

Regis & Berkeley

Walk Denver and The City of Denver

URPL 5010 Planning Methods Fall
2019

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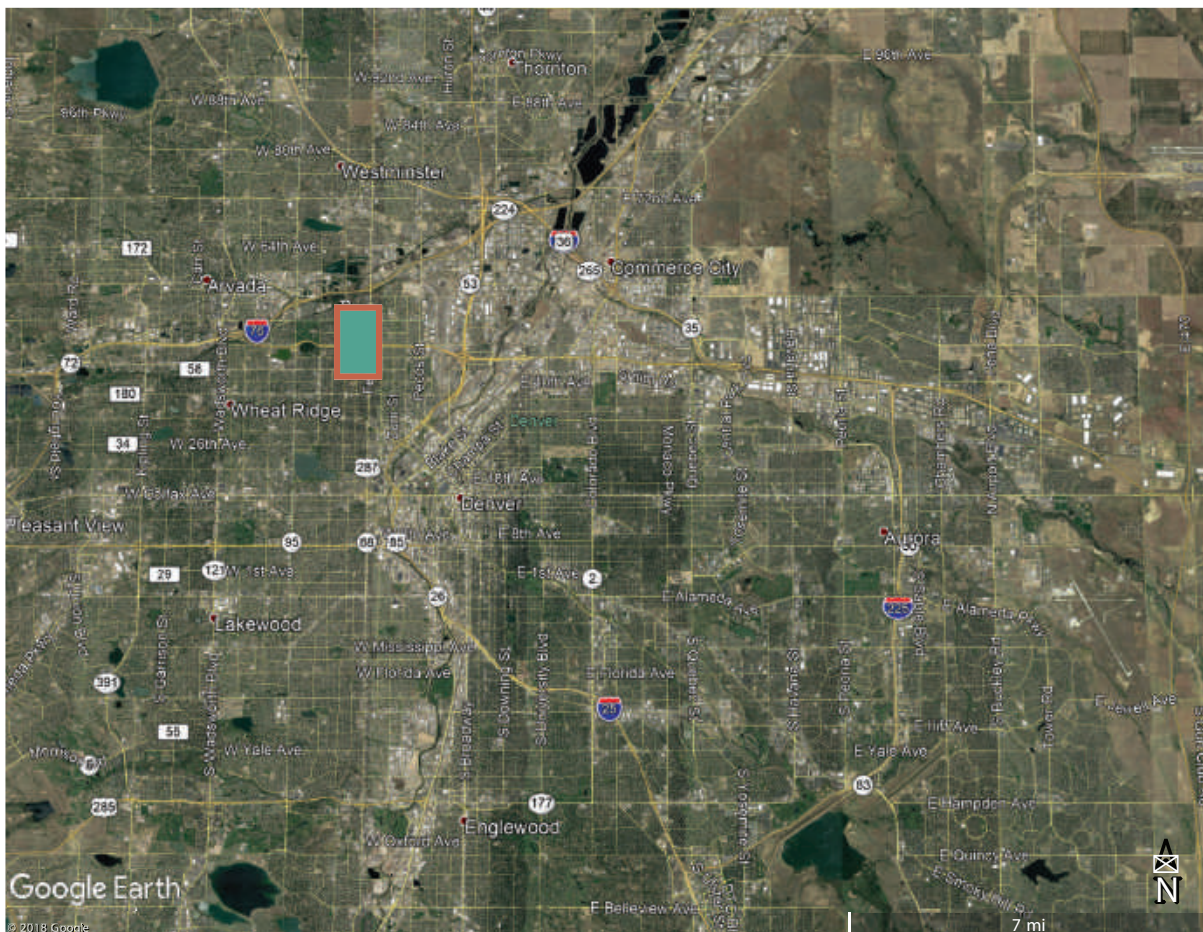
Chapter 1: Project Context

Project Introduction

In an effort to increase ridership on public transit, the city of Denver adopted Denver Moves:Transit, a comprehensive initiative aimed to reduce single-occupant vehicle commuters and increase transit commuters to 15%. Understanding that ease and comfort is an integral component when encouraging people to choose public transit, the city has partnered with CU Denver's Planning Methods classes to perform an inventory study of the bus stops along Federal Boulevard. Ken Schroepel's Planning Methods Section 001 class has been tasked with studying the neighborhoods and inventorying bus stops along the North Federal Boulevard. In this chapter, Ahmad Alhammadi, Ian Conrardy, Bryn McKillop and Andrea Vaughn have examined the demographics and urban fabric of the Regis and Berkeley neighborhoods that fall within the project boundaries.

The Regis and Berkeley neighborhoods are both located in the northwest corner of Denver, with Regis being the northernmost neighborhood in Denver and Berkeley located just south of Regis. Regis is bordered by I-76 to the east, West 52nd Avenue to the north and I-70 to the south, while Berkeley is bordered by I-70 to the north, Sheridan Boulevard to the east, West 38th Avenue to the south; both neighborhoods are bordered by Federal Boulevard to the west (Figure 2). Through an examination of the demographics and urban fabric of these neighborhoods, the team is seeking to assist the city and county of Denver in meeting the goals outlined in Denver Moves:Transit.

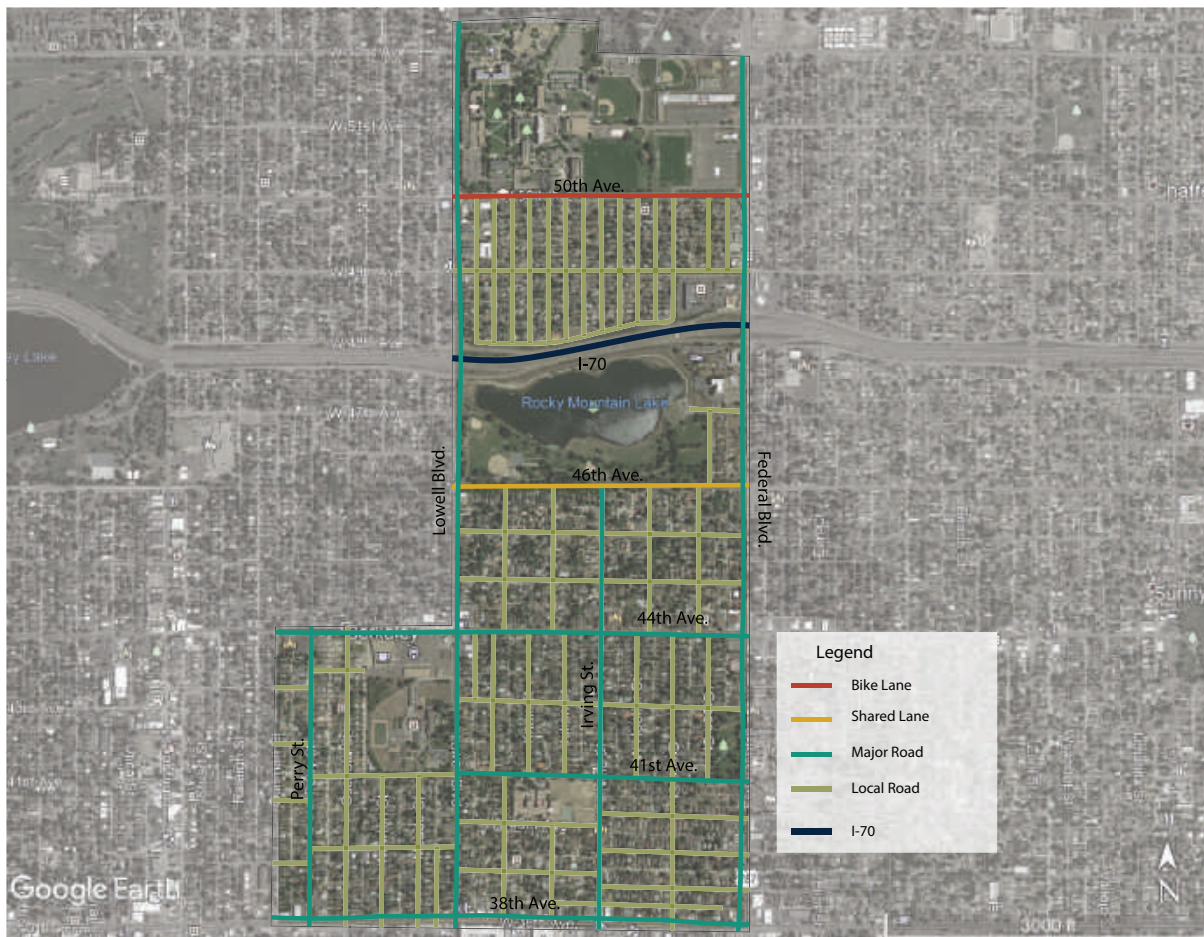
Figure 1: Context Map



Source: Google Earth

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Figure 2: Site Map



Source: Google Earth

Demographic Profile

To gain a better understanding of how the two neighborhoods may be better served by public transit, the team examined four datasets - two pertaining to the population demographics and two pertaining to housing attributes.

Datasets

Four datasets were chosen to examine the demographics and housing attributes of the study area: race, annual income, mode of commute to work and rate of home ownership. All four datasets were analyzed both at the level of the study area and the county.

Geographies

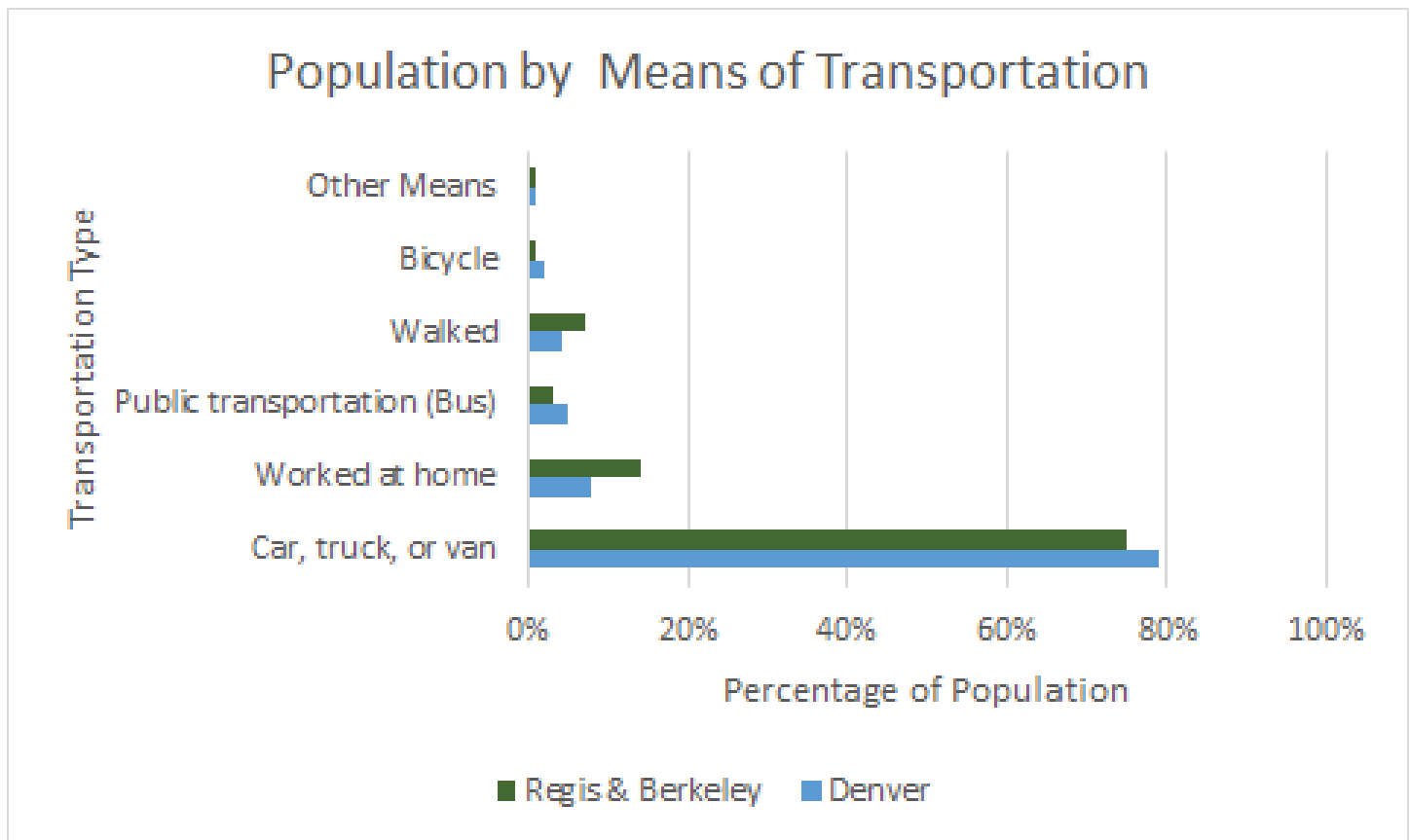
Examining Figure 3.1 below, one can see that the study region, generally, utilizes different modes of transit in similar ways. Within the study area, only 75% of people used a car, truck or van, compared to the overall population at 79%. Similarly, one can see that there is a slightly higher percentage of the population in the study area that prefers to walk to work, while far more people appear to prefer to work from home, compared to the rest of the Denver region. These patterns of commuting may indicate several things: that a smaller percentage of people are living closer to work in the study area than most of the county or that car ownership may be higher in the study area.

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Figure 3.1: Transportation to Work

Means of Transportation to Work Category	Denver		Regis & Berkeley	
	Count	Percentage	Count	Percentage
Car, truck, or van	286,512	79%	2,074	75%
Worked at home	27,869	8%	374	14%
Public transportation (Bus)	19,301	5%	81	3%
Walked	16,133	4%	192	7%
Bicycle	8,081	2%	18	1%
Other Means	3,865	1%	17	1%
Total	361,761	100%	2,756	100%

Figure 3.2: Transportation to Work Chart



Source: US Census Bureau, 2017 ACS 5-year estimates (Table: B08301)

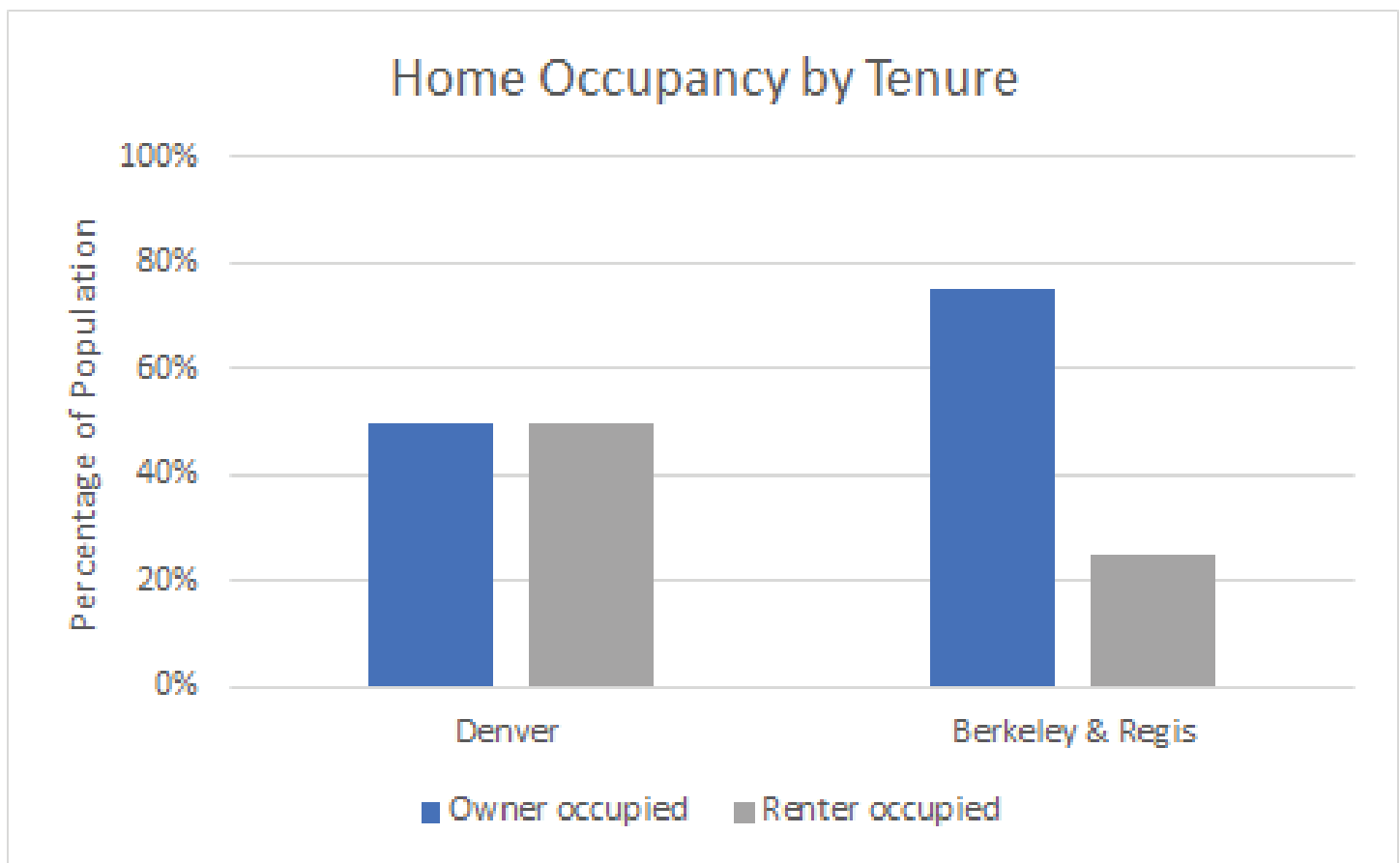
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Figure 4.1 compares rates of homeownership in the study area compared to the general population of Denver County. Home ownership occurs at a 50% higher rate in the study area, compared to the county in general. The team may be able to infer that this higher rate of home ownership could mean that there is a larger number of single-family homes, with potentially less connectivity to mixed-use neighborhoods. This, in turn, may have an effect on the number of bus routes offered through this area, as well as the frequency of existing routes.

Figure 4.1: Home Occupancy by Tenure

Categories	Denver		Berkeley & Regis	
	Count	Percentage	Count	Percentage
Owner occupied	143,874	50%	1,477	75%
Renter occupied	143,388	50%	488	25%
Total	287,262	100%	1,965	100%

Figure 4.2: Home Occupancy by Tenure Chart



Source: US Census Bureau, 2017 ACS 5-year estimates (Table: B25003)

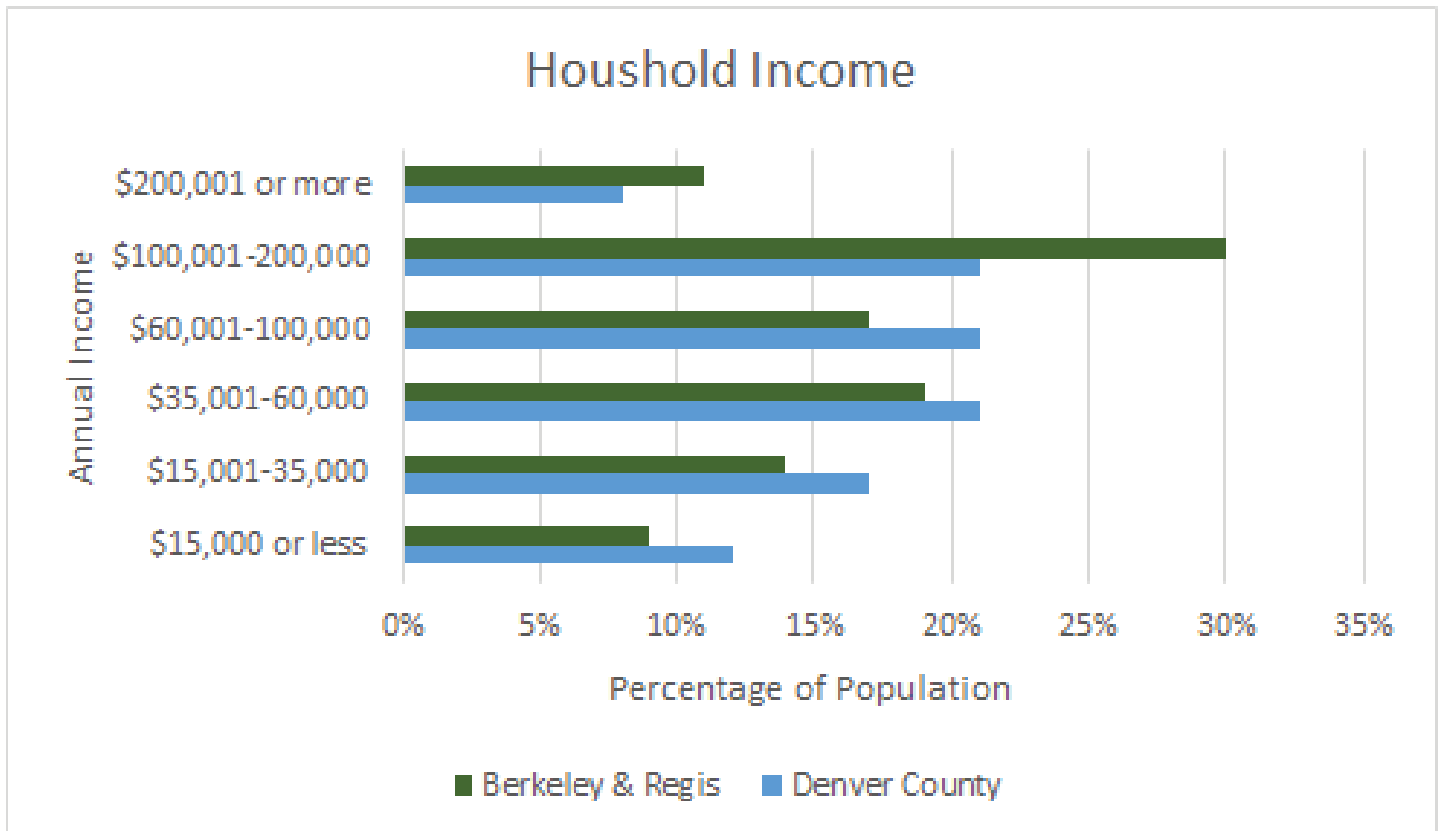
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Figure 5.1 demonstrates that when compared to the county, the study area has a higher concentration of wealth; 57% of the population in the study area generates more than \$60,000 per year in income, with the vast majority of that population generating more than \$100,000 per year. These figures may indicate that there is a smaller demand for public transit in the area, compared to other areas within the county. With higher levels of income, one may expect to see higher rates of car ownership. Beyond that, commuters in the study area may find it more convenient to pay an additional premium to have flexibility in their commute that public transit may not be able to provide.

Figure 5.1: Household Income

Household Income	Denver		Berkeley & Regis	
	Count	Percentage	Count	Percentage
\$15,000 or less	33,850	12%	170	9%
\$15,001-35,000	50,042	17%	267	14%
\$35,001-60,000	59,535	21%	374	19%
\$60,001-100,000	61,389	21%	337	17%
\$100,001-200,000	58,963	21%	597	30%
\$200,001 or more	23,483	8%	217	11%
Total	287,262	100%	1,962	100%

Figure 5.2: Household Income Chart



Source: US Census Bureau, 2017 ACS 5-year estimates (Table: B19001)

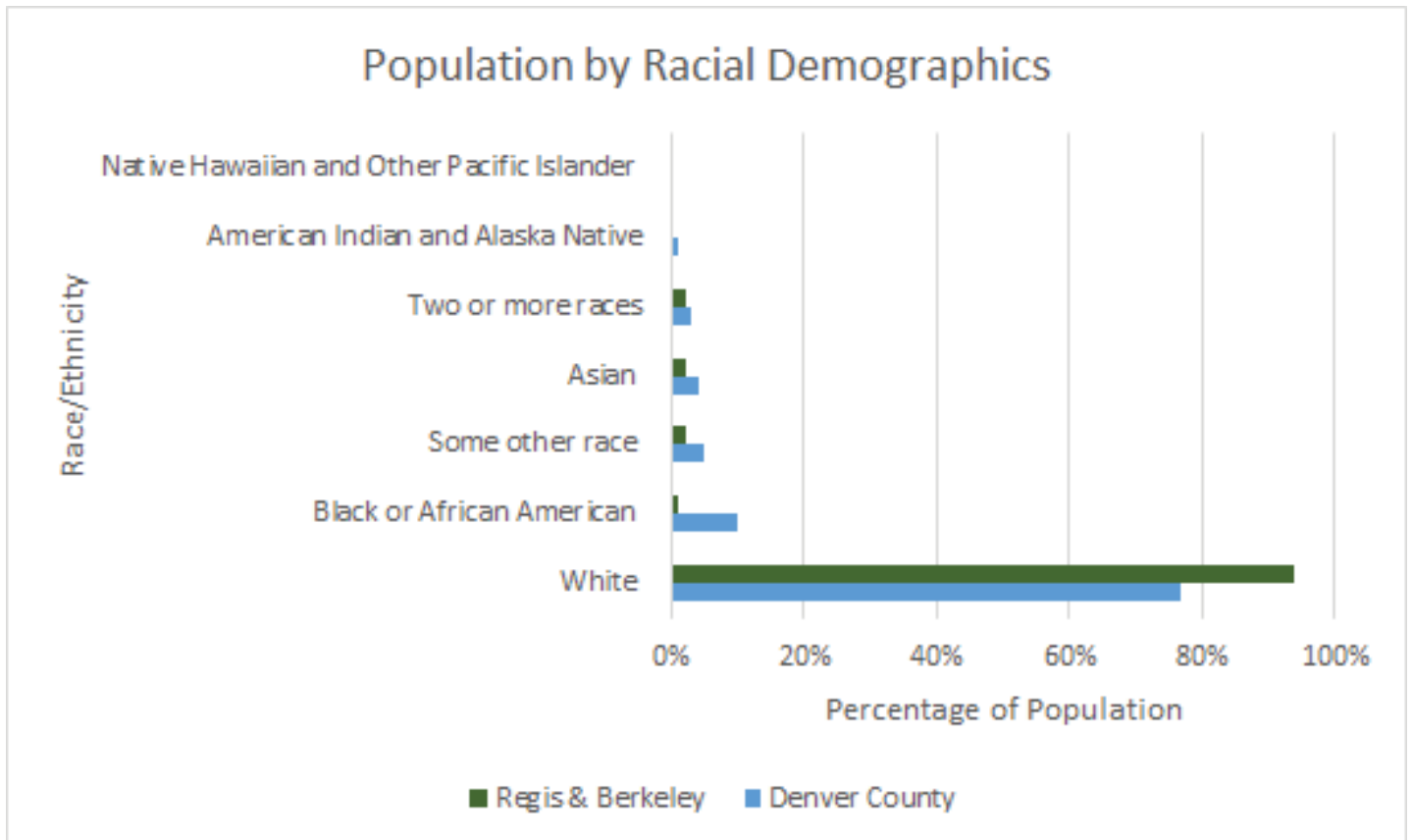
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Figure 6.1 highlights the racial and ethnic makeup of the study area compared to the general population in the county. Comparing Census data on population diversity, one can see that there are stark differences between the study area and Denver. Only 6% of the population within our study area is nonwhite, compared to 23% of the county. Given this lack of diversity, one may be able to extrapolate that there may be a different use or need for public transportation, depending on cultural factors. For instance, transit may be stigmatized at higher rates in wealthier white communities than in other communities.

Figure 6.1: Race and Ethnicity

Categories	Denver		Berkeley & Regis	
	Count	Percentage	Count	Percentage
White	521,481	77%	4,828	94%
Black or African American	64,466	10%	54	1%
Some other race	37,216	5%	84	2%
Asian	24,433	4%	84	2%
Two or more races	23,429	3%	88	2%
American Indian and Alaska Native	6,537	1%	24	<1%
Native Hawaiian and Other Pacific Islander	993	<1%	0	0%
Total	678,467	100%	5,162	100%

Figure 6.2: Race and Ethnicity Chart



Source: US Census Bureau, 2017 ACS 5-year estimates (Table: B02001)

Chapter 1: Project Context

Analysis and Results

Increasing walkability and transit use in the study area may pose a bit of a challenge, however, based on the data analyzed in this chapter, there may be some existing advantages in the city. While not drastically larger than the general population in the county, 7% of the study area walks to work, as compared to 4% of the county. Though slight, there may be a reason that people within the study area are willing to walk to work, which may be expanded upon to encourage more of the study area to reconsider commuting in a personal vehicle.

However, the data presented here may indicate that moving towards Denver Moves stated goals may be difficult to achieve within the study area. To begin, while commuting in a personal vehicle is slightly lower than the county average (75% compared to 79%, respectively), transit ridership is also lower in the study area (3% of the study area commutes on public transit, compared to 5% of the county). Furthermore, the large concentration of wealth in the study area may minimize the need for better public transit options. While 50% of Denver county households earn less than \$60,000 annually (nearly 60% of the same populace averages no more than \$35,000 annually), only 42% of the study generates less than \$60,000 in income annually, and 41% of the population generates at least \$100,000 in income annually. Without a direct need for better access to public transit will need to be the more convenient mode of transportation to attract residents within the study area. Finally, the biggest challenge in increasing walkability and ridership within the study area may be the amount of homeowners residing within the study area. While Denver county has an equal amount of homeowners to renters, within the study area, there are three times as many homeowners as renters. If this area is primarily comprised of single-family neighborhoods, there may be little points of interest or importance within a short distance that would make multi-modal transit convenient.

Land Use, Transportation and Urban Fabric

Land Use

Residential

Eighty-four percent of the residential units in the Regis-Berkeley neighborhood are designated as single-family units and the remaining sixteen percent of units are designated as multi-family units. Comparatively, sixty-eight percent of residential units in the city of Denver are designated as single-family units while the remaining thirty-two percent of residential units are designated as multi-family. This means that the Regis-Berkeley neighborhood has a greater percentage of people living in homes with one family occupying them than the city of Denver by sixteen percentage points. Compared to the other neighborhoods that comprise the city, Regis-Berkeley has fewer people living in apartments or other kinds of buildings that house more than one family. The dominance of single family housing in the neighborhood can be seen in light yellow in Figure 7 on page 10.

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Commercial

The Tennyson Cultural District between 48th and 36th streets along Tennyson Street is coded as “General Mixed Use” by the Denver Zoning Code. Therefore, the buildings are zoned to sit back to improve connection between multiple uses of the street, minimize the visual impact of parking, provide human scale, give prominence to the pedestrian realm, and to arrange their heights to provide transitions between areas (Denver Zoning Code). The mixed use zone along Tennyson features about sixty-five businesses “from chic art galleries and boutiques to salons, studios, flower shops” (9News).

The neighborhood has two large grocery stores concentrated in the southern portion of the neighborhood’s boundaries in the “Main Street” zone along 38th and at the end of Tennyson Street. Regis Square in the north is “a suburban style community scale shopping center of 17 acres anchored by a K-Mart store (Denver Gov). Fast food restaurants and inns are concentrated along Federal Boulevard.

Community

Five schools, eight churches, one DMV office, a municipal golf course and two large parks serving the community exist within or right outside of the neighborhood boundaries. Regis University, one of the schools, enrolls over 4,000 students. Willis Case Golf course located in the northeast end of the neighborhood is a municipal golf course owned by the government. It is one of seven municipal golf courses in the city of Denver.

Parks and Open Space

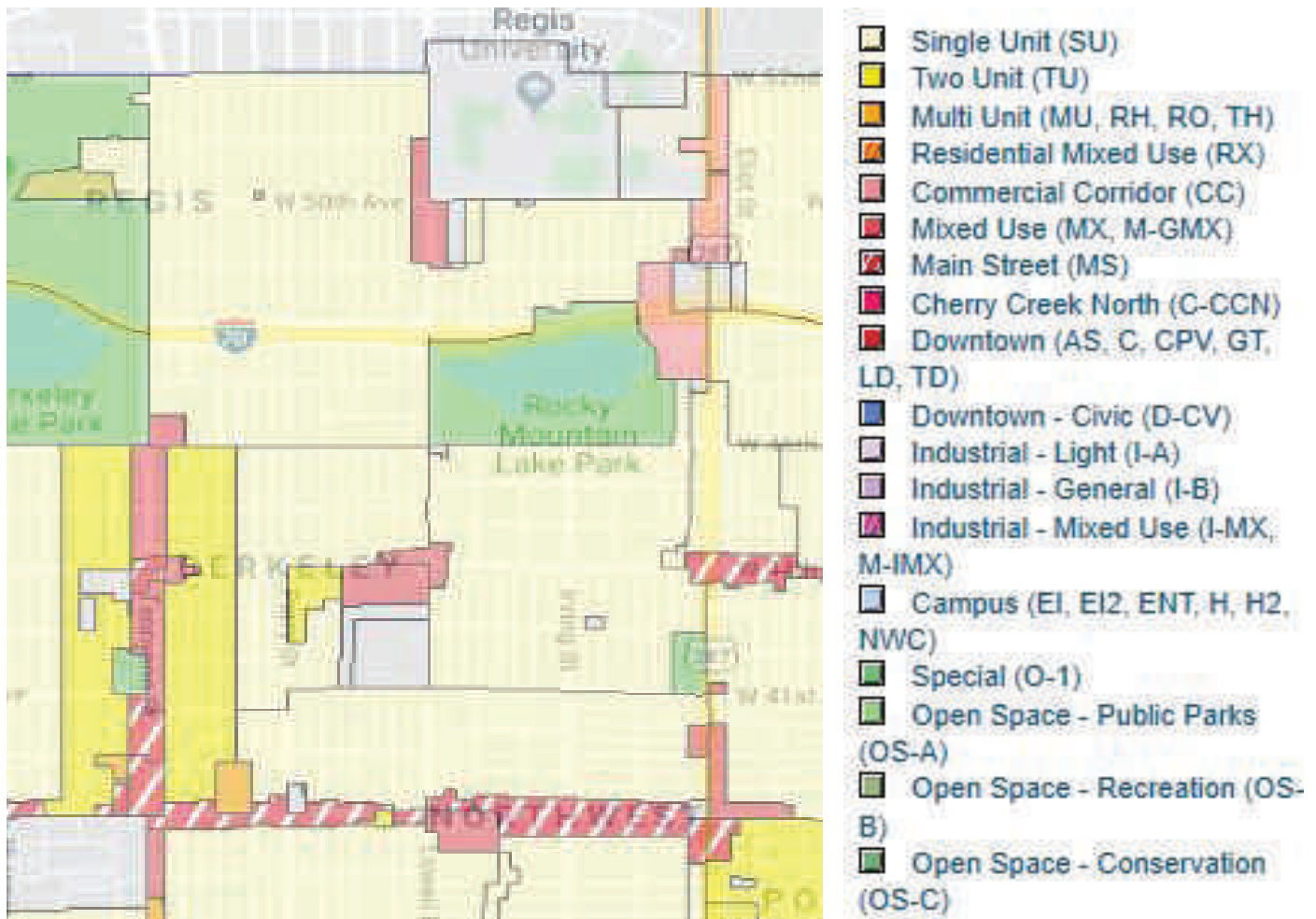
Inspiration Point: The nonprofit The Cultural Landscape Foundation says, “Located seven miles northwest of downtown Denver, the idea for this park was introduced by Charles Mulford Robinson in 1906 as a vista point from which to view the growing city to the east and 200 miles of the Front Range to the west. A year later, in his plan for the Denver Park and Parkway System, George Kessler included the 25-acre park atop a bluff overlooking the Clear Creek Valley. Kessler, working with architect Henry Wright, completed the park in 1910” (tclf.org).

Berkeley Lake Park: A recreation guide called Uncover Colorado says, “Berkeley Lake is the highlight to this beautiful North Denver park. There are numerous grassy and shady areas to have a BBQ and picnic. Walkers and joggers frequently use the trail around the lake. I-70 runs parallel to the park, which is located at the corner of Sheridan and 46th, across from Lakeside Amusement Park. It’s easy to ignore the highway as you enjoy the fascinating scenery.” Although the lake is dominant, tennis courts, basketball courts, a dog park, soccer fields, a playground, and the William Scheitler Recreation Center are located at the park (uncovercolorado.com)

Rocky Mountain Park: The 501(c)(3) charitable organization History Colorado describes Rocky Mountain Park as “typical of the water parks planned for Denver before 1900. The lake, once a watering hole for a branch of the Overland Trail, covers most of the park area. The park features a beautifully planted lake shore, designed in the Edwardian manner, for strolling. Park construction took place between 1906 and 1910. The property is associated with the Denver Park and Parkway System Thematic Resource.” (historycolorado.org)

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Figure 7: Land Use



Source:DenverGov.org

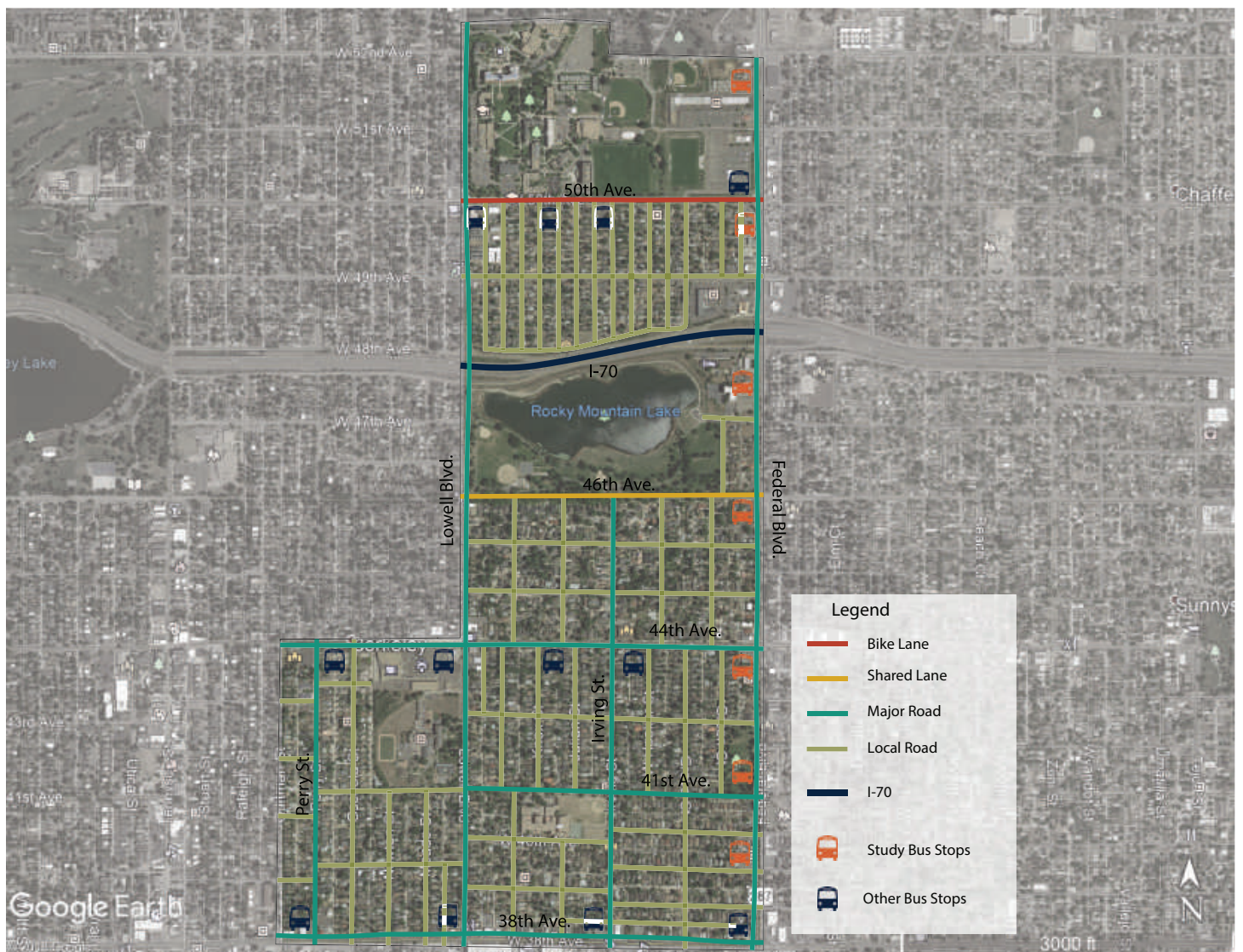
Transportation

Transportation through the neighborhood is centered around ease of mobility for cars. In a car there is ease of access to interstate 70 and Federal Blvd. this makes it easy to travel to and from the neighborhood by car. As for bicycles, it is a far different situation; there is a single road in the neighborhood that has a defined bike lane (50th Ave.). There is one road that is listed as a shared road for bikes and cars (46th Ave.) and the rest of the neighborhood people on bikes are left to their best judgment for moving through the area. For a pedestrian in the neighborhood, all of the streets are lined with sidewalks and the parks in the neighborhood host a network of trails. That being said, the sidewalks along the major roads do not have a buffer from the traffic making it a harsh place to be a pedestrian. On top of this, as a pedestrian you have to cross up to four lanes of traffic at once to cross a major road in the neighborhood. As for public transit, there are 20 bus stops in the neighborhood that are serviced by routes 31, 38, 44 and 52. From some spots in the neighborhood it is up to half a mile walk to the closest bus stop, and up to a mile walk to a bus stop on Federal Blvd. Overall the easiest mode of transportation to and from and in the neighborhood is by car. On a bike you do not have a defined or protected space in the majority of the neighborhood. As a pedestrian, there is ample access to sidewalks, but you are an uncomfortable distance from traffic and crossing major roads is stressful at best.

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For using public transit on Federal Blvd., route 31, the stop frequency is roughly 15 minutes, but this route only runs north and south along Federal. As for the bus stops along routes 38, 44 and 52, the frequency is roughly 30 minutes. That combined with the routes running east and west means you would likely have to transfer buses at some point meaning if you miss your bus along one of these three routes you would have to wait up to 30 minutes for the next bus and likely have to figure out another transfer. The frequency and linear routes of the buses in the neighborhood may make it difficult to utilize public transportation on a daily basis in the neighborhood.

Figure 8: Transportation Map



Sources: RTD, class files and Denver Bike Map

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Urban Fabric

Built Environment

The description of “Urban Neighborhood” in the Denver Zoning Code applies to the majority of Regis-Berkeley Neighborhood’s built environment: The Urban Neighborhood Context consists of a regular pattern of block shapes surrounded by an orthogonal street grid. Orthogonal streets provide a regular pattern of pedestrian and vehicular connections through this context and there is a consistent presence of alleys. Block sizes and shapes are consistent and primarily include detached sidewalks (though attached sidewalks are also found), tree lawns where provided for by detached sidewalks, street and surface parking, and landscaping in the front setback. Residential buildings typically have consistent, moderate front setbacks, shallow side setbacks and consistent orientation. Commercial buildings typically have consistent orientation and shallow front setbacks with parking at the rear and/or side of the building. The Urban Neighborhood Context is characterized by low scale buildings except for some mid-rise commercial and mixed use structures, particularly at nodes or along arterial streets.

Although many of these zoning standards are seen in the neighborhood between the arterial streets, the built environment of Federal Boulevard differs because it is an arterial street.

Figure 9: Picture of Federal Boulevard



Source: Andrea Vaughn

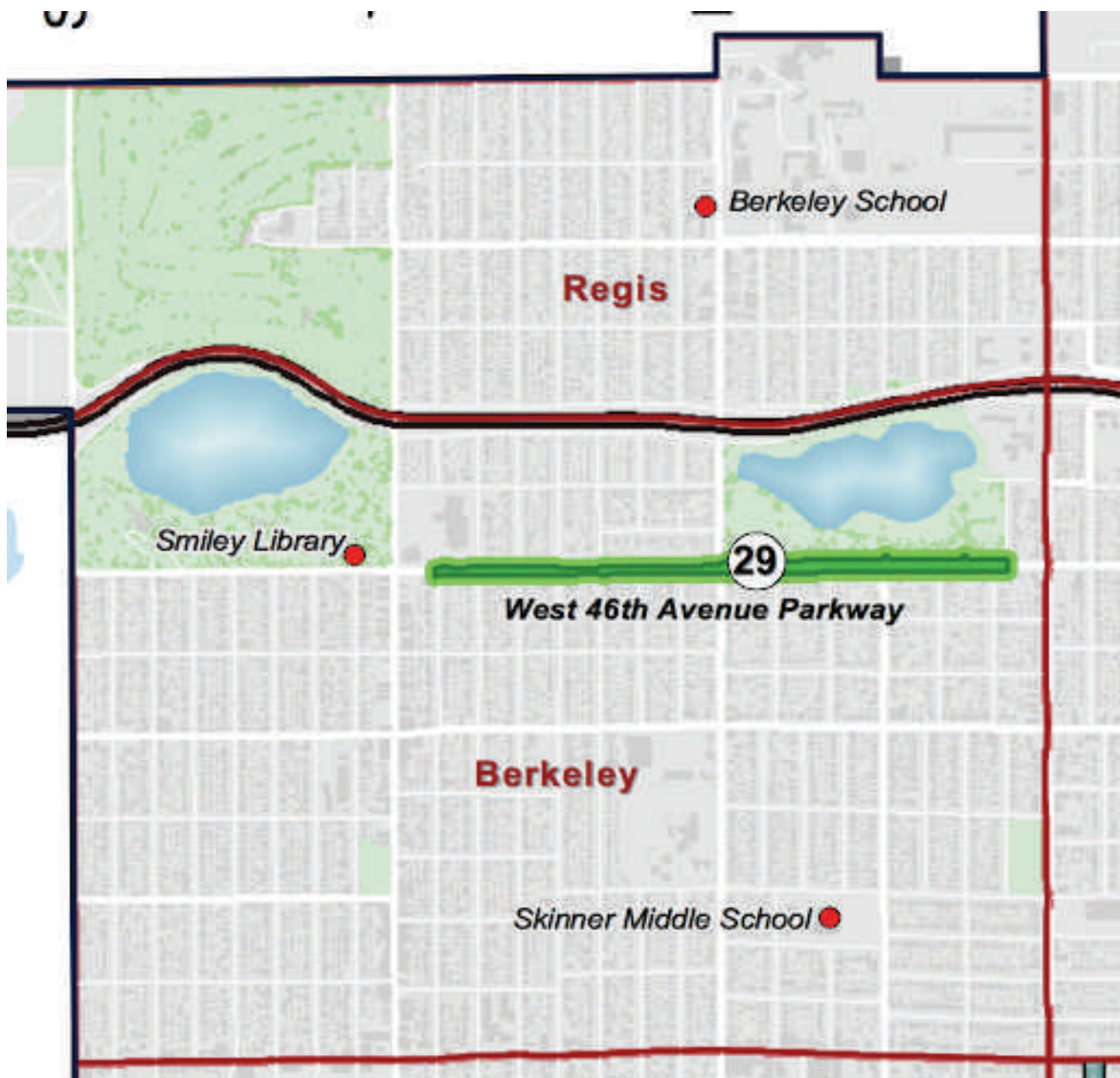
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Figure 9 shows deep setbacks, vehicle-oriented design, and spaces with little thought put into the connectivity between them as the zoning code for “General Mixed Use” and “Single-Unit” that makes up most of Regis-Berkeley calls for. The dip between the sidewalk and the road is the only buffer between the person walking along this boulevard and the lanes of traffic. In addition to the lanes of traffic, a person walking must be alert to cars coming and going from the businesses.

Designated Historic Places

West 46th Avenue Parkway was designated as a historic district in the 1980s. Berkeley School, Smiley Library, and Skinner Middle School are designated as “Historic Landmarks” (Denver Gov).

Figure 10: Historical Places



Sources: Denver Maps, Historic Landmarks and Districts.

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The urban fabric and built environment of much of Regis-Berkeley provides pedestrians with access to sidewalks. But what the major thoroughfares provide contrasts starkly to the blocks of residential single-unit homes and mixed use zones. Although Tennyson is zoned to provide pedestrian scale infrastructure, there is a lack of bike lanes, bus routes, and pedestrian infrastructure to connect people to bus stops along Federal Boulevard in an adequate enough way to increase ridership. In addition to Tennyson Street, the neighborhood does not offer good enough connections between its limited number of grocery stores, historic landmarks, and parks to entice people to take transit instead of to take a car. There are many attractions for people in this neighborhood but poor connection between them and Federal Boulevard.

Conclusion

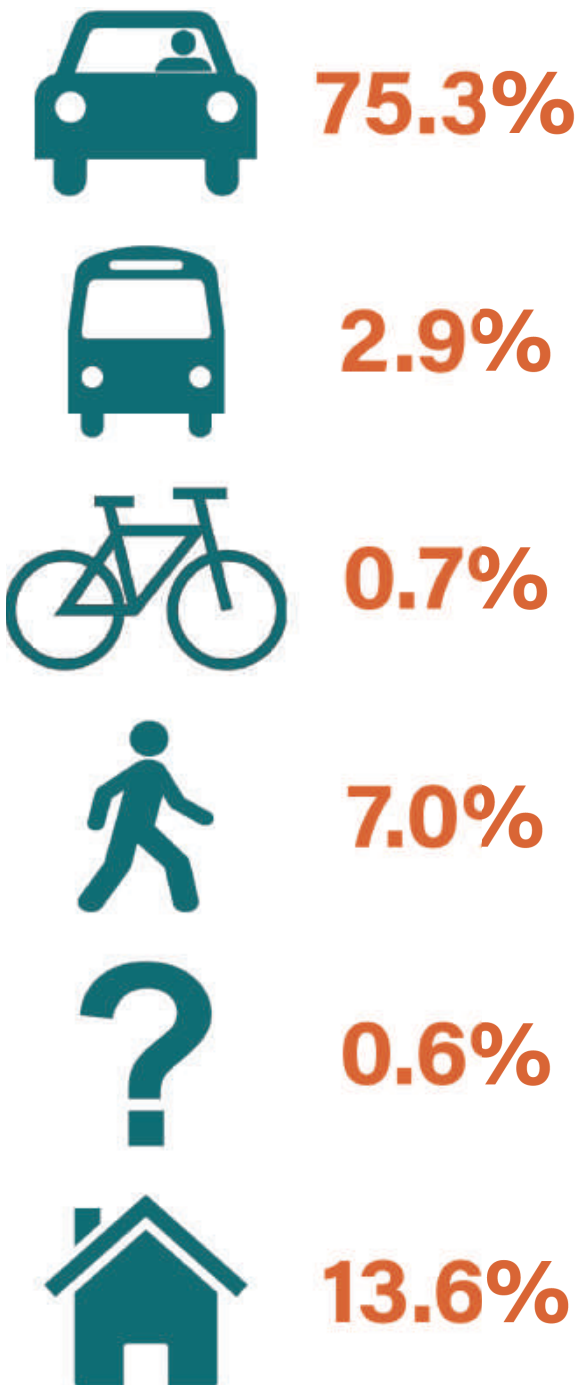
In the Regis-Berkeley neighborhood, car ownership is high and transit ridership is low. The neighborhood can afford to drive their own cars based on the demographic data. The neighborhood is almost eighty-four percent residential, yet it only has a few grocery store options in the southern portion of the neighborhood. The neighborhood is made up of built environment qualities consistent with what the Denver Zoning Code categories as an “Urban Neighborhood” besides the major arteries such as Federal Boulevard and two large parks. Federal Boulevard has fast food restaurants with four lanes of traffic. It is not a pedestrian friendly place based on the sidewalk’s close proximity to the street and large building setbacks. The connectivity between Federal Boulevard and the rest of the neighborhood is weak because of limited bus routes, bike lanes, and pedestrian infrastructure. Because of these qualities of the neighborhood, the current three percent of people who use transit to commute is not at the city’s goal of fifteen percent.

Chapter 2: Site Assessment

Site Assessments Introduction

Based on the preliminary information gathered in the project introduction and context chapter, there were a few things the team expected to encounter. Based on the census data previously collected, the team knew that only 2.9% of the residents in the Berkley and Regis neighborhoods took public transportation to commute to work (Figure 11). From this, the team expected that either there was low ridership in these neighborhoods, or that much of the ridership came from people living outside of the neighborhoods. From the information

Figure 11: Transportation to Work



gathered in the preliminary research, the team was prepared to go into the field in order to better understand the Regis and Berkley neighborhoods. The team then prepared a safety and execution plan. This plan is meant to ensure the safety of the team as well as organize how the data and information were to be collected. The following step was to get an initial impression and understanding of project area. This step is vital to the process, because it provides the team with a real world understanding of the project area. Following this, the next step was to gather as a team and define the ratings in which they would use on the bus stops. Once the team had a consistent understanding of how to observe and rate the bus stops, they split into teams of two assess and investigate the Federal Boulevard bus stops in their project area. While assessing the bus stops, the teams of two also took the opportunity to perform intercept interviews of people at the bus stops. This step is crucial in understanding the ridership that uses the bus stops and their concerns. Lastly once all of the field data was collected, the team reconvened to organize and analyze the data. This is important because it gives the team a chance to understand the data that was collected and turn it into a compelling and truthful narrative.

Source: ACS 5-Year Estimates (B08301)

Chapter 2: Site Assessment

Study Area Windshield Survey

In order to be able to understand the data collected through assessments and interviews it is important to have a first hand understanding of the community. In order to get this first hand contextual understanding, the team conducted a windshield survey. The team started this survey by meeting at Rocky Mountain Lake Park, just off of 46th Avenue. Just by looking at the road, it is clear that the community is designed for transportation by car. With the only bike lane in the community being the one along 46th Avenue, it should be noted that this lane is also used for parking (Figure 12). Overall, 46th Avenue is a good example of how the roads in Regis and Berkley prioritize cars over pedestrians and bikes. After visiting the park, the team then traveled to the intersection of Federal Boulevard and 52nd Avenue. At this intersection, the team took the opportunity to survey the northernmost bus stop in the study area. At this bus stop, the team worked to establish a consistent criteria in which to assess the remaining six bus stops in the study area. At this bus stop it was clear that there was minimal pedestrian connectivity between the east and west sides of Federal Boulevard.

It was also clear that the primary land use around the bus stop and along this section of Federal Boulevard is commercial. From there the team drove south along Federal Boulevard to 38th Avenue, the southern boundary of the study area. In this section of the survey, the team had the opportunity to see all of the bus stops included in the projects. Following this, the team traveled west down 38th Avenue to Perry Street. Along this stretch of the study area, the team noted that there is a more diverse mix of residential and commercial land uses compared to the area along Federal Boulevard. After this, the team traveled north along Perry Street to Lowell Boulevard to the northwest corner of the study area. When traveling along the western edge of the study area, the team noted how the neighborhood had a much more residential feel than the eastern boundary along Federal Boulevard. Along the western boundary, the team also noticed how I-70 separated the communities.

Figure 12: 46th Avenue



Source: Ian Conrardy, Google Earth

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After surveying the boundary of the study area, the team took the opportunity to drive through the neighborhood to the north of the project area. In this neighborhood, the team noted that it appeared to be of a lower economic class than the neighborhoods to the south in the project area. The team also noticed that the neighborhood was lacking in that there were no curbs or sidewalks along the road. From here, the team traveled south to the neighborhood south of Rocky Mountain Lake Park. This neighborhood had larger lot sizes than the neighborhood north of the study area. Additionally, the neighborhood had much better infrastructure, including better roads and sidewalks throughout. Overall from the windshield survey, the team gained first hand experience of the urban fabric and make up of the neighborhood. This understanding would be valuable in the interview process, because the team would be able to avoid coming off as complete outsiders to the public.

Execution and Safety Plan

Prior to conducting fieldwork, the team put together an Execution and Safety Plan, which outlined the best practices for collecting data and ensuring personal safety. Firstly, the team agreed that interviews should be conducted during peak hours and that the team will select participants in a way that tries to reflect bus ridership of the area. It was also discussed that if an interview is conducted in Spanish, the team will try to obtain permission to audio record for transcription later, but that no interview should be recorded, either audio or visual, without the participants permission to do so.

Personal safety was also taken into consideration for conducting field work. The planning team was split into two groups, based on availability, to ensure that no one individual would conduct field work alone. It was also agreed upon that fieldwork shall only take place during daylight hours and in favorable weather, to reduce potential hazards. Finally, recognizing the danger of performing field work along a busy thoroughfare, it was also agreed upon that the team will practice safe behavior, such as avoiding jay-walking and if a vehicle is to be utilized, the driver will avoid making left turns and maintain a minimal speed that is safe to all passengers and others on the street.

Bus Stop Assessments Site Investigation

During the assessment of the bus stops, the team obeyed the execution and safety plan. The team made two teams of two and split the number of sites assessed in half; one team covered the southern portion while the other team covered the northern portion of the assigned stops on Federal Boulevard. All fieldwork was performed on weekdays and in decent weather. The team conducted the assessments during both the morning and evening hours. Both teams of two walked south to north, stopping at each of their sites to make an assessment. The team assessed the sites by having one person describe the absence or presence of the data attributes of interest while the other person used the CCD/WalkDenver app to record the assessment. The team made sure to obey traffic and safety laws.

Prior to performing the assessments of the Regis-Berkeley bus stops, the team agreed upon a strategy to determine the ratings for the three categories of safety, accessibility, and amenities. Below are the general attributes and the specific ratings the team agreed to use

Chapter 2: Site Assessment

for the assessments.

Safety:

The team considered the length of the block, lighting, proximity to the curb, level of traffic, and the level of activity on the sidewalk to determine how safe the bus stop felt.

- 5 - No improvements needed
- 4 - Better than average, could use some minor improvements
- 3 - Generally pretty safe, but major improvements needed (ie long blocks with no crosswalks)
- 2 - Has some safe features but needs overhaul
- 1 - Feels very unsafe

There is one question from the CCD/WalkDenver app with numerical answers that applies to safety:

- How would you rate the safety of the bus stop?

Accessibility:

The team considered proximity to crosswalks, ADA compliance, barriers to finding the stop, and the size of the stop to determine how accessible the bus stop felt.

- 5 - perfectly accessible to all riders
- 4 - ADA compliant, but needs some minor improvements
- 3 - Not ADA accessible, but fairly accessible to able-bodied people
- 2 - Bus stops are located too far from crosswalks, no ADA accessibility
- 1 - Not accessible

The questions from the CCD/WalkDenver app with numerical answers that apply to accessibility:

- How would you rate the accessibility of the bus stop to people with disabilities?
- How would you rate pedestrian connectivity to the bus stop (e.g., sidewalks)?

Amenities:

The team considered the “physical condition” rating to cover the presence of garbage cans, benches, shelters, and public artwork to determine the level of amenities provided at the bus stop.

Amenities:

- 5 - Nearly all amenities are present
- 4 - Meets most basic amenities
- 3 - Has a bench and a trash can
- 2 - Has a bench, but not much else
- 1 - No amenities present

The questions from the CCD/WalkDenver app with numerical answers that apply to accessibility:

- How would you rate the physical condition of the bus stop (state of good repair)?
- How would you rate the cleanliness of the bus stop?

Chapter 2: Site Assessment

Overall Ratings:

The class project survey asked for an overall rating of each bus stop. See Exhibit 5 below for a graphic summary of the locations and the overall ratings.

Inventory Questions:

The class project survey included the following questions and prompts

- What, if anything, makes the bus stop feel unsafe?
- What amenities are present at the bus stop?
- If public art is present at the bus stop, please describe it
- How close is the nearest marked crosswalk to the bus stop?
- What amenities are present at the bus stop?

Summaries of the Characteristics and Conditions of the Bus Stops:

Below is how the team assessed #13726 and an example of how the team assessed every stop:

In Figure 13, the buffer and sidewalk create distance between the bus stop's bench and the two-lane traffic of Federal Boulevard. This image and graphic illustrates a combination of the variations of the attributes of safety, accessibility, and amenities present at the bus stops the team assessed. The team gave the bus stop below a rating of "2" for the Amenities category because it provides a bench, but not much else. It received a rating of "2" for the Safety category because it has some features but needs overhaul and it received a rating of "3" for the Accessibility category. The team gave it an overall rating of "3". The team's notes on it: "Bench is rusting, no overhead lighting. Generally feels unsafe, but is setback from the street."

Figure 13: Federal Boulevard and 47th Avenue Bus Stop (#13726)



Source: Ian Conrardy, Google Earth

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#13722

Overall Rating: 3

Although it feels decently safe, there is frequent traffic close to the bus stop. It is very clean and in good repair. The accessibility for people with disabilities is poor but the connectivity for pedestrians is decent because it is very close to pedestrian infrastructure. The block of the site is long and it sits in front of a park. It has a bench, trees, and a trash can.

#13724

Overall Rating: 2

The physical condition of this bus stop was extremely poor. The team found broken glass surrounding it and the leg of the bench was broken. But, it felt relatively safe because of the low traffic, some lighting, and short block length. For people with and without disabilities, it has decent accessibility.

#13726

Overall Rating: 3

This bus stop received a score of 3 for safety because of some lack of lighting, visibility, and close proximity to busy traffic. It was in a very poor state of repair. Its connectivity and accessibility were fairly good. It was very close to pedestrian infrastructure. It was surrounded by residential buildings and homes. It had a bench.

#13728

Overall Rating: 2

This bus stop received a low score for how safe it felt because of a lack of lighting, visibility, and space for one to wait. The lack of sidewalks makes this stop not very accessible and its physical state was very poor, although it was clean. Due to the lack of sidewalks, the site is not accessible for disabled people. It has a bench and trees which provide shade.

#13731

Overall Rating: 4

Although it received a high score for how safe it felt, the lack of lighting and visibility did interfere with a sense of safety. It is somewhat close to pedestrian infrastructure, but some people may not want to walk the distance. The accessibility for people with and without disabilities was decent. It is very close to a lot of fast food restaurants. It was not a mostly clean bus stop. It has a bench, trees, a shelter, and a trash can.

#13732

Overall Rating: 3

This bus stop features the only public art the team found: an artfully painted bench. Although it received a high score for how safe it felt, the frequent traffic did interfere with a sense of safety. It is somewhat close to pedestrian infrastructure, but some people may not want to walk the distance. Not very clean. It has a bench.

#21367

Overall Rating: 4

Although it received a high score for how safe it felt, the lack of lighting and visibility did interfere with a sense of safety. The accessibility for people with and without disabilities

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was decent. Although it scored well in the categories covered by the class survey, the team suspects that the potholes on the sidewalk and a large dip at the edge of where the sidewalk meets the curb create a less inviting bus stop. It was a mostly clean bus stop. It has a bench and lighting.

Figure 14: Location of Bus Stops and Ratings



Source: Bryn McKillop, RTD Open Data Download

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Intercept Interviews

The planning team conducted twenty intercept interviews to get input from the public about their experience and opinion about the bus system in Federal Boulevard in Regis and Berkeley neighborhoods. The team separated into two groups; each group has two members that conducted ten interviews in different bus stops. The team made sure to conduct interviews with people from different backgrounds, gender, age groups, races and ethnicities. This section will present and analyze the data collected from the interviews.

Figure 15: Race, Ethnicity, and Gender

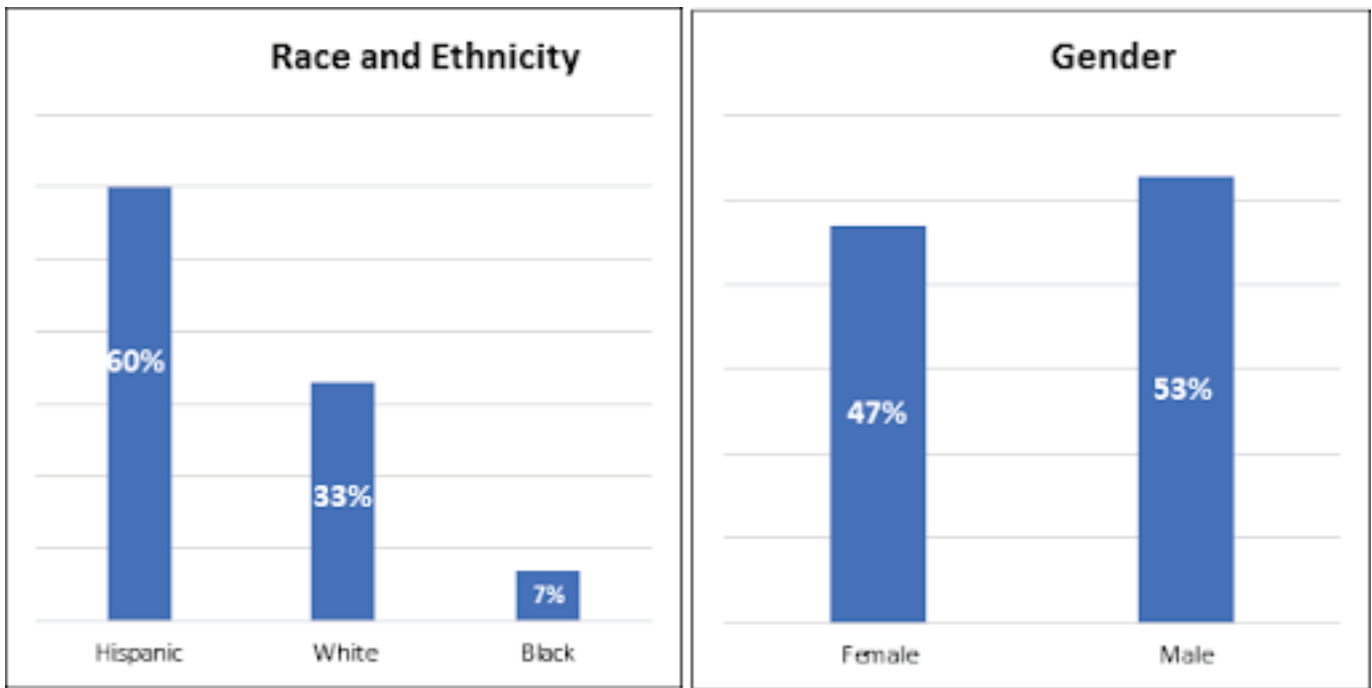


Figure 16: Age

Exhibit 8: Age Groups		
Age	Count	Percentage
17-24	3	19%
25 -35	2	12%
36 -50	3	19%
>50	8	50%
Total	16	100%

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Figure 15 shows that most of the population that uses the bus stations on Federal Boulevard in Regis and Berkeley neighborhoods are Hispanics and white. Sixty percent of the people using the bus in this area are Hispanics and only one third of riders are white. The planning team found that it is rare to find black and other races in the area. This may indicate that most of the Hispanics population living and working in the area. The concentration of Hispanics population in the area could be due to the urban renewal happened in the 1970s, where the Hispanics in Auraria moved to the surrounding areas (Page & Ross, 2015). Figure 15 also shows that the percentage of men and women that uses the bus system on Federal Boulevard are almost equal. The number of men using the bus is slightly higher, where fifty three percent are men and forty seven percent are women. Figure 16 presents that fifty percent of population using these bus stops are above 50 years old, which could be the older generations living in the area. Nineteen percent of bus riders are between 17-24 age group, most likely those are the students commuting to and from Regis University. The other age groups could be the workers in the area.

Figure 17: Residents and Workers

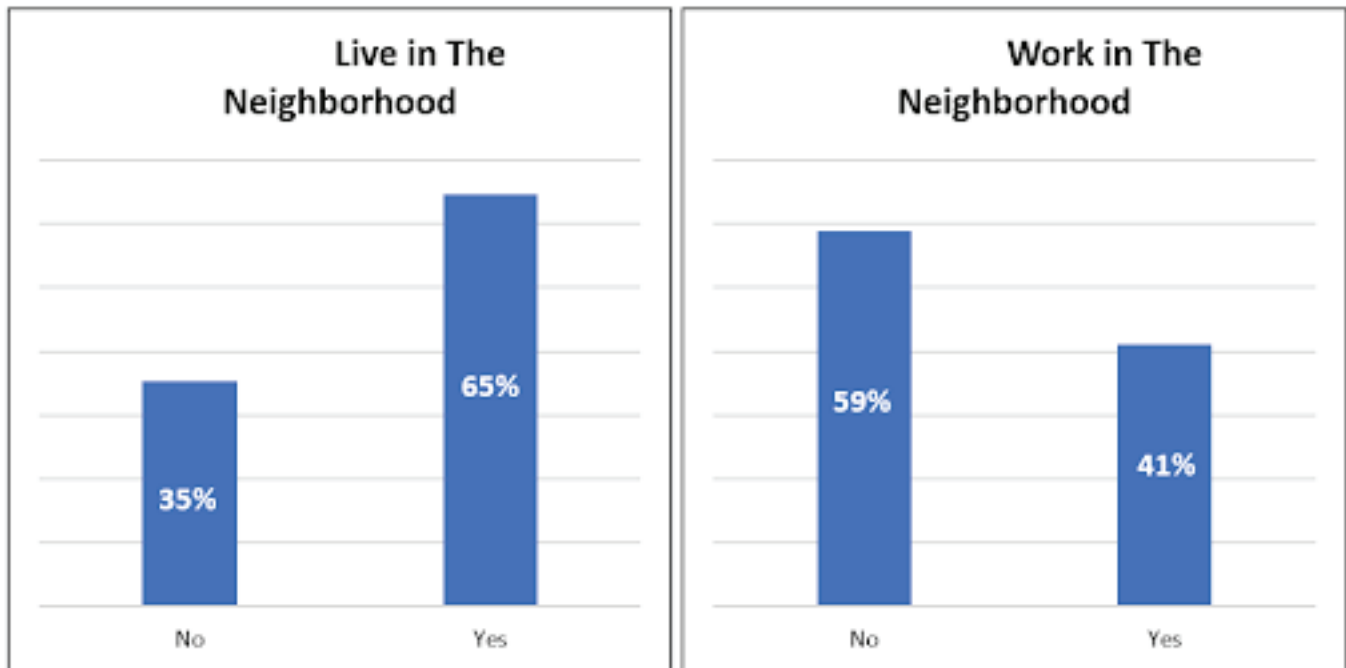
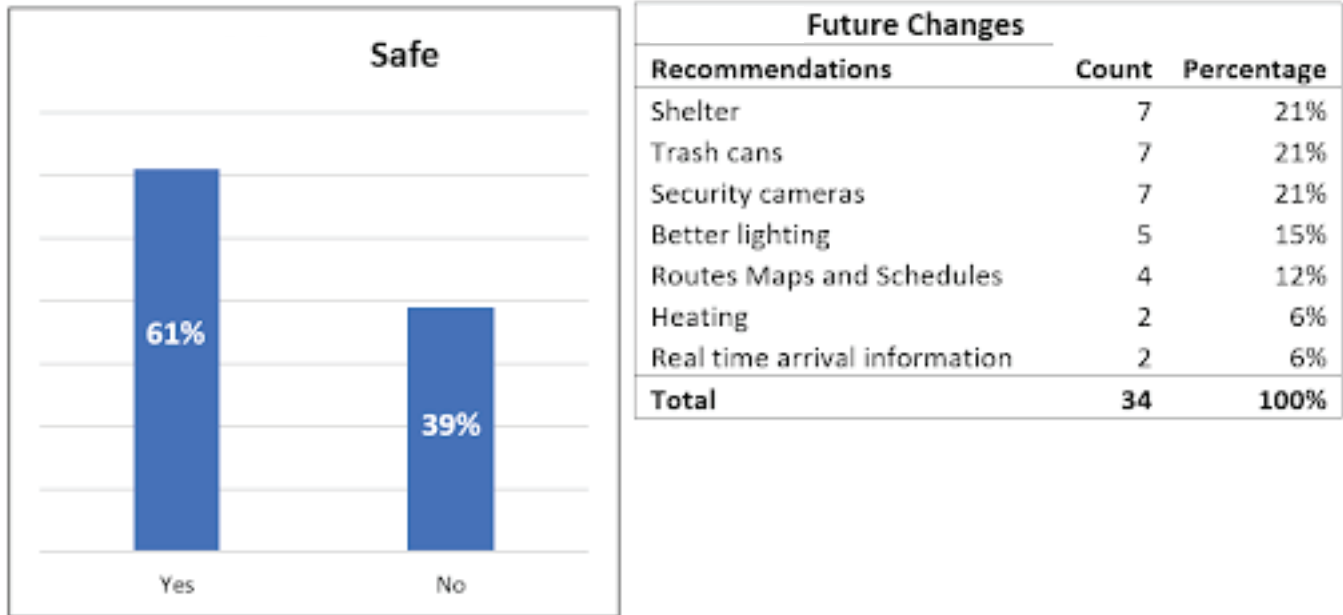


Figure 17 shows that most of the bus riders live in the neighborhood and work outside the neighborhood. Although, not a small percentage of bus riders live outside the neighborhood and work in the neighborhood. These exhibits indicate that there is a balanced movement between the percentage of people who are commuting in and out of the area.

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Figure 18: Safety and Future Changes



The planning team asked people if they feel safe while waiting in the bus stops. As represented in Figure 18, thirty nine percent said they don't feel safe at all. Sixty one percent said that they feel safe but with conditions. The conditions are using the transit during the daytime and stay away from drunk people. In addition, most of the people complained about how dirty the bus stops are and wished that they are cleaner. Further, the people were asked what would make the bus stops better. Figure 18 also presents the most desired changes. The results show that the people are concerned about the safety and cleanliness, which are the basics of having a good bus stop.

Figure 19: Bus Usage

Category	Count	Percent
At least once a day	11	55%
2-5 times per week	7	35%
Once per week	2	10%
Total	20	100%

During the interviews the people were asked "Why are you taking transit today?". A popular answer to this question is having no other choice. The planning team found that one hundred percent of the interviewees do not own a car. Therefore, they are forced to use the transit whether they prefer or not. Walker called this group of people "captive riders" (43). Also, the team found that all the interviewees either walk to the bus stop or transfer from other bus, that's due not having another choice, too. Figure 19 illustrate the bus usage by

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the interviewees, more than half of them use the bus at least once a day, and more than one third uses the bus between 2-5 times per week. That shows the transit is essential for these people's daily life. Therefore, it is important to improve the quality of the services provided, especially the essentials like safety and hygiene.

Assessment and Interview Methodology Critique

Assessment

The planning team found that the online tool for the bus stop assessment to be very easy to use and that the user-interface was intuitive and user-friendly. The only faults that the team found with the assessments are in the Excel spreadsheets given for interviews. Using the Excel sheet given to the class, the planning team had noted that there was no field for the bus stop ID. The team felt that this was an oversight, since the interviewees were responding to questions about the particular bus stop they were at, but with the materials provided by the client, this crucial bit of information is lacking. As the team discovered, the condition and amenities of the bus stops varied widely, from some being well-maintained, while others were in various states of disrepair. Furthermore, through omitting this bit of information, it is impossible to analyze trends of who is using which bus stop and potentially investigating why. The team found, fairly consistently, that no matter the time of day, most people that were interviewed were intercepted at one bus stop in particular, while other stops were intermittently and sparsely populated.

Interview

Overall, the planning team feels that they had executed the intercept interviews well. However, there were some limitations that the team had run into. In terms of performing the interviews, the group felt that there were barriers that would have been more manageable in a more formalized setting. Given each individual's academic, professional and personal schedules, as well as inclement weather, coordinating time to go to the field at times that may have been optimal was a challenge. Beyond schedule conflicts, the planning team also had encountered a language barrier that was found to be insurmountable. Even with a Spanish translation of the interview questions, the team was unable to get any Spanish speakers to participate in the interview. While the logistics of being able to provide a translator to ease the language barrier may not be feasible, the group does feel that there might be a key demographic whose voice is unrepresented in the work that is presented in this report.

Furthermore, the planning team did encounter some issues with the survey itself. Given the regularity of Route 31, the team had found that most people using the bus stop generally only arrived approximately five minutes before the bus was scheduled to arrive. Given that the survey could take two to three minutes, depending on the respondents answers, this was, on occasion, an inadequate amount of time to complete the survey. Some questions, such as question number eight had to be approached strategically and the choices were read in rapid succession to give the interviewers time to read through the question in its entirety. After some discussion, the group agreed that a more open ended question that allowed respondents to formulate their answers independently may be more effective. Furthermore, some respondents had trouble understanding question number nine and required the interviewer to repeat the question. This may be due to the length of the

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question and wording, in which respondents are asked if they would prefer “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” (author emphasis). It is of the teams opinion that placing words that appear to have contradictory meaning within the same sentence may create confusion among respondents. The inclusion of riding time could also be removed for better comprehension, as the time one spends walking to a bus stop should be indicative of the time spent on the bus, considering the length of the route is not dependent on the location of bus stops.

Conclusion

Through the team’s experience of conducting a windshield survey, bus stop analysis, and intercept interviews, they learned a lot about the Regis and Berkley neighborhoods and the Federal Boulevard bus stops. The windshield survey gave the team an expanded understanding of the study area that could only be obtained by experiencing it first hand. With this newfound understanding the team was able to survey and analyze the seven bus stops on Federal Boulevard within the study area. Form the survey and analysis of the bus stops, the team learned that overall the bus stops are functional and meet basic necessities. That being said, the team also learned that the bus stops still have a fair amount of room for improvement. Only one of the seven bus stops had shelter, this is critical with Denver’s climate. The process of performing intercept interviews was a critical part of this study and offered the team a valuable insight into the public opinion of the bus stops. Through this process, the team learned that the public prioritized comfort and safety. Overall, the team had the opportunity to compare their outside perspective and that of the public’s perspectives of the bus stops. From this comparison, on thing that the team learned was that the people using the bus stops were primarily concerned with safety concerning other people near the bus stops. Where as the team expected there to be a larger concern with safety considering road traffic and crossing Federal Boulevard as a pedestrian. Following the study, the team concluded that the most pressing improvement for the bus stops is increasing a sense of safety concerning things such as homelessness of people in and around the bus stops.

Chapter 3: Gaps and Recommendations

Existing Infrastructure

Gaps

Pedestrian Infrastructure

The planning team found that the pedestrian experience on Federal Boulevard to be an uncomfortable experience, in large part due to the existing infrastructure. Another safety concern noted by the planning team are speeding cars on Federal Boulevard. Between 52nd Ave and 39th Ave, Federal Boulevard is comprised of four lanes and though the posted speed limit is 35 MPH, Federal Boulevard can often feel like a highway, instead of a city street.

The planning team also observed that approximately between the north side of I-70 and 42nd Avenue, the sidewalks are approximately three feet wide, leaving little room between the pedestrian and the street. We found this problem to be worst along the bridge of I-70, in which pedestrians are squeezed between protective railing and the street. Furthermore, in our windshield survey, the team observed that in the neighborhoods surrounding Regis University, in particular, that the sidewalk curbs lack a defined edge, making it easier for vehicles to roll over the curb, putting pedestrians at higher risk on these sidewalks.

Figure 20: Sidewalk on I-70 Bridge



Source: Andrea Vaughn

Chapter 3: Gaps and Recommendations

Bicycle Infrastructure

The planning team observed no bicycle infrastructure along Federal Boulevard or in the surrounding study area. Currently, only 1% of residents (Figure 3.1) in the study area cycle as a means of transportation, possibly due to the harsh environment created through the street design.

Recommendations

Pedestrian Infrastructure

Denver should prioritize pedestrian safety Federal Boulevard and Denver's Vision Zero policies that have begun to be implemented throughout the city should be adopted on Federal Boulevard. To minimize the potential of fatal crashes involving pedestrians, the speed limit should be lowered to an ideal speed of 20 miles per hour, but no more than 30 miles per hour.

Bicycle Infrastructure

In order to encourage multi-modal transit along the route and to enhance pedestrian safety, it is the team's recommendation that Federal Boulevard be converted from a four lane street, to a three lane street with a protected bike lane. This bike lane would create an additional sense of security for pedestrians utilizing narrow sidewalks and provide a cost-effective alternative to widening sidewalks.

Missing Infrastructure

Gaps

As US Census data demonstrates, 7% of residents in the study area walk to work, compared to 4% of residents in Denver, overall. Given this data, it would be beneficial for the city to invest in infrastructure that encourages more of the residents in the Regis and Berkeley neighborhoods to walk, as well as possibly explore other facets of multi-modal transportation.

Figure 21: Offset Crosswalk at 41st Avenue



Source: Andrea Vaughn

Chapter 3: Gaps and Recommendations

Pedestrians are also at risk along Federal Boulevard, especially those who require accessible infrastructure for accessing public transit. According to the demographic data collected from the intercept interviews, 50% of those interviewed were over the age of 50 (Figure 16), indicating that there is a need for infrastructure to support this aging population. The team was unable to identify any infrastructure that would comply with the Americans with Disabilities Act (ADA), with the exception of rumble strips installed south of 42nd Avenue. Crosswalks were not accommodating for those with neither hearing nor seeing disabilities. The narrow sidewalks and long blocks would make it difficult for a person with physical disabilities to navigate along Federal Boulevard.

City blocks along this stretch of Federal Boulevard range from approximately 300 feet to 1,200 feet, with most being slightly below 600 feet; south of 46th Avenue, the street blocks range from 200 feet to 300 feet, which the team felt to be manageable compared to the longer blocks. In addition to the long blocks, there are five street-light intersections dispersed along Federal Boulevard and three offset crosswalks, all located between W. 43rd Avenue and W. 41st Avenue, totaling to eight safe pedestrian crossing along the mile and a half length of the study area.

Bicycle Infrastructure

Along the mile and a half stretch of Federal Boulevard, between 52nd Avenue and 39th Avenue, the planning team noted that there was a lack of biking infrastructure. Though Federal Boulevard is four lanes wide, not a single lane was dedicated for cyclists. Currently, only 1% of residents (Figure 3.1) in the study area cycle as a means of transportation, possibly due to the harsh environment created through the street design.

Recommendations

Pedestrian Infrastructure

In order for all transit-riders to be able to safely access the bus stops for both the north and southbound, it is highly recommended that cross-walks connecting bus stops be installed with appropriate signaling. Crosswalks should be made attractive, where possible, to encourage walkability and as a method of slowing the speed of vehicles.

To ensure that Federal Boulevard is safe and accessible for all users of all ages and abilities, accessible pedestrian signals should be installed at each traffic signal, along with rumble strips at every crosswalk. Sidewalks should be widened and the sidewalk should remain free of obstruction to ensure equitable access to all.

Bicycle Infrastructure

Bike lanes should be considered around Rocky Mountain Lake Park to encourage leisurely use of multi-modal transit and connect the vibrant retail area on Tennyson Street to Federal Boulevard.

Rider and Pedestrian Experience

Pedestrian Experience Gaps

Along Federal Boulevard, the pedestrian experience is overwhelmingly defined by auto-

Chapter 3: Gaps and Recommendations

centric design, especially between 52nd Avenue and I-70, where the urban fabric is largely made up of drive-in fast food restaurants, auto services, such as tire shops and a car wash and a large number of parking lots. South of I-70, there are some retail businesses, such as a 7-11 and wireless phone store which share the same parking lot. From W. 43rd Avenue to W. 39th Avenue, much of Federal Boulevard is dominated by single-family residential houses and McDonough Park, located between W. 42nd Avenue and W. 41st Avenue. There is very little interesting architecture, landscaping or art along Federal Boulevard in the Regis and Berkeley neighborhoods.

Recommendations

In order to entice enhance pedestrian experience along Federal Boulevard, Federal Boulevard must have, what Jeff Speck refers to as "sticky edges" - features that attract people. Attractive landscaping and art installations should be placed along the route and possibly along the edges of residential neighborhoods, such as in McDonough Park. Zoning in this area should also be reconsidered to more effectively draw in more attractive local businesses. Local businesses would help draw residents to the sidewalks of Federal Boulevard, similar to the effect that local businesses have had on Tennyson Street.

Rider Experience Gaps

Federal Boulevard in the Regis and Berkeley neighborhoods are well serviced by RTD. Each of the six bus stops surveyed along the west side of Federal Boulevard are placed approximately one-quarter mile apart (Human Transit pg. 209) and Route 31 arrives approximately every fifteen minutes. An individual's experience utilizing the bus itself is, presumably, a comfortable one. The planning team, however, found that a transit user's experience could be improved through bus stop improvements focusing on improvements that improve the aesthetics, comfort and safety of the bus stops.

Figure 22: Businesses Located North of I-70 on Federal Boulevard



Source: Andrea Vaughn

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To begin to attract drivers to bus stops, art installations, whether it be the bench itself or art installed in a shelter or around the bus stops have had a proven effect of increasing transit use, such as in Montreal (Walkable City pg. 204-205). Currently, the Regis and Berkeley neighborhoods on Federal Boulevard, however, only one of the six bus stops (stop #13732) assessed possessed any aesthetic qualities. While none of the survey respondents said that they would like to see more public art installed along the route, it is important to note that 100% survey participants are what Jarrett Walker describes as “captive riders” (Human Transit pg. 43). These riders, having no choice in their modes of transit, had largely stated that they would sacrifice amenities to have a shorter walk. However, for those who do have more options available, the city may succeed in attracting more riders through the installation of public art at bus stops.

The planning team also found that though each of the six bus stops had a bus bench for users, not all benches provided a comfortable experience. Only one-third of the stops provided trash cans, one of which users complained was not enough to service the volume of people that utilize that particular stop. As a result, some of these benches become littered, with people leaving refuse both on the ground surrounding the bench and on the bench itself.

Most importantly, for a city such as Denver, where the seasons can shift from oppressive heat to freezing conditions, only one of the six bus stops surveyed offered any shelter. This bus stop, located on Federal Blvd and W. 50th Avenue, had the most utilization when the planning team was in the field conducting surveys, with approximately 45% of all intercept surveys taking place at this stop. This may, in part, be due to the location of this stop – Regis University is located north of the same intersection and a variety of service industry businesses, particularly fast food establishments, are located along with this section of the study area.

During the course of our survey, the team interviewed five individuals who identified as homeless. These men utilizing the bus stop expressed that because this was the only stop with shelter, they frequent this stop for the warmth provided by the shelter. According to the results of the teams intercept interviews, 21% of respondents stated that providing shelter would improve their bus stop experience (Figure 18), suggesting that shelter is an amenity that many would like to have provided.

The issue of homelessness along this route proved to be a concern for safety that had been expressed by a number of interview participants. While 61% of transit riders surveyed said that they felt safe at the bus stops (Figure 18), many of those answers were qualified that the amount of people at the stop affect their feeling of safety. Furthermore, of the 39% of the respondents that stated that they did not feel safe, some of those had identified the homeless population utilizing the stop as the reason that they do not feel safe. Anecdotally, the planning team had witnessed individuals sleeping under the sheltered bus stop, as well as one violent incident in which the police were called, while the team was conducting an interview. While the crisis of homelessness can certainly not be solved through an assessment of bus stops, it is an issue present when discussing improving transit and riders' experiences.

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Figure 23: Bus Bench on Federal Boulevard and 39th Avenue



Source: Andrea Vaughn

The planning team and interview participants also noted other safety concerns for those waiting at bus stops. The most noticeable concern was a lack of adequate lighting, which 15% of survey respondents said would improve the bus stops. The team had even heard from three of the respondents that they would not use the bus stop outside of daylight hours. Of the bus stops surveyed, the team noted that only 50% of the stops had a street light post within ten feet of the stop. Much of the lighting provided for the bus stops without a light post located nearby comes from either street signals or light posts located on private property, largely parking lots.

Another safety concern noted by the planning team was the placement of bus benches in relation to the street. Only one of the six bus stops assessed were set back from the curb, while the other five were placed within three feet of the edge of the curb. Team members found that sitting on bus benches placed so close to speeding traffic was an uncomfortable experience that discomfort would be compounded when the roads are slick with ice.

Recommendations

Safety

The highest priority for Denver in improving the safety of its bus stops should be to install better lighting at each of its bus stops. As Jeff Speck states, “In walkable environments, poles should be between 10 and 14 feet tall, and no taller, to support an intimate feel” (pg. 204-205). If installing new light poles to minimize the gaps in between poles, alternative lighting options should be taken into consideration. Lighting may be installed in bus shelters or alternative forms of lighting, such as a top light post may be installed at stops requiring additional lighting. New lighting installations should minimize energy use and emit a soft glow that encourages pedestrian activity to increase the safety of bus stops. To ensure the safety of those utilizing benches that are located near the curb should be placed further back, when feasible and speed limits should be adjusted when this is not a feasible option.

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Comfort

Bus shelters should be placed strategically along this route, with at least one additional shelter being installed south of I-70. Additional shelters will protect riders from inclement weather, but may also help alleviate the pressures of the bus stop at Federal Boulevard & W 50th Ave, where riders have reported that there is insufficient garbage cans and safety concerns, due to the homeless population using the stop for its shelter. In addition, trash cans should be installed at bus stops currently lacking in proper refuse disposal.

Figure 24: Federal Boulevard & W 50th Ave



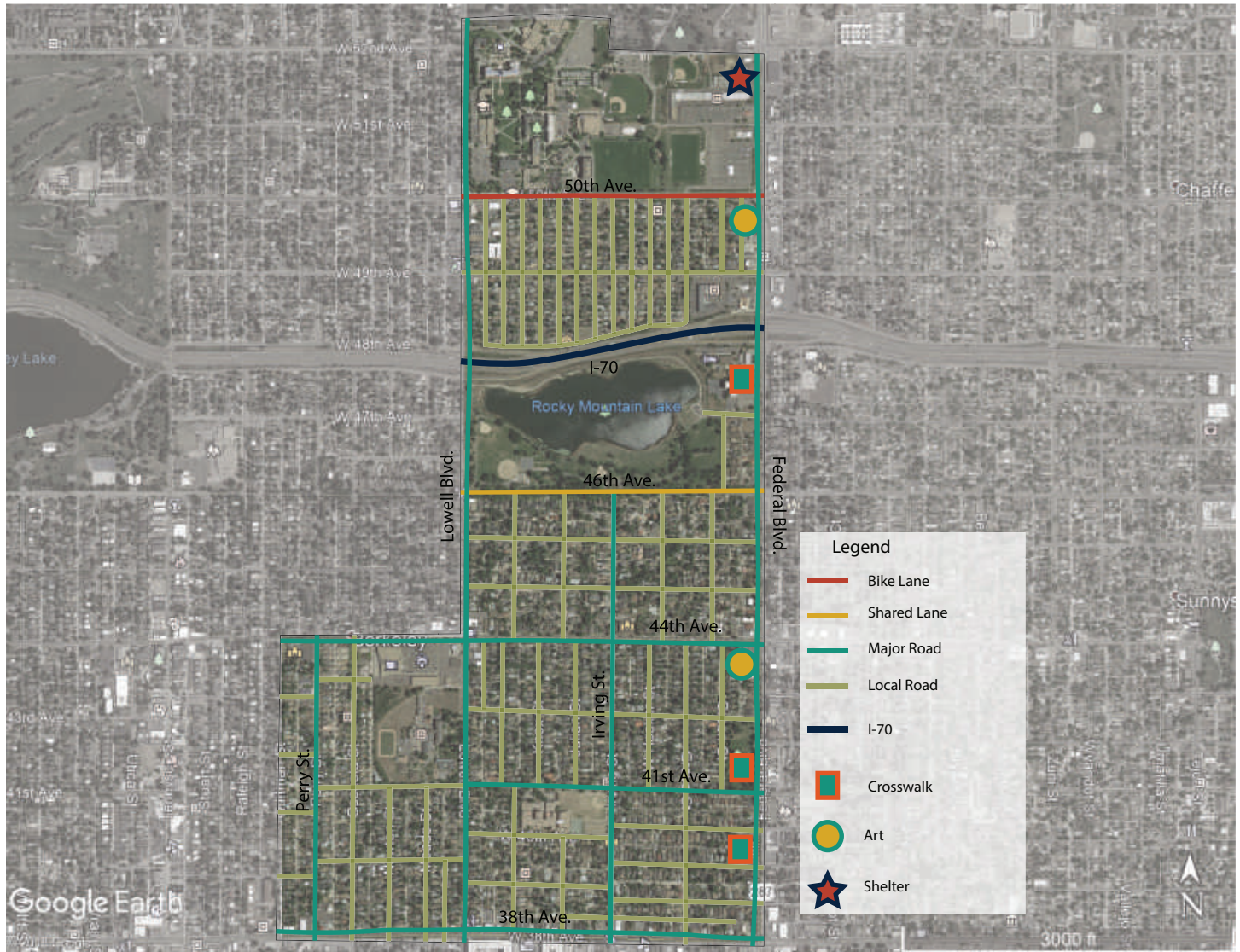
Source: Andrea Vaughn

Aesthetics

Federal Boulevard, particularly north of I-70 is dominated by auto-centric businesses and infrastructure. As a result, there is little aesthetic quality to Federal Boulevard in the Regis and Berkeley neighborhoods. To draw in more transit riders, public art installations should be installed either at bus stops or be encouraged around bus stops (Walkable City pg. 54-55). These installations should have a touch of whimsy to them or should change periodically, to avoid fatigue.

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Figure 25: Recommendations Map



Sources: RTD, class files and Denver Bike Map

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