
Valverde + Athmar Park



Erik Braaten, Kortney Harris, Nikisha Mistry, and Justin Rinaldi



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Chapter 1: Introduction and Existing Conditions





Safe access to reliable public transportation should be an essential goal in every community. The City and County of Denver (CCD) has made this a priority in its transit plan *Denver Moves: Transit*. In its effort to do so, CCD made it a goal to take inventory of the conditions at the over 2,000 bus stops in the city. WalkDenver is a nonprofit organization in Denver that operates to enhance conditions for pedestrians on the streets by making them more safe and accessible. WalkDenver's self-stated mission is "to reclaim Denver's streets for people" (WalkDenver). The organization has teamed up with The University of Colorado Denver's Master of Urban and Regional Planning program to allow its students to aid CCD in this effort. This project will provide insightful information to the city as they work to improve bus stops, in particular stops providing bus service to residents in neighborhoods along one of the city's busiest streets, Federal Boulevard.

The group has been assigned the neighborhoods of Valverde and the north half of Athmar Park as their study area. The neighborhoods are situated west of I-25 and south of 6th Street, along Federal Boulevard's east side. The other busy street in the study area, Alameda Avenue, separates the two neighborhoods. There are six Regional Transportation District (RTD) bus stops in the study area along Federal Boulevard that will be the focus of our study.

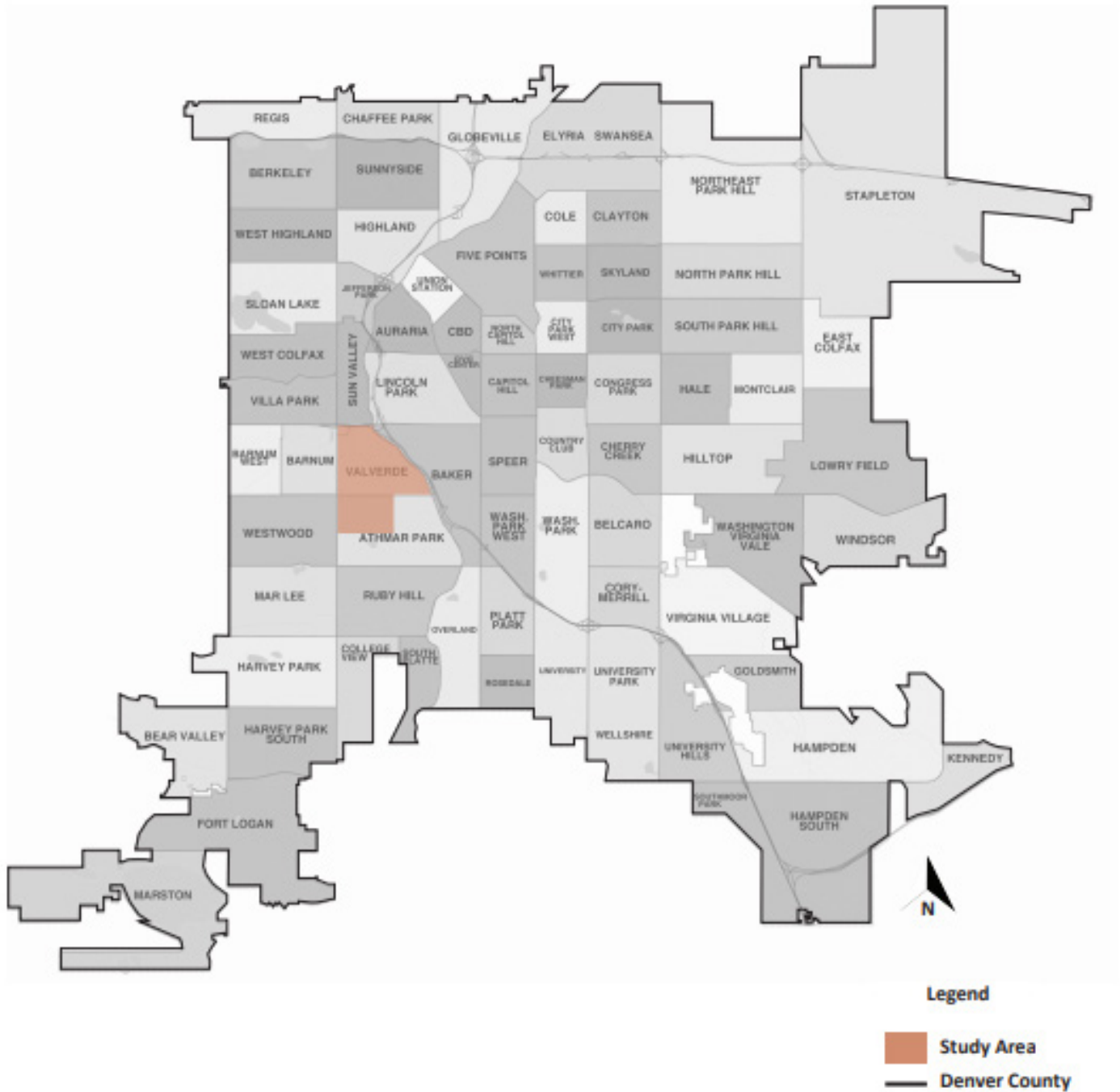
The team members are Erik Braaten, Kortney Harris, Nikisha Mistry, and Justin Rinaldi. All are students pursuing masters degrees in urban and regional planning. This course, Planning Methods, is a required course in the curriculum that aims to teach and reinforce strategies and methods professional planners use regularly in their profession. During the course of this project, each group will deliver three tasks each with specific criteria aimed at giving an in-depth analysis of existing conditions in the study areas and ultimately provide recommendations to our client to help them accomplish their goals of improving the bus stops along Federal Boulevard and making Denver streets safer.

The following report will give a detailed account of these conditions by providing a look at the current context of the study area and site assessments. The area context will be shown through researching certain demographic features of the area's residents, current permitted land uses, transportation network, and urban fabric. Site assessments will be made in person using observations made in Valverde and Athmar Park. The group will be looking at the area's physical features as well as converse with residents in the neighborhoods. The results of the research will inform recommendations to help CCD in its goal of providing safe, reliable, and accessible public transportation.



Introduction | Study Area Location Map

Figure 1

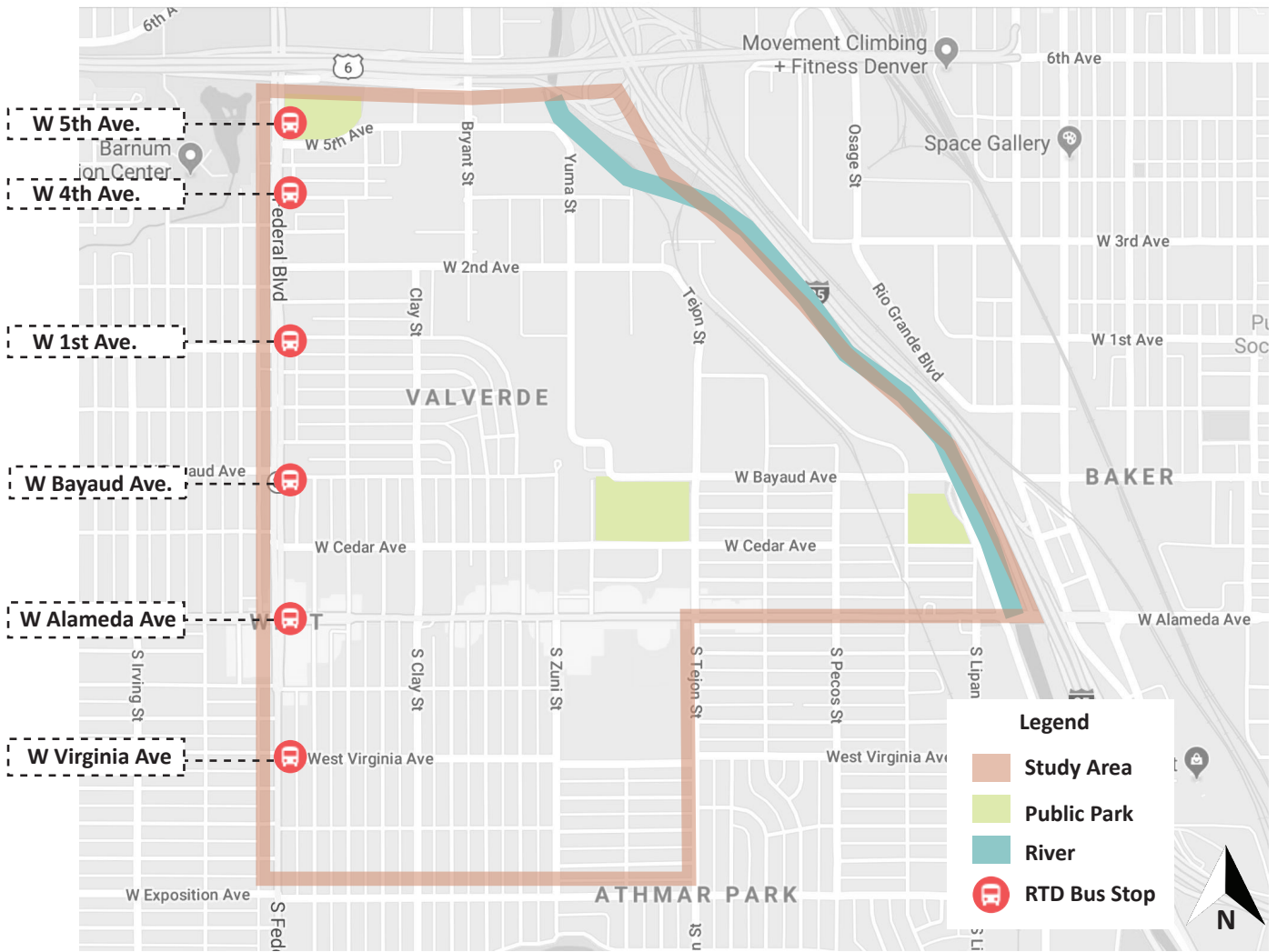


Source: City and County of Denver



Introduction | Study Area Detail Map

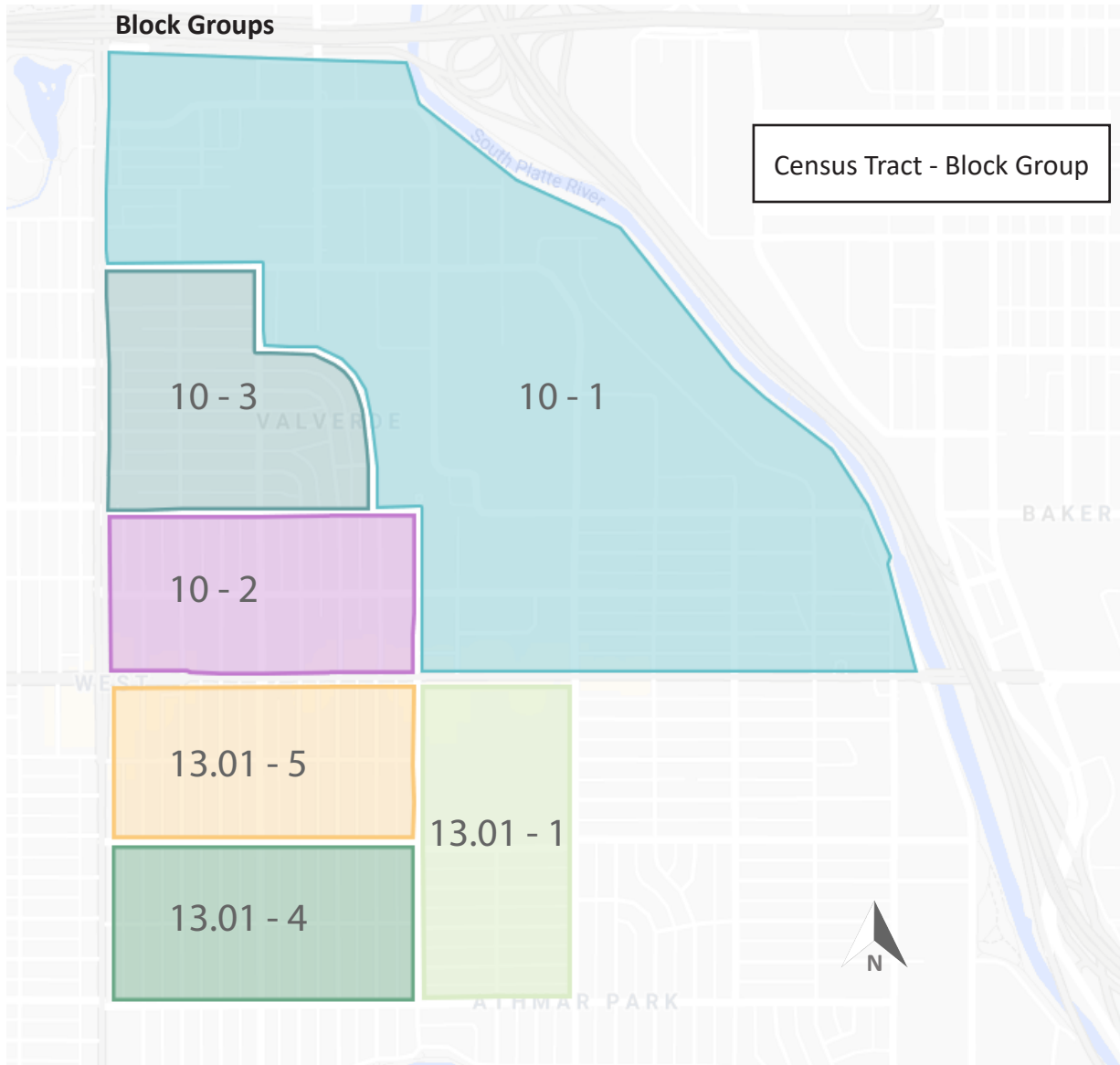
Figure 2



Source: Google Maps



Figure 3



Source: Denver Open GIS

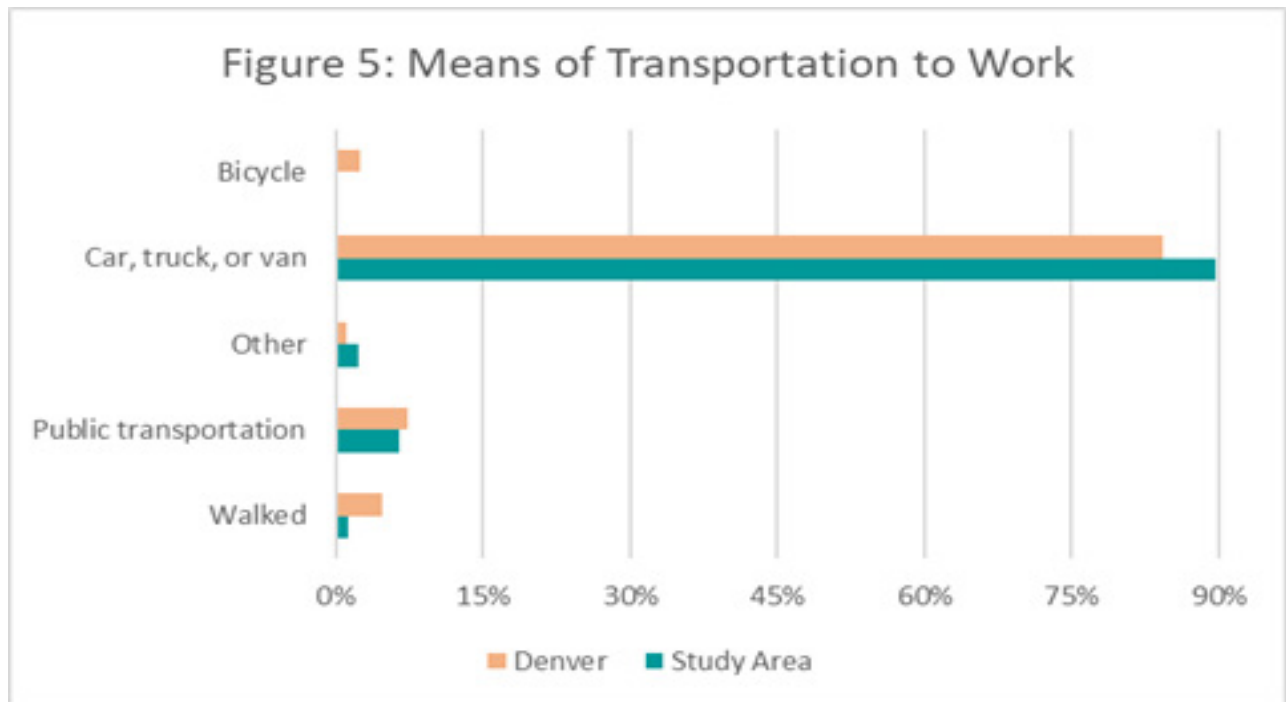


Demographic Profile | Means of Transportation

The ways in which people get to work can potentially tell a lot about the community they are from or the built environment of their neighborhoods. According to U.S. Census Bureau American Community Survey (ACS) data from 2017, in both the study area and Denver as a whole, the majority of individuals over 16 is six percent higher in the study area compared to the rest of Denver. The rate of public transportation use is slightly lower, and alternative means like bicycling and walking to jobs is markedly lower. This could be due to multiple factors such as a potential lack of safe bicycle infrastructure discouraging bicycling, a lack of effective public transportation lines, unsafe sidewalks, local culture of preferring driving to other means, the types of jobs people are working, and when and where they are commuting. Any combination of these factors and countless others are possibly at play to influence residents of the study area to choose driving and carpooling over other methods.

Figure 4: Means of Transportation to Work

Mode	Study Area		Denver	
	Count	Percentage	Count	Percentage
Car, Truck, Van	2,811	90%	286,512	84%
Public Transportation	200	6%	24,960	7%
Bicycle	11	< 1%	8,081	2%
Walked	40	1%	16,133	5%
Other	74	2%	3,865	1%
Total	3,136	100%	339,551	100%





Demographic Profile | Household Income

The number of households in the study area is less than one percent of the number of Denver’s households. The data was divided into four categories based on income. Per the US Census Bureau, household incomes under \$20,000 were considered below or near the poverty line. Low incomes ranged from \$20,000 to \$44,999. The team chose to combine the Bureau’s classifications for middle and upper middle classes into just one middle class which ranged from \$45,000 to \$149,999 for total household income. The high-income classification was \$150,000 and higher (Amadeo).

Distribution of wealth appears to be more spread out for Denver County compared to the study area. The highest count for total household income (mode) in both the study area and Denver county was within the middle-class category. In the study area, this category was 42 percent, almost half of the population. The Denver County middle class was 48 percent, even closer to half the population. Compared to Denver county, where 15 percent of the population falls within the high-income classification, the study area’s high-income population was less than half that at five percent. Denver county’s high-income population was about three times that in percentage points. Outside of the middle class income range, the study area’s household income fell mostly in the “Low Income” classification. Total low income for this area was 12 percentage points higher than Denver County as a whole.

As the team walked South Federal, they noticed that residential streets did not sit far from this major road. Just one block out from South Federal was a grid of small homes. The team concluded that public transit in the form of bus transportation was used heavily in the section of South Federal. This was based on the large count of low income households and the proximity of residential areas to the main road.

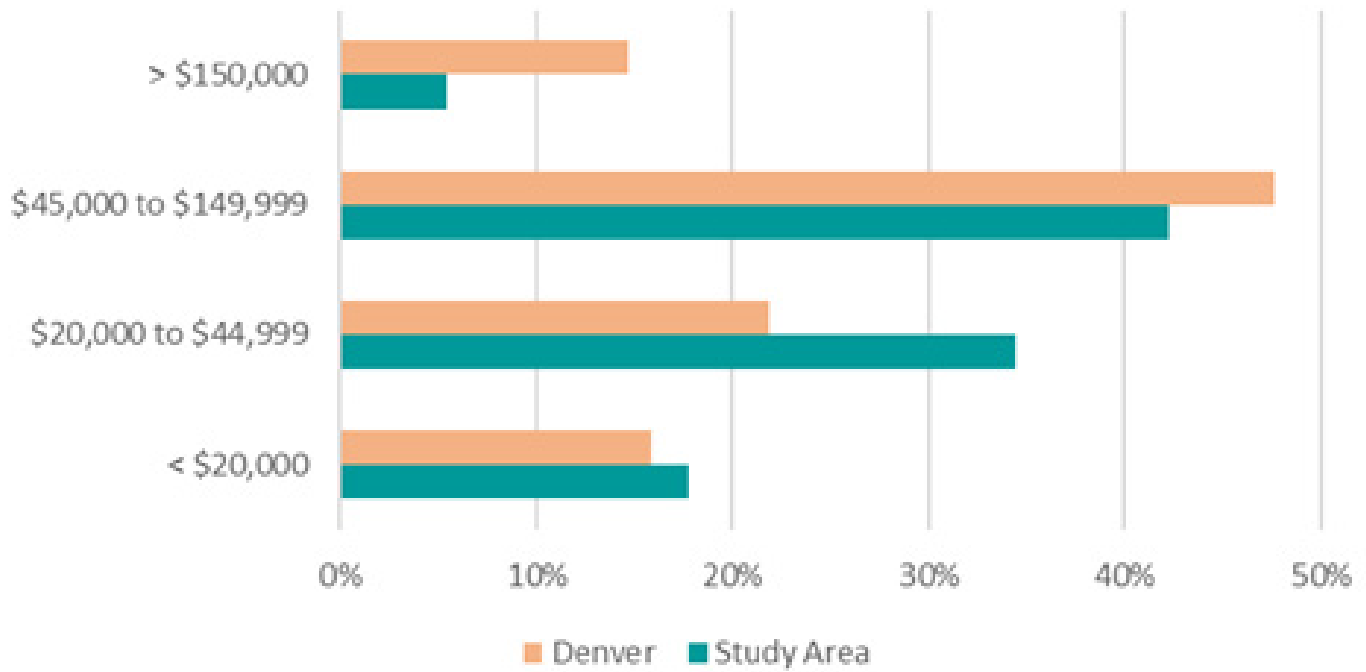
Figure 6: Household Income

Dollars per year	Study Area		Denver	
	Count	Percentage	Count	Percentage
< \$20,000	385	18%	45,498	16%
\$20,000 to \$44,999	744	34%	62,747	22%
\$45,000 to \$149,999	915	42%	136,861	48%
> \$150,000	118	5%	42,156	15%
Total	2,162	100%	287,262	100%

Source: US Census Bureau



Figure 7: Household Income





Demographic Profile | Race

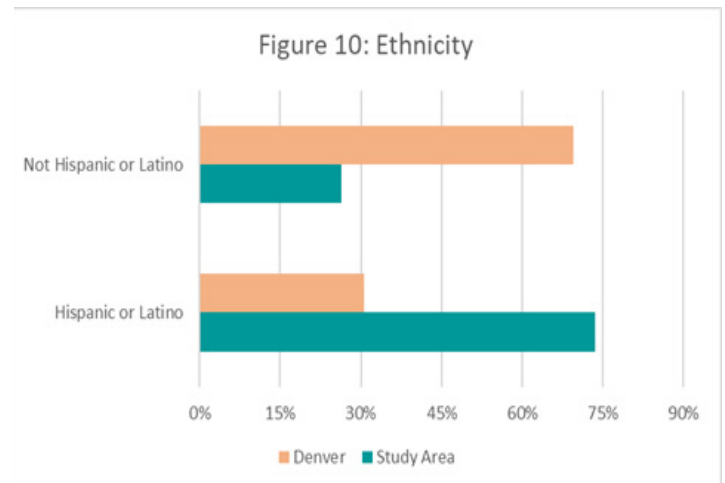
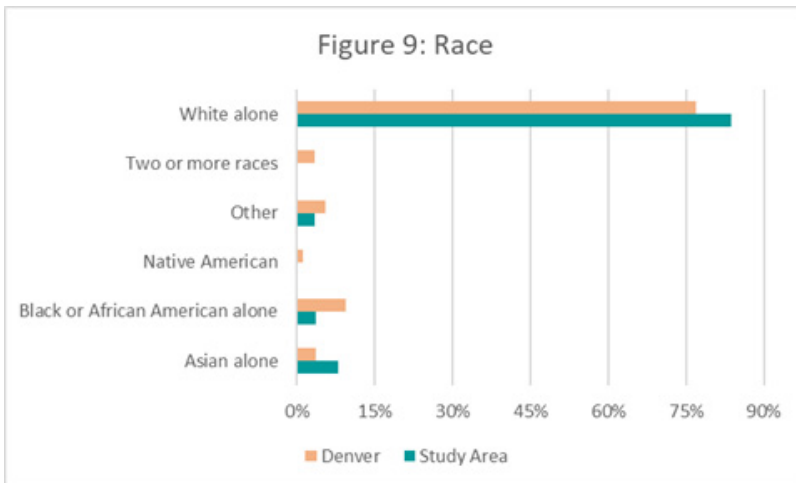
Traveling along Federal Blvd reveals much about the people who lives in this study area. The racial background of the residents of the study area differs greatly from Denver as a whole. Many of the businesses lining the busy street cater to the Hispanic and Latino community who make up 74 percent of the area’s residents. At 31 percent, Denver has a substantially lower population of Hispanic or Latino residents. Contrastly, there is a higher percentage of Asians in the study area compared to Denver as a whole. As seen in Figure 9 below, the study area population is eight percent Asian compared to Denver’s four percent. The study area has less than half the percentage of the African Americans as Denver.

Figure 8: Race and Ethnicity

Race	Study Area		Denver	
	Count	Percentage	Count	Percentage
White alone	5,912	84%	521,481	77%
Black or African American alone	259	4%	64,466	10%
Asian alone	562	8%	24,433	4%
Other	245	3%	37,216	5%
Two or more races	49	<1%	23,341	3%
Native American	43	<1%	7,530	1%
Total	7,070	100%	678,467	100%

Ethnicity	Study Area		Denver	
	Count	Percentage	Count	Percentage
Hispanic or Latino	5,201	74%	207,100	31%
Not Hispanic or Latino	1,869	26%	471,367	69%
Total	7,070	100%	678,467	100%

Source: US Census Bureau





Demographic Profile | Age

The study area has significantly less people than Denver as a whole, but has very similar percentages regarding age. To analyze this, the groups were broken down into five different age groups. This can be seen in Figures 10 and 11. The study area has a significant amount of people under the age of 60, making up more than half of their neighborhood population. The smallest percent of the population consists of people over the age of 75, which is four percent of the area's total population. This is similar to Denver, where more than half the population is also under the age of 50 and the smallest age group is over the age of 75 at five percent.

Figure 11: Age

Years	Study Area		Denver	
	Count	Percentage	Count	Percentage
Newborn to 19	1,986	28%	152,330	22%
20 - 34	1,641	23%	194,874	29%
35 - 59	2,402	34%	221,860	33%
60 - 74	766	11%	78,130	12%
75 +	275	4%	31,273	5%
Total	7,070	100%	678,467	100%

Source: US Census Bureau

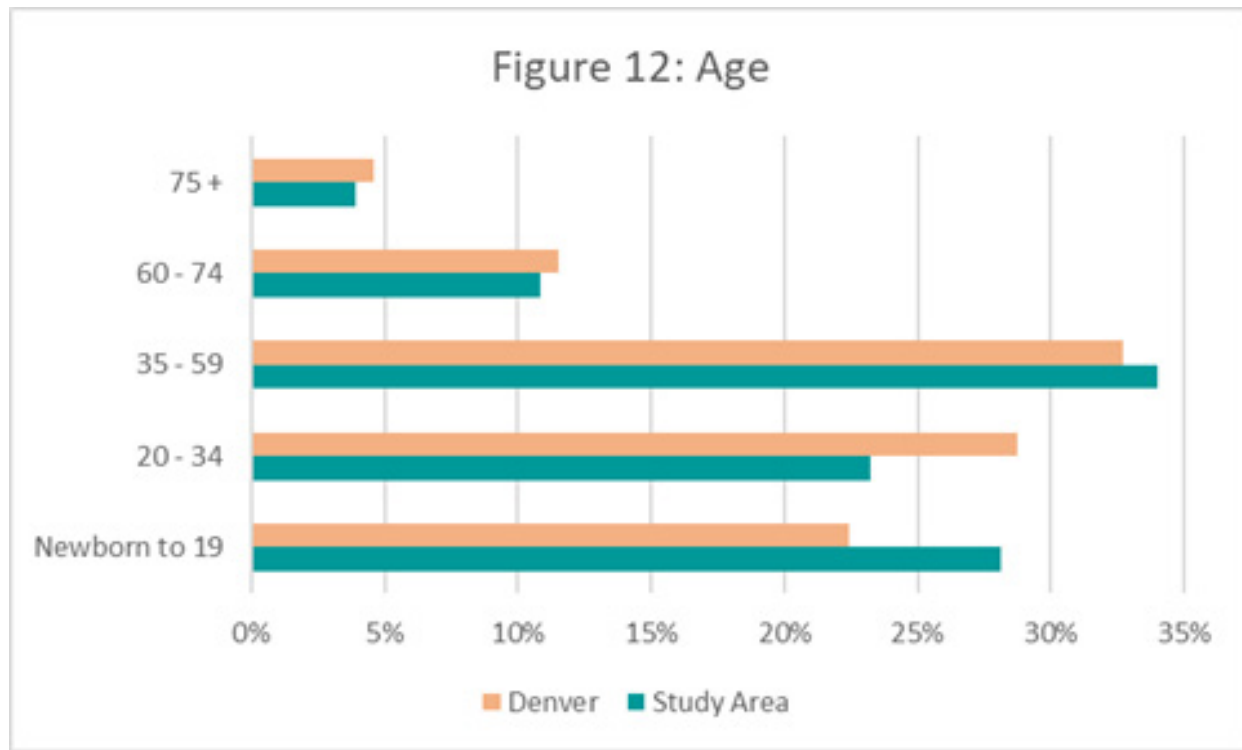
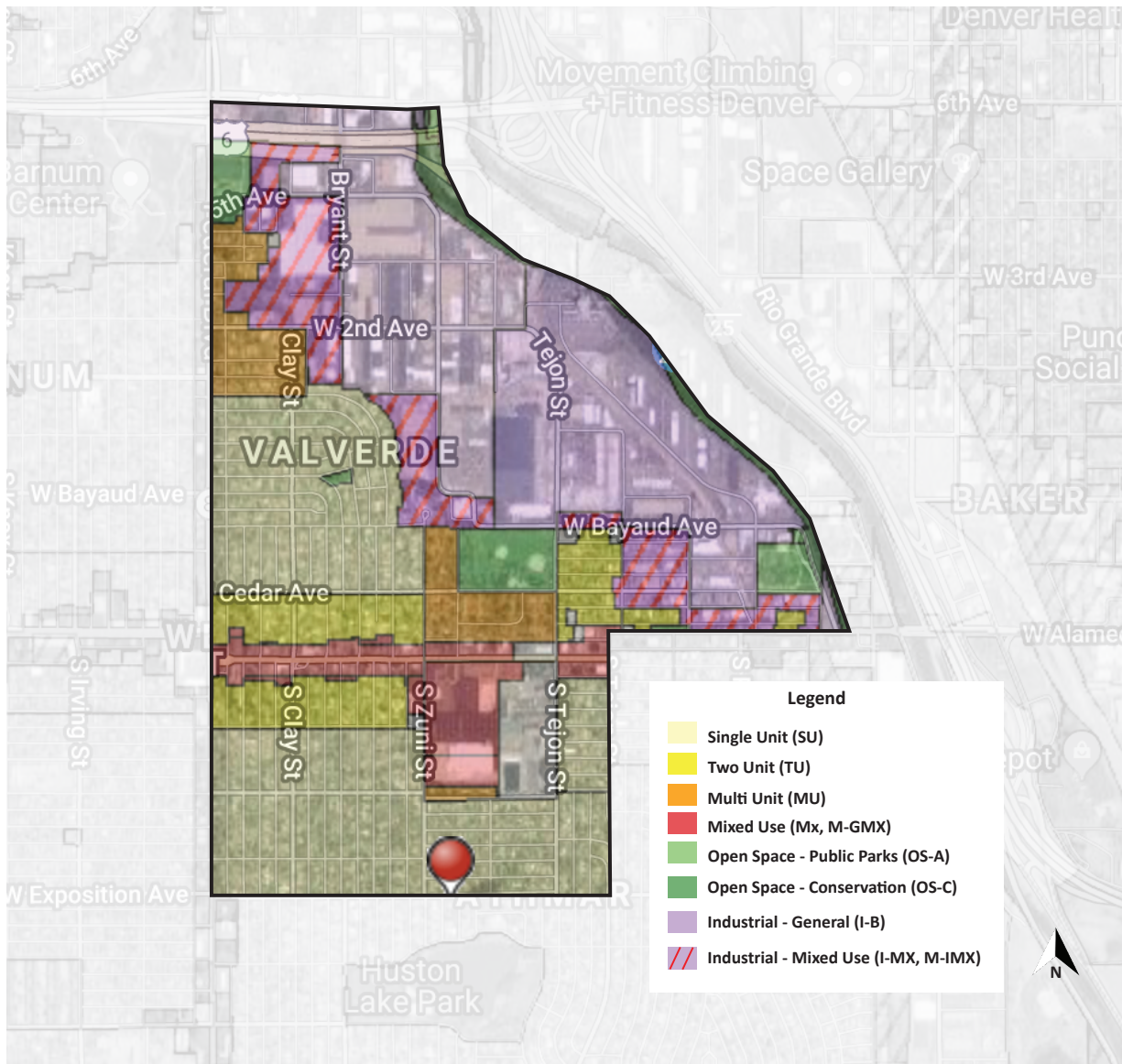




Figure 13



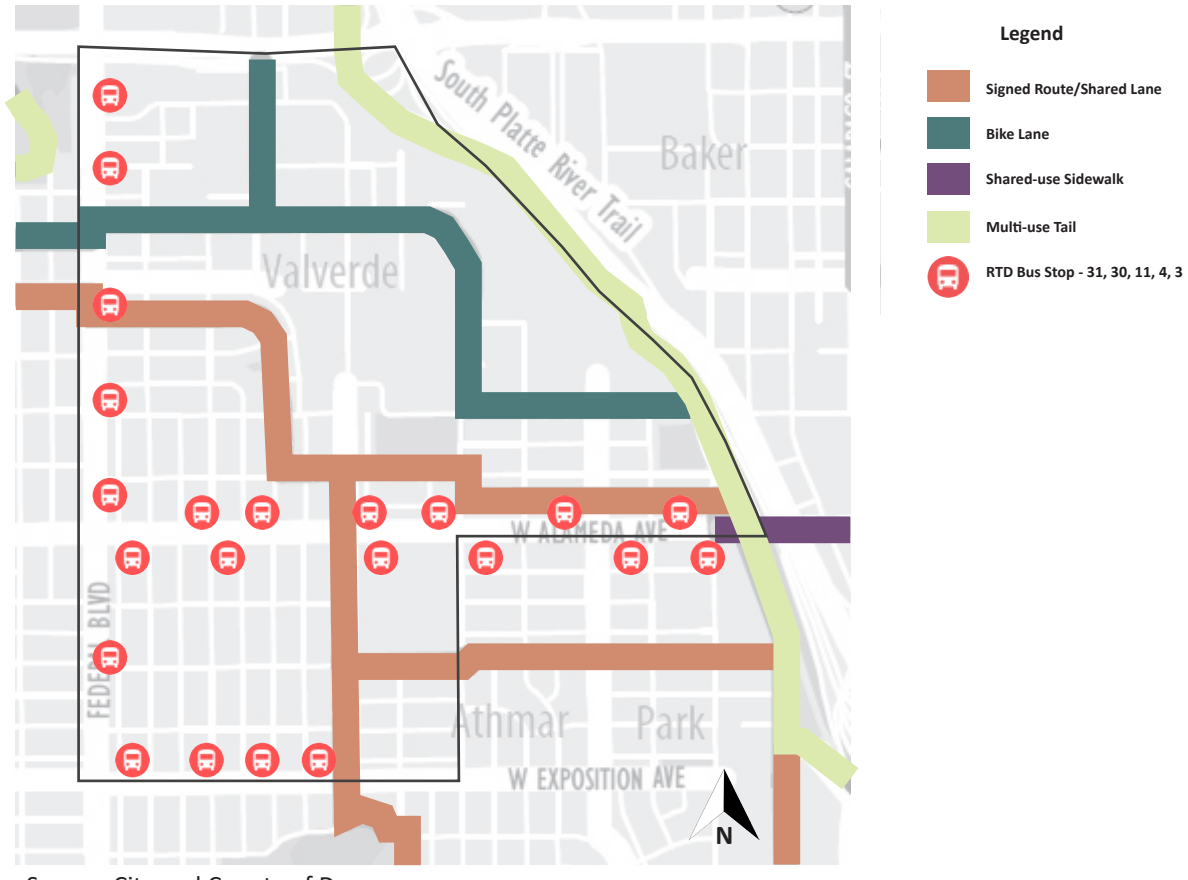
Source: City and County of Denver

The study area contains a variety of land uses. While there are residential zones consisting of primarily single-family housing, commercial and industrial uses are dominant here. This is most apparent in Valverde, where it is clear that industrial zones make up most of that neighborhood. However, once one goes south of Alameda Avenue into Athmar Park, the area is predominantly residential. Most commercial activity is restricted to parcels along the two main streets: Federal Blvd and Alameda Ave. The area contains two public schools, Valverde Elementary School and Rishel Jr. High School, and three other schools, Kipp Sunshine Academy, Florence Crittenton Services, and St. Rose of Lima School. There are green spaces here as well including Barnum East Park, West Bar Val Park, Valverde Park, and the area along the Platte River which makes up the area's eastern border.



Neighborhood Context | Transportation

Figure 14



Source: City and County of Denver

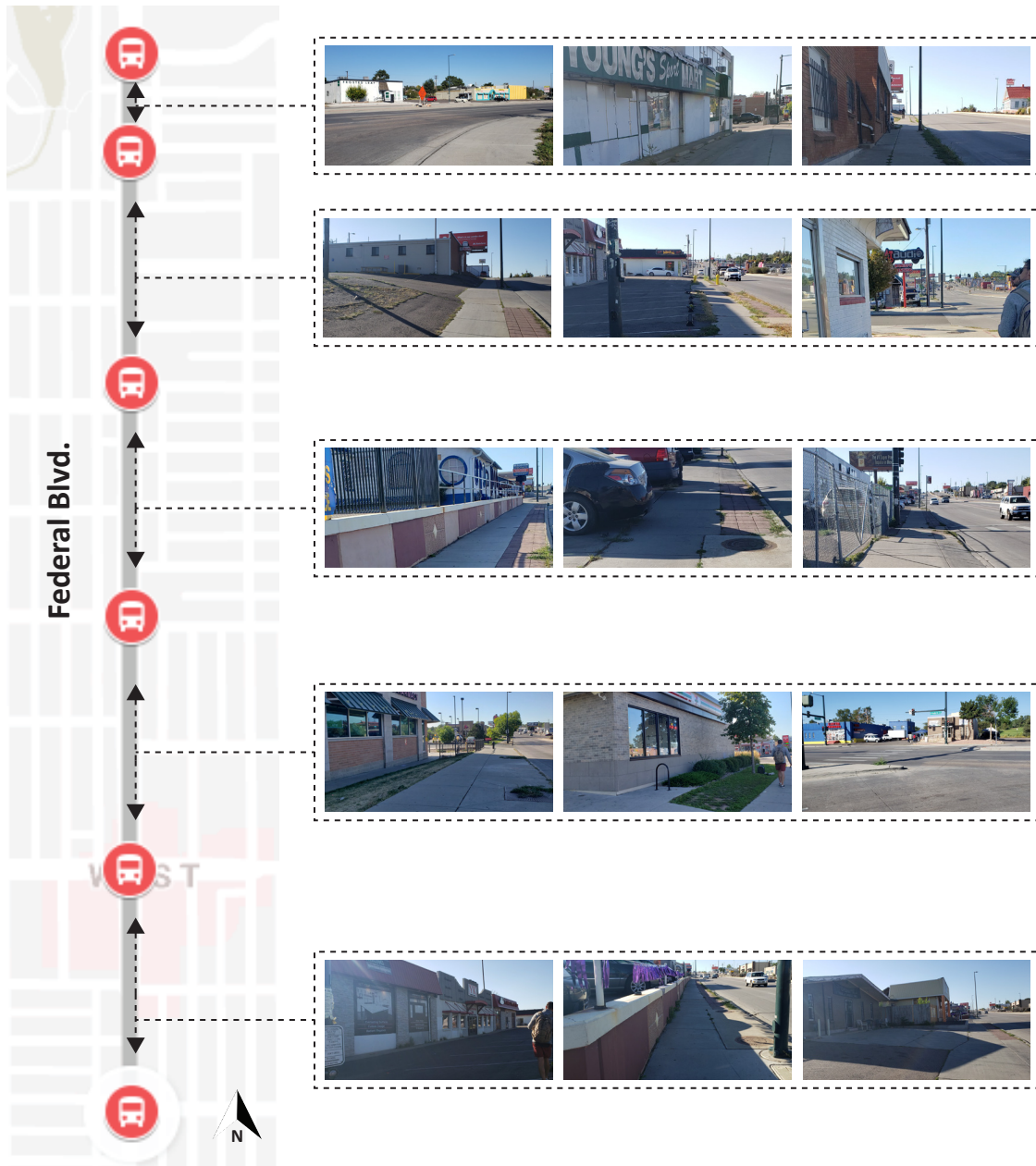
The system of transportation in the study area was very much aimed towards automobile use. There was limited bicycle infrastructure, especially along the main streets. The study area's main streets, Federal Boulevard and Alameda Avenue, are both part of the City and County of Denver's High Injury Network identified by Denver's Vision Zero initiative. The High Injury Network comprises five percent of Denver's streets, but 50 percent of traffic deaths. Neither Federal Boulevard nor Alameda Avenue have dedicated lanes for buses even though several lines use both streets, and neither have any sort of bicycle infrastructure. In the rest of the study area there were no streets with protected bike lanes, but there were two short routes that have an unprotected bike lane in Valverde where most of the land use is industrial. There were some signed route/shared lane bike routes in the southern part of Valverde going east and west and going through part of Athmar Park heading to the south. A multi-use trail does go along the northeastern edge of Valverde, the South Platte River Trail, which could be used to connect residents to other areas of the city and metro area. There were no light or commuter rail lines that go through the study area. Several bus routes run through the study area and may be used by residents to get around the city, but according to Figure 4 above, very few residents use public transportation as their means to get to work. The vast majority of residents drive, whether alone in a single occupancy vehicle or by carpool.



Neighborhood Context | Urban Fabric

The urban fabric of the neighborhood is comprised consistently of narrow sidewalks and buildings of similar height with varying setbacks. The buildings are often either right up to the sidewalk or very far back, providing parking in some instances. The urban fabric was consistent from the northern end of the study area along Federal Boulevard to the southern end, with the exception of its intersection with Alameda Avenue. This area had a completely different feel from the rest of the neighborhood. There were wider sidewalks, street trees, and plenty of chain restaurants, whereas the northern and southern ends contained mostly small local businesses. The intersection of Alameda Avenue and Federal Boulevard is the highest point along Federal Boulevard in the study area.

Figure 15



Source: Google Maps



Chapter 2: Site Assessments





Introduction

Studying the demographics of an area can reveal significant details about the people who live there and can give us a small but important glimpse into their lives. It is also important to become familiar with the conditions of the built environment. This can include the presence (or lack thereof) of green spaces, the quality of the infrastructure, the types of businesses or the absence of businesses altogether, and numerous other features that are significant. These observations are another piece of the puzzle that are critical for developing a thorough understanding of an area.

CCD zoning shows that Valverde and North Athmar Park are home to a variety of land uses, as discussed earlier. Federal Blvd. and Alameda Ave. are the two main streets which pass through the study area. These streets are primary corridors which connect to many other Denver neighborhoods and surrounding suburbs. This results in heavy and fast-moving traffic and a concentration of commercial uses lining both sides of both streets. Storefronts and strip malls contain several auto body shops and a variety of other businesses which largely cater to a Hispanic/Latino and in some cases Asian clientele.

The intersection of Federal Blvd. and Alameda Ave. is a highly congested and active area. Here there are popular chain fast food restaurants and a Walgreens pharmacy. There are also three other RTD bus stops at the intersection in addition to one that sits in the Valverde and North Athmar Park study area. Pedestrians using the crosswalk at the intersection must cross six traffic lanes on all sides. This includes many bus users.

The areas directly behind the commercial corridor of Federal Blvd. and Alameda Ave. are residential areas, consisting of mostly single-family housing and some multi-family housing. There are several great parks in the area: Barnum East Park, West-Bar-Val Park, Valverde Park, and the South Platte River Trail. These are excellent spaces that are available to community members and provide them with an array of recreation and sporting opportunities from biking along the Platte River to playing soccer with a stunning view of downtown in East Barnum Park.

In the eastern-most section of the study area, particularly in the Valverde neighborhood, there is a prominent industrial/commercial district which sits between the Platte River the residential areas. This area is dominated by multiple warehouses and large parking lots.



Execution and Safety Plan

Fieldwork is an essential function of meaningful and credible urban and regional planning. Planners create plans for communities therefore it is imperative that we go into the communities that we are planning for. In order to ensure that fieldwork is conducted in a timely, efficient and safe way, it is important for teams to reflect on how that can be accomplished. This is done by creating a detailed execution and safety plan.

Timeline

This project requires both site inspections and on-site interviews of community members, specifically RTD transit users. Deadlines are always looming, so it is important to allow for sufficient time to conduct all of the appropriate fieldwork. All intercept interviews are to be completed by Tuesday, October 22. Each group member is responsible for obtaining at least five interviews each. We will meet at pre-decided dates and times that work with each group member's schedule to acquire the required number of interviews. Kortney and Nikisha have volunteered to use CCD & WalkDenver's ratemystop online rating survey to take inventory of the conditions at each stop. This work will be completed by Sunday, October 26.

On-Site Methodology and Back-Up Plans

Each group member has access to a car but some use a variety of modes of transportation. Kortney and Erik are most familiar with the bus and use it frequently, so they will take the bus to the study area or their cars depending on the day and convenience. Justin and Nikisha will be using their cars to get to the area. Once on site, the group will be conducting analysis and interviews with transit-users on foot.

For the interviews, Kortney has printed 20 surveys in English, five in Spanish, and three in Vietnamese. The surveys will be conducted through one-on-one discussions where group members will read the questions to the respondent and recording the answers on each sheet. One sheet per respondent. Site investigations are to be conducted by using ratemystop, a website provided by CCD and WalkDenver. Any additional observations will be recorded using personal notes. The results from interviews and site investigations will then be reviewed and synthesized for further analysis.

Since group members are only somewhat familiar with the area and the popularity of the bus stops there, we anticipate the possibility of not obtaining a sufficient number of interviews from our initial visit. In that case, an earlier date for completion of interviews was chosen (October 22) in order to allow additional time to obtain all interviews. Inclement weather is always possibility when fieldwork is conducted outside. The group determined that fieldwork will go forward in the event of any weather. Smart phones allow for easily accessible and reliable weather information and the team will prepare accordingly by dressing for the weather. With group work, there is always the potential for conflicting schedules. It is important to keep open communication in the case of any unpredicted emergency or time conflict so that a fall back time can be chosen or other options can be explored.



Safety Plan

In addition to having a timeline and methodology for conducting fieldwork, planning for any potential hazards in the field is another critical step to make sure that all group members are mindful of danger and also prepared in the event that conditions become unsafe. For fieldwork specific to this project, dangerous situations can occur on different fronts: from the elements, the physical environment, and other people.

The group will check the weather prior to any fieldwork and with that information in mind, prepare accordingly. If weather becomes too much of a nuisance, the group will choose another day to return and continue work. The group commits to observing all traffic laws while operating their personal vehicles coming to and from and navigating around the site. Specific meeting spots in easily accessible areas will be chosen. While on foot, the group commits to using all safety options for pedestrians including the use of crosswalks at the appropriate times and staying on sidewalks at all other times. Jaywalking and setting foot on any main roads will be avoided. In the case of a street that has no crosswalk, such as a smaller road in residential area, group members will use the classic “look both ways” method to make sure the road is clear before crossing. All field work will be conducted in teams of two or more so that no group member is alone. Having backup is always important.



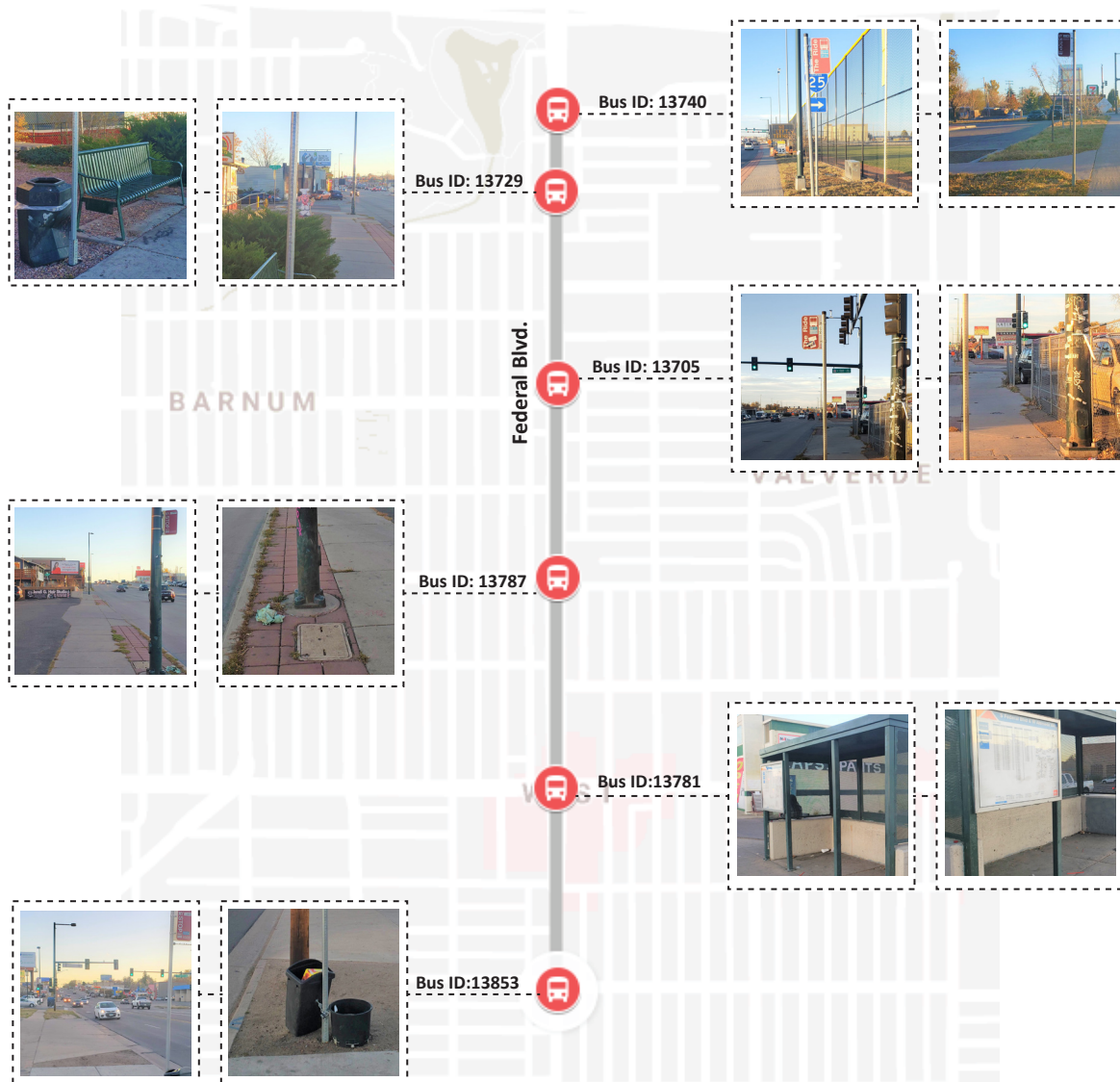


Bus Stop Assessment

The data collected throughout the site consisted of questions that focused around bus stop amenities, pedestrian connection and safety, and the quality and cleanliness of the bus stop. Many of the questions to determine the status of the bus stops came from questions that were provided by WalkDenver, but there were also notes that were taken and discussed both before and after over-viewing the WalkDenver questions. Aside from the direct observations, there was some research done looking at existing conditions through Google images over previous years and research based on walk and transit scores in the area.

In order to determine a methodology for the WalkDenver survey it was decided to set the cleanest and most up to date bus stop as the highest rating. This bus stop set the standard for the following bus stops and is compared

Figure 16





Bus Stop Assessment

Bus Stop 1: Federal Blvd. & W. 5th Ave.

The Federal Blvd. and W. 5th Ave. bus stop is located directly next to Barnum East Park and just south of 6th Ave. The existing sidewalk is in great condition and it is accessible from the park. Although there are no amenities at this stop, the park has some amenities very close by which includes some light, a trashcan, and public parking. There is seating and benches provided at the park, but it isn't as close to the bus stop as the other amenities listed.

Bus Stop 2: Federal Blvd. & W. 4th Ave.

Bus stop 2 is the Federal Blvd. and W. 4th Ave. is located directly outside of the Conoco gas station. It sits back off of the side on a concrete pad with decorative rocks surrounding the concrete pad, which consist of evergreen shrubbery. Although there is not lighting, it is well lit from the gas station behind it and also includes a bench and trashcan. The trashcan does not seem to be an RTD trashcan, but one put out by a third party. It is relatively clean but does have some light graffiti on the bench and trashcan.

Bus Stop 3: Federal Blvd. & W. 1st Ave.

This stop is in the middle of the site and is located next to a crosswalk and underneath a traffic light. The sidewalks begin to narrow and there is a chain link fence that goes all the way up to right of way, making it unwelcoming and less accessible for multiple users or users in a wheelchair.

Bus Stop 4: S. Federal Blvd. & W. Bayaud Ave.

The 4th bus stop that was evaluated was the Federal Blvd. and W. Bayaud Ave. This bus stop has no amenities and is located next to a parking lot. It has heavy traffic and no lighting, creating a lack of feeling of safety.

Bus Stop 5: S. Federal Blvd. & W. Alameda Ave.

Federal Blvd. and W. Alameda Ave. is at the busiest intersection within the project boundary. It consists of a shelter, a route map, two benches, and a trashcan. Although not affiliated with RTD, the business behind it has visible security cameras and body guards sitting outside, which starts to provide a sense of safety that isn't found at the other bus stops.

Bus Stop 6: S. Federal Blvd. & W. Virginia Ave.

The final bus stop is adjacent to a narrow, cracked sidewalk and located next to an open parking lot. From observation, many cars pull in and turn around there, making it feel unsafe. The concrete pad is surrounded by dirt and consists of a trashcan and a bucket for used cigarette buds. The trashcan is a small store-bought trashcan that one may buy for a kitchen, again, not representing an RTD trashcan. There also was a bench in the past, according to Google images, but there isn't anymore. The bench also looked to be a personal buy and not representative of RTD.

Overall the bus stops are missing many amenities that would help enhance the pedestrian experience. Business owners and other pedestrians are adding their own amenities to the bus stop to make it more comfortable for those who use the space. The bus stops that have RTD amenities have much more use and create a safer environment for pedestrians while waiting for the bus.



Intercept Interviews

As a result of conducting intercept interviews with twenty RTD riders waiting for the bus at the Alameda Ave and Federal Boulevard stop, several interesting trends were observed in their responses. Responses to many of the questions tended to clump together and were quite similar, despite differences in age, race, and sex.

It was discovered that most of the riders interviewed were commuting either to school or work. Among those who responded this way, most were getting to or returning from work, often saying that they worked downtown. This tied in reasonably with another finding of our survey, that almost all surveyed used transit multiple times a week, with 55% saying they used it at least once per day, 40% using it two to five times a week, and only 5% of respondents, one individual of the 20 surveyed, saying they used transit once per week. We were unable to ask all respondents whether they owned a car, but 17 responded, with 16 saying they did not, and only one responding that they did. Considering that 93% of respondents to the question of whether they worked in the area replied that they did not, these numbers in relation to each other were not surprising to the study team. Further questioning found that 85% of respondents said they were traveling 3-10 miles to reach their destination, with only 10% traveling 1-2 miles and 5% travelling 10-20 miles. While Valverde has a fairly industrial and commercial component when it comes to current land use, the responses of those interviewed suggested that there potentially is not enough economic opportunity, whether that is in the type of jobs or availability of jobs, locally to support the local population, who must travel considerable distances to work.

When it came to the bus stop in which the interviews took place, most respondents gave it a rating of three out of a scale of one to five. Taken together and averaged, the mean rating of the responses was 3.75. When asked what would improve the stop, the most common response, with 25% of respondents choosing, was benches and seating. This was interesting as there are several benches at this bus stop, but it appears that at certain times of day there are many people waiting and it might be difficult to find a spot at times. The three next most common responses, with 15% of respondents choosing each, were the options for more space to wait (related to benches perhaps), better lighting, and real time arrival information. The next most common responses at 10% of respondents each were security cameras, shelter, and heating. Security while waiting, in a comfortable environment, is clearly important to the riders who use the bus from this stop, though no respondents clearly replied that they did not feel (safe?) at the bus stop. Several replied that they sometimes or mostly felt safe, but none replied in the negative to that question. Interestingly, in light of potential safety concerns and a general feeling that the quality of amenities at the bus stop was adequate and okay but for most not passing into really positive territory, 86% of respondents when asked if they would prefer a shorter walk to a stop with less amenities and more time riding or a longer walk to a nicer stop and less time riding chose the shorter walk to a stop with less amenities and more time riding.

Considering the interview responses and viewing the state of the bus stop where the interviews were conducted, a key strength to the location of the stop is the proximity to other bus lines and its accessibility by foot, despite several of the other local stops being on the other sides of the



Intercept Interviews

busy six lane streets of Federal Boulevard and Alameda Avenue. The stop possesses a number of features including a shelter structure, though there is no seating within the shelter, benches on either side of the shelter, and bins for garbage collection. Some of these factors were commented on by interviewees as things that could improve the stop, perhaps if more capacity was built into them, but even though the stop is at the intersection of two wide streets consisting of fast moving traffic, they seem safe enough for people to get to in order to start or continue on with their journeys. A key weakness in regards to safety has to do with other people at the bus stop according to the interviews, as it was perceived to be a bit sketchy, especially in the evening hours as reported by several women. A local business directly behind the stop with flood lights over its parking area and security camera provide some semblance of security for at one respondent, even if those features are not coming from RTD's design of the stop. The stop was viewed as average by respondents, but compared to others in the study area, it clearly has more amenities and features. The apparent real draw to the stop for the respondents interviewed did not have to do with what features were present or incentivize the stop. What is important based on our interviews is the location of the stop physically so that interviewees could access it on foot and its proximity to other lines so that easy connections can be made.

Demographically, there was a slightly skewed distribution of younger people who responded to our intercept interview requests, at 44% responding who were under the age of 30, 34% of respondents were between 30 and 49, and 22% were between the ages of 50 and 69. 61% of respondents identified as Hispanic or Latino, 17% as White, 17% as Black and 5% as Asian. In regard to sex, 73% identified as female, and 27% as male. Whether or not they lived in the area was split, with a slight majority of 57% saying they lived in the area. Of the eight respondents who identified the nearest intersection to their homes, five of the intersections named involved Federal Boulevard, though the distribution varied from Alameda Avenue to the south to West 72nd Avenue to the north in Westminster.

Figure 17

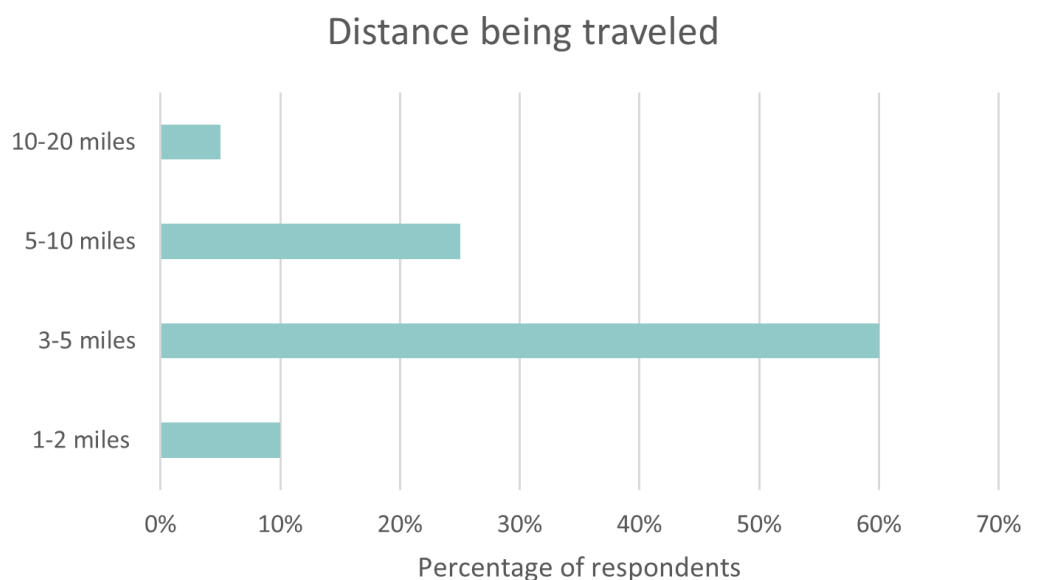




Figure 18

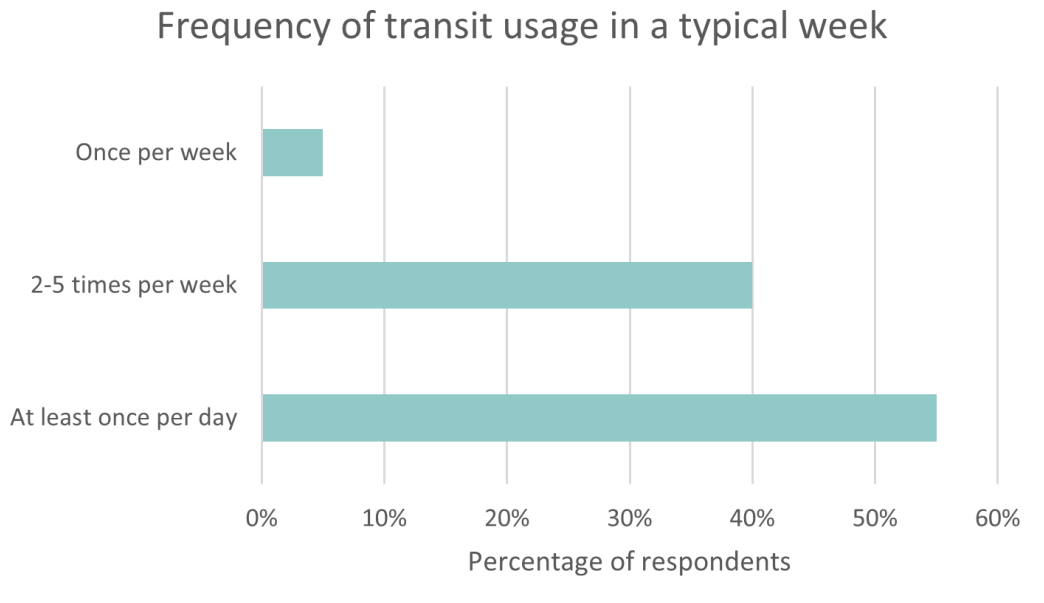
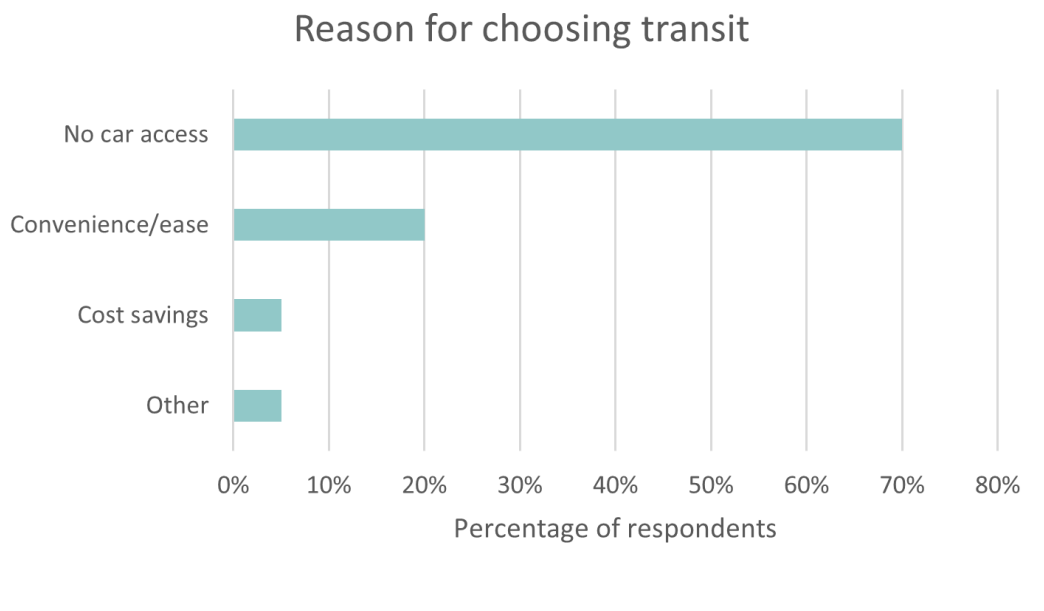


Figure 19





Methodology

The group strayed a little from the original Execution Plan. Members initially went out to the site on October 19, 2019, which provided about two weeks to accomplish the intercept interviews for the site. The bus stop where the interviews took place was located at the intersection of Federal Boulevard and Alameda Avenue.

The original plan was to have the intercept interviews completed by October 22nd. However, it proved difficult to meet this deadline. The group first went to the site in the early evening of October 19th, around 4:30 pm. It was a Friday, and the team believed they would be able to complete most of the interviews since it was around the rush hour of people returning home from work. Two members of the team stayed at the Alameda bus stop, #13781, for an hour while two other members walked to the closest bus stop south of that location, bus stop #13787 at the intersection of Federal and Bayaud. Unfortunately, the team was only able to complete four interviews that night, all of which were done at the Alameda stop.

From that experience, the team concluded it was best to stay and complete the intercept interviews at the Alameda bus stop as it proved to have the most transit rider traffic. Three members of the team returned to the site on Wednesday, October 23rd at 8:30 am. That time and day proved to be better for successful completion of interviews as there were more riders. Many were people headed to work, and a considerable amount of these riders were transferring buses from the West Alameda bus stop on the other side of Alameda Avenue. The team managed to interview another handful of people but did not finish all 20 at that time. Two members returned to the site the following Friday, October 25th at 7:50 am where they successfully completed the remaining surveys needed for the intercept interview portion of the project. The morning rush hour around 8:00 am proved to be the most effective time to complete the intercept interviews at the chosen bus stop due to factors such as a shelter being present, ample seating and standing space, and the optimal location site being where two major corridors meet in West Denver.

Despite all the planning and preparation for completing this portion of the project, the team realized that not everything can go as planned. Although the group agreed to meet at certain times, some members were held up by factors like traffic or employers assigning last minute tasks. Members also learned that public interviews are not as simple as the assignment claims. The team's site was often frequented by homeless people who were unable to answer questions like "What is the closest intersection you live by?". Members also experienced times when interviewees were not taking the survey seriously. There were other instances where timing got in the way of completing the full interview as riders needed to catch their bus.

The survey questions provided by Walk Denver were another challenge. The team determined that the priority questions, which were underlined, as well as the demographic questions should have been at the top of the survey to guarantee answers in a rushed situation. The first question, "Why are you taking transit today?" did not feel very effective as an icebreaker. It was also awkward as the answers were often similar to question three, "Why did you choose transit today versus another mode of transportation?" Not having a car was the common answer for both questions. The answer options for question two, "How often do you take transit to get somewhere in a typical week?", did not seem relevant to the ridership interviewed. Most interviewees used transit



Methodology

multiple times a day. This was not a response option on the survey which could really skew the data of ridership for this project, as taking the bus is such a consistent part of people's daily routine. Finally, the study team agreed that question ten, regarding safety, should have had a scale response of one to five or something similar as the answers received during interviews was rarely a straightforward "yes or no". Most of the answers were often "sometimes", "most of the time", or it depended on the time of day.

To summarize, data collection of public experience is difficult regardless of environmental and social factors. Despite this, the data gathered was extremely revealing of the bus stop infrastructure, ridership, and the experience of transit-users.



Chapter 3: Gaps and Recommendations





Transit/Pedestrian Infrastructure Gaps

Existing infrastructure conditions deter local residents and workers from frequent transit use in the study area. Elements such as cracked and narrowing sidewalks, dirtied and graffitied benches, and littered concrete slabs, meant as a waiting area for riders, contribute to the negative attitudes and low frequency of use. Around the third bus stop, located at West 1st Ave, was where the sidewalks started to narrow. This limits accessibility for larger groups of people who want to travel together to the bus stop. There was also a chain link fence present all the way to the right of way. This could prevent people with disabilities, for example those who travel in a wheelchair, from accessing the bus stop safely.

The northernmost bus stop in the study area is located at Federal Blvd and West 5th Avenue, next to Barnum East Park. While the sidewalk around this stop is in good condition, there were no other amenities like lighting, a trash can, bench, or shelter. The fourth bus stop, located at Federal and W. Bayaud Ave., also had no other amenities aside from the bus stop pole and sign. This area sits at the edge of a residential neighborhood and has the potential for excessive use by residents. However, with the lack of shelter, seating, crosswalks, and especially lighting, this bus stop fails at providing a safe environment for transit riders at any time of the day or year. The sixth and final bus stop of this study area is located at Federal and W. Virginia Ave. next to an open parking lot. This lot is often used by drivers turning around, posing potential safety threats for pedestrians traveling to and from this stop. There are no RTD provided amenities at this stop aside from the dirtied concrete slab. A trashcan and bucket for cigarette butts were placed at this stop presumably by residents or local business owners, as no RTD logos were noted.

To make these stop more popular for local resident and worker use, it is clear that infrastructure to create a safer sense of place is necessary in the study area. Certain amenities that interviewees appreciated were not provided by RTD but by the local businesses that surround the stop. For example, during an interview at the Alameda intersection stop, one transit rider mentioned that she felt safer due to the presence of the security cameras provided by the dispensary directly behind the bus stop. Infrastructure for public safety must include a shelter from the elements, lighting, and a trash can at the bare minimum. Improving pedestrian infrastructure in this area could inspire a growth in transit use for residents and workers in the area. By adding more crosswalks and more obvious amenities, pedestrianism could increase which could then inspire economic growth of the businesses which sit up against the sidewalks of this major corridor. Safe and consistent pedestrian infrastructure has the potential to reshape this area into a safe and environmentally friendly transit-positive corridor as well as a popular economic hub for the neighborhood.



Transit/Pedestrian Infrastructure Gaps

The assessment of conditions for bus users in the study area revealed a significant lack of attention to the environment from the perspective of pedestrians. This is significant because bus users are inherently pedestrians. People walking on the sidewalk along Federal Blvd are directly adjacent to busy traffic moving up and down the road with no buffer. This is the case along much of Federal Blvd, not just in this particular study area. Vegetation is not completely absent from the study area. Landscaping does exist in the medians; however, this is not extended to the sidewalks. This results in a harsh environment for pedestrians and a space where cars are obviously a priority.

The City and County of Denver has specifically identified the safety on its streets as an area of particular concern. The city's VisionZero initiative has spearheaded an effort to enhance safety among all classes of individuals using city streets. Pedestrians are the most vulnerable of these classes. According to the 2017 Federal Boulevard Corridor Plan – Opportunities and Implementation Report, Federal Blvd has the second highest RTD ridership of the city's corridors. The plan also estimates that between 30,000 and 40,000 cars travel through Federal Blvd daily. A number which has likely increased since 2017. According to VisionZero findings, Alameda Ave through the study area and Federal Blvd throughout the wider project area are identified as corridors which are part of the High Injury Network (HIN), "the corridors in Denver with the highest number of fatal and injury crashes. These streets connect all of Denver's neighborhoods." (Denver Vision Zero: Data & Trends). Within the study area, six fatal and 13 serious injury crashes have occurred along Federal Blvd in the study area since January 2013. As of November, 66 deaths have occurred on Denver streets in 2019. Of those deaths, 33 percent were pedestrians.

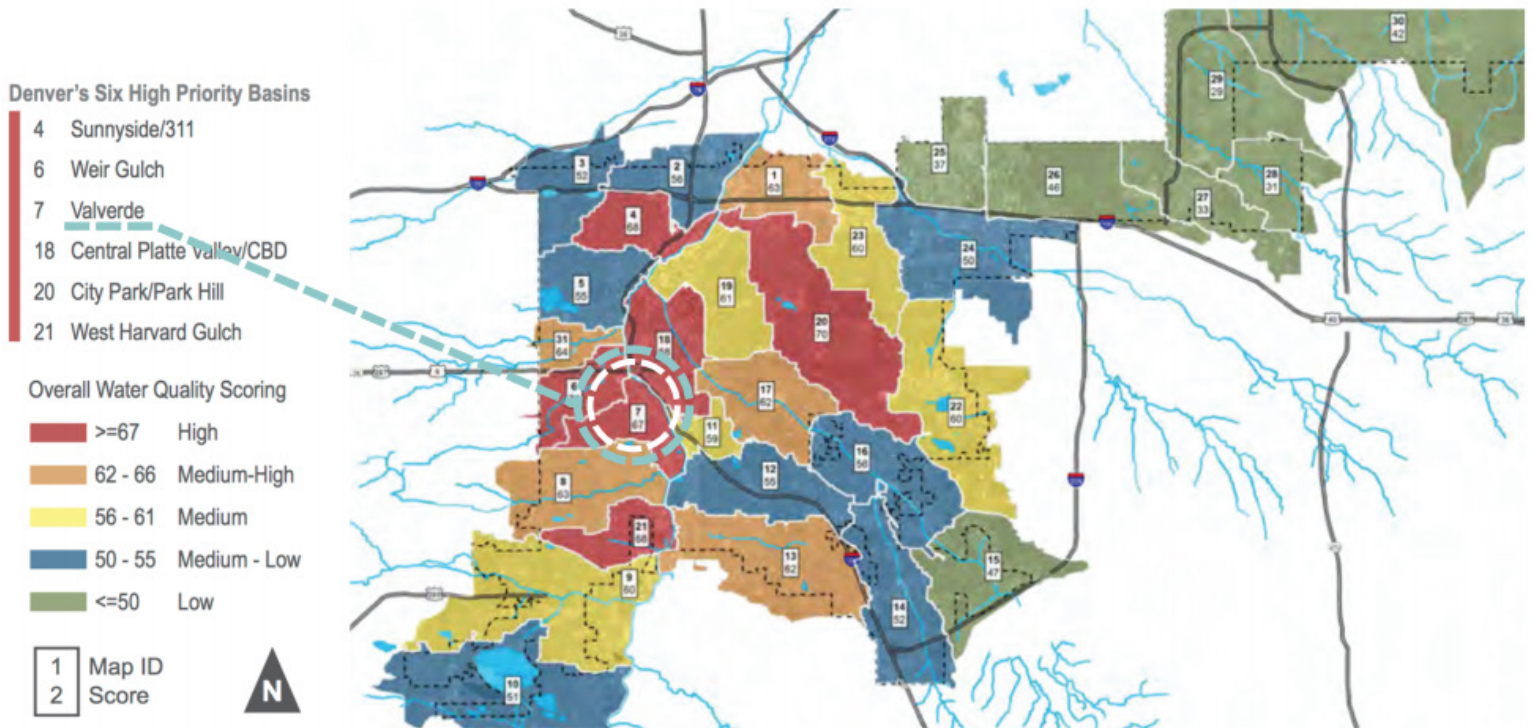
Denver's Green Infrastructure Implementation Strategy (GIIS), released by CCD Department of Public Works in 2017, conducted an assessment of the 30 of the city's water basins to determine which basins are in most need of water treatment. The report identifies the Valverde basin, which includes the Valverde neighborhood, Athmar Park and surrounding areas, as the third highest priority basin within the city (Figure 20). The purpose behind this assessment is to identify opportunities to implement green infrastructure as a way of improving the water quality in the city's high-priority basins and the city overall.

Impervious surfaces impact water quality by eliminating opportunities for storm water to be absorbed. As a result, storm water and all the pollutants it collects as it moves through gutters and sewers is discharged directly from the street to the stream. Impervious surfaces also contribute the urban heat island effect, in which urban areas are prone to significantly higher temperatures than surrounding rural areas. According to the city's Climate Resilience Committee, these higher temperatures increase our energy consumption and can impact the health and safety of Denver's residents. Denver has the third worst urban heat island effect of cities in the US.



Transit/Pedestrian Infrastructure Gaps

Figure 20





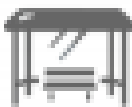




WalkDenver is a nonprofit organization that advocates for walkability and believes that making the city's streets more hospitable to pedestrians should be a priority of future transportation infrastructure projects. This is clear in their stated mission "to reclaim Denver's streets for people". Their efforts support substantial interventions in the city's existing street network which they feel has plenty of potential for enhancing the experience of pedestrians.

There is an obvious gap in green infrastructure along Federal Blvd. in and outside of the study area. This gap could provide an excellent opportunity for CCD to accomplish a range of goals that the city has already emphasized as being important. Green infrastructure reduces impervious surfaces and replaces it with trees and shrubs that provide more opportunities for storm water to be absorbed and for pollutants to be filtered out. It can also combat the urban heat island effect which is an area of particular concern as global warming accelerates. In addition, site-scale green infrastructure along sidewalks creates a buffer between pedestrians and traffic. This provides a safer and more hospitable environment for transit users and other pedestrians who walk along the busy corridor on a daily basis.



Figure 21

Amenities							
Bus Stop # 1	●	●	●	●	●		●
Bus Stop # 2	●	●	●			●	●
Bus Stop # 3			●	●	●		●
Bus Stop # 4		●	●	●			
Bus Stop # 5	●	●	●	●			
Bus Stop # 6			●	●	●	●	●
Total Count	3	4	6	5	3	2	4



Transit/Pedestrian Infrastructure Recommendations

There are many things that could be done to improve not only the everyday experience of transit riders and pedestrians along the Federal Boulevard corridor but promote safety and contribute to the overall green infrastructure of area. In crafting our specific recommendations for the study area, we reviewed the literature of plans that have already been created for the area including Denver's Green Infrastructure Implementation Strategy (GIIS) and Federal Boulevard Corridor Plan, both from 2017. The team's ideas are in line with the recommendations found in both documents, and encourage further action by the city to implement both plans further (City and County of Denver 2017, 2018).

At each stop and between stops there is generally a few inches to a few feet of cement between the curb and the actual sidewalk which does nothing to encourage safety from the quickly moving traffic along Federal Boulevard or work to improve the appearance and permeability of the area. Thus in addition to investing in the six bus stops of the study area an investment in green infrastructure which would create a safer barrier between traffic, provide surface permeability in line with GIIS, and provide for an all around better experience for individuals walking along Federal Boulevard to their stop and waiting are recommended.

When it comes to the specific stops in the study area, the most common improvements that could be made that apply to almost each stop are improved seating capacity, shelter from the elements and sun, dedicated pedestrian lighting, and additional space removed from the sidewalk for greater wheelchair accessibility. Specific recommendations for each stop are as follows:

13740: West 5th Avenue

Set aside space for wheelchair accessibility, install bench or other seating, install shelter from wind, rain, and sun, and install pedestrian lighting so riders do not need to rely on light coming from East Barnum Park.

13729: West 4th Avenue

Set aside space for wheelchair accessibility and install pedestrian lighting so riders do not need to rely on light coming from the convenience store nearby. The addition of a permanent trash can here is also recommended due to the large volume of litter observed likely generated by purchases from the convenience store. To improve the physical appearance of the stop, the bench should be repainted, graffiti removed, and public art added to the space.

13705: West 1st Avenue

Widen the sidewalk by several feet to create a buffer between the current sidewalk and right of way and existing private property and fencing, set aside space for wheelchair accessibility, install bench and shelter from wind, rain, and sun, and install dedicated lighting.



13787: West Bayaud Avenue

Install pedestrian lighting and seating.

13781: West Alameda Avenue

Expand seating area and shelter from wind, rain, and sun around seating. The current arrangement has a small shelter but does not allow any place for a waiting rider to sit. This may provide an opportunity for riders who use a wheelchair, and should thus be preserved, but if possible it should be expanded. While there is considerable light from a neighboring business and the intersection with Alameda Avenue, due to the safety concerns expressed by riders at this stop particularly, pedestrian lighting is recommended. This stop appears to receive the most traffic of any in the study area, so public art is recommended to improve the experience for riders and bring a sense of place, which may help with the security issues and feelings of unease respondents communicated.

13853: West Virginia Avenue

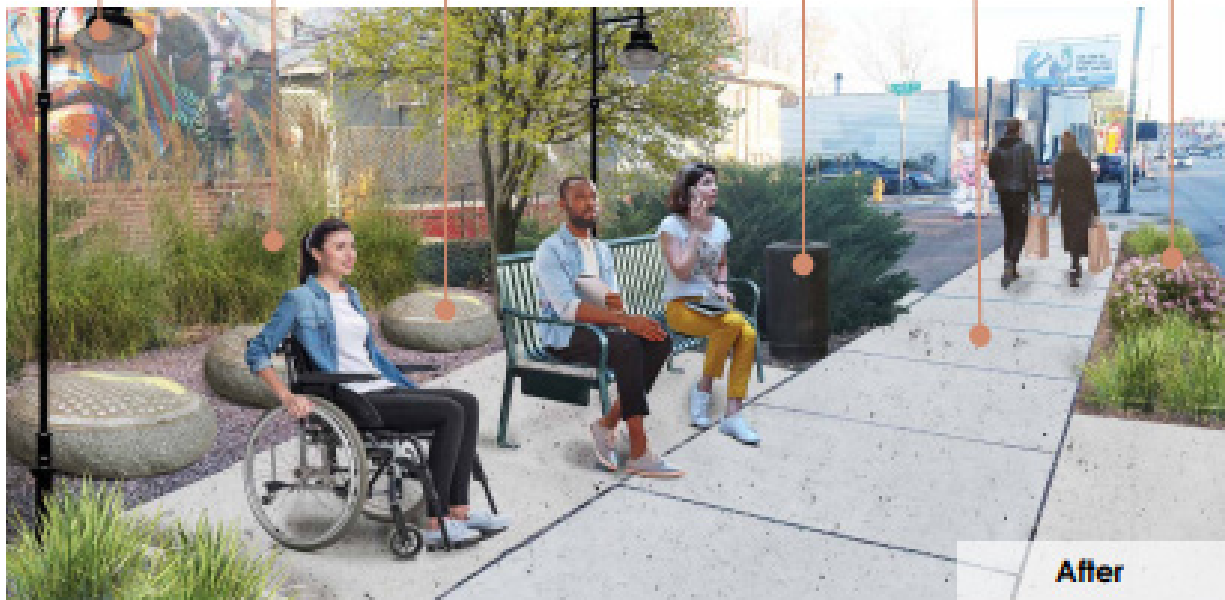
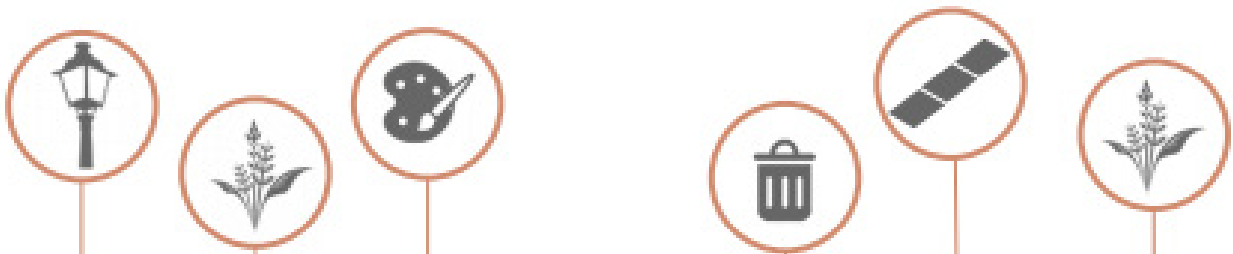
Repair the heavily broken sidewalk at this stop and install a wheelchair accessible area set aside from the curb, sidewalk, and surrounding parking lots. Install a seating area, and install shelter from wind, rain, and sun, and install a permanent trash can to replace the impromptu bin found on the site due to a lack of other publicly provided trash receptacles in the area.

In addition to these improvements, the team recommends that the city do what it can to re-evaluate the location of each bus stop and negotiate with RTD to locate them closer to signalized crosswalks, thus improving safe pedestrian access to the stops and away from the stops. Several of the stops are already ideally located at a signalized crosswalk, and one in particular, stop 13787, is located roughly 900 feet the nearest crosswalk to the north and almost 1,500 feet from the nearest crosswalk to the south. There is an island between the northbound and southbound lanes of Federal Boulevard and a cutout exists in the island roughly 100 feet from the stop which could encourage pedestrians to cross Federal Boulevard there instead of walking 1,000 feet or more to cross the roadway, which is inherently dangerous, especially given Federal Boulevard's status as a part of the city's High Injury Network (City and County of Denver 2019).



Transit/Pedestrian Infrastructure Recommendations

Figure 22





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