

RUBY HILL + ATHMAR PARK

BUS STOP ASSESSMENT

URPL5010: PLANNING METHODS

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1. Project context

PROJECT INTRODUCTION

As one of the fastest growing metropolitan areas in the country, Denver will be challenged to provide mobility options for more residents with the same limited street space. The City and County of Denver, and its impressive transportation initiative, *Denver Moves: Transit* (2019), is poised to do just that. The plan not only examines congestion on Denver roadways, but also considers alternative mobility options to fit additional residents on a given street and the potential to increase connectivity between modes. This study, which aims to support the City and County of Denver in implementing Denver Moves, focuses on bus stop amenities and access along South Federal Boulevard within the Ruby Hill and South Athmar Park neighborhoods.

The *Denver Moves* plan has identified that many bus stops in the Denver area lack necessary amenities and other conditions that would make using the bus an attractive alternative to driving. The availability of data regarding conditions and amenities is vital to understanding who utilizes the bus system and why, and can ultimately help Denver connect its residents to resources that will have a positive impact on overall health.

The goal of this study is to provide the City and County of Denver with accurate and reliable information and data regarding the neighborhoods of Ruby Hill and South Athmar Park, and conduct additional field

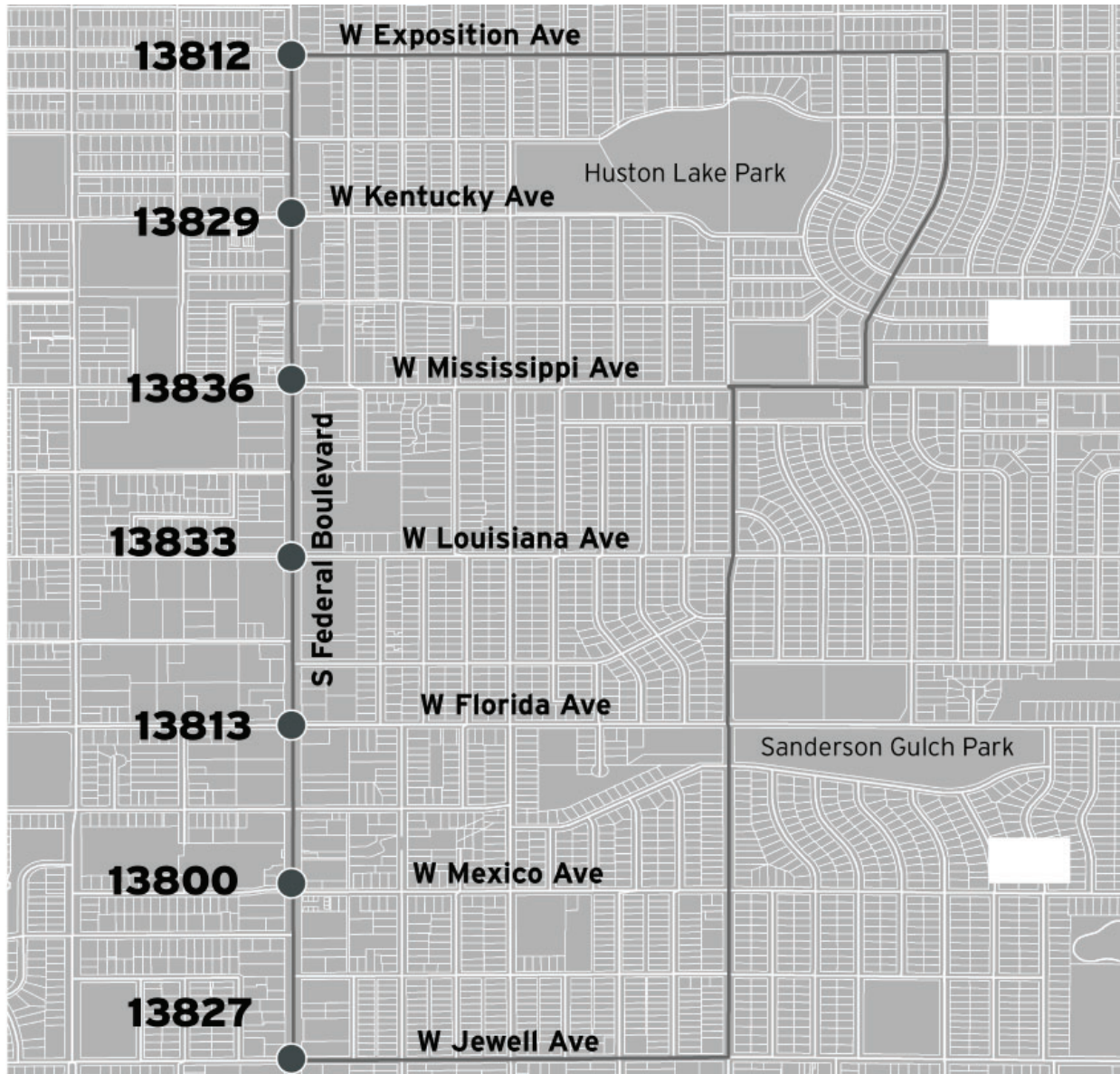
EXHIBIT 1: Study area location map



Source: Map tiles by Stamen Design, under CC BY 3.0. Data by OpenStreetMap, under ODbL.

work on local conditions to supplement the City and County's bus stop inventory in the area, which will in turn improve implementation of the *Denver Moves: Transit Plan*.

EXHIBIT 2: Study area detail map



To accomplish this, a talented team has been compiled from the University of Colorado Denver's Master of Urban Planning Program. The team conducting this study on Ruby Hill and South Athmar Park includes first-year students Annie Rice, Karlyn Vasan, Sam Snyder, and Sarah Grossi. Based on knowledge gained from their professional settings, the program, as well as the Planning Methods course specifically, the team has gathered data on the Ruby Hill and South Athmar Park areas to inform the study and present the City and County of Denver with identifiable gaps and appropriate recommendations.

The Planning Methods class is a core course in the MURP program at the University of Colorado Denver that aims to teach students data collection, analysis, and presentation skills used by planning practitioners daily. These important aptitudes are successfully transferred to the work completed in this bus stop study.

The study area of Ruby Hill and South Athmar Park is located in Southwest Denver along South Federal Boulevard. The study area is bounded by West Exposition Avenue to the north, South Tejon and South Zuni Streets to the east, West Jewell Avenue to the south and South Federal Boulevard to the west. The area boasts affordability, greenery and recreation, a host of available

trails, and strong community atmosphere. In the following report, the team will work to further understand the community and assess specific bus stops along the busy South Federal corridor to better understand safety conditions and amenities available for riders.

In the following report, the team collected and analyzed data from a variety of resources, including census data, site visits, news, and transit user interviews. Since the City and County have already collected and coded imagery of the bus stops via Trimble, this report’s qualitative data will be a supplement to that. Ideally the findings will assist with implementation of the Denver Moves: Transit Plan and better inform investment of transportation system funding to increase safety along our roads.

DEMOGRAPHIC PROFILE

When comparing Ruby Hill and Athmar Park to the greater Denver County, we see several notable differences in demographic makeup. The most significant are differences in racial demographics and educational attainment for residents 25 years and older.

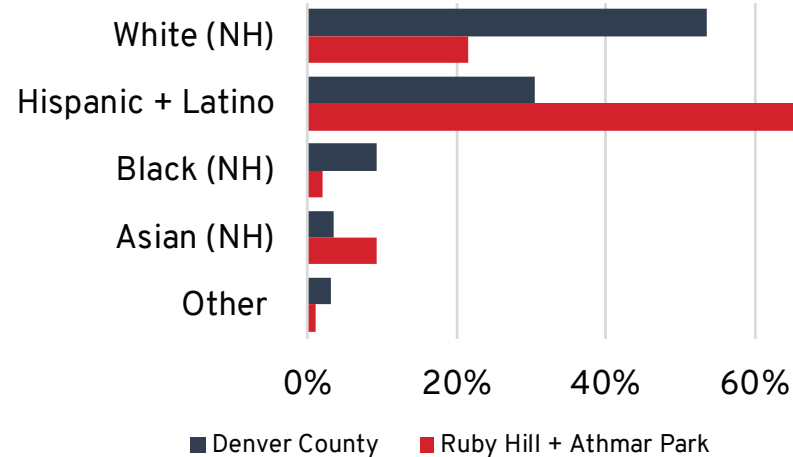
These demographic differences can be better understood by examining the area’s history. Southwest Denver neighborhoods like Athmar Park and Ruby Hill sprang up to meet the housing demands of many employees at the nearby Gates Rubber Company (Garcia, 2017). For young men not drafted yet and those returning from

the war, Gates was a dominant place of employment. Moreover, individuals without high-school diplomas and skills could learn and earn a living from Gates. In addition to Gates (which closed in the 1990s), the far eastern parts of these neighborhoods have many industrial uses that provided many jobs. These economic forces may have impacted the racial, educational, and income demographics of the nearby neighborhoods.

Race

The racial makeup of Ruby Hill differs from Denver’s demographics. The most useful racial comparisons in this context is the percentage of those with Hispanic/Latino origins. The majority of Ruby Hill residents are Hispanic/Latino at 65%, while Denver County is 31% Hispanic/Latino. The Latino population made up a large part of the workforce at Gates and other nearby factories.

EXHIBIT 3: Population by racial + ethnic origin



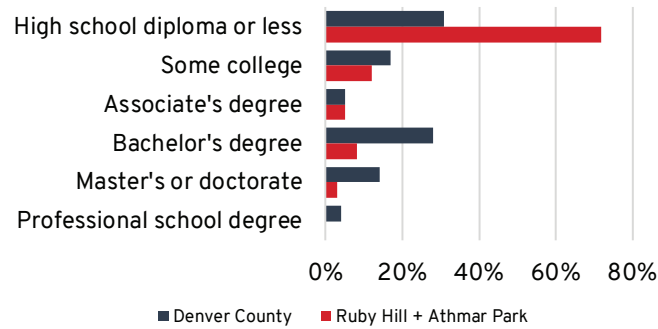
Race/Ethnicity	Denver County		Ruby Hill + Athmar Park	
	Count	Percent	Count	Percent
White (NH)	363712	54%	1765	21%
Hispanic + Latino	207100	31%	5442	66%
Black (NH)	62166	9%	164	2%
Asian (NH)	23967	4%	767	9%
Other	21522	3%	87	1%
Total	678467	100%	8225	100%

Source: ACS 2017 5-year estimates.

Educational attainment

Ruby Hill varies greatly with Denver County in educational attainment. Most notably, 39% of Ruby Hill residents over the age of 25 years old have less than a high school education compared to 13% of Denver County. Almost half of Denver County residents have a Bachelor's Degree or higher (46%), while only 12% of Ruby Hill residents do. This difference could be explained by the prominence of industrial jobs available nearby. The majority of jobs in the area were historically industrial and did not require higher education. That discrepancy still exists today.

EXHIBIT 4: Population by educational attainment

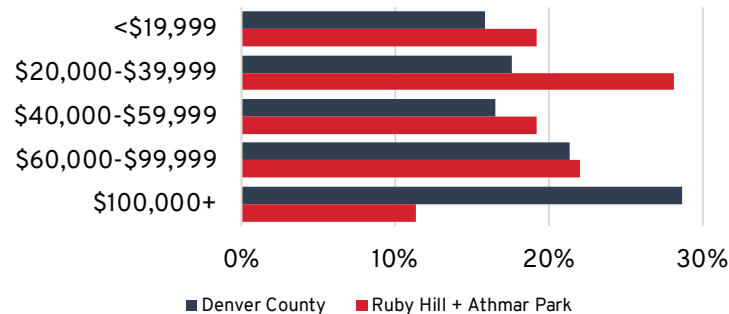


Educational attainment	Denver County		Ruby Hill + Athmar Park	
	Count	Percent	Count	Percent
High school diploma or less	149,304	31%	3,784	72%
Some college	83,391	17%	623	12%
Associate's degree	25,807	5%	243	5%
Bachelor's degree	137,052	28%	448	8%
Master's or doctorate	68,262	14%	161	3%
Professional school degree	19,312	4%	12	<1%
Total	483,128	100%	5,271	100%

Household income

Residents of Ruby Hill have somewhat lower household incomes than Denver County as a whole. The most notable difference is that Denver County has a much larger proportion of residents making more than \$100,000 a year at 29%, whereas Ruby Hill only has 11%. Almost half of the Ruby Hill population (46%) has a population between \$10,000-\$49,999, compared to 34% in Denver County. Part of the reason for the lower incomes may be due to the prominence of nearby industrial jobs, which pay lower wages.

EXHIBIT 5: Population by median household income



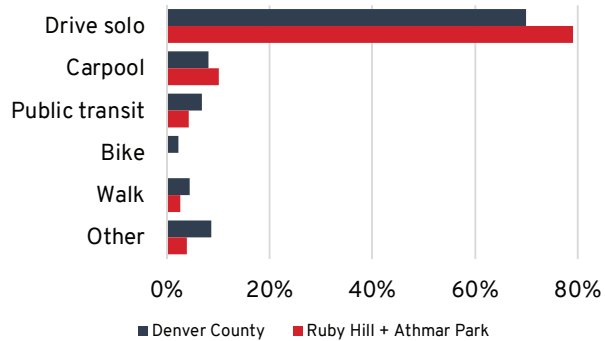
Household income	Denver County		Ruby Hill + Athmar Park	
	Count	Percent	Count	Percent
<\$19,999	45498	16%	504	19%
\$20,000-\$39,999	50491	18%	737	28%
\$40,000-\$59,999	47438	17%	504	19%
\$60,000-\$99,999	61389	21%	577	22%
\$100,000+	82446	29%	297	11%
Total	287,262	100%	2,619	100%

Source: ACS 2017 5-year estimates.

Means of transportation to work

Among public transit users, bus usage is quite high. However, when compared to all other modes of transportation, using a car, truck, or van to commute to work is overwhelmingly the most popular for Ruby Hill and Athmar Park residents, while only 5% of citizens use public transit. Of the surveyed residents, 94% commute via personal vehicle (car, truck, van), five percentage points higher than Denver County as a whole. This potentially may be related to the unsafe bus facilities and unreliable bus routes, however, the bus stop assessment and interviews did not confirm this (see Chapter 2).

EXHIBIT 6: Population by means of transportation to work



Mode	Denver County		Ruby Hill + Athmar Park	
	Count	Percent	Count	Percent
Drive solo	256,782	70%	2,911	79%
Carpool	29,730	8%	370	10%
Public transit	24,960	7%	159	4%
Bike	8,081	2%	0	0%
Walk	16,133	4%	98	3%
Other	31,734	9%	146	4%
Total	367,420	100%	3,684	100%

Source: ACS 2017 5-year estimates.

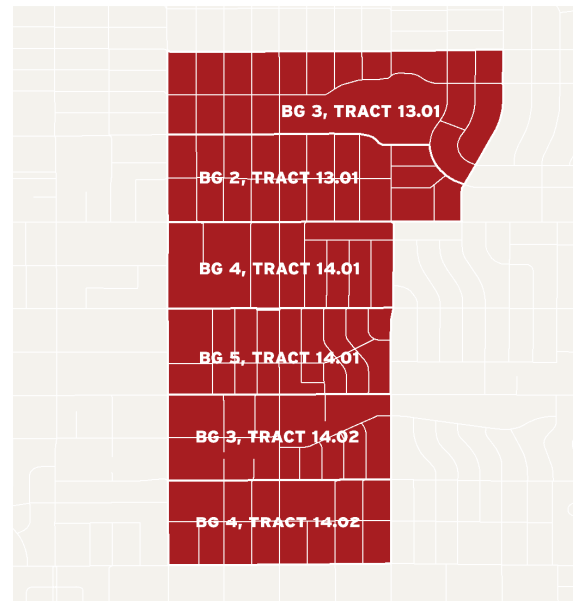
LAND USE

The primary land use in the study area is single-unit residential comprising 91% of all parcels in the area. Concentrated areas of commercial/retail, office, and some multi-unit residential are found along the South Federal Boulevard corridor. There are also some parks and open spaces as well as public/institutions uses scattered around the study area.

Residential

The vast majority of the area is made up of single-unit residential on both sides of the streets. Four of the five border streets (West Exposition, South Tejon, South Zuni, West Jewell) are lined with residential, and the street grid in between is filled with single-unit residential.

EXHIBIT 7: Census geographies map



South Federal has some multi-unit residential uses. Two of the largest units are Denver Housing Authority's subsidized housing complexes of Eliot Elderly and Mountain View at 1222 and 1212 South Federal, respectively. Both offer one and two-bedroom units for the elderly and disabled. There is an additional cluster of multi-residential units close to the South Federal and West Mexico intersection, including the 14-story Columbine Towers Senior Living at 1750 South Federal.

Commercial/retail + office

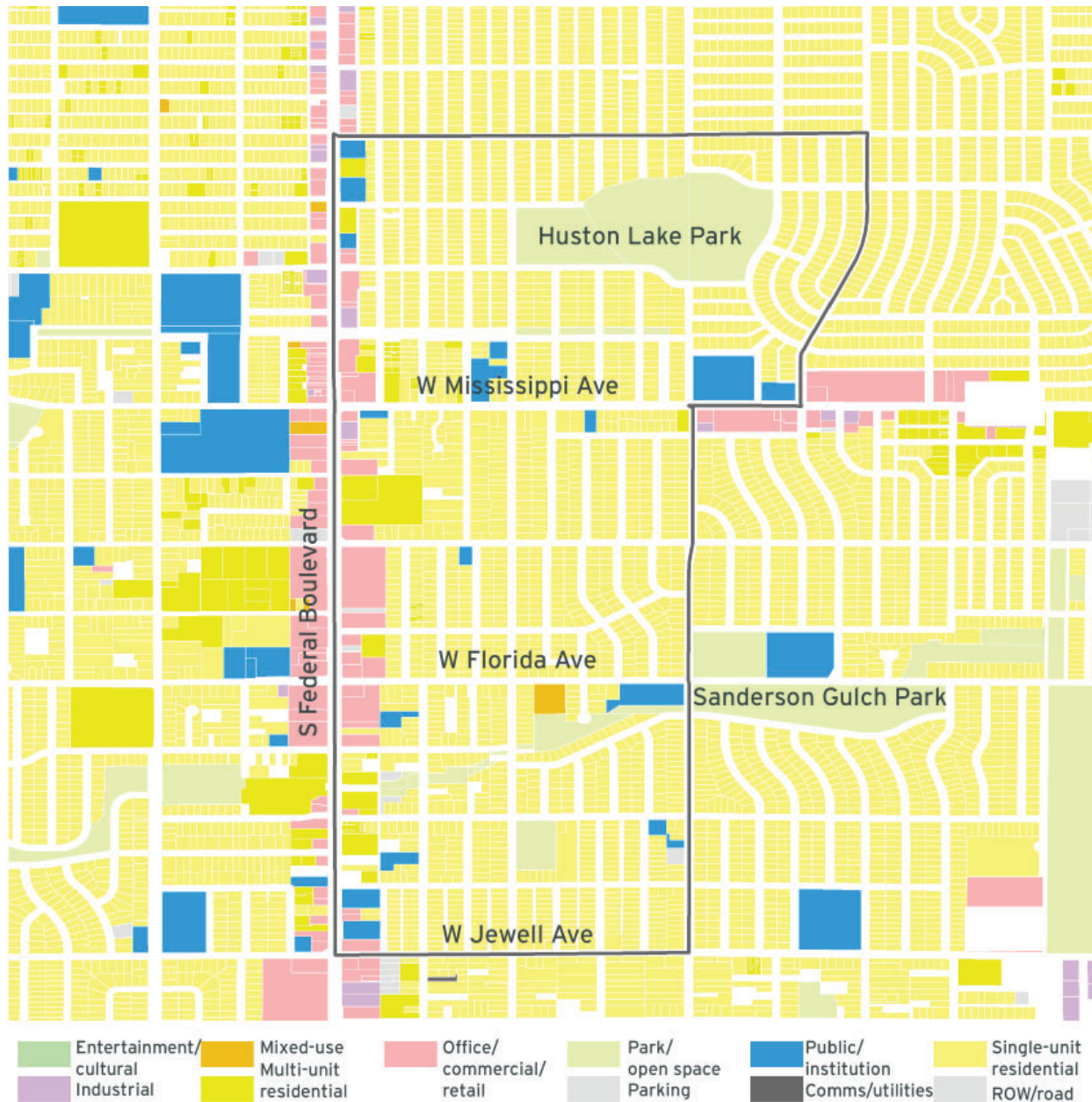
The Western perimeter of South Federal Boulevard is a busy corridor lined with commercial/retail, office. Some of the types of businesses include manufacturing companies, print shops, small service businesses, construction related businesses, auto services, local and fast-food restaurants, gas stations, grocery and convenience stores. Many of these businesses are part of a "strip-mall" commercial format. West Mississippi also has a smaller commercial/retail corridor on the Eastern edge of the study area near South Zuni and South Tejon. It includes gas stations, grocery stores, and various retail businesses with large surface parking lots.

Parks + open space

There are three primary parks and open space uses that offer recreational opportunities for nearby residents:

- Huston Lake Park at 850 South Bryant Street surrounds a beautiful lake. The facilities include a 1-mile bike/pedestrian path around the lake, picnic areas,

EXHIBIT 8: Land use map



Source: City and County of Denver, Community Development and Planning, Existing Land Use 2018.

horseshoe pits, basketball and pickleball courts, soccer and baseball fields, tennis courts, and a fitness zone.

- Sanderson Gulch Park is a long, narrow open space built along the Sanderson Creek flood plain. It runs east-west just south of West Florida Avenue. It offers a bike/pedestrian path, natural areas, and a playground.
- Athmar Park at 2690 West Mexico Avenue includes the Athmar Park Recreation Center with swimming pool, baseball fields, horseshoe pits, and picnic tables.

EXHIBIT 9: Huston Lake Park



Public + institutions

The public and institution land uses are scattered throughout the area. Some of these include Goldrick Elementary School (1050 South Zuni Street), Athmar Park Public Library Branch (1055 South Tejon Street), Denver Fire Station #23 (850 South Federal Boulevard), Athmar Recreation Center (2680 West Mexico Avenue). In addition, there are also at least six religious institutions in the area.

In summary, given that the primary land use in the study area is single-unit residential and that there is concentrated commercial land use along the South Federal Corridor, it is anticipated that most transit users would need to walk to South Federal to use transit. It will be important for these users to be able to safely walk or bike to transit stops along the busy corridor.

EXHIBIT 10: Federal Boulevard Fire Station



TRANSPORTATION

The main arterial streets in the study area are South Federal and West Mississippi, each with heavy traffic from motorists. By driving north, South Federal provides quick access to the major east-west arterials of West Alameda, 6th Avenue (Hwy 6) and West Colfax to the north, all of which provide on-ramps to north and south I-25. By driving west, West Mississippi provides quick connectivity to the major north-south Broadway arterial.

The area is served primarily by public transit buses along South Federal. This is the major transportation corridor and has bus service

every 10 minutes connecting to many parts of Denver. Some of the bus stops in the study area along South Federal are served by up to four different routes. The bus stops 13836 (Federal and Mississippi) and 13812 (Federal and Exposition) offer multiple routes traveling north-south and east-west. The east-west routes provide service roughly every 20-30 minutes.

In addition to buses, residents can utilize RTD light rail to connect to other parts of Denver. While the nearest train stations are three miles away, the bus connectivity and frequent service helps make this a viable option. To the north, Decatur-Federal Station can be accessed with the frequent bus service along Federal Boulevard. To the east, Broadway Station can be accessed with bus service every 30 minutes from South Federal and West Mississippi. Each of these stations also includes a park-and-ride as well as bicycle parking for any commuters wishing to drive or bike to the station.

This area does not have a well-established bike mobility plan. West Florida Avenue offers the best connectivity with its non-protected bike lane that intersects with the South Platte River Bike Trail. In addition, Sanderson Gulch has a bike and pedestrian trail that also intersects with the South Platte River Bike Trail. A cyclist biking to Broadway Station would need to bike the last few blocks on a sidewalk on West Mississippi and South Broadway due to the lack of bike lanes. The other perimeter streets of South Zuni, West Kentucky, and West Tennessee are part of Denver's signed bike routes, but the bikes must share the

lanes with cars. The main arterials of South Federal and West Mississippi have no safe capability to support bicycle mobility.

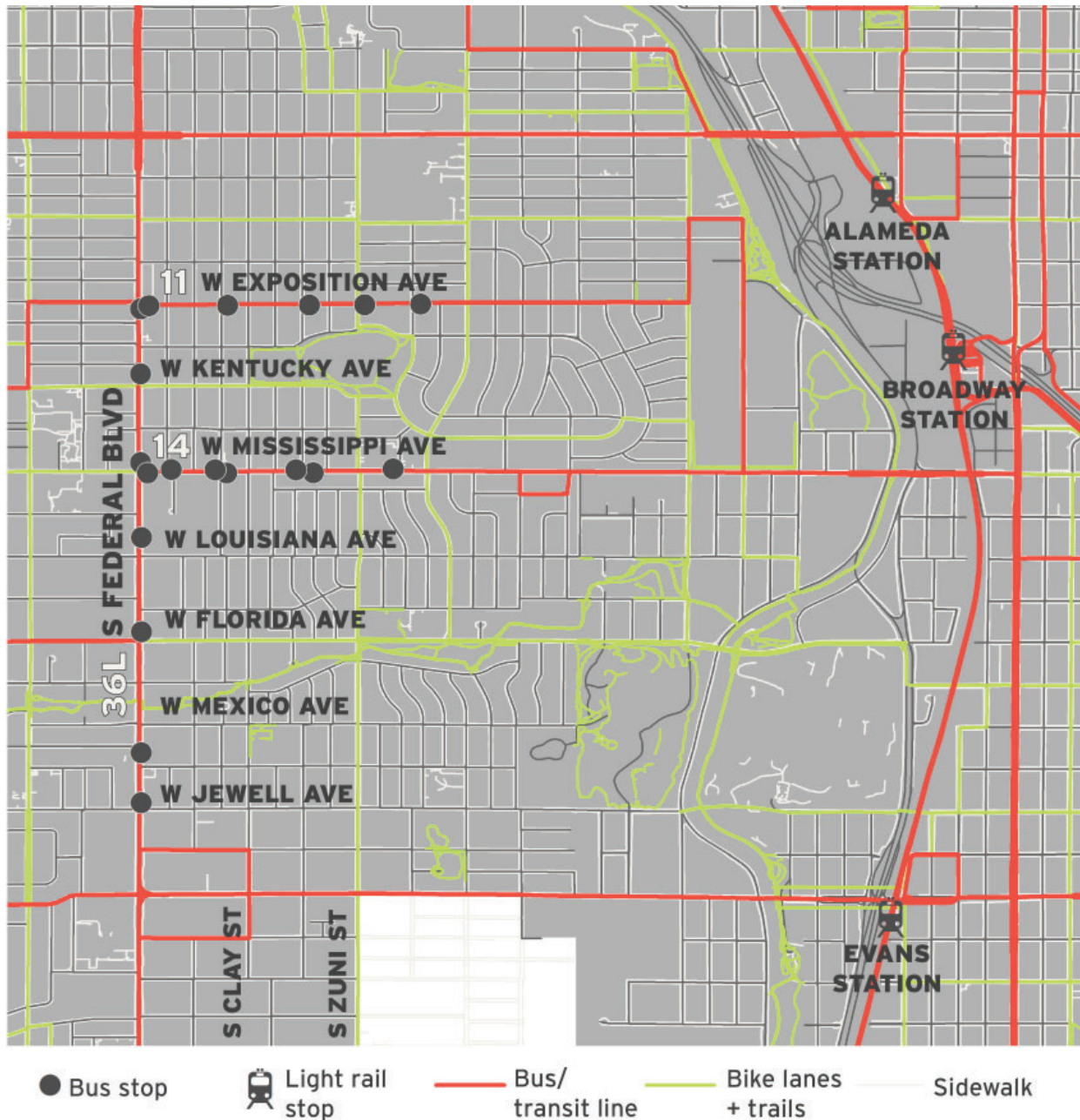
With its predominantly residential streets and standard grid, the study area is quite accessible for pedestrians moving through the neighborhood on its residential sidewalks. However, a pedestrian's ability to safely access transit on South Federal, West Mississippi, or West Exposition is more difficult. These high traffic streets have varying types of sidewalks so walking just a few blocks along them can be dangerous, and the location of the bus stops may also encourage unsafe street crossings. In addition, the "strip-mall" format of the commercial/retail land uses results in many curb cuts with cars turning in and out making this particularly unsafe for pedestrians.

THE URBAN FABRIC

The topography of the area gently rises from the South Platte River Valley that runs north-south to the East. From certain spots in the neighborhood, there are nice views to the east as well as west toward the mountains. The Ruby Hill part of the study area gets its name from Ruby Hill, a 5,390 ft elevation hill, east of the study area at 1200 West Florida that is popular for sledding, skiing, mountain biking, and general recreation.

Except for the businesses along South Federal and the area's parks and open spaces, this area is predominantly residential. The homes are small, brick and vinyl siding one-story bungalows that were

EXHIBIT 11: Transportation map



Source: City and County of Denver, Community Development and Planning, Existing Land Use 2018.

built in the early 1950s during the housing boom after World War II. The homes are typically on 6,000-6,250 sq. ft. lots with large front set-backs from the street and sidewalks right next to the street with no parking strips. Since the home square footage is typically small compared to the lot size, the spacing between the homes is quite generous with large front, side, and backyards. The blocks have alleys, with some homes having garage access from the alley and some with driveways in the front. Most lots have nice mature trees, and the landscaping is predominantly grass lawns.

For the commercial and retail corridor along South Federal, there is a mix of building types ranging from stand-alone small one-story buildings to 1950s or 1960s “strip-malls” to multi-story buildings. The street is dense with buildings and commercial signage, as well as large areas of surface parking in front of the buildings. There is no uniformity and the building styles vary widely. Some are well-maintained while others are in quite a state of disrepair. The size and quality of the sidewalks along Federal Boulevard varies, and some are not protected from the street with a parking strip.

SUMMARY

This chapter focused on the initial impressions of Ruby Hill and Athmar Park, and it provided the team with insights into the community and land use structure. The study area has a strong Latino/Hispanic population and character, and is largely residential. With that said, there is also strip mall-oriented development along South

Federal, which has created major safety issues regarding consistent, heavy traffic along the arterial road. This busy street and lack of safety features disincentivizes people from biking or walking. Because Ruby Hill and Athmar Park are comprised primarily of low-income households, these issues of availability and safety present a serious problem as many of these individuals most likely cannot afford vehicles. Therefore, it is equally as important to have appropriate public transit accessibility and reliability.

From the preliminary research, the research team found that options are fair when it comes to the light rail. And, buses along the Ruby Hill and Athmar Park route run frequently. However, without the existence of well-maintained facilities that allow access to these stations, people will continue to drive. The team found that access to these neighborhoods is best via car, however, because of the hectic bordering roads, even driving is quite unsafe. Overall, coming and going from Ruby Hill and Athmar Park is difficult no matter what the chosen mode of transportation is. The next chapter will focus on bus transit in the area where the team will conduct a walking survey, bus stop assessment, and interviews to gather more data on the study area.

2. Site assessments

INTRODUCTION

In order to aid WalkDenver in assessing and improving bus stops along Federal Boulevard in the Ruby Hill and Athmar Park neighborhoods, the project team has collected a mix of both primary and secondary data. Research has shown that residents of these communities are in dire need of decent public transportation. With Federal Boulevard being about 20 times more dangerous than any other road in Colorado and accidents involving pedestrians happening frequently, these bus stop improvements could not be more important (Sachs, 2018).

The following report evaluates the design quality, safety, accessibility, cleanliness, and connectivity of seven bus stops along Federal Boulevard within the communities of Ruby Hill and Athmar Park. Using a rating system involving a walking survey, windshield survey, and interviews, the project team collected useful information that will inform recommendations for the bus stops in question. Interviews and surveys were conducted, recorded, and analyzed by four Master's students from the University of Colorado Denver. Through individual observations as well as speaking with many community members, the project team was able to uncover interesting details about these bus facilities that have a large impact on the lives of residents and others who utilize the seven bus stops.

STUDY AREA WINDSHIELD AND WALKING SURVEY

The project team conducted a windshield and walking survey throughout the study area. The team broke into groups of two and divided the area roughly in half. Each group drove through a selection of side streets, around public parks and open spaces, along Federal Boulevard and the main east-west corridors including Exposition, Mississippi, Louisiana, Florida, Mexico, and Jewell.

Most streets follow the typical grid pattern, however, there are several streets that are curved along several blocks of the study area. These appear to follow the hilly topography in some places. The project team found many examples of north-south residential streets that did not connect to the east-west corridors. These streets were not continuous, and this could impact pedestrian and bicycle movement accessing the bus routes. This was especially true in the neighboring blocks immediately adjacent to the study area in East Ruby Hill. These residents may find it more difficult to access transit on foot or by bicycle. An example of this discontinuous pattern within the study area is the Sanderson Gulch Open Space which effectively divides the neighborhood.

The team drove around and walked around Huston Lake Park and observed heavy recreational use on weekend days on two occasions. One concern that was identified

was the lack of safe pedestrian crossings for residents to access the park. There are no crosswalks available at any of the main intersections at each corner of the park (Kentucky and Clay, Kentucky and Vallejo, Ohio and Clay, Ohio and Vallejo). While each of these intersections had stop signs for each direction of travel, crosswalks would enhance the safety of the area.

The team also observed that the streets bordering the north (Ohio) and the south (Kentucky) sides of the park are both one-way streets with traffic flowing east from high-traffic Federal Boulevard just three

blocks to the west. On one occasion, the team observed a car driving the wrong way on Kentucky, and a nearby resident living on the corner of Kentucky and Clay told the team that this behavior is a regular occurrence and very dangerous. There are a few crosswalks along Kentucky on the south side of the park where the City appears to have done some street improvements recently with traffic calming islands as well.

From a walkability and safety perspective, the predominant sidewalk design is one that is less than three feet wide with a rollover curb. This design does not

adequately protect pedestrians from cars. In addition, the narrow sidewalk width makes it difficult for two people to walk side by side. The project team observed groups of pedestrians walking together, with at least one person walking in the street next to the person on the sidewalk.

As the major corridor in the study area, Federal Boulevard has a constant flow of high-speed traffic. The quality of the sidewalks along the road varies from narrow and unprotected, wide and detached, or no sidewalk at all. In addition, the walkability is impacted by the proliferation of curb cuts every 100 feet or so (sometimes much less) that are designed to allow vehicles to access the businesses along the boulevard.

The two photos in Exhibit 13 are a good representation of Federal Boulevard. The photo on the right shows a narrow, unprotected sidewalk sandwiched between the street and a surface parking lot. It also has a utility pole placed in the middle of the sidewalk. Walking along this section,

EXHIBIT 13: Sidewalks along Federal Boulevard



EXHIBIT 14: Rollover curbs along S Clay St.



Source: Google Maps Streetview.

the project team felt safer walking through the surface parking lot rather than along the sidewalk next to the high-speed traffic. Neither is a good choice. The photo on the right shows a large curb cut that the project team was required to walk through to continue along to the safer detached sidewalk further ahead.

BUS STOPS ASSESSMENTS SITE INVESTIGATION

Methodology

The bus stop assessment was designed to study the existing conditions of the bus stops in the study area. The project team divided into two groups of two and split up the bus stop assessments. Each group drove to the first bus stop and then walked along Federal Boulevard between each of the stops. At each stop, the online survey was completed through the mobile phone, and one person took notes while the other took photos of the current conditions.

Data attributes

For each bus stop, the team filled out an online survey to collect the data about the level and condition of amenities. The assessment captured quantitative and qualitative data. The project team collected specific attributes to assess the conditions.

EXHIBIT 15: Bus stop assessment rating, sorted by overall rating

Bus stop	Overall	Physical			Pedestrian connectivity	
		Safety	condition	Cleanliness Accessibility		
13833	5	4	5	4	4	5
13827	4	4	4	2	4	5
13800	4	4	5	3	4	5
13812	4	4	4	2	5	5
13829	3	3	3	2	4	4
13836	3	3	3	2	3	3
13813	2	3	2	2	5	5

A quantitative bus stop rating of 1 to 5 was assigned to the following attributes:

- Overall rating based on amenities present (e.g. shelter, concrete pad, bench, etc.)
- Safety
- Physical condition (state of good repair)
- Cleanliness
- Accessibility for people with disabilities
- Pedestrian connectivity (e.g. sidewalks)

Additional qualitative attributes gathered included:

- What surface is on the ground? Concrete pad, asphalt, dirt/grass, other
- What amenities are present? Bench, trash can, standard shelter, enhanced shelter, lighting shade trees, system map, route information/schedule, area map, public art, other
- How close is the nearest marked crosswalk? No crosswalk, so far away, close enough, very close



Short subjective responses including the following:

- What, if anything, makes the bus stop feel unsafe?
- If public art is present, please describe it.
- Any additional observations?

The map in Exhibit 16 displays the highlights from the bus stop assessments, including the ranking of the stops, the amenities and features present at each stop, as well as the pedestrian areas with particularly good and bad conditions.

EXHIBIT 16: Bus stop attributes present + lacking



- █ Best Bus Stops
- █ Average Bus Stops
- █ Worst Bus Stops
-  Bus Shelter
-  Bench
-  Cleanliness
-  Safety
-  Accessibility
-  Connectivity
-  Tree Coverage

Bus stop #13827: Federal + Jewell

This stop offered decent amenities including a trash bin and a bench and is accompanied by wide ADA accessible sidewalks as well as a large loading area. The stop received a high physical condition rating as all amenities are in good condition. The stop is located close to the Federal and Jewell intersection which provides a marked crossing and allows pedestrians to cross safely to access the stop. In addition, the stop is several yards away from the nearest curb cut, which provides a safer environment for individuals at this stop.

With that said, the cleanliness of the stop could be greatly improved. It is evident that it has not been cleaned regularly, as there is litter surrounding the waiting area. The surrounding landscape and parking strip area is also poorly maintained.

EXHIBIT 17: Federal + Jewell stop



Bus stop #13800: Federal + Colorado

The high overall rating of four given to this stop was attributed mainly to the location of the stop and the amenities provided. The stop provides a well-maintained shelter, benches, and a route map. The sidewalks leading to the stop are even and wide to accommodate disabled individuals as well as strollers. Additionally, the sidewalk and the area itself is well shaded by tree coverage and other landscape features. The stop is also near the Federal and Colorado intersection that provides marked crossings (right photo below), and is not near any curb cuts, providing a safer environment for individuals waiting or walking to the bus. Overall, the connectivity to the bus is quite good. That being said, like other stops in this area, cleanliness is poor. This is no surprise due to the lack of trash disposal at the shelter.

Bus stop #13813: Federal + Florida

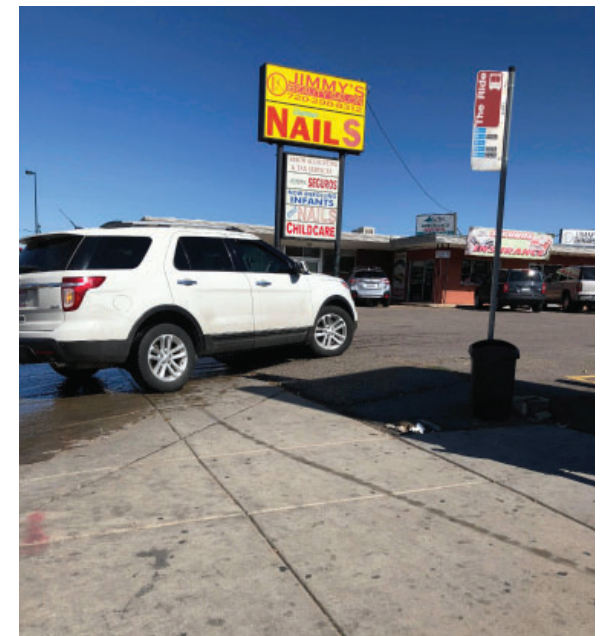
This stop has significant issues in many rating areas. As far as safety is concerned, the stop is sandwiched between an extremely busy gas station and a small plaza with a couple of restaurants. The stop sits right along the parking lot of this plaza. This makes access to the stop unsafe. In addition, while the stop sits near an intersection with a marked crossing, many pedestrians coming to the stop were seen crossing the street mid-block. A positive aspect of this stop location is that the setback from the road is large, meaning those waiting for their buses are not waiting dangerously close to the road.

Along with quite poor pedestrian safety, cleanliness and physical conditions are equally poor. A small trash can is strapped to the bus sign, and there is no available seating in the area. There are about four

EXHIBIT 18: Federal + Florida stop



EXHIBIT 18: Federal + Colorado stop



posts meant to separate the sidewalk and the parking lot of the plaza (as seen in the middle photo below) and individuals were observed using these as a makeshift bench. The project team also observed that when individuals were not waiting for their bus by sitting on these posts, they would instead wait in the parking lot of the gas station. The area itself was also littered with trash despite the small trash bin, and there was no surrounding landscape (i.e. grass, plants, tree shading, etc).

Bus stop #13833: Federal + Louisiana

This stop is one of the better stops along Federal. The amenities are extensive in order to accommodate the high number of individuals that board and deboard at this stop. Amenities include a shelter, additional benches, trash disposal, and route map. The high quality of the ADA accessible sidewalks are equally sustained, and the boarding area and setback of the shelter and benches is large. In addition, the stop was quite clean without the presence of any litter.

EXHIBIT 19: Federal + Mississippi stop



While not near any driveways, it's situated about mid-block, which may dissuade pedestrians from using the marked crossing at either the north or south intersection. However, the stop sits in a popular location right outside of large apartment complexes, providing excellent accessibility to those residents in particular.

Bus stop #13836: Federal + Mississippi

This bus stop had significant accessibility and cleanliness issues that impacted its ratings. The bus stop was completely surrounded by vast curb cuts on both sides (a large strip mall to the north and a busy restaurant to the south) and the surrounding sidewalks were narrow, right next to Federal, and covered with debris. The bus stop was located close to the intersection, so most people would probably use it.

Amenities include attractive sidewalk art, standard shelter, additional bench seating outside the shelter, and a permanent trash can. The center photo shows the

EXHIBIT 20: Federal + Kentucky stop



approach from the north with its dirt covered sidewalk. The far-right photo is a bit further north and shows the very narrow sidewalk right next to the road with utility poles right in the middle. These two photos demonstrate how difficult it would be for a person with a disability to use the sidewalk to get to the bus stop.

Bus stop #13829: Federal + Kentucky

This bus stop's safety was impacted by the surrounding curb cuts. On one side there is a fire station with a vast entry and exit driveway, and on the other side there is surface parking for a strip mall with a very wide entrance for cars. This made the project team feel very exposed when standing at the stop. Some positive attributes included having a concrete and asphalt pad and being located close to the intersection, so most people would probably use it.



Exhibit 20 shows the adjacent strip mall. The center photo shows the amenities including a standard shelter with a bench and a route schedule on the back wall. The far-right photo shows the nice wall art to the north side of the bus stop, along with a plastic trash can that is chained to the bus shelter.

Bus stop #13812: Federal + Exposition

This bus stop’s higher rating of four was due to the high number of amenities and improved sidewalk safety due to new building construction underway on the corner. It was accessible by a wide new protected sidewalk with no curb cuts on either side. Its amenities included an extra-large shelter with two covered benches, an additional uncovered bench, concrete pad, route schedule, trash can, and nearby landscaping. The bus stop was further set back from the street and felt safe. It was

also located close to the intersection, so most people would probably use it.

The right photo in Exhibit 21 shows the wide protected sidewalk south of the stop as well as the extra large shelter with two covered benches and route schedule. The left photo shows the additional uncovered bench, the trash can, and some of the new landscaping next to the stop. The photo also shows the large concrete wall behind the shelter and benches that protect people from cars that park directly behind it.

INTERCEPT INTERVIEWS

The bus stop site assessment included not only a windshield and walking survey to record conditions at each stop, but also intercept interviews with local bus stop users. This allowed collection of not only the team’s own impressions, but also community input by accounting for riders’

opinions of the amenities at each stop. In several cases, rider opinion about the condition and potential for a stop did not align with the team’s ratings of a given stop, so it was helpful to gather the views of those actually utilizing the resource.

Demographics

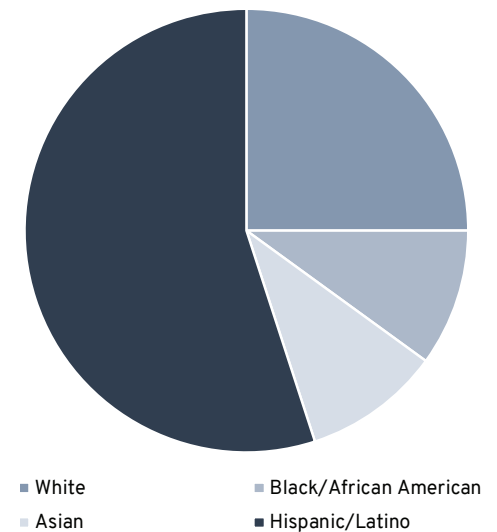
The team attempted to secure a well-rounded, representative sample of bus stop users by interviewing riders of all races, genders, ages, and abilities. Over the course of about two weeks, during the weekend, weekday during the morning, afternoon, and night, the team interviewed 20 riders across the study area.

Most respondents were Hispanic or Latino, which is not surprising given the demographics of the area. The next largest group of respondents were white, followed by equal shares of Asian and

EXHIBIT 21: Federal + Exposition stop



EXHIBIT 22: Race/ethnicity of respondents



black respondents. The team gathered almost equal shares of male and female respondents (12 male, 8 female).

Most of the interviewees were below the age of 39, though there were also relatively high shares of older adults. This may suggest that younger riders are bus riders because they do not yet own cars, though older adults in neighborhoods around Federal

EXHIBIT 23: Age distribution of respondents

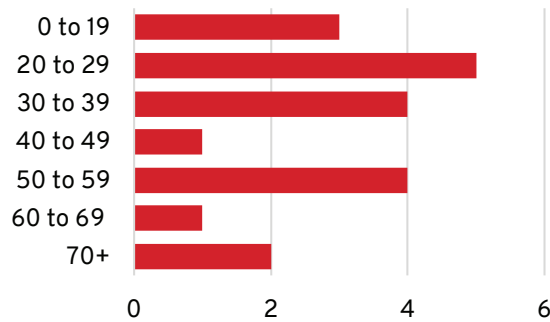


EXHIBIT 24: Frequency of transit usage

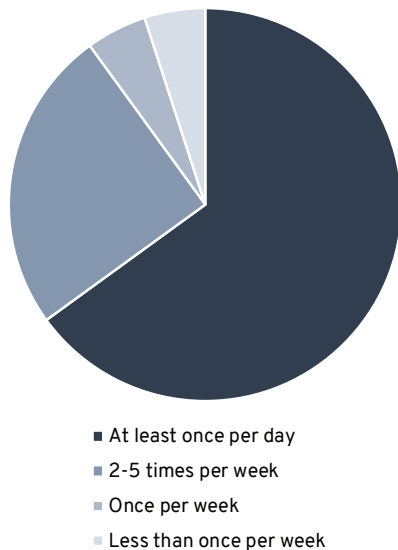
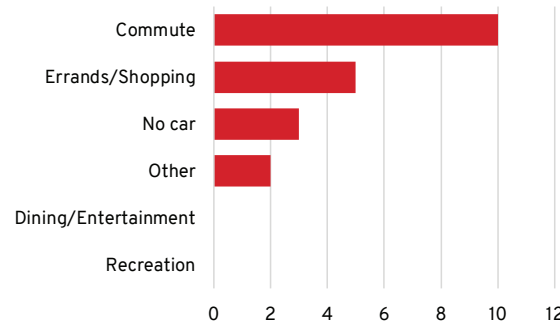


EXHIBIT 25: Stated reason for trip



Boulevard also rely on transit for their travel needs.

Finally, 90% of the respondents frequently used transit, at least twice a week or at least once daily.

Half of respondents stated that their reason for taking the bus was to get to work, and a quarter were using it for errands or shopping. It is worth noting that no respondents were using the bus for leisure, but rather for utilitarian reasons.

When asked to describe the reasons that they chose transit and not another mode, most respondents were quick to answer that they either did not own a car or could not afford another option. It is worth noting that many respondents reacted to the question as if it were asking why they did not just drive, rather than understanding the question as why transit might be desirable.

Most respondents took the bus because they had no other option. Only 3 of 20 respondents owned a car, and therefore most of the riders had no alternate reliable mode. Several interviewees did mention

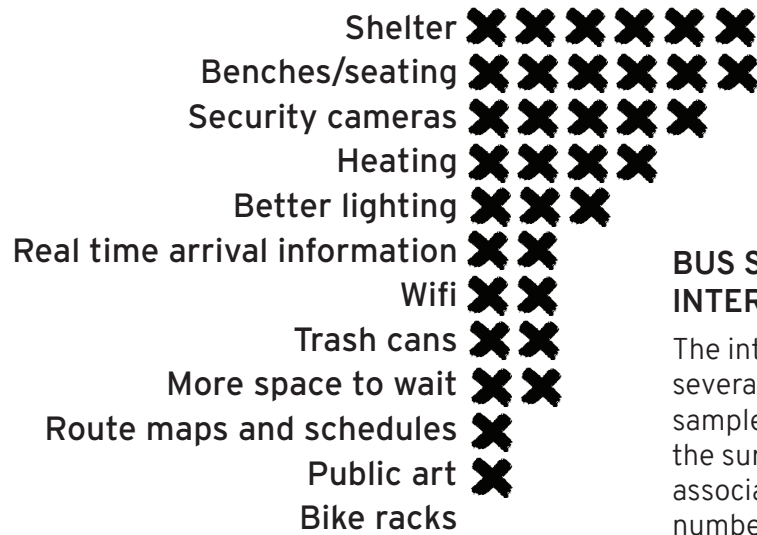
that the bus was easier than driving in Denver and that the frequent service was convenient. It is important to note that few respondents were attracted by the environmental and personal health benefits of transit. Most were using transit for utilitarian reasons.

The team asked interviewees what would improve the bus stop, providing a list of possible options. The first surprising result was that many respondents checked amenities that were already present at the stop, such as shelter, benches, or seating. This suggests that many respondents thought that their needs were already being met or that they just wanted to draw attention to basic needs. A few people at the stops in the southern portion of the study area mentioned how shelters along Federal have been removed (such as at the intersection of Federal and Florida) and they would like them back.

The second finding of note was that despite the long list of potential improvements, most respondents only selected two or three amenities (sometimes, even despite encouraging words like “Nothing else here?”). This is interesting given that they had an entire wishlist in front of them and could have selected everything, if they so desired, but did not.

The most requested bus stop features were simply shelter and seating, along with quite a few requests for security cameras. Many interviewees mentioned that they feel unsafe on Federal because of people with mental health issues and people smoking

EXHIBIT 26: Improvement options selected by respondents



or using drugs at bus stops. Heating, lighting enhancements, and real time arrival information were also requested several times.

Finally, respondents were asked to rate the stop on a scale of 1 (terrible) to 5 (great). The average of all 20 bus stop ratings was 3.3 - fine, but could be better. Though the team might have initially expected more impressive improvements like Wifi, public art, and bike racks, few respondents prioritized those factors. Instead, the general sentiment was to provide more basic amenities like shelter, seating, security cameras, and lighting across bus stops in the study area.

BUS STOP ASSESSMENT + INTERCEPT INTERVIEW METHODOLOGY CRITIQUE

The intercept interview methodology had several limitations that may have lead to sample bias. These include flaws within the survey questions as well as limitations associated with the researchers. Question number nine within the Survey states “Would you rather have: A longer walk to a nicer stop and less time riding? Or a shorter walk to a stop with less amenities and more time riding?” A majority of respondents were confused by this question, needing it to be repeated or reading the question themselves. It is likely that due to the confusing language many respondents picked an answer without really understanding the question. An additional miscommunication may have been present in question seven: “How would you rate this bus stop on a scale from 1-5?” This question seeks to explore a bus riders’ perception of bus stop quality in terms of amenities and safety. However, many respondents would rate a bus stop devoid of amenities a four or five, because they were happy with the frequency of their chosen bus at this particular spot.

There are several limitations associated with the intercept interview process.

These include language barriers and time constraints. Between the two groups of two interviewers, one group did not have a Spanish speaker. Though they had Spanish surveys, riders who primarily speak Spanish may have been more likely to turn down an interview. Additionally, neither group conducted interviews earlier than 8:30 AM, which eliminates responses from bus riders who work earlier than this time. Thus, the sample may be skewed towards English speakers and riders who take the bus in the late morning. Additionally, because the project team had limited availability, the majority of intercept interviews were conducted at the busiest bus stops, instead of being spread out over the seven stops.

CONCLUSION

The windshield and walking surveys reveal a lack of quality pedestrian infrastructure including a lack of connectivity, narrow unprotected sidewalks, and numerous curb cuts along Federal. Major findings from the bus stop assessment include a general lack of cleanliness across a majority of the bus stops within the study area. Of least concern across the board is pedestrian connectivity, with most of the stops rated a ‘5’ by the research team. The bus stops that stand out as having the worst conditions are stops at Federal and Florida (13813) and Federal and Mississippi (13836). The former was ranked a ‘2’ overall by the research team, primarily because of its lack of amenities and cleanliness, with litter scattered around the stop. The stop at Mississippi Ave. was rated a ‘3’ overall by the team, due to accessibility and cleanliness issues.

3. Gaps + recommendations

After completing the bus stop assessment and intercept interviews in the study area, the team identified the main bus stop and pedestrian infrastructure gaps outlined in this chapter. In addition, the team provides recommendations to the City and County of Denver and WalkDenver for reducing or eliminating these gaps.

TRANSIT + PEDESTRIAN INFRASTRUCTURE GAPS

Existing transit/pedestrian infrastructure gaps

The transit and pedestrian gaps in the Ruby Hill/Athmar Park study area must be addressed, especially to improve connectivity and comfort along the bus stop route. Many sidewalks along Federal are unprotected, detached, or, in some cases, non-existent. Throughout the residential areas of Ruby Hill and Athmar Park, sidewalks and pedestrian walkways are less than three feet wide with a rollover curb, making it difficult to connect to the transit corridor along Federal.

In addition, much of the area on the East as well as the West side of Federal Boulevard has vast curb cuts and very narrow sidewalks surrounding the bus stops. Many sidewalks are also obstructed by telephone polls and offer little setback from the hectic roadway. Moreover, some sidewalks around

new development are unpaved dirt paths, which make it impossible for individuals with disabilities to use. Besides the significant sidewalk issues in the area, this study also discovered that bus stops sit close to driveways making it unsafe for pedestrians to access as well as comfortably sit at the bus stop.

Missing transit/pedestrian infrastructure gaps

The study team found many examples of missing infrastructure needed. In particular, the North-South residential streets currently do not connect to the East-West corridors, and these streets are not continuous, greatly impacting pedestrians and bicyclists trying to access the bus stops. As mentioned earlier, the team also saw instances of a complete lack of sidewalks and pedestrian walkways. In particular, there is a lack of safe pedestrian crossings for residents within the residential areas, again making it difficult for individuals to access the bus routes along Federal.

There were also gaps found in the bus facility infrastructure. While many stops did offer shelters, the study found instances of busy bus stops with no infrastructure at all, requiring waiting passengers to sit on the ground, on posts, and loiter in nearby business parking lots.

Finally, it was found that while all traffic signals provided marked and timed crossings, many pedestrians still crossed mid-block. This is primarily due to the fact that blocks along Federal are quite long, and walking to a crossing may take longer

than taking a chance to run across traffic. Without a median or mid-block flashing crosswalk, this is extremely dangerous for pedestrians.

Transit-rider/pedestrian experience gaps

The largest issues found within the experience gaps are directly related to the transit-rider/pedestrian experience. Main gaps found included poor maintenance including overgrown vegetation, almost no lighting, and excess litter at all bus stops. Especially with regards to lighting, the team found that after it gets dark, almost no pedestrians or transit-riders can be seen at the stops along Ruby Hill and Athmar Park, as well as at the bus stops at the adjacent neighborhoods on the West side of Federal Boulevard.

Another significant gap is the lack of tree canopy, which is existent along the full stretch of Federal. Finally, through interviews, it was discovered that many transit-riders fear their safety, primarily due to pedestrians on the other side of Federal who loiter at the bus stops.

GAPS



Existing transit/pedestrian infrastructure gaps

Unprotected, detached, narrow sidewalks
 Vast curb cuts
 Obstructions blocking paths
 Bus stops near driveways
 Unpaved dirt paths

Transit-rider/pedestrian infrastructure gaps

Poor maintenance
 Lighting
 Tree canopy
 Safety

Missing transit/pedestrian infrastructure gaps

Connectivity to east-west corridors
 Some areas where there are no sidewalks
 Lack of safe pedestrian crossings
 Bus stop infrastructure
 Mid-block crossing

— Best Bus Stops

— Average Bus Stops

— Worst Bus Stops

Bus Shelter

Bench

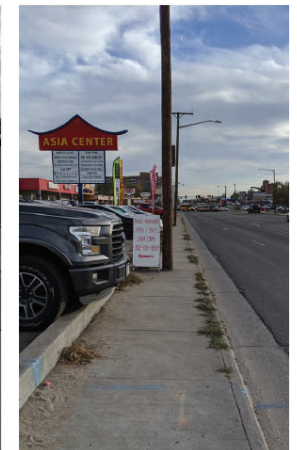
Cleanliness

Safety

Accessibility

Connectivity

Tree Coverage



TRANSIT + PEDESTRIAN INFRASTRUCTURE RECOMMENDATIONS

In order to address the gaps identified above, the team makes the following recommendations to the City and County of Denver and Walk Denver to eliminate or reduce these gaps. The recommendations aim to improve the overall transit-rider and pedestrian environment/experience within the Study Area. In addition, the team produced recommendations for two specific bus stops that were of particular concern based on the bus stop assessments.

Curb cut consolidation + parking needs assessment

The study found that Federal Boulevard's safe sidewalk infrastructure is greatly hindered by the abundant and frequent curb cuts that allow access to parking for all of the businesses along the corridor. It is important to maintain access to these businesses and not impact their viability while also improving the pedestrian, bicycle, and transit experience along the boulevard.

The recommendation is for the City to conduct a parking needs assessment to determine where curb cuts can be consolidated and where parking lots can be shared. Adjusting the parking requirements by introducing a shared parking model and reducing curb cuts could minimize the parking while also reducing the complexity around the major sidewalk improvement projects that are needed.

Sidewalk infrastructure improvements + uniformity

In order to provide a continuous and safe pedestrian environment along Federal Boulevard as well as adequate connections to neighborhood streets, the City needs to upgrade the sidewalk infrastructure. There is currently no consistency with the sidewalks along the corridor, and this prohibits pedestrian safety. Sidewalks varied from non-existent to narrow and unsafe right next to the road to wide new sidewalks with landscaping present (typically where new development has occurred and City code required these improvements).

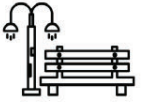
City ordinance already establishes that sidewalk maintenance, repair, and installation is the responsibility of the property owner, but this is not being enforced along Federal Boulevard. The City has a Neighborhood Sidewalk Repair Program that currently provides financial assistance for homeowners in certain areas. A recommendation is to expand this program to Federal Boulevard businesses or to seek additional funding to make these improvements.

Street crossing infrastructure

The study found that pedestrians often cross mid-block along Federal Boulevard due to the long distances between the traffic signals. In order to increase the safety for pedestrians along the corridor, the team recommends introducing pedestrian friendly infrastructure including:

- **High visibility crosswalks at intersections:** All intersections must have well painted, highly visible crosswalks.
- **Mid-block crossings:** Adding these additional crossings will connect important destinations that do not align with the street network. This would be appropriate near parks, schools, major shopping centers, and bus stops. These crossings need to include high visibility crosswalks, pedestrian signs, medians, ADA ramps, and traffic signals to stop traffic when pedestrians are present.
- **Medians:** Install new raised medians for increased safety and beautification of the corridor. The medians should be planted with trees to improve the tree canopy as well. It may be appropriate to include median fencing in some areas to further discourage pedestrians from crossing unsafely.

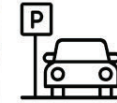
RECOMMENDATIONS



Minimum amenity requirements for each bus stop.



Sidewalk infrastructure improvements + uniformity.



Curb cut consolidation + parking needs assessment.



Street crossing infrastructure like median refuge islands.



Minimum amenity requirements for each bus stop

The city should require a minimum set of amenities for every bus stop along the corridor. Given the high ridership along Federal Boulevard, a minimum set of amenities is justifiable to keep transit riders safe and to encourage greater use of the transit system. The set of required amenities must include:

- A concrete platform set back at least ten feet from the curb
- Connecting concrete sidewalks that require safe access to the stop for people of all abilities and ages
- A bus shelter with bus stop benches for transit riders
- Transit signage and bus schedule with a transit map
- Waste receptacles
- Regular maintenance of bus shelters: trash, debris, and graffiti removal

Specific improvements: bus stop #13813 at Florida + Federal

Of particular concern is the Florida and Federal bus stop (#13813). The team observed that this bus stop was one of the busiest stops, yet had the worst conditions. Due to the lack of amenities and cleanliness as described earlier in this report, the team recommends a shelter with a bench.

Many riders stated that they used the bus instead of a car due to their age or health conditions. Thus, bus benches and shelters are critical to the populations who are reliant on bus infrastructure. Specific to this bus stop, there needs to be a defined barrier between the bus shelter and the bordering parking lot. The team recommends several planters to act as this barrier.

Specific improvements: bus stop #13836 at Mississippi + Federal

The team found the bus stop at Mississippi and Federal to have serious accessibility and cleanliness issues. The sidewalk next to this bus stop is very narrow with utility poles protruding through the very middle of the sidewalk. This would prevent anyone in a wheelchair from accessing the bus stop.

Therefore, we recommend expanding the sidewalk back from the road into the parking lot in order to create adequate sidewalk widths and accessibility for all people. Additionally, the team recommends reducing curb cuts in this area to ensure the safety and comfort of those walking to and utilizing this bus stop.

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