

Appendix A.

Purpose and Need





Appendix A: Purpose and Need

The Vasquez Boulevard (State Highway 6 [SH 6] or United States Route 6 [US 6]) I-270 to 64th Avenue project (Project) is located within the limits of the City of Commerce City (Commerce City) in Adams County, Colorado. The study area extends along Vasquez Boulevard from 58th Avenue (just north of the I-270 interchange), north to the Burlington Northern Santa Fe (BNSF) Railroad bridge. West of Vasquez Boulevard, the study area extends to Clermont Street, between the on-ramp to I-270 and just north of east 60th Avenue. East of Vasquez Boulevard, the study area includes Parkway Drive, 60th Avenue and 62nd Avenue (Figure 1). The study area also includes a planned water quality pond and proposed drainage work area within the Mile High Greyhound Park (MHGP) property at the corner of 62nd Avenue and Highway 2.

Background

The Colorado Department of Transportation (CDOT), in cooperation with the Federal Highway Administration (FHWA) and local agencies including Adams County, the City of Commerce City, City and County of Denver, Denver Regional Council of Governments (DRCOG) and the Regional Transportation District (RTD), conducted a Planning and Environmental Linkages (PEL) study in 2018. The Vasquez Boulevard PEL study provided a framework for the implementation of transportation improvements along the corridor between 52nd Avenue and 64th Avenue and along I-270 for ½-mile north and south of the I-270/Vasquez Boulevard interchange. The Project falls within the limits of the PEL study and is now following the National Environmental Policy Act process to prepare an Environmental Assessment to identify a preferred alternative based on the needs identified in the PEL.

Purpose and Need

PEL Study Purpose and Need

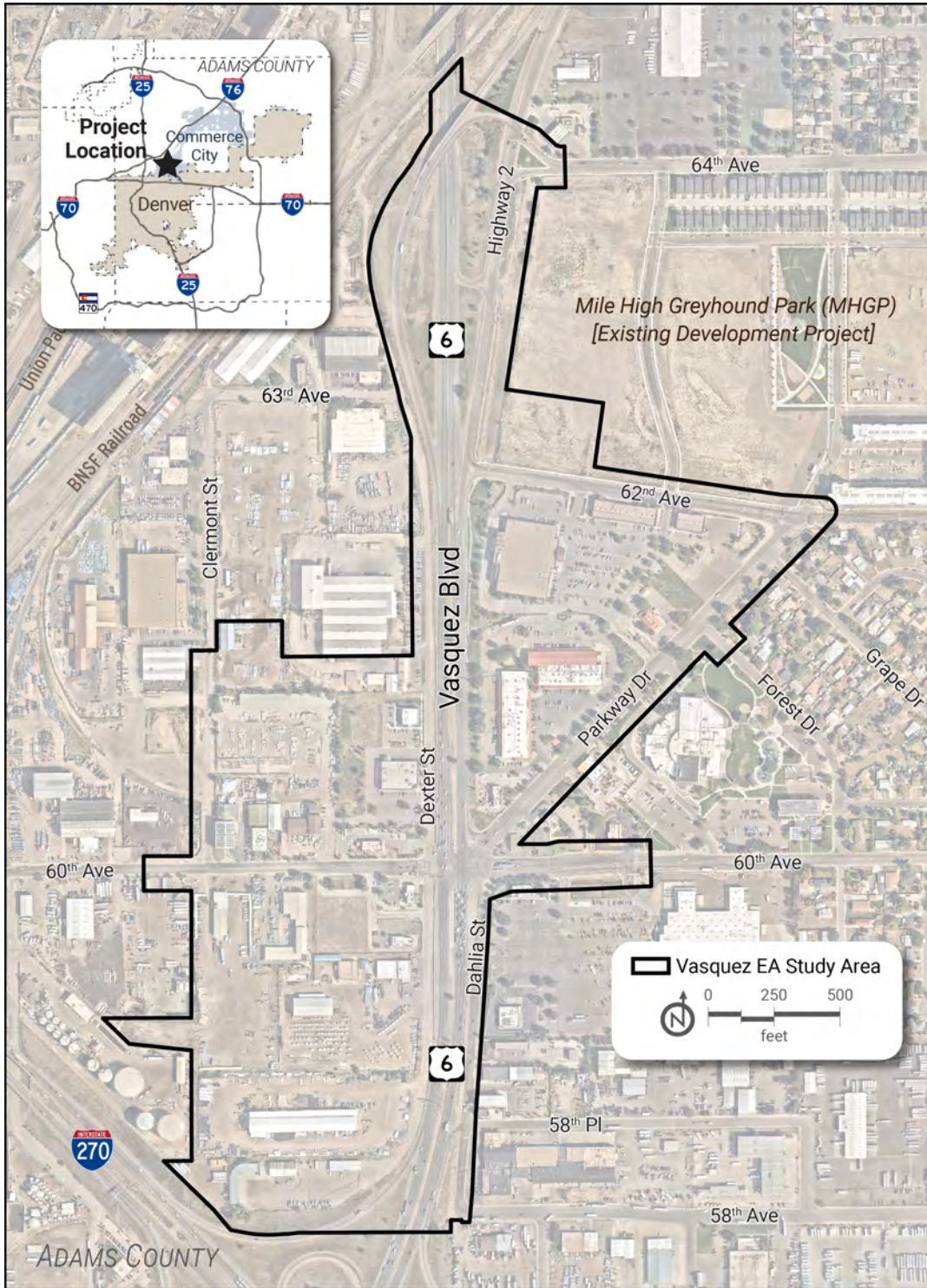
A Purpose and Need statement and Project goals were developed during the Vasquez Boulevard PEL study for a broader study area. The following PEL Purpose and Need statement was created to reflect the ultimate vision for the overall Vasquez corridor and I-270 interchange area.

The purpose of transportation improvements in the vicinity of I-270 and Vasquez Boulevard is to:

- improve operations, mobility, and safety for vehicles and freight at the I-270/Vasquez Boulevard interchange;



Figure 1: Project Location and Study Area





- improve connections to the Vasquez Boulevard/56th Avenue and Vasquez Boulevard/60th Avenue intersections, on Vasquez Boulevard and the surrounding local road system; and
- improve transportation connectivity for all modes.

Current Project

Unlike the PEL, the current Project is focused on near-term improvements at intersections along Vasquez Boulevard north of I-270 from 58th Avenue to 64th Avenue, including some local road improvements. Therefore, it was necessary to refine the Purpose and Need statement from the PEL and develop a Project-specific Purpose and Need statement.

Project Purpose and Need

The Purpose of the Vasquez Boulevard I-270 to 64th Avenue Project is to address the following needs:

- improve operations for vehicles and freight;
- improve safety; and
- improve multimodal connections.

Project Goals

Goals from the PEL that were not already included as part of the Purpose and Need were retained for this Project. The goals of the Vasquez Boulevard I-270 to 64th Avenue Project transportation improvements are to:

- balance access between the transportation network and adjacent land uses;
- minimize and mitigate impacts to the built environment consistent with local master plans; and
- minimize impacts to the natural environment.

Explanation of Identified Needs

Operations

Vasquez Boulevard, at its busiest, carries over 40,000 vehicles per day (vpd) while 60th Avenue carries 12,000 vpd east of Vasquez Boulevard. Both Vasquez Boulevard and 60th Avenue east of Vasquez Boulevard are projected to experience moderate growth in ADT of 24% and 19%, respectively. Vasquez Boulevard plays a crucial role in conveying freight traffic to local businesses and industries. The continual presence of trucks, between 10-12% during peak and off-peak periods, contributes significantly to congestion throughout the corridor. 60th Avenue



also carries significant freight volumes, accounting for 5% of traffic east of Vasquez Boulevard and over 6% of traffic west of Vasquez Boulevard. The intersection of 60th Avenue and Vasquez Boulevard is a critical point in the movement of freight and the poor performance of the intersection is partially attributed to the high percentage of trucks passing through the intersection.

In December 2019, daily, Ante Meridiem (AM), and Post Meridiem (PM) traffic counts at ten locations within the study area were conducted. In addition, traffic counts and data collected within the study area by CDOT, Commerce City and the MHGP property were compiled. Although growth is expected, the increase in traffic volume alone doesn't accurately reflect the issues facing the corridor. A comparative analysis of the intersection delay, maximum queue lengths and vehicular travel times highlights the issues facing the corridor.

The peak hour traffic volumes are used to evaluate and quantify the intersection delay, queue length and travel times for this analysis. Vasquez Boulevard primarily experiences one-directional traffic flow during its peak hours, with the majority of traffic traveling southbound during the AM peak period and more traffic traveling northbound during the PM peak period, although southbound queues are still longer than the northbound queues in the afternoon. Traffic volumes remain high throughout the day, but the peak hours occur from 7:00 AM to 8:00 AM and from 4:30 PM to 5:30 PM. The data output from the TransModeler analysis for the intersection analysis is summarized in **Table 1** and **Table 2**.

Table 1: AM Peak Hour Intersection Operations - Existing (2019)/No Action (2040)

Vasquez Intersection	AM Peak (7:00 AM to 8:00 AM)			
	Existing (2019)		No Action (2040)	
	Delay (seconds/vehicle)	Maximum Queue (feet)	Delay (seconds/vehicle)	Maximum Queue (feet)
60 th Avenue	101.3	2,174 (southbound Vasquez)	148.4	3,610 (southbound Vasquez)
62 nd Avenue	2.9	80 (westbound 62 nd)	3.6	107 (westbound 62 nd)

Source: Muller Engineering TransModeler analysis



Table 2: PM Peak Hour Intersection Operations - Existing (2019)/No Action (2040)

Vasquez Intersection	PM Peak (4:30 PM to 5:30 PM)			
	Existing (2019)		No Action (2040)	
	Delay (seconds/vehicle)	Maximum Queue (feet)	Delay (seconds/vehicle)	Maximum Queue (feet)
60 th Avenue	109.3	1,246 (southbound Vasquez)	214.4	3,572 (southbound Vasquez)
62 nd Avenue	9.9	216 (westbound 62 nd)	147.0	1,164 (westbound 62 nd)

Source: Muller Engineering TransModeler analysis

The Vasquez Boulevard/60th Avenue intersection currently operates at a subpar level with delays approaching two minutes in both the AM and PM peak hours. Even though Vasquez Boulevard has six lanes through the intersection, the allocated green time for the signal at 60th Avenue is significantly reduced by the unusual configuration of the intersection. There are eight legs to the intersection, six of which require signal phasing. This configuration is a significant factor in the poor performance of the intersection. Even though the traffic volumes are only projected to grow by 24%, if the no action is taken, the intersection delay will increase by 46% (47 seconds) in the AM and 96% (105 seconds) in the PM. This results in total delay times of 2.5 minutes in the AM and 3.5 minutes in the PM.

The unsignalized, right-in, right-out Vasquez Boulevard/62nd Avenue intersection currently operates without significant delays but by 2040 the delay will increase in the PM peak hour to 2.5 minutes, and the queue length increases by more than a factor of five.

The third key factor, travel time, was also compiled from the TransModeler model for the corridor. The average travel times for vehicles between a point south of the 60th Avenue intersection to north of the railroad underpass are summarized in **Table 3**.



Table 3: Peak Hour Travel Time along Vasquez Boulevard - Existing (2019)/No Action 2040

Vasquez Travel Direction	Free Flow Travel Time (minutes)	AM Peak Travel Time (minutes)		PM Peak Travel Time (minutes)	
	Existing (2019)	Existing (2019)	No Action (2040)	Existing (2019)	No Action (2040)
Southbound	1.33	3.9	6.5	2.2	5.2
Northbound	1.33	1.9	2.1	2.8	5.3

Source: Muller Engineering TransModeler analysis

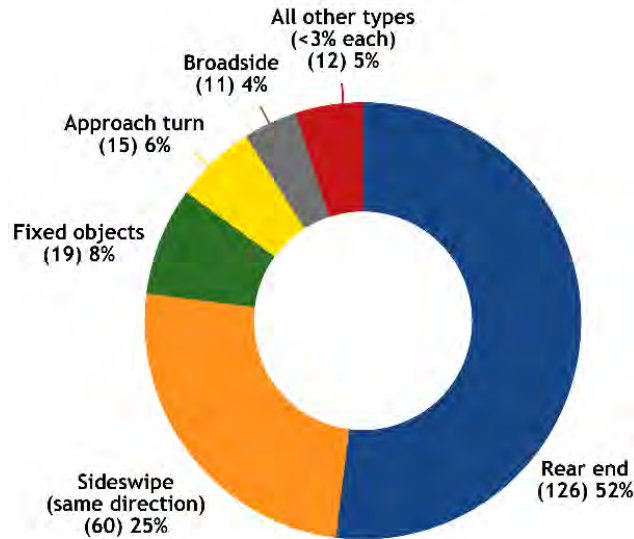
The free-flow travel time is a measure of the time needed to traverse the corridor between two set locations under ideal circumstances. Currently the AM peak travel time in the southbound direction is almost 3 times the ideal time while the PM time is over twice as long in the northbound direction. These conditions will only grow worse by 2040 with both the AM and PM peaks almost doubling to just under five times the ideal travel time in the AM southbound direction, and just under four times the ideal time in the PM northbound and southbound directions.

Safety

A safety assessment for the study area was conducted and documented in the Transportation Resources Memo (**Appendix C1**, Safety Assessment Report, Muller Engineering, September 2022). The report is based on an analysis of five years of crash history on Vasquez Boulevard from south of the 60th Avenue intersection through the 62nd Avenue intersection to the overpass that connects Highway 2 to southbound Vasquez Boulevard. The crash history included in the safety assessment was January 1, 2015, through December 31, 2019. Crash data from 2020 and later was excluded from the analysis due to the atypical traffic volume impacts of the Coronavirus 2019 (COVID-19) pandemic.

During the five-year period from January 1, 2015, to December 31, 2019, there were 243 crashes along Vasquez Boulevard between south of 60th Avenue and north of 62nd Avenue/Highway 2. Rear-end crashes were the predominant type (52%), followed by sideswipe (same direction) crashes (25%), and fixed object crashes (8%). **Figure 2** shows the crash distribution by type for the corridor.

Figure 2: Vasquez Boulevard Crash Distribution (2015 - 2019)



Source: State Highway 6 Safety Assessment Report: MP 292.94 - MP 293.67 (September 2022), Muller Engineering

Crashes that can be attributed to intersections (located at intersections or that are intersection-related) accounted for 54% of the total crashes (131 of 243 crashes). Most of these crashes occurred at the Vasquez Boulevard/60th Avenue intersection (116 of 131 crashes, 89%).

Rear end crashes, which comprise more than half of all crashes, were generally more frequent on weekdays, as might be expected for commuting traffic. The off-peak time period between 10 a.m. and 4 p.m. experienced higher frequencies of crashes than either the AM or PM peak periods, with an additional peak in the 6 p.m. to 8 p.m. time period, which is later in the day than the typical evening peak hour of traffic. This could be related to higher levels of activity on the side-streets in the middle of the day, as there are several fast-food restaurants and retail centers in the immediate vicinity.

The Safety Assessment report identified traffic congestion as the primary cause of rear end crashes at Vasquez Boulevard/60th Avenue. The report recommended reconfiguring the intersection and adjacent frontage roads to reduce the number of traffic signal phases and improve traffic flow for Vasquez Boulevard.

Crash records indicate that inconsistent traffic signal placement is also a contributing factor for rear end crashes. The Safety Assessment report identified a need for upgraded traffic signals and stop bar placement to improve signal head visibility.



Sideswipe crashes are also predominant at Vasquez Boulevard/60th Avenue, most of which involved vehicles turning left. The sideswipe crashes are exacerbated by the high volume of large trucks and tight turning paths.

The Dahlia Street one-way frontage road at the southeast quadrant of Vasquez Boulevard/60th Avenue is confusing due to its parallel proximity to Vasquez Boulevard. During field visits to the intersection, motorists were observed traveling in the wrong direction in the southbound lane while entering the intersection from Dahlia Street to turn left onto Vasquez Boulevard. While there was no clear indication of crashes caused by this behavior, this behavior should be actively discouraged due to a high risk of head-on or driver-side broadside collision.

High traffic volumes and deficient pedestrian facilities create safety concerns for pedestrians and bicyclists traveling through the study area. During the five-year period from January 1, 2015 to December 31, 2019, there was one pedestrian-involved crash and no bicyclist-involved crashes along Vasquez Boulevard between south of 60th Avenue and north of 62nd Avenue/Highway 2. The pedestrian-involved crash occurred at the Vasquez Boulevard/60th Avenue intersection in October 2018 at 7:28 p.m. in night-time conditions with street lighting. The vehicle was traveling southbound, and the crash resulted in injuries. Although only one accident occurred during the five-year period, lack of pedestrian facilities creates a significant safety hazard. In addition, current facilities are aged and less than ideal, indicating a need for appropriate measures to be taken to upgrade facilities to current design standards.

Other general safety needs identified in the Safety Assessment report include:

- Good skid resistance and drainage of the roadway surface
- Adjustment, repair and upgrade of existing guardrail to meet current standards
- Elimination of pavement edge drop-offs (Safety Edge Application)
- Crown correction where required
- Replace all button reflectors and guardrail reflectors to ensure good nighttime and inclement weather (fog, snow, rain, etc.) delineation
- All pedestrian signal heads should have countdown displays
- Installation of retroreflective back plates on all overhead signals
- Review signal timing plans to ensure appropriate signal change period

Evaluate the conspicuity of lane markings to ensure high visibility at all times as well as the clarity of the guide signing in the study area.

Multimodal Connectivity

The pedestrian and bicyclist infrastructure within the study area is limited to sidewalks along

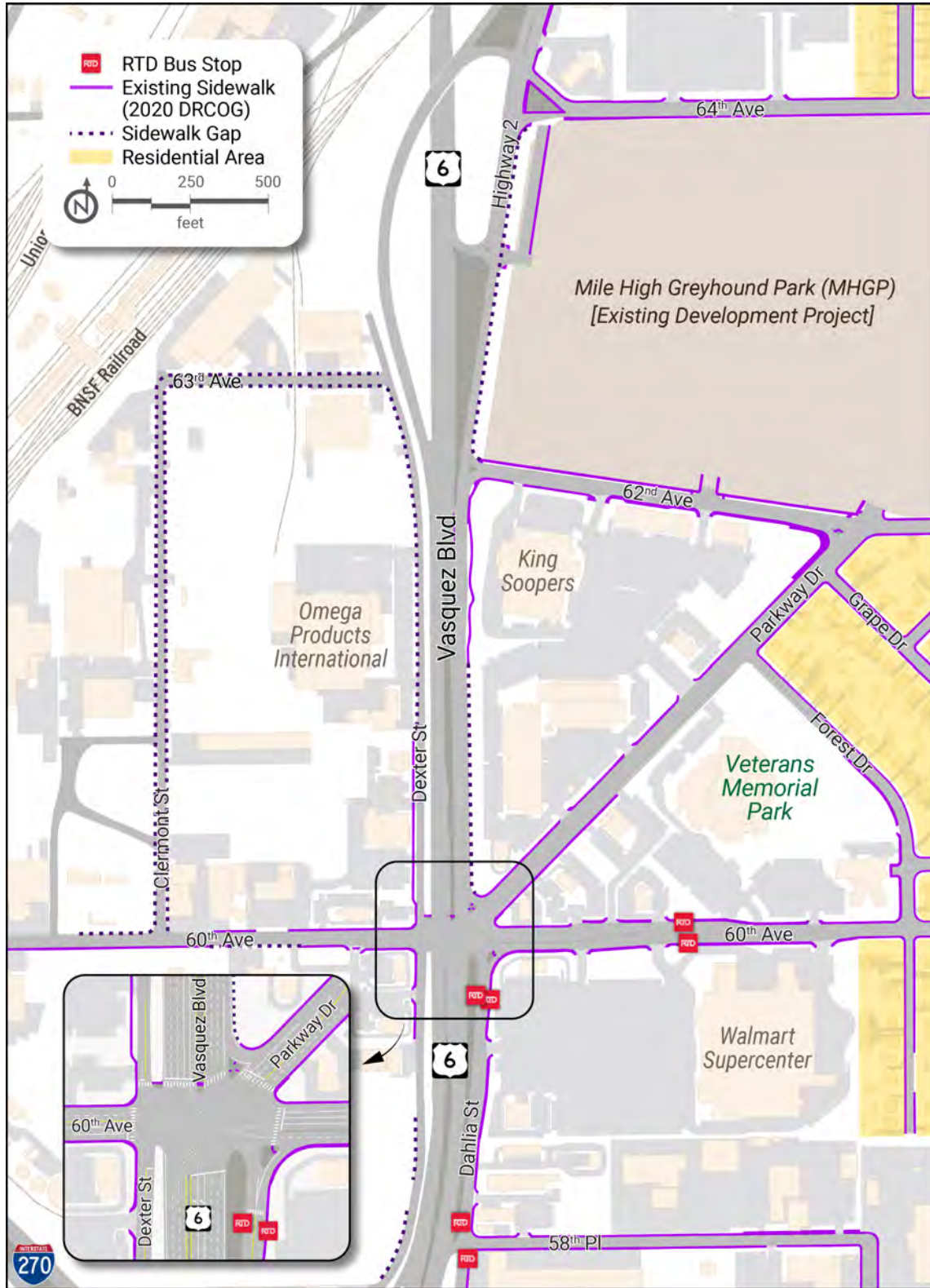


60th Avenue east of Vasquez Boulevard, Parkway Drive and Dahlia Street (the southeast frontage road along the east side of Vasquez Boulevard). There are short sections of sidewalk adjacent to more recently developed properties, but without connections to other existing facilities. The crossing at 60th Avenue is the only east/west pedestrian crossing of Vasquez Boulevard within the study area and for 1.75 miles (between the 56th Avenue signal south of the I-270 interchange and the 69th Avenue signal to the north). Vasquez Boulevard is effectively serving as a barrier for east/west pedestrian and bicyclist travel. Continued redevelopment of the MHGP will bring additional residential neighborhood population and multimodal infrastructure, increasing the demand for safe and efficient multimodal connections through the area.

Within the study area, lack of sidewalk connectivity limits mobility and increases the risks of non-motorized travel. **Figure 3** shows the existing sidewalks and the gaps between facilities. Sidewalks are present along portions of adjacent roadways (Dahlia and Dexter Streets). Bus stops located in the vicinity of Vasquez Boulevard/60th Avenue are located along the southeast frontage road (Dahlia Street) and 60th Avenue. Buses stopped at the southbound stop block the single travel lane, causing traffic to back up into the Vasquez Boulevard/60th Avenue intersection and also block the designated crosswalk for pedestrians to access the bus stop. The northbound stop is located on the east side of Dahlia Street with sidewalk connections along Dahlia Street and 60th Avenue. Currently, there is not a connected Americans with Disabilities Act compliant path from the neighborhoods and businesses in the area to the existing bus stops.



Figure 3: Multimodal Facilities





According to the DRCOG Denver Regional Bicycle Map, there are three bicycle facilities adjacent to the study area including an on-street bicycle lane on Holly Street, the Pioneer Loop Trail and the Sand Creek Greenway Trail. The Commerce City Park, Trail, Open Space, and Recreation Map identifies a multiuse path that starts at the MHGD property and runs along Highway 2 for approximately eight miles to the interchange of Highway 2 and I-76. These bikeways allow for bicyclists to safely enjoy traveling the area without needing to cross a highway or interstate. While the nearby trail systems and paths are robust with opportunities to travel and navigate within the entire metro-Denver area, the current sidewalk infrastructure does not provide an accessible and connected route for users to enjoy the opportunities the non-motorized network provides.

Figure 3 and **Figure 4** illustrate the lack of consecutive routes for non-motorized north/south travel along Vasquez Boulevard and other parallel routes within the study area. From the I-270 interchange to 60th Avenue, there are no sidewalks on either side of Vasquez Boulevard. North of 60th Avenue, there are no sidewalks except for a path along the King Soopers property. West of Vasquez Boulevard, the sidewalks along 60th Avenue are discontinuous and there are no sidewalks along Clermont Street. On Dexter Street, the sidewalk terminates just before the Omega Products International property and there are no northern connections to 63rd Avenue.



Figure 4: Bike Facilities Near the Project Study Area

