.09 percent).

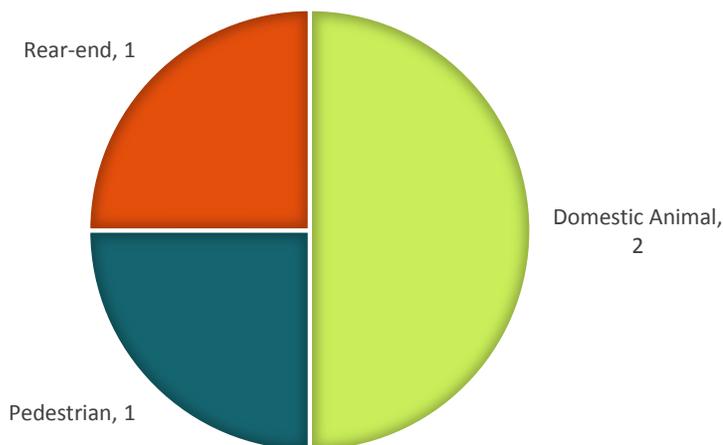
Figure 23. 9th Street and Canyon Boulevard Crashes by Type



4.5.1.2. 10th Street Mid-Block Crossing

There were four crashes at this intersection during the analysis period. The crash rate for this mid-block crossing was 0.14 crashes per MEV (-85.71 percent) and the injury crash rate was 0.04 crashes per MEV (-82.61 percent). A summary of the crash types at this intersection is shown in Figure 24.

Figure 24. 10th Street Mid-Block Crossing Crashes by Type

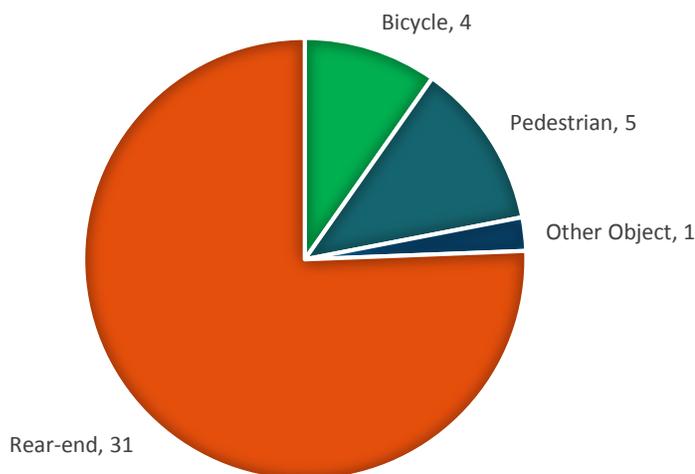


4.5.1.3. 11th Street and Canyon Boulevard

The intersection of 11th Street and Canyon Boulevard had more crashes involving bicycles and pedestrians than the corridor average. There are no vehicular left-turns permitted at this intersection; therefore, there are fewer opportunities for the broadside and approach turn collisions observed at other intersections within the corridor. Figure 25 shows the breakdown of crashes at this intersection.

The crash rate at this intersection was 1.28 crashes per MEV (+30.61 percent) and the injury crash rate was 0.59 crashes per MEV (+156.52 percent). A majority of these crashes, the highest percentage of any intersection in the study area, are rear-end collisions. Bicycles and pedestrians account for 9.8 percent and 12.2 percent, respectively, of the crashes at this intersection. These are both higher than the corridor averages, 4.5 percent for bicyclists and 3.9 percent for pedestrians, as well as the statewide averages, 1.3 percent for bicyclists and 1.8 percent for pedestrians. Crashes involving motorized and non-motorized users often are more severe because pedestrians and bicyclists lack the same protection as travelers in motorized vehicles.

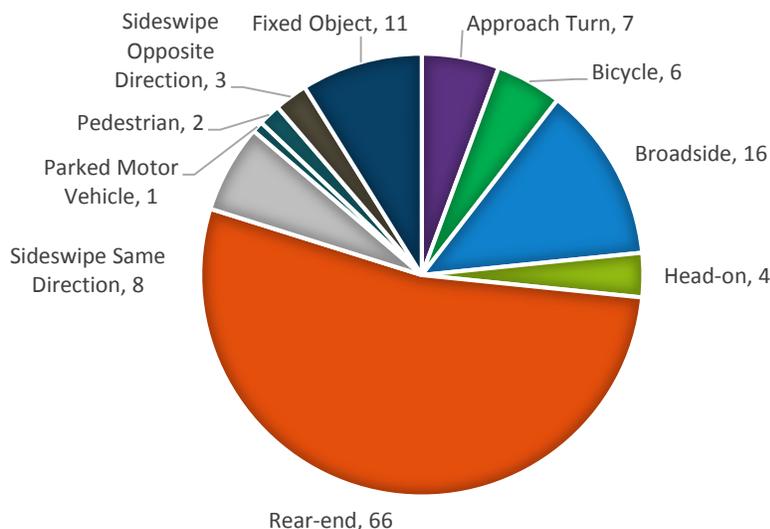
Figure 25. 11th Street and Canyon Boulevard Crashes by Type



4.5.1.4. Broadway Street and Canyon Boulevard

The intersection at Broadway Street and Canyon Boulevard had a total of 125 crashes. Similar to the corridor average, rear-ends made up a majority of the crash types. The normalized crash rate for this intersection was 1.80 crashes per MEV (+83.67 percent) and the injury rate was 0.25 crashes per MEV (+8.70 percent). A summary of the crashes by type is shown in Figure 26.

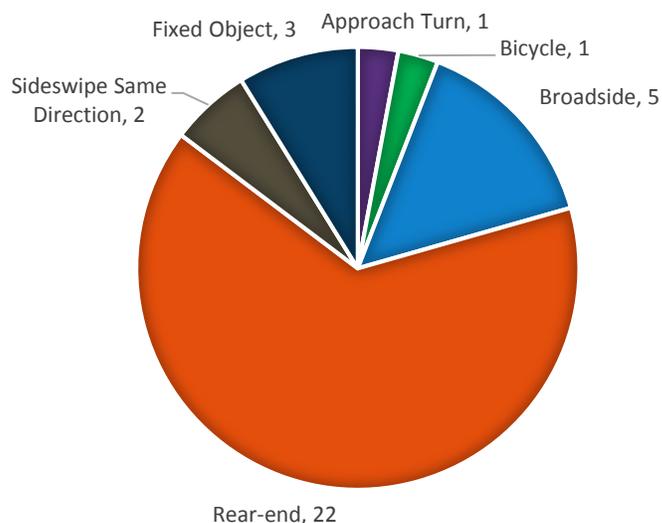
Figure 26. Broadway Street and Canyon Boulevard Crashes by Type



4.5.1.5. 13th Street and Canyon Boulevard

During the data collection period, there were 34 crashes at the intersection at 13th Street and Canyon Boulevard. The crash rate for the intersection was 0.95 crashes per MEV (-3.06 percent) and the injury crash rate was 0.08 crashes per MEV (-65.22 percent). Figure 27 summarizes the crashes by type for this intersection.

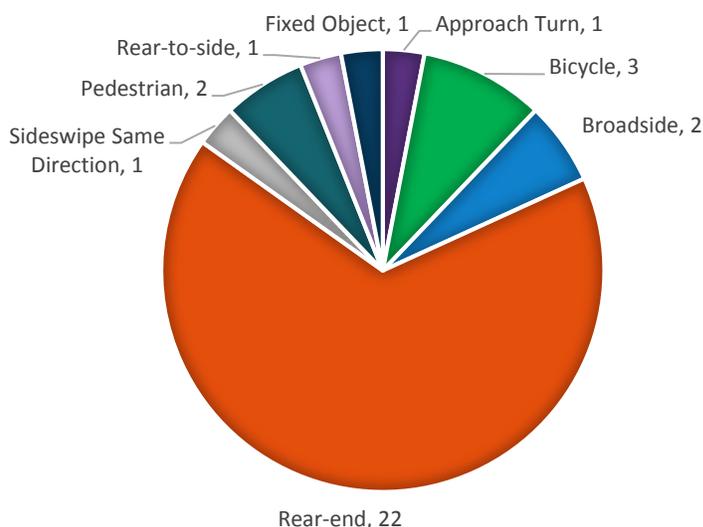
Figure 27. 13th Street and Canyon Boulevard Crashes by Type



4.5.1.6. 14th Street and Canyon Boulevard

The crash rate and injury crash rate at the intersection of 14th Street and Canyon Boulevard were 0.81 crashes per MEV (-17.35 percent) and 0.12 crashes per MEV (-47.83 percent), respectively. Figure 28 shows the type of crashes at this intersection. In late 2013, during the data collection period, the operations at 14th Street between Canyon Boulevard and Walnut Street changed. 14th Street, within this section, is now only open to transit vehicles entering the Downtown Boulder Station. The normalized crash rates were calculated using the historical volume data taken before the street was converted. Based on the one year of data collected since the modification, there has not been a discernible difference in crash patterns at the intersection.

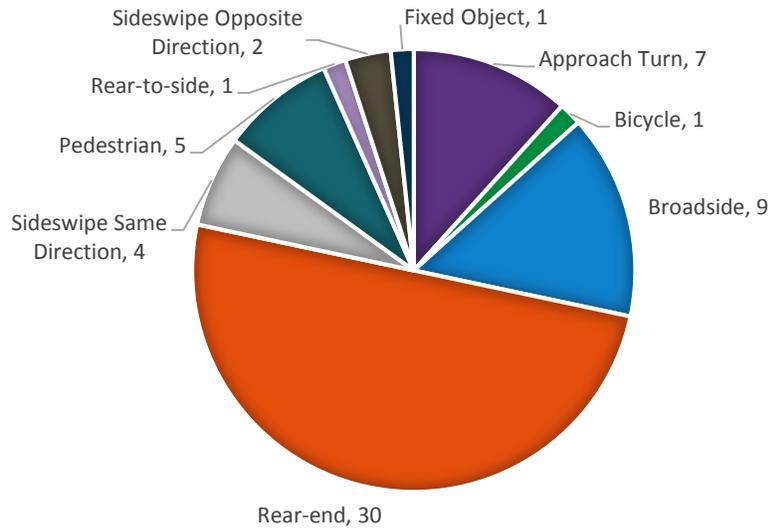
Figure 28. 14th Street and Canyon Boulevard Crashes by Type



4.5.1.7. 15th Street and Canyon Boulevard

The intersection at 15th Street and Canyon Boulevard had a crash rate of 1.37 crashes per MEV (+39.80 percent) and an injury crash rate of 0.32 crashes per MEV (+39.13 percent). Pedestrian crashes make up a higher-than-average proportion of crashes at this intersection. Pedestrian crashes are discussed in more detail in the Bicycle and Pedestrian Safety portion of this section. Figure 29 summarizes the crashes by type at this intersection.

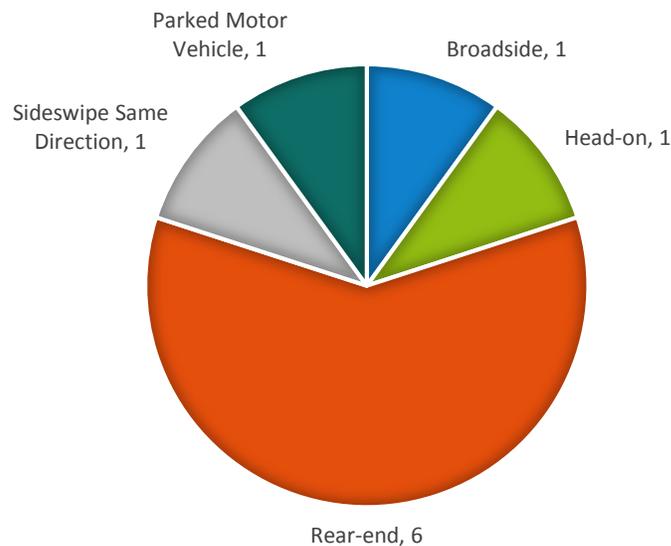
Figure 29. 15th Street and Canyon Boulevard Crashes by Type



4.5.1.8. 16th Street and Canyon Boulevard

The crash rate for the intersection at 16th Street and Canyon Boulevard was 0.25 crashes per MEV (-74.49 percent) and the injury crash rate was 0.05 crashes per MEV (-78.26 percent). A summary of the crashes by type is shown in Figure 30.

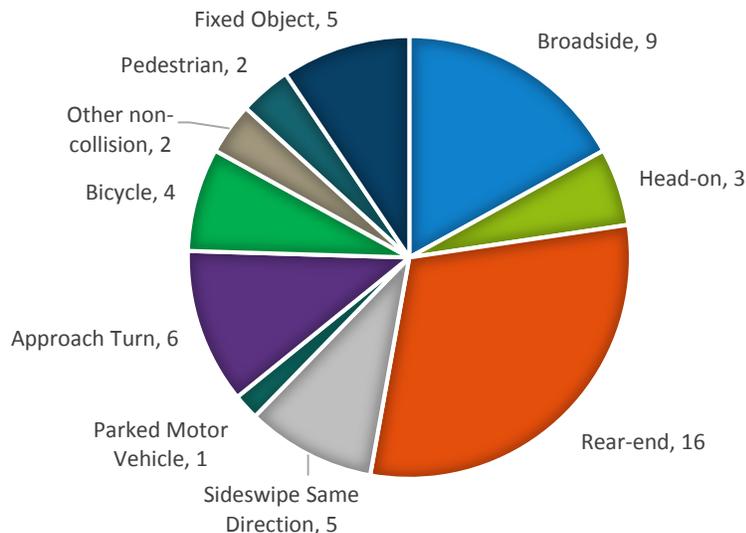
Figure 30. 16th Street and Canyon Boulevard Crashes by Type



4.5.1.9. 17th Street and Canyon Boulevard

The intersection at 17th Street and Canyon Boulevard experienced a greater variety of crash types. The overall crash rate was 1.21 crashes per MEV (+23.47 percent) and the injury crash rate was 0.30 crashes per MEV (+30.43 percent). Figure 31 summarizes the types of crashes at this intersection.

Figure 31. 17th Street and Canyon Boulevard Crashes by Type



4.5.2. Bicycle and Pedestrian Safety

In addition to the overall crash data, bicycle and pedestrian crashes were analyzed for the same segments over the same period. In the study area, there were a total of 17 crashes involving pedestrians and 20 involving bicycles. The highest number of pedestrian crashes occurred at the 15th Street intersection, with five crashes involving pedestrians during the data collection period. The Broadway Street intersection had the next highest number of crashes involving pedestrians at four. The Broadway Street intersection had the most bicycle crashes at six, with both the intersections at 11th Street and 17th Street having four bicycle crashes during the data collection period. Table 8 shows the total number of pedestrian and bicycle crashes at each intersection during the study period.

The high number of pedestrian crashes at the 15th Street intersection is likely caused by a combination of two factors. First, the unprotected left-turns at this intersection increase the chance for vehicle and pedestrian conflicts at the crosswalk. Additionally, it is common for pedestrians to cross Canyon Boulevard mid-block near 15th Street. Many of these are related to people traveling to and from the Downtown Boulder Station. On January 20 and 21, 2016, between the hours of 6:00 a.m. and 6:00 p.m., video devices recorded more than 75 mid-block pedestrian movements crossing Canyon Boulevard between 14th Street and 15th Street. Pedestrians not crossing at designated crosswalks increase the likelihood for conflicts and crashes.

The high number of bicycle crashes at the Broadway Street intersection is likely a reflection of the congestion and lack of bicycle facilities at that location. The high congestion of vehicles increases the chance for collisions in general, and the lack of bicycle facilities means bicyclists use the sidewalk which increases the unpredictability of behavior.

Table 8. Bicycle and Pedestrian Crashes

Location	Pedestrian Crashes (PDO, Injury, Fatality)	Bicycle Crashes (PDO, Injury, Fatality)
9th Street and Canyon Boulevard	0	1 (1, 0, 0)
10th Street mid-block crossing	1 (1, 0, 0)	0
11th Street and Canyon Boulevard	5 (1, 4, 0)	4 (1, 3, 0)
Broadway Street and Canyon Boulevard	2 (1, 1, 0)	6 (4, 2, 0)
13th Street and Canyon Boulevard	0	1 (1, 0, 0)
14th Street and Canyon Boulevard	2 (1, 0, 1)	3 (3, 0, 0)
15th Street and Canyon Boulevard	5 (4, 1, 0)	1 (1, 0, 0)
16th Street and Canyon Boulevard	0	0
17th Street and Canyon Boulevard	2 (2, 0, 0)	4 (2, 2, 0)

Property Damage Only (PDO)

Source: Crash data collected from City of Boulder Crash Database, CDOT DiExSys database, and The Federal Highway Administration's Pedestrian and Bicycle Crash Analysis Tool for the period between January 2010 and December 2014.

5. Environmental Considerations

The following sections describe environmental considerations that include a preliminary environmental analysis of resources within the Canyon Boulevard study area. Of the resource subjects analyzed, historic landmarks and landmark areas, floodplains, water quality, forestry, and noise were observed to have the most potential for impacts by transportation improvement activities with the study area. The City of Boulder has regulations and permitting processes that must be pursued in the event of anticipated impacts to several of these resources. When design options are identified for the study area, a detailed analysis can provide further information about environmental considerations. A summary of all environmental resources and their locations is provided in Table 9.

Table 9. Environmental Summary

Resource	Corridor Location	
	North of Canyon Boulevard	South of Canyon Boulevard
Environmental Justice	Low-income or minority community unlikely	Low-income or minority community unlikely
Land Use	Downtown—Commercial businesses, residential, mixed use	Downtown—Park, residential, mixed use
Historic Preservation	The Chamberlin Historic District on the east end of the corridor	Landmarked area (includes Boulder Band Shell and Municipal Building); Boulder Building Services Center
Paleontological/Archaeological	Paleontological and archaeological resources unlikely	Paleontological and archaeological resources unlikely
Parks and Recreation	No parks or recreational facilities identified	Central Park (Civic Area) and Boulder Creek Greenway
Wildlife	Potential migratory bird nesting areas	Potential migratory bird nesting areas
Vegetation/Forestry	Mixed grasses and shrubs; landscaped areas	Mixed grasses and shrubs, small, and large trees; landscaped areas
Wetlands/Waters of the US	Resource not present in the area	Potential wetlands near Boulder Creek
Floodplains	100-year and 500-year floodplains identified	100-year and 500-year floodplains identified
Water Quality	Boulder Creek	Boulder Creek
Farmlands	No Prime Farmlands of national importance identified	No Prime Farmlands of national importance identified
Hazardous Materials	No hazardous materials generators identified	Shell gas station
Noise	Residential and church receptors	Residential and Landmarked area

5.1. Methods of Environmental Analysis

A desktop review of environmental resource data was completed to record existing environmental resources and land uses within the study area. The goal was to determine if the resources currently presented would affect the implementation of the project. Data were obtained from the City of Boulder and aerial maps from Google and ESRI ArcMap.

5.2. Socioeconomics and Environmental Justice

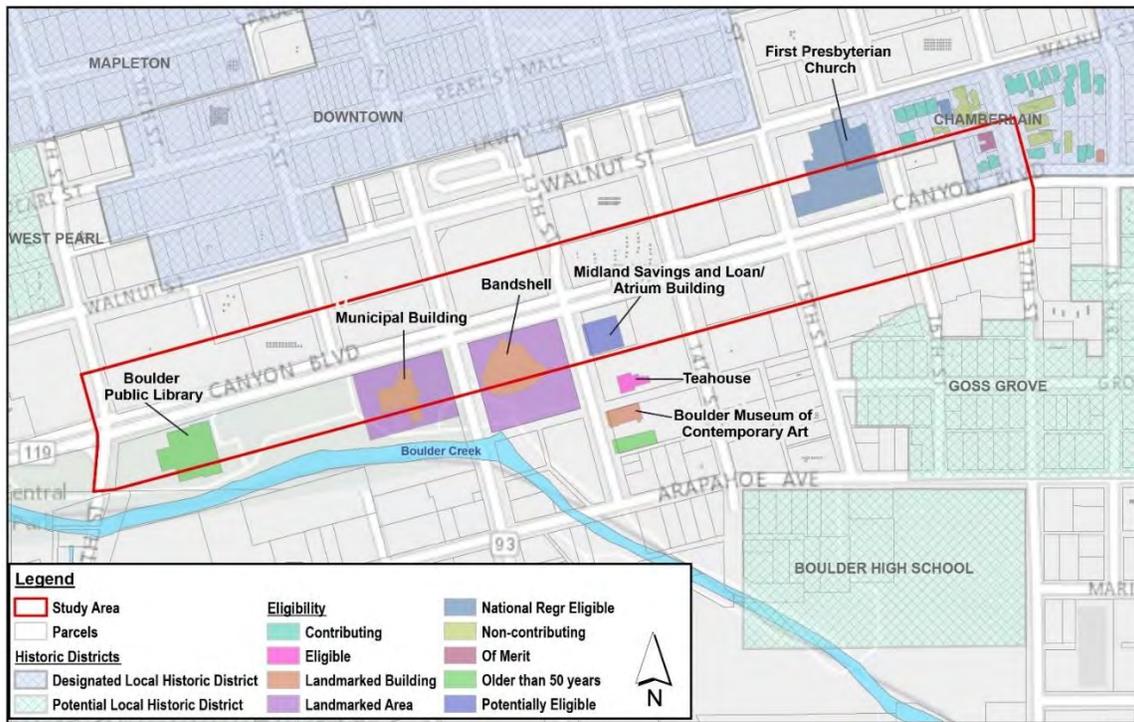
The study area generally is characterized as a mixed urban corridor. The west side of the corridor is zoned as downtown land use and consists of mostly commercial businesses on the north side. Businesses include restaurants, retail shops, and banks. Boulder Creek Greenway and Central Park are located south of Canyon Boulevard between 9th Street and 13th Street.

Currently, the Census data for the City of Boulder indicates that the minority population of the city is 12.0 percent and the low-income population is 22.8 percent (referring to the number of individuals living below the poverty level) (Census, 2010). These percentages are well below the 50-percent threshold for minority and low-income and environmental justice communities.

5.3. Historic, Paleontological/Archaeological Resources

The study area encompasses five properties within the Chamberlain Historic District and two local landmark sites, the Glen Huntington Band Shell (see Section 2.2) and the Municipal Building. The Chamberlain Historic District is located north of Canyon Boulevard, between 15th and 17th Streets. The district primarily contains residential buildings constructed between 1890 and 1910 that have been converted to small businesses or serve as dual purpose buildings (residential and small business) and the First Presbyterian Church. Only a portion of the First Presbyterian Church is included in the Chamberlain Historic District. Inspired by the International style school of architecture, the Municipal Building was constructed in 1952 after designs by noted Boulder architect, James Hunter. A 1962 rear addition to the building, designed by Modernist architect Hobart D. Wagener, is recognized as being an important example of the Formalist architecture. The Municipal Building is environmentally significant as a prominent visual feature along Broadway Street, and is historically significant for its association with the history of local government in Boulder. The landmark boundaries for the Glen Huntington Band Shell and Municipal Building include the structures and a portion of the site upon which they sit. In addition, the Midland Savings and Loan/Atrium Building at 1300 Canyon Street, designed by local modernist architect Hobart Wagener, has been proposed for individual landmark designation, and there is a pending designation application (submitted March 2015). The Boulder Public Library, designed by James Hunter and completed in 1961, was found to be potentially eligible for landmark designation in 1995. Efforts are underway to resurvey the building. Figure 32 shows the designated and potential historic districts within and near to the study area, along with each potential historic structure. There were no paleontological or archaeological areas identified within the study area.

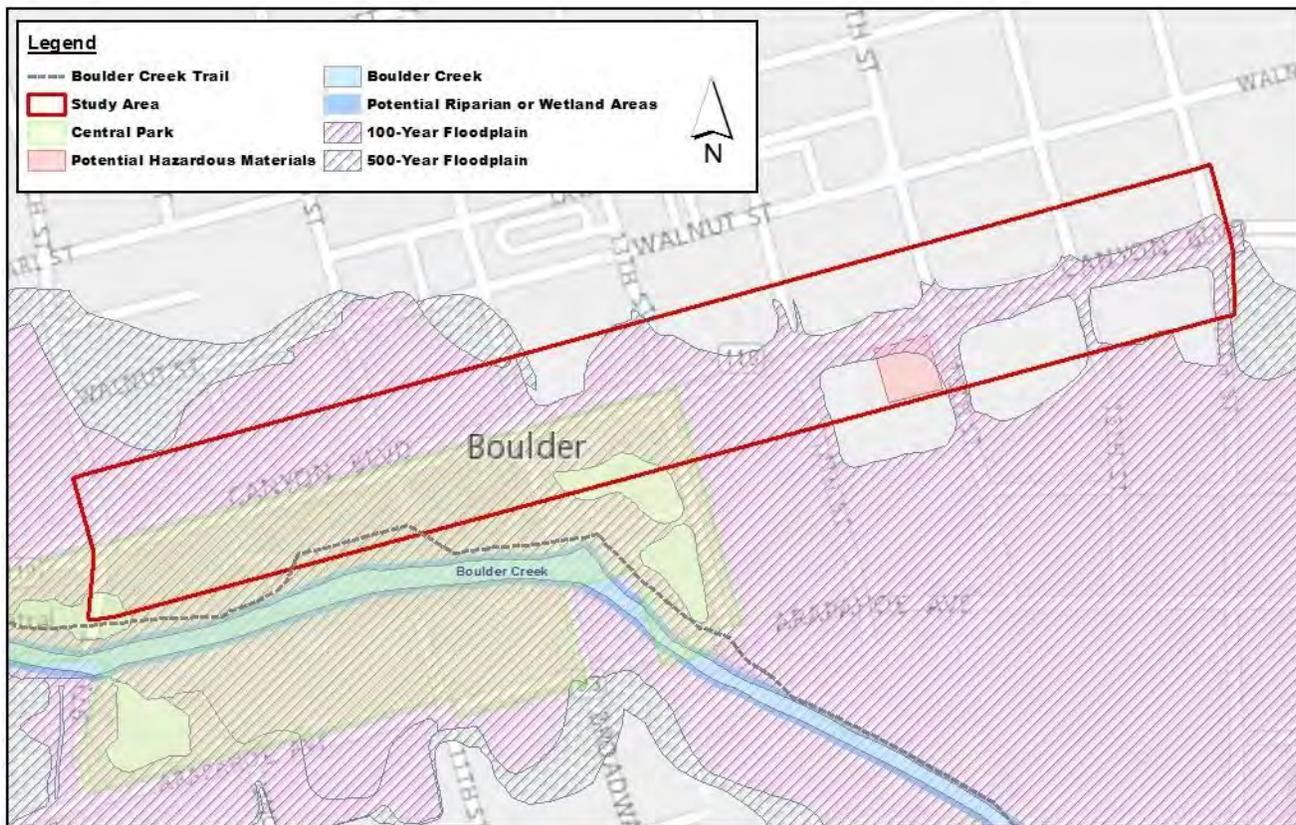
Figure 32. Potential Historic Structures



5.4. Parks and Recreation

There is one park located within the study area. Central Park (see Figure 33) is located between 9th Street and 13th Street. The park incorporates the Boulder Creek Path and Greenway, along with many other recreation opportunities. This area also has been referred to as the Civic Area and its long-term vision, goals, and needs have been discussed previously.

Figure 33. Potential Resources in the Study Area



5.5. Wildlife, Vegetation, and Wetlands and Waters of the United States

The following are topics to consider prior to design and construction. A more detailed analysis would be conducted during later engineering and design phases. The study area was run through the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) database. Results show numerous resources, including 25 migratory bird species that could be present within the study area. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA). Any person or organization planning or conducting activities that may result in the taking of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures. Small trees, shrubs, and brush provide potential habitat for smaller migratory birds and larger birds, such as raptors, have the potential to nest in the taller trees, especially near Boulder Creek. A site visit to provide observations was not performed as part of this study.

Within the study area, 11 proposed, candidate, threatened, and endangered species managed by the Endangered Species Program of the USFWS may occur or could potentially be affected by activities. Three of the 11 listed species are associated with riparian habitat. These listed species include the Preble's meadow jumping mouse (*Zapus hudsonius preblei*), the Ute ladies'-tresses orchid (*Spiranthes diluvialis*), and the Colorado butterfly plant (*Gaura neomexicana ssp. coloradensis*). Riparian areas (see Figure 33), where these species are most likely to exist, are located adjacent to the study area; however, any activity could potentially cause indirect effects. A field study to determine if populations for these three species exist in the study area would be conducted prior to any construction.

Habitat for the eight other listed species is limited within the study area. Five species are listed because they occur downstream of the project area along the South Platte River and could be impacted by projects that would

result in water depletions, including: the Least Tern (*Sterna antillarum*), the pallid sturgeon (*Scaphirhynchus albus*), the Piping Plover (*Charadrius melodus*), the Western prairie-fringed orchid (*Platanthera praeclara*), and the Whooping Crane (*Grus americana*). There is no suitable habitat for the remaining three species. The Canada lynx (*Lynx canadensis*) occurs in high elevation spruce-fir forests. The greenback cutthroat trout (*Oncorhynchus clarki stomias*) occupies cold, clear streams of moderate gradient in the mountains and foothills. The Mexican Spotted Owl (*Strix occidentalis lucida*) occurs in mixed conifer forests and rocky canyons.

Wetland mapping received from the City of Boulder shows that any wetlands present will be associated with Boulder Creek and will exist on the south side of Canyon Boulevard between 9th Street and 13th Street. Vegetation in the study area appears to be mostly landscaped, but wetlands could potentially be present within the study area. A site visit is recommended for wetland and biological resources. If wetland indicators are present, a wetland delineation will be conducted and documented during future stages of project development using the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Great Plains Region* (USACE, 2010). If impacts to wetlands are identified, a mitigation plan would be created during later engineering and design phases, when impacts to wetland resources are more detailed.

In terms of forestry, a landscaping plan will identify any effects to existing trees in the study area. Prior to removing or relocating trees within any public right of way, the City of Boulder requires an approved landscaping plan and a right-of-way permit. Furthermore, tree removal or relocation will be done in accordance with Section 3.04 of the City of Boulder *Design and Construction Standards*. If the City finds a tree in any public right of way to be desirable, protection procedures will be followed, as detailed in Section 3.05 of the City of Boulder *Design and Construction Standards*.

5.6. Floodplains and Water Quality

The study area is within the Boulder Creek floodplain (see Figure 33). Both 100-year and 500-year floodplains are mapped within the study area. The City of Boulder uses Canyon Boulevard as a method for controlling flood waters during high flows. Any work in a conveyance zone within public right of way or land owned or controlled by the government will comply with all necessary FEMA requirements and obtain a Floodplain Development Permit from the City Manager. In some cases, the City Manager may require a floodplain analysis by a Colorado registered professional engineer. Additional regulations for development in a floodplain are detailed in Section 9-3 of the City of Boulder *Municipal Code*.

5.7. Farmlands

Because there are no farmlands identified within the study area, this resource is not applicable for this study.

5.8. Hazardous Materials

There is a potential for hazardous materials to occur in the study area based on current and historical uses. There was one gas station identified along the corridor as a potential hazardous material site (see Figure 33). According to the Colorado Department of Public Health and Environment (CDPHE), this location is no longer generating hazardous waste. The use, storage, and disposal of hazardous materials associated with this facility may have the potential to impact soils and water within the study area.

5.9. Noise

The study area contains multiple noise receptors, including the band shell, the Saint Julien Hotel and Spa, and numerous downtown businesses on the west side of the corridor, multiple government buildings along the south side of Canyon Boulevard in the Central Park area, and residential and mixed-use properties along the east end of corridor. Impacts for the corridor on the activities that occur at and around the band shell have been specifically identified as an issue.

5.10. Air Quality

The criteria pollutants of concern for transportation projects in the Denver Metro region, which includes the study area, are particulate matter (PM₁₀), carbon monoxide (CO), and ground-level ozone (O₃) because these are pollutants for which the Front Range/Denver has been classified as being either a nonattainment or an attainment/maintenance area. Based on air quality monitoring data, regions are designated as having either “attainment/maintenance” or “nonattainment” status for the criteria pollutants based on the National Ambient Air Quality Standards (NAAQS). Nonattainment status means that a region is not compliant with NAAQS. When a nonattainment area achieves compliance with the NAAQS, the area is considered an air quality “attainment/maintenance” area until the standard has been maintained for 10 years and a long-term maintenance plan has been approved by the United States Environmental Protection Agency (USEPA). The Denver-metropolitan and Northern Front Range area is currently designated as attainment/maintenance for CO and PM₁₀, and nonattainment for the 8-hour O₃ standard.

If the project became identified as part of the Denver Regional Council of Government’s (DRCOG) fiscally constrained long-range plan, the project would need to demonstrate regional and local air quality conformity.

5.10.1. Climate Change

Currently, Boulder’s Climate and Sustainability Division provides leadership to achieve goals of sustainability, resilience, and environmental quality. To supplement existing programs, the City of Boulder is making commitments to reduce energy-related emissions by implementing strategies in target action areas, including energy, resources, and ecosystems. The goals are to:

- Reduce the amount of energy consumed by implementing energy-efficient methods
- Identify local renewable sources to improve sustainability
- Use natural resources more wisely
- Restore the health of the various ecosystems that help sustain the Boulder community and ensure climate stability

For more information, please see the draft *Boulder’s Climate Commitment* (October 2015).

5.11. Environmental References

Boulder County, Colorado, 2016. “Geographical Information Systems (GIS) Downloadable Data.”
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U.S. Fish & Wildlife Service, 2016. “Information for Planning and Conservation.” <https://ecos.fws.gov/ipac/>, website accessed January 2016.

United States Census Bureau, 2016. “Boulder County, Colorado Quick Facts.”
<http://quickfacts.census.gov/qfd/states/08/08013.html>, website accessed January 2016.

Appendix A: Existing Conditions Summary

Data Sources

1.1. Vehicle Data

Data	Source	Provided by	Date Updated
Average Daily Traffic	Tube count data	All Traffic Data	January 20-21, 2016
	CDOT OTIS traffic counters	http://dtdapps.coloradodot.info/otis	2010-2013
Intersection Volumes	City of Boulder synchro model	City of Boulder	2015
	Turning movement counts	https://bouldercolorado.gov/pages/city-of-boulder-traffic-counts	May 2013 – August 2014
Signal Timing	City of Boulder synchro model	City of Boulder	2015
Bus Blockages	Regional Transit District daily schedules	http://www.rtd-denver.com/Schedules.shtml#schedulefinder	January 2016

1.2. Bicycle Data

Data	Source	Provided by	Date Updated
Bicycle Counts	Turning movement counts	https://bouldercolorado.gov/pages/city-of-boulder-traffic-counts	May 2013 – August 2014
	Tube count data	All Traffic Data	January 20-21, 2016
	Annual counts	Boulder arterial count program	April 7-14, 2015
	Permanent bicycle counter	City of Boulder	2014
	Mid-block crosswalk counts	City of Boulder	February 2016
Existing Bicycle Facilities	City of Boulder GIS data	https://bouldercolorado.gov/open-data/tag/gis	December 5, 2014
Bicycle Facility Geometry	GoogleEarth/Google Maps/Google Streetview	Maps.google.com	2015

Appendix A: Existing Conditions Summary

Data Sources



1.3. Pedestrian Data

Data	Source	Provided by	Date updated
Pedestrian Counts	Crosswalk compliance studies	City of Boulder	July 2009 – June 2012
	Turning movement counts	https://bouldercolorado.gov/pages/city-of-boulder-traffic-counts	May 2013 – August 2014
	Mid-block crosswalk counts	City of Boulder	February 2016
Existing Pedestrian Facilities	GoogleEarth/Google Maps/Google Streetview	Maps.google.com	2015
	Walking audit	On-site observations	November 20, 2015
Pedestrian Facility Geometry	GoogleEarth/Google Maps/Google Streetview	Maps.google.com	2015
	Walking audit	On-site measurements	November 20, 2015

1.4. Safety Data

Data	Source	Provided by	Date updated
Crash Data	Boulder Crash Database	City of Boulder	January 1, 2010 – December 31, 2014
	DiExSys	CDOT	January 1, 2010 – December 31, 2014
	Pedestrian and Bicycle Crash Analysis Tool (PBCAT)	http://www.pedbikeinfo.org/data/library/library.cfm	January 1, 2010 – December 31, 2014

Appendix A: Pedestrian Performance Measures

Subject: Canyon Boulevard Complete Streets Study, Existing Conditions Summary

Background

The Pedestrian Performance Measures (PPM) model methodology was used to score each sidewalk segment for pedestrian comfort and facility performance. This points-based-model assigns a score for certain features of the pedestrian infrastructure and, based on the total score, assigns a pedestrian level of service to the facility.

Originally developed by the University of Florida, this methodology was chosen over others, such as the Highway Capacity Manual’s (HCM) Pedestrian Level of Service model, because of its ability to evaluate the corridor on a block-by-block basis and capture elements of the pedestrian experience beyond a simple point-to-point travel evaluation. The points-based methodology of the PPM model was reviewed by the Sacramento Area Council of Governments’ study entitled, *Application of New Pedestrian Level of Service Measures*. The study compared the PPM model to the HCM’s Pedestrian Level of Service (PLOS) model and determined them to be equally useful in their ability to evaluate pedestrian facilities. Additionally, the criteria evaluated in the PPM model, summarized above, are very similar to those evaluated by many civic pedestrian planning documents, including the City of Seattle, Washington’s *Pedestrian Master Plan*, and the City of San Francisco, California’s *Better Streets Plan*. Although neither of these documents specifically utilizes the PPM scoring model, they place importance on the same aspects the model evaluates. The PPM model gives the ability to consistently measure the features and amenities that are widely accepted to be a necessary part of a vibrant pedestrian facility. The PPM is also evaluated in the *Transportation Research Record: Journal of the Transportation Research Board 2014*, Volume 1538, pp.1-9. Table 1 and Table 2 show the categories, criterion, and points available per criterion of the PPM as well as the scoring ranges.

Table 1. PPM Criteria

Category	Criterion	Points
Facility (Max. possible value = 10)	Not continuous or non-existent	0
	Continuous on one side	4
	Continuous on both sides	6
	Min. 5-foot wide & barrier free	2
	Sidewalk width > 5-feet	1
	Off-street/parallel alternative facility	1
Conflicts (Max. possible value = 4)	<22 driveways and side streets per mile	1
	Ped. Signal delay of 40 sec. or less	0.5
	Reduced turn conflict implementation	0.5
	Crossing width 60-feet or less	0.5
	Posted speed <= 35 mph	0.5
	Median present	1

Appendix A: Pedestrian Performance Measures

Category	Criterion	Points
Amenities (Max possible value = 2)	Buffer not less than 3.5-feet	1
	Benches or pedestrian scale lighting	0.5
	Shade trees	0.5
Motor Vehicle LOS (Max. possible value = 2)	E or F OR 6+ travel lanes	0
	D and <6 travel lanes	1
	A, B, or C and <6 travel lanes	2
Maintenance (Max. possible value = 2)	Major or frequent problems	-1
	Minor or infrequent problems	0
	No problems	2
TDM/Multi Modal (Max. possible value = 1)	No support	0
	Support exists	1
Maximum possible score = 21		

Table 2. PPM LOS Scoring Ranges

21-17	A
14-16.9	B
11-13.9	C
7-10.9	D
3-6.9	E
≤ 3	F

To fully capture the pedestrian experience across the corridor, two pedestrian level of service analyses were conducted. The first, using the standard PPM methodology was applied to a corridor-wide analysis. These are presented in the results summary tables. This resulted in an overall pedestrian LOS B for the corridor. A second, modified the PPM methodology to determine pedestrian conditions on each side of the street. Because of the variability in sidewalk characteristics between the north and south side of Canyon Boulevard, the PPM model was modified determine how well each side of Canyon meets the needs of pedestrians. The modification did not impact the tool’s core assumptions, and therefore it was determined that this modification would be applicable for use on this project. The individual scoring tables, included as an attachment to this Appendix, show the points each segment received for each criterion evaluated. The attachment also shows the original and modified scoring tables used for this analysis.

Modeling Assumptions, specifications, and methodology

The following are assumptions, specifications, or modifications to the PPM as it was presented in the original model by the University of Florida.

Appendix A: Pedestrian Performance Measures

PPM LOS Assumptions (on Canyon)

1. Intersection delay
 - a. Always taken as the worst intersection on either side of the segment
 - b. Taken as ½ the time from the beginning of yellow to the next green phase
2. LOS
3. Crossing Distance
 - a. Taken as the longest crossing at either intersection

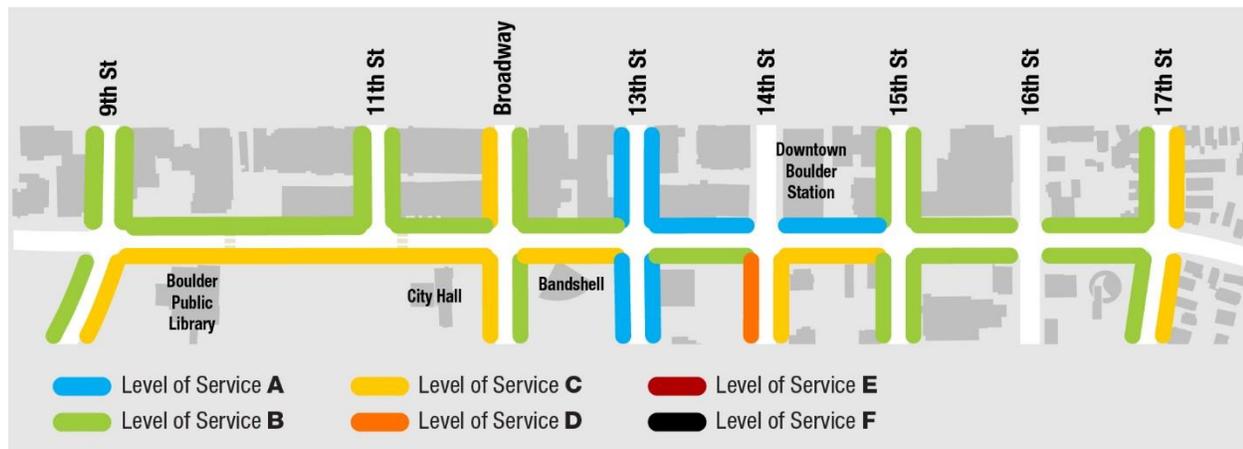
PPM LOS Assumptions for cross streets

1. Intersection delay
 - a. Taken at the intersection with Canyon
 - b. Taken as ½ the time from the beginning of yellow to the next green phase
2. LOS
 - a. Always reported at the intersection with Canyon

The original PPM was modified to create directional functionality. This was accomplished by removing the “Continuous on both sides” criterion from the Facilities category and increasing the possible points in the “Continuous” criterion from 4 to 5 points. This eliminates the only criterion that looks at both sides of the street, and re-balances the points to maintain the validity of the final LOS scoring table.

Figure 1 shows the results of the modified PPM conducted for the existing facilities along Canyon Boulevard. In general, the existing pedestrian facilities are adequate for transportation purposes, but do not always provide a comfortable experience. The best-scoring pedestrian facilities are those located around 13th Street and near the Downtown Boulder Station. These segments scored better than the others due to the increased separation from vehicle traffic and presence of human-scaled amenities. The worst performing pedestrian facility is the sidewalk west of 14th Street and south of Canyon Boulevard. This section scored poorly due to the narrow sidewalk, lack of amenities, and high volume of driveways.

Figure 1. PPM Results



Corridor wide	Pedestrian LOS Inputs	Points		Eastbound Pedestrian LOS Inputs	Points		Existing Condition	Westbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous		5		Continuous		5	
	Continuous on both sides	6	6								
	Min. 5' wide and barrier free	1	2	Min. 5' wide and barrier free	2	2		Min. 5' wide and barrier free	2	2	
	Sidewalk width > 5'	0.75	1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility	0	1	Off-street/parallel alternative facility	1	1		Off-street/parallel alternative facility	1	1	
Conflicts (max 4)	< 22 driveways and side streets/mile	1	1	<22 driveways and side streets/mile (dpm)	1	1		< 22 driveways and side streets/mile	1	1	
	Ped. Signal delay 40 seconds or less	0.5	0.5	Ped. Signal delay 40 seconds or less	0.5	0.5		Ped. Signal delay 40 seconds or less	0.5	0.5	
	Reduced turn conflict implementation	0	0.5	Reduced turn conflict implementation	0.5	0.5		Reduced turn conflict implementation	0.5	0.5	
	Crossing width 60' or less	0.5	0.5	Crossing width 60' or less	0.5	0.5		Crossing width 60' or less	0.5	0.5	
	Posted speed <= 35mph	0.5	0.5	Posted speed <= 35mph	0.5	0.5		Posted speed <= 35mph	0.5	0.5	
	Median present	1	1	Median present	1	1		Median present	1	1	
Amenities (max 2)	Buffer not less than 3'5"	0.75	1	Buffer not less than 3'5"	1	1		Buffer not less than 3'5"	1	1	
	Benches or pedestrian scale lighting	0	0.5	Benches or pedestrian scale lighting	0.5	0.5		Benches or pedestrian scale lighting	0.5	0.5	
	Shade trees	0.25	0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes	0	0		E or F OR 6 or more travel lanes	0	0	
	D and <6 travel lanes		1	D and <6 travel lanes	1	1		D and <6 travel lanes	1	1	
	A, B, or C and <6 travel lanes	1.5	2	A, B, or C and <6 travel lanes	2	2		A, B, or C and <6 travel lanes	2	2	
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems	-1	-1		Major or frequent problems	-1	-1	
	Minor or infrequent problems		0	Minor or infrequent problems	0	0		Minor or infrequent problems	0	0	
	No problems	2	2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support	0	0		No support	0	0	
	Support exists	0.5	1	Support exists	1	1		Support exists	1	1	
PPM LOS		B 16.25	21		21				21		

9th Street to Broadway	Pedestrian LOS Inputs	Points		Eastbound Pedestrian LOS Inputs	Points		Existing Condition	Westbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	3	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	1	2		Min. 5' wide and barrier free	2	2	
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	1	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	5 dpm	< 22 driveways and side streets/mile	1	1	5 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	27.5 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	27.5 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0.5	0.5	60'	Crossing width 60' or less	0.5	0.5	50'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	35 mph	Posted speed <= 35mph	0.5	0.5	35 mph
	Median present		1	Median present	1	1		Median present	1	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	1	1	20'	Buffer not less than 3'5"	1	1	10'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5	
	Shade trees		0.5	Shade trees	0.25	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes	0	0	LOS E	E or F OR 6 or more travel lanes	0	0	LOS E
	D and <6 travel lanes		1	D and <6 travel lanes	1	1		D and <6 travel lanes	1	1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS C	A, B, or C and <6 travel lanes	2	2	
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems	-1	-1		Major or frequent problems	-1	-1	
	Minor or infrequent problems		0	Minor or infrequent problems	0	0		Minor or infrequent problems	0	0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support	0	0		No support	0	0	
	Support exists		1	Support exists	0.5	1		Support exists	0.5	1	
PPM LOS		0	21		C 12.25	21			B 15.5	21	

Broadway to 13th Street	Pedestrian LOS Inputs	Points		Pedestrian LOS Inputs	Points		Existing Condition	Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	0	2		Min. 5' wide and barrier free	2	2	
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	< 22 driveways and side streets/mile	1	1	0 dpm	< 22 driveways and side streets/mile	1	1	0 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	37.1 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	32.6 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0.5	0.5	53'	Crossing width 60' or less	0.5	0.5	53'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	35 mph	Posted speed <= 35mph	0.5	0.5	35 mph
	Median present		1	Median present	1	1		Median present	1	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1	0'	Buffer not less than 3'5"	1	1	6'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0.5	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes	0	0	LOS E	E or F OR 6 or more travel lanes	0	0	LOS E
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes		2		A, B, or C and <6 travel lanes		2	
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists		1		Support exists	0	1	
PPM LOS		21		C	12	21			B	15.5	21

13th Street to 14th Street	Pedestrian LOS Inputs	Points		Pedestrian LOS Inputs	Points		Existing Condition	Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	5'	Min. 5' wide and barrier free	2	2	8'
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	< 22 driveways and side streets/mile	1	1	18 dpm	< 22 driveways and side streets/mile	1	1	18 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	17.6 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	17.6 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0.5	0.5	40'	Crossing width 60' or less	0.5	0.5	40'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	35 mph	Posted speed <= 35mph	0.5	0.5	35 mph
	Median present		1	Median present	1	1		Median present	1	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0.5	1	0'-15'	Buffer not less than 3'5"	1	1	9'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0.5	0.5		Benches or pedestrian scale lighting	0.5	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support	0	0		No support		0	
	Support exists		1	Support exists		1		Support exists	1	1	
PPM LOS		21		B	16	21			A	18.5	21

14th Street to 15th Street	Pedestrian LOS Inputs	Points		Pedestrian LOS Inputs	Points		Existing Condition	Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	5'	Min. 5' wide and barrier free	2	2	5'-10'
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	0.5	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	< 22 driveways and side streets/mile	0	1	36.2 dpm	< 22 driveways and side streets/mile	0	1	37.7 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	33.3 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	33.3 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation		0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0.5	0.5	40'	Crossing width 60' or less	0.5	0.5	45'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	35 mph	Posted speed <= 35mph	0.5	0.5	35 mph
	Median present		1	Median present	1	1		Median present	1	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1	0'	Buffer not less than 3'5"	1	1	18'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0.5	0.5	
	Shade trees		0.5	Shade trees	0.2	0.5		Shade trees	0.25	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists	0	1		Support exists	1	1	
PPM LOS		21		C	13.7	21			A	16.75	21

15th Street to 17th Street	Pedestrian LOS Inputs	Points		Pedestrian LOS Inputs	Points		Existing Condition	Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	5'	Min. 5' wide and barrier free	1.5	2	4'-6'
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	0.25	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	< 22 driveways and side streets/mile	0	1	24 dpm	< 22 driveways and side streets/mile	1	1	16 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	16.2 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	16.2 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0.5	0.5	50'	Crossing width 60' or less	0.5	0.5	45'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	35 mph	Posted speed <= 35mph	0.5	0.5	35 mph
	Median present		1	Median present	1	1		Median present	1	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	1	1	5'-12'	Buffer not less than 3'5"	0.5	1	0'-5'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5	
	Shade trees		0.5	Shade trees	0	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS A	A, B, or C and <6 travel lanes	2	2	LOS A
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support	0	0		No support	0	0	
	Support exists		1	Support exists		1		Support exists		1	
PPM LOS		21		B	14.5	21			B	15.25	21

9th Street South of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	0	2	4'	Min. 5' wide and barrier free	2	2	5'
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	0	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	9 dpm	< 22 driveways and side streets/mile	1	1	0 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	27.5 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	27.5 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	75'	Crossing width 60' or less	0	0.5	67'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	0	1		Median present	0	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1	0'	Buffer not less than 3'5"	0	1	0'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS C	A, B, or C and <6 travel lanes	2	2	LOS C
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists	0	1		Support exists	1	1	
PPM LOS				C	11.5	21			B	14.5	

9th Street North of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	8.5	Min. 5' wide and barrier free	2	2	6'
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	0 dpm	< 22 driveways and side streets/mile	1	1	0 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	27.5 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	27.5 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	75'	Crossing width 60' or less	0	0.5	67'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	0	1		Median present	0	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	1	1	3.5'	Buffer not less than 3'5"	1	1	5'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS C	A, B, or C and <6 travel lanes	2	2	LOS C
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists	1	1		Support exists	1	1	
PPM LOS				B	16.5	21			B	16.5	21

11th Street North of Canyon	Points		Northbound		Points		Existing Condition	Southbound		Points		Existing Condition
	Pedestrian LOS Inputs	Total	out of	Pedestrian LOS Inputs	Total	out of		Pedestrian LOS Inputs	Total	out of		
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0		
	Continuous on one side		4	Continuous	5	5		Continuous	5	5		
	Continuous on both sides		6									
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	10'	Min. 5' wide and barrier free	2	2	10'	
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1		
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1		
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	8 dpm	< 22 driveways and side streets/mile	1	1	8 dpm	
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	0 sec	Ped. Signal delay 40 seconds or less	0	0.5		
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0.25	0.5		Reduced turn conflict implementation	0	0.5		
	Crossing width 60' or less		0.5	Crossing width 60' or less	0.5	0.5	28'	Crossing width 60' or less	0	0.5		
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph	
	Median present		1	Median present	0	1		Median present	0	1		
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1	0'	Buffer not less than 3'5"	0	1	0'	
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5		
	Shade trees		0.5	Shade trees	0	0.5		Shade trees	0.5	0.5		
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0		
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1		
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS A	A, B, or C and <6 travel lanes	2	2	LOS C	
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1		
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0		
	No problems		2	No problems	2	2		No problems	2	2		
TDM/Multi Modal (max 1)	No support		0	No support	0	0		No support	0	0		
	Support exists		1	Support exists		1		Support exists		1		
PPM LOS				B	14.75	21		B	14			

Broadway Street South of Canyon	Points		Northbound		Points		Existing Condition	Southbound		Points		Existing Condition
	Pedestrian LOS Inputs	Total	out of	Pedestrian LOS Inputs	Total	out of		Pedestrian LOS Inputs	Total	out of		
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0		
	Continuous on one side		4	Continuous	5	5		Continuous	5	5		
	Continuous on both sides		6									
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	10'	Min. 5' wide and barrier free	2	2	10'	
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1		
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	1	1		Off-street/parallel alternative facility	0	1		
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	0 dpm	< 22 driveways and side streets/mile	1	1	0 dpm	
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	35.3 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	35.3 sec	
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5		
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	70'	Crossing width 60' or less	0	0.5	70'	
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	30 mph	Posted speed <= 35mph	0.5	0.5	30 mph	
	Median present		1	Median present	0	1		Median present	0	1		
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1	0'	Buffer not less than 3'5"	0	1	0'	
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0.25	0.5		Benches or pedestrian scale lighting	0.25	0.5		
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5		
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes	0	0	LOS E	E or F OR 6 or more travel lanes	0	0	LOS E	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1		
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2		A, B, or C and <6 travel lanes		2		
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1		
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0		
	No problems		2	No problems	2	2		No problems	2	2		
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0		
	Support exists		1	Support exists	1	1		Support exists	1	1		
PPM LOS				B	14.75	21		C	13.75			

Broadway Street North of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	10' +	Min. 5' wide and barrier free	2	2	10' +
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	0 dpm	< 22 driveways and side streets/mile	1	1	19 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	35.3 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	35.3 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	70'	Crossing width 60' or less	0	0.5	70'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	0	1		Median present	0	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	1	1	10'	Buffer not less than 3'5"	0	1	0'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0.5	0.5		Benches or pedestrian scale lighting	0	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes	0	0	LOS E	E or F OR 6 or more travel lanes	0	0	LOS E
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes		2		A, B, or C and <6 travel lanes		2	
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support	0	0		No support	0	0	
	Support exists		1	Support exists		1		Support exists	1	1	
PPM LOS				B	14	21			C	13.5	

13th Street South of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	10'	Min. 5' wide and barrier free	2	2	8'
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	1	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	9 dpm	< 22 driveways and side streets/mile	1	1	0 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	35.7 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	37.5 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	65'	Crossing width 60' or less	0	0.5	65'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	0	1		Median present	0	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0.5	1	4'	Buffer not less than 3'5"	1	1	5'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0.5	0.5		Benches or pedestrian scale lighting	0.5	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes	1	1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists	1	1		Support exists	1	1	
PPM LOS				A	16.5	21			A	18	

13th Street North of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	10'+	Min. 5' wide and barrier free	2	2	10'
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	0 dpm	< 22 driveways and side streets/mile	1	1	0 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	37.5 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	35.3 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	65'	Crossing width 60' or less	0	0.5	65'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	1	1		Median present	1	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1		Buffer not less than 3'5"	1	1	0'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0.5	0.5		Benches or pedestrian scale lighting	0.5	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems	0	0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists	1	1		Support exists	1	1	
PPM LOS				A	17	21			A	18	

14th Street South of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	5'	Min. 5' wide and barrier free	0	2	4'
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	0	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	0	1	26 dpm	< 22 driveways and side streets/mile	0	1	44 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	38.5 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	38.5 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	70'	Crossing width 60' or less	0	0.5	70'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	0	1		Median present	0	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1	0'	Buffer not less than 3'5"	0	1	0'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5	
	Shade trees		0.5	Shade trees	0	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems	0	0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support	0	0		No support	0	0	
	Support exists		1	Support exists		1		Support exists		1	
PPM LOS				C	12	21			D	10.5	

15th Street South of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	10'	Min. 5' wide and barrier free	2	2	10'
	Sidewalk width > 5'		1	Sidewalk width > 5'	1	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	0	1	26 dpm	< 22 driveways and side streets/mile	0	1	26 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	39 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	39 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	65'	Crossing width 60' or less	0	0.5	65'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	0	1		Median present	0	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	0	1	0'	Buffer not less than 3'5"	0	1	0'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0.5	0.5		Benches or pedestrian scale lighting	0.5	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists		1		Support exists		1	
PPM LOS				B	14	21		B	14		

15th Street North of Canyon	Pedestrian LOS Inputs	Points		Northbound Pedestrian LOS Inputs	Points		Existing Condition	Southbound Pedestrian LOS Inputs	Points		Existing Condition
		Total	out of		Total	out of			Total	out of	
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0	
	Continuous on one side		4	Continuous	5	5		Continuous	5	5	
	Continuous on both sides		6								
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	2	2	5'	Min. 5' wide and barrier free	2	2	6'
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	1	1	
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1	
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	1	1	19 dpm	< 22 driveways and side streets/mile	1	1	19 dpm
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	39 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	39 sec
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5	
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	65'	Crossing width 60' or less	0	0.5	65'
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph
	Median present		1	Median present	0	1		Median present	0	1	
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	1	1	12'	Buffer not less than 3'5"	1	1	10'
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5	
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5	
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0	
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1	
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1	
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0	
	No problems		2	No problems	2	2		No problems	2	2	
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0	
	Support exists		1	Support exists		1		Support exists		1	
PPM LOS				B	14.5	21		B	15.5		

17th Street South of Canyon	Points		Northbound		Points		Existing Condition	Southbound		Points		Existing Condition
	Pedestrian LOS Inputs	Total	out of	Pedestrian LOS Inputs	Total	out of		Pedestrian LOS Inputs	Total	out of		
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0		
	Continuous on one side		4	Continuous	5	5		Continuous	5	5		
	Continuous on both sides		6									
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	1	2	4'-5'	Min. 5' wide and barrier free	2	2	5-6'	
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	0.5	1		
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1		
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	0	1	37 dpm	< 22 driveways and side streets/mile	1	1	18 dpm	
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	37.5 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	37.5 sec	
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5		
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	65'	Crossing width 60' or less	0	0.5	65'	
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph	
	Median present		1	Median present	0	1		Median present	0	1		
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	1	1	3.5'	Buffer not less than 3'5"	0	1	0'	
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5		
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5		
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0		
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1		
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B	
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1		
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0		
	No problems		2	No problems	2	2		No problems	2	2		
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0		
	Support exists		1	Support exists	1	1		Support exists	1	1		
PPM LOS				C	13.5	21		B	15			

17th Street North of Canyon	Points		Northbound		Points		Existing Condition	Southbound		Points		Existing Condition
	Pedestrian LOS Inputs	Total	out of	Pedestrian LOS Inputs	Total	out of		Pedestrian LOS Inputs	Total	out of		
Facility (max 10)	Not continuous or non-existent		0	Not continuous or non-existent		0		Not continuous or non-existent		0		
	Continuous on one side		4	Continuous	5	5		Continuous	5	5		
	Continuous on both sides		6									
	Min. 5' wide and barrier free		2	Min. 5' wide and barrier free	1	2	4'-5'	Min. 5' wide and barrier free	2	2	5'	
	Sidewalk width > 5'		1	Sidewalk width > 5'	0	1		Sidewalk width > 5'	0	1		
	Off-street/parallel alternative facility		1	Off-street/parallel alternative facility	0	1		Off-street/parallel alternative facility	0	1		
Conflicts (max 4)	< 22 driveways and side streets/mile		1	<22 driveways and side streets/mile (dpm)	0	1	57 dpm	< 22 driveways and side streets/mile	1	1	19 dpm	
	Ped. Signal delay 40 seconds or less		0.5	Ped. Signal delay 40 seconds or less	0.5	0.5	37.5 sec	Ped. Signal delay 40 seconds or less	0.5	0.5	37.5 sec	
	Reduced turn conflict implementation		0.5	Reduced turn conflict implementation	0	0.5		Reduced turn conflict implementation	0	0.5		
	Crossing width 60' or less		0.5	Crossing width 60' or less	0	0.5	65'	Crossing width 60' or less	0	0.5	65'	
	Posted speed <= 35mph		0.5	Posted speed <= 35mph	0.5	0.5	25 mph	Posted speed <= 35mph	0.5	0.5	25 mph	
	Median present		1	Median present	0	1		Median present	0	1		
Amenities (max 2)	Buffer not less than 3'5"		1	Buffer not less than 3'5"	1	1	8'	Buffer not less than 3'5"	1	1	10' +	
	Benches or pedestrian scale lighting		0.5	Benches or pedestrian scale lighting	0	0.5		Benches or pedestrian scale lighting	0	0.5		
	Shade trees		0.5	Shade trees	0.5	0.5		Shade trees	0.5	0.5		
Motor Vehicle LOS (max 2)	E or F OR 6 or more travel lanes		0	E or F OR 6 or more travel lanes		0		E or F OR 6 or more travel lanes		0		
	D and <6 travel lanes		1	D and <6 travel lanes		1		D and <6 travel lanes		1		
	A, B, or C and <6 travel lanes		2	A, B, or C and <6 travel lanes	2	2	LOS B	A, B, or C and <6 travel lanes	2	2	LOS B	
Maintenance (max 2)	Major or frequent problems		-1	Major or frequent problems		-1		Major or frequent problems		-1		
	Minor or infrequent problems		0	Minor or infrequent problems		0		Minor or infrequent problems		0		
	No problems		2	No problems	2	2		No problems	2	2		
TDM/Multi Modal (max 1)	No support		0	No support		0		No support		0		
	Support exists		1	Support exists	1	1		Support exists	1	1		
PPM LOS				C	13.5	21		B	15.5			