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Complete Streets:

An Analysis of San Jose Streets; Urban and Suburban

Senior Project, Spring 2011

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Introduction

Introduction

1.1 Abstract

San Jose was chosen as the city for data collection because it is a majorly populous city within California, and is known to be affected by traffic congestion. It is the third largest city in California, and is the largest city in the Bay Area in terms of population (City of San Jose, 2011). San Jose is an established community, and has produced major revitalization projects to existing downtown streets as result of age and innovation. Unfortunately, not all streets are as well maintained as others. This made it easy for me to differentiate street sets in order to compare them for analysis. With the information I have collected, I will be able to demonstrate the affects of implementing complete street design principles. In the end, the reader will tell the difference between the street sets analyzed, and what contributors are most effective in increasing safety and diversity of transportation.

1.2 Project Overview

Streets are a major part of a person's daily life; they transport and connect people to places all over the United States. They include pedestrian streets, alleyways, and city-centers, which all facilitate public interaction and sustain activities vital to civilization. As important as streets are to society, so is the way that we design them. In order to become more efficient and sustainable, America must support all modes of transportation to give people a diverse set of mode choices.

Designing streets is also about creating a built environment that is aesthetically pleasing to users. Complete streets are roadways that are designed to enable safe, comfortable, and attractive access to all users of all ages and abilities (Ritter, 2007). They are the answer to creating more livable spaces, and encouraging more active living and social interaction. Also, our dependency on vehicles is limited because of the impermanent supply of oil in the world. We must start thinking about the future of transportation, and how the public shall perceive

it. Having a diverse set of transportation options available is beneficial in many different ways. With the implementation of complete street design principles, cities and their residents will benefit in the long run.

I believe that our dependency on vehicles is limited, and that we need to start thinking about future generations and how they will perceive transportation. Having a diverse set of transportation options available is beneficial in many different ways. With the implementation of complete street design principles, cities and their residents can benefit in the long run. My hope for this project is to bring to light the need for change in how we design streets.

1.2 Project Location

This project is intended to evaluate the effectiveness of complete streets. Complete Streets is a relatively new term that is gaining strength in the United States. For this project, I conducted research and analysis on the effectiveness of complete streets. My evaluation begins with a review of urban transportation history and complete streets research. The literature review section summarizes how streets became the way they are today, and what problems or implications have occurred as a result. I then introduce complete streets in detail and summarize the range of outcomes possible from complete streets implementation. The project description then discusses methodology, results, and the data analysis section where I demonstrate the materials and data I have collected by analyzing complete and incomplete street sets in San Jose, California. My overall goal in the end is to examine the difference between complete and incomplete streets by using data analysis done in an area where vehicles dominate most streets.

Introduction

San Jose was chosen as the city for data collection because it is a large metropolitan city within California that is affected by traffic congestion. It is the third largest city in California, and is the largest city in the Bay Area in terms of population (City of San Jose, 2011). San Jose is an established community and has produced major revitalization projects to existing downtown streets. Unfortunately, not all streets are as well maintained as others. This made it easy for me to differentiate street sets in order to compare them for analysis. With the information I have collected, I will be able to evaluate the effectiveness of implementing complete street design principles. In the end, the reader will tell the difference between the street sets analyzed, and what contributors are most important in increasing safety and diversity of transportation. My hope for this project is to bring to light the need for change in how we design streets.

Chapter 2

Literature Review

Literature Review

2.1 Introduction

In order to better understand complete streets and how policies promote them, a history of street patterns and their issues must be discussed. This literature review will also help to define what a complete street is; including the basic principles and the overall benefits. I have researched a diverse collection of books, online journals, and websites in order to collect my information. Based on the resources, the following section reviews; the history of street patterns, the problems and outcomes related to those, and finally, complete streets and its benefits as a result of these patterns.

2.2 History of Street Patterns

Historically, cities have been at the center of activity for community members. They serve as a center for storage, trade, and manufacture, and they have been to known increase social interaction (Ellis, 2011). Within the city, a Grid Plan was developed in order to design streets in a consistent manner. This Grid Plan designed streets to run at right angles to each other so that there is a form of consistency within the city. But during the Industrial Revolution, a change was beginning to take place in how streets would be designed. More and more people started to flood the cities for work; in just 50 years, New York 's population increased from 313,000 to 4,767,000 people (Ellis, 2011). New York's remarkable growth initiated the country's first ever-comprehensive plan (Fulton, 2005, p. 50).

Although commercial enterprises were thriving, the safety of the community was in jeopardy. Crowding, pollution, and disease rapidly increased within the city center. With all of the devastation occurring in the city centers, the upper class citizens started to retreat to healthier environments inthe suburbs to get away. This was around the time when soldiers were returning home from World War II. They were coming home to start their lives living the American Dream; to start a family and move their families to the private, quiet suburbs. But with so many people inhabiting suburban areas, street patterns started to make a shift and something had to be done about it.

During the 20th Century, zoning started to take hold as an idea in places other than New York (Fulton, 2005, p. 52). The idea was to specify fixed locations for development in cities and surrounding areas. Euclidean Zoning came about during the 1920s, and is still the predominant form of zoning in the United States. Its goals were to separate land uses and preserve the privacy of single-family homes (Fulton, 2005, p. 50). Commercial retail land uses started being developed away from residential neighborhoods. Big box retail shopping centers started to pop

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up on the outskirts of town; forcing suburban residents to drive farther distances.

Urban Sprawl became widespread across the United States, especially in places like Los Angeles where wide freeways and arterial roads crowded the town. This was largely a result of land uses being separated. Post-war development was fragmented into small suburban municipalities, which caused a shift in community design (Fulton, 2005, p. 56). Planners and engineers began to design wide expanses of road systems to accommodate automobiles. Sidewalks started to become vacant, and roads continued to expand; only increasing road congestion.

As streets were designed for the personalized vehicle, all other users were not seeing the same type of attention and detail. Designing roads to accommodate personal vehicles encouraged people's reliance on driving and less on other modes of transportation. Cities were not administering a diversity of mode choices, which only encouraged more personal vehicle use. From 1950-2000, the proportion of US citizens living in the suburbs has more than doubled, causing a series of issues (Brownson, p. 12). Today, pedestrian ways are considered "sterile" and inhospitable environments,especially when located along busy thoroughfares (Hall, 2011, p. 104). The shape of city streets took a whole new form of life.

Figure 1: Suburban neighborhoods became increasingly popular after World War II, which caused Urban Sprawl.

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San Jose

San Jose, California has the same characteristics as most metropolitan areas in the Western United States. During the late 1950's and early 1960's, San Jose experienced a huge population growth, an increase of 80% of its population (City of San Jose, 2011). The City manager at the time annexed major pieces of agriculture land, creating a very dispersed urbanization. San Jose was quickly becoming a center for urban sprawl, before a few anti-growth politicians were elected into office in the late 60's. At this time, they decided to adopt a general plan that established 'urban growth boundaries' to maintain growth within the city limits. But in little time, the area experienced rapid growth again with boom of the electronics industry. During the early 90's, San Jose received harsh criticism of being a poorly planned and troubled area (City of San Jose, 2011).

Figure 2: This arieal view of San Jose shows the urban sprawl pattern that has developed over the years.

Figure 3: Building types in downtown San Jose.

2.3 Outcomes of Street Patterns

While urban sprawl was taking place, it was hard to see the crippling effects we were causing to the nation, the people, and the environment. Now, we are starting to grasp just how destructive we have been over the past few decades. Some of the negative consequences of street patterns include; air quality, obesity and public health, urban sprawl, pubic safety, economic vitality, and social interaction between citizens.

As congestion has increased, air quality has decreased. Greenhouse gas emissions and the destruction of the ozone layer are mainly caused by the over-use of vehicles. In 2004, it was reported that personal vehicles emit over 314 million metric tons (EDF, 2006). Gasoline leaks from cars, gas stations, and underground storage containers, and pollutes the groundwater citizens we rely so heavily on. Cars also cause smog in major cities such as Los Angeles, where urban sprawl is prevalent. Not only is the aesthetic beauty of our cities in jeopardy, but so is our health.

America is suffering from an obesity epidemic. Each year, between 200,00-300,000 lives are lost due to obesity (Brownson). There has been a significant increase in the number of people with diabetes, and cardiovascular and hypertension. There are many reasons for why our nation encounters these issues, and one of the most significant is due to the natural space that we encounter everyday. The physical, 'Built', environment has created a climate that promotes increased energy consumption and a reduction in energy expenditure (Papas, 2007). America's street patterns greatly influence people's tendencies to exercise. By using empirical methods for 14 studies, researchers have found that people walk and bike more when communities contain connected streets (Brownson).

The present, 'Freeway Era', and urban sprawl have contributed greatly to the effects of obesity in America (Peirce, 2011). By forcing people in their cars, we have decreased their daily activity level. In an American Housing Survey, only 55.2% of respondents reported having access to public transportation (Brownson, p. 12, 2011). Not having

transportation choices forces people to use vehicles. If peoples had options, they would be forced to walk and maintain the physical activity that is necessary for their health. According to an analysis of physical activity done by McCann (2003), citizens in sprawling counties are more likely to have a higher body mass index (BMI) than their more urban counterparts (McCann, 2003). Today, we have lost sight of the original grid system street design, which was known to create a more active lifestyle.

As a result of more congestion, public safety has become jeopardized as well. Efforts to calm traffic through street design have caused a reduction in accident severity and frequency (Steiner, 2007). When vehicles are forced to travel and reduced speeds, citizens who frequent the streets are less likely to suffer severe traffic injuries. When designed properly, narrower streets contain speeds of 20 mph or less. As the Abbreviated Injury Scale (AIS) indicates, when vehicles travel 20mph or more, the potential for serious injury increases (Steiner, 2007).

Economic functions of our streets have been deeply affected by dependence on personal vehicles. “The average American family spends 19% of their household income on transportation, while those who live near public transit spend only 9% on transportation” (Raphael, 2011, p. 1). Not to mention, those who choose to walk or bike are spending even less on increasing gas prices. Most streets were designed so that drivers quickly pass by storefronts without stops. But local investments on transit projects are starting to pay off, and really prove their worth. Developers and citizens are flocking to areas where transit lines are being developed, and local property taxes are increasing as a result (Raphael, 2011, p. 1).

Social functions also serve an important purpose in society. People are naturally drawn to where other people are. Citizens are drawn to popular shopping, recreation, and entertainment centers (Hall, 2001). As planning during the 20th Century changed, it caused a serious lack of social interaction at the street level. In the past, most retail transactions had occurred along urban thoroughfares (ITE, 2006). This type of economic

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transaction allowed people to interact with others on a daily basis. Nowadays, people spend approximately 34 hours commuting in their cars; Californians spend closer to 82 hours (Schrank, 2010). In order to alleviate traffic congestion and get people to think outside the box when it comes to mobility, planners must be able to provide diverse opportunities.

Unfortunately, San Jose has seen many of the negative implications of a community designed to focus on the use of vehicles. Urban sprawl has had the same types of impacts on San Jose as other areas that have been affected by it. In the Northern part of San Jose, strip malls and low-rise office parks dominate the area (Temple, 2008). The City found that sprawling urban developments did not generate enough revenue to cover the costs of providing sufficient urban services and infrastructures for those uses (Greenline Initiative, 1996). Traffic congestion and public health have been a major issue, as people drive in and out of the city for work.

As discussed earlier, the dependence on vehicles has been a cause of many things that we can change. Smart Growth principles would make spaces more compact, which would ultimately make an area more walkable (Peirce, 2011). A change is needed in order to fix the problems we have created in society. Changing the way we design our communities, streets in particular, will help to alleviate these issues. This may come in the form of a policy, which brings me to the topic of discussion for this paper; complete streets.

Figure 4: Smart growth characteristics focuses on the redesigning of communities to be more community and enviornmentally-friendly (Resnik, 2011).

2.4 Complete Streets

Complete Street policies are designed to encourage cities and counties to developed road networks that are safer, more livable, and welcome to everyone. With this idea, planners account for all users when creating urban spaces. Users consist of bicyclists, motorists, pedestrians, public transit users, riders of all ages and abilities. They will help to move people along and across urban streets in the safest manner possible (ITE, 2006, p. 27). Complete streets policies call for transportation agencies and planners to change development that is geared for motor vehicles alone. With current trends increasingly focused on being environmentally-friendly, complete streets also help to encourage the healthy lifestyles that accompany walking, bicycling, and safety. It is said that more than 55% of Americans would prefer to walk than drive (NCSC, 2011).

Complete street policies apply to any street that is built, altered, or maintained. Successful integration of transit facilities and operations are necessary. With complete streets, all modes and users are important on all thoroughfares. Basic accommodations for bicyclists, pedestrians, transit users, and disabled travelers are necessities rather than optional items (ITE, 2006, p.27). One of the main principles behind complete streets is; designing walkable communities with appropriately spaced and properly sized pedestrian, bicycle, transit, and vehicular components, instead of increasing space for vehicular travel (ITE, 2006). Complete streets promote active living, increase mode choice, increase social interaction, and establish better road systems.

The overall goal for a complete street is to provide convenience and safety for everyone that uses them. But not every complete street is made up of the same qualities and design. There are some basic characteristics that make up a complete street, but each street varies based on the needs of the community. A complete street in a rural area may be different than planning for a complete street in an urban area. That's why planners must be certain to apply the most beneficial qualities to streets in order to comply with the community's needs.

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The National Complete Streets Coalition has put together a list of characteristics that can be found on a complete street (NCSC, 2011).

Design Characteristics

- **Wide sidewalks**
- **Designated bike and public transit lanes**
- **Streetscaping**
- **Wide paved shoulders**
- **Comfortable and accessible transit stops**
- **Frequent crossing opportunities**
- **Curb extensions**
- **Narrow travel lanes**
- **Median islands**
- **Pedestrian signals**

Included are a few examples of what existing streets may look like if complete street characteristics were included:

FIgure 5: The National Complete Streets Coalition has put together an example of a dynamic and efficient complete street (NCSC, 2011).

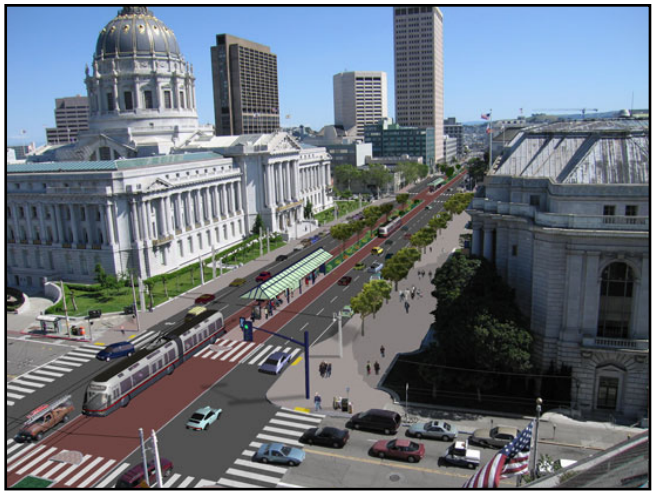

Figure 6: Representation of a complete street for Van Ness in San Francisco (Roth, 2009).

Figure 7: The City of Milwaukie has created a complete street example of a major street downtown (Reid, 2009).

2.5 How do Complete Streets Address Problems from the Past?

Places where complete street policies are being implemented are seeing a reduction in greenhouse-gas emissions. In 2001, the National Household Transportation Survey found that 65% of trips under one mile are made by automobiles, in part because incomplete streets make it dangerous or unpleasant for people to walk, bicycle or use public transit. Complete streets help to alleviate these issues and get people to feel more comfortable on the streets. Boulder, Colorado has been working to create a complete streets network with 350 miles of dedicated bike lanes, paved shoulders, and a comprehensive transit network. Between 1990 and 2003, Boulder's transit trips increased by 500%, and has cut annual CO2 emissions by half a million pounds (City of Boulder, 2004). Giving people a diversity of mode choices has helped to increase awareness and to reduce the environmental effects we have been causing in years past.

Complete Streets encourage active living for citizens, and decrease the risk of obesity. When streets are only designed for vehicles, it does give the citizen an opportunity of mode choice. Even when there are sidewalks, sometimes they are too unsafe or unfriendly, which discourages non-motorized travel (NCSC, 2011). Health experts have found that a huge factor of obesity is due to inactivity- 55% of Americans fall short of recommended activity guidelines, and 25% report being completely inactive (Healthy People, 2011). Complete streets are beneficial in promoting walking, cycling and transit use when designed properly. According to the department of Health in Australia, 65% of people are more likely to walk in a neighborhood with streets (Corti, 2002). And, nearly one third of transit users meet the minimum daily exercise through their daily travels, according to the Surgeon General's recommendations. If cities work to implement more complete street policies, we can encourage the majority of Americans to increase or sustain their daily level of activity, and prevent issues related to obesity.

Incomplete streets are unsafe; more than 40% of pedestrian deaths in 2007 and 2008 occurred in areas where crosswalks weren't available (USDT, 2010).

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In 2008 in the US; 5,000 bicyclists and pedestrians were killed, and over more than 120,000 were injured. Compared to countries like Germany and the Netherlands, where complete streets are common, the US had two to six times more bicyclist and pedestrian deaths (Livable Street Coalition, 2011). One study has found that complete streets have increased public safety by 28% (NCSC, 2011). Things such as, redesigning medians and intersections, improve public safety and help to slow traffic, which ultimately reduces the number of pedestrian, automobile, and bicycle accidents. Designing bicycle lanes reduced traffic accidents by 50% (Reynolds, 2009). Complete streets encourage slower speeds and better design, which ultimately protect the safety of all road users.

Designing streets to accommodate various non-motorized users has helped to increase the economic vitality of many cities. By creating more walkable areas, and having storefronts located on the street, citizens are more likely to walk in the area and stop at certain places. Valencia Street, in the Mission District of San Francisco, is a good example of how changing the street could improve economic vitality. Traffic lanes along Valencia Street were narrowed, and were redesigned to slow vehicles and allow for other users. Merchants along the street saw an increase in sales; over two thirds of respondents from a survey reported street changes to have increase levels of pedestrian and bicycle activity, which also improved business and sales (Drennen, 2003). San Jose has used this project as a template for future transit-oriented projects in the city. Having a transit stop located along a major thoroughfare also helps to increase business and commercial development. Complete streets encourage diverse mode choices, improving existing business and attracting new development. They also increase property value and encouraging more walkable communities.

Social interactions at the street level are also increased because of implementations made by complete street policies. By being constricted to the use of only motor vehicles, people spend less and less time interacting with other citizens. As discussed earlier, people are naturally drawn to areas places of activity, where others gather (Hall, 2001). Encouraging transit ridership allows people

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to travel around the safety of others. Designing better sidewalks and bike lanes will encourage people to get outside, and interact with each other on a daily basis. Establishing events held on streets, such as festivals and farmers markets also benefit the community (APA, 2011). Having more people on the streets also promotes a diversity of people to interact with one another; from the disabled person to the international immigrant, streets bring people together and create a sense of place. Complete streets help to encourage this type of social interaction at the street level that helps to identify a place and make citizens happy.

Complete street policies will help to better road systems for the future, and will alter society in a beneficial way. It will encourage more public transit use and create more diverse accessibility. Complete streets will also help to improve social interaction, healthy living, and safety. Environmental impacts will decrease when less and less people depend on personal vehicles for transportation. And cities that choose to implement complete street policies will see an economic benefit.

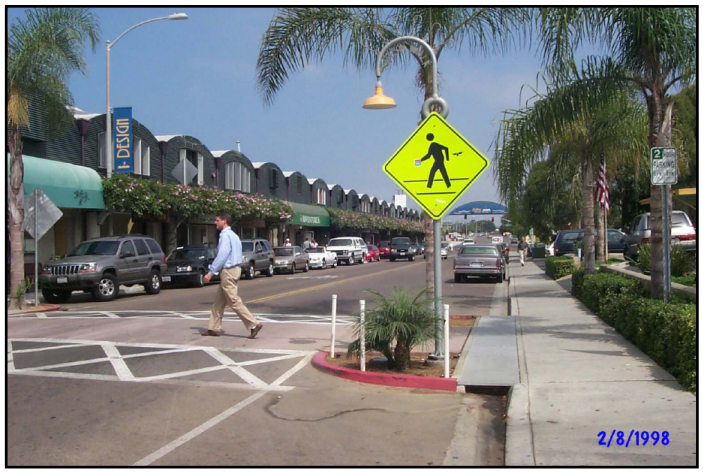

Figure 8: Complete streets are safe for pedestrians, with legible crosswalks and signage.

Figure 9: Designated bike lanes increase safety and promote bicycling.

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2.6 Complete Street Policies Today

As people are starting to recognize the need for better transportation practices, they are beginning to look to complete street policies to help provide safe travels. Over the past four years, the number of communities adopting complete street policies has more than doubled; with more than 200 policies in place by 2010 (McCann, 2010 p. 4). Policies range from community-wide initiatives to state law policies. They can be implemented in many ways; in a General Plan, through design manuals, or ordinances made by transportation agencies, etc. In 2008, Gov. Schwarzenegger signed the Assembly Bill 1358 into law; which is the Complete Streets Act. And in 2010, the Governor's office of Planning and Research issued general plan update guidelines in order to implement AB 1358 ("Complete Streets in California"). The National Complete Streets Coalition has found that stronger policies tend to be newer policies (McCann, 2010, p. 26). This shows policies are progressing and they will only improve as time goes on.

Figure 10: This image displays which states have enacted forms of a complete street policy ("Complete Streets Policy Analysis 2010 Report" , p.4).

Literature Review

The National Complete Streets Coalition has put together a comprehensive policy model that includes a list of ten elements to help support communities in creating complete street policies. They are as follows (McCann, 2010, p. 6):

- Include a vision for how and why the community wants to complete its streets
- Specifies that 'all users' includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, buses, and automobiles
- Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes
- Adoptable by all agencies to cover all roads
- Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right of way
- Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions
- Directs the use of the latest and best design criteria and guidelines while recognizing the need for flexibility in balancing user needs
- Directs that complete streets solutions will complement the context of the community
- Establishes performance standards with measurable outcomes
- Includes specific next steps for implementation of the policy

The city of San Jose has recognized the needs of the city, and is working to implement more complete street policies. City officials are working to reverse the effects of urban sprawl by introducing a long-term redevelopment plan that would increase development along urban lines. Plans are to add 30,000 new homes and 80,000 jobs within walking distance of Santa Clara Valley Transportation Authority light-rail line on North First Street (Temple, 2008). Planners, architects, and environmentalists praise this plan, and see that compact transit-oriented development will reduce driving and ultimately reduce greenhouse gas emissions and create better functioning cities praise this plan

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(Temple, 2008).

Unfortunately, working with Caltrans has made it difficult to undergo projects that would narrow street lanes, and accommodate wider bike lanes and sidewalks. Recently though, the Tully Road overpass (outside of downtown San Jose) reconstruction was approved by Caltrans; which includes an 11 foot travel lanes, 6 foot bike lanes, and 10 foot sidewalks (Roth, 2010). Projects like these show that efforts made by San Jose city officials are geared toward providing healthier and safer streets for residents.

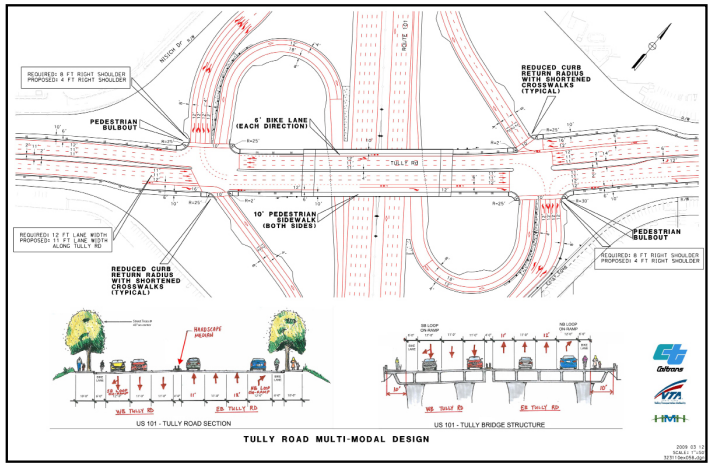


Figure 11: The Tully Road overpass project will incoporate more bike lanes, wider sidwalks, and a median (Silicon Valley Bicycle Coalition, 2011).

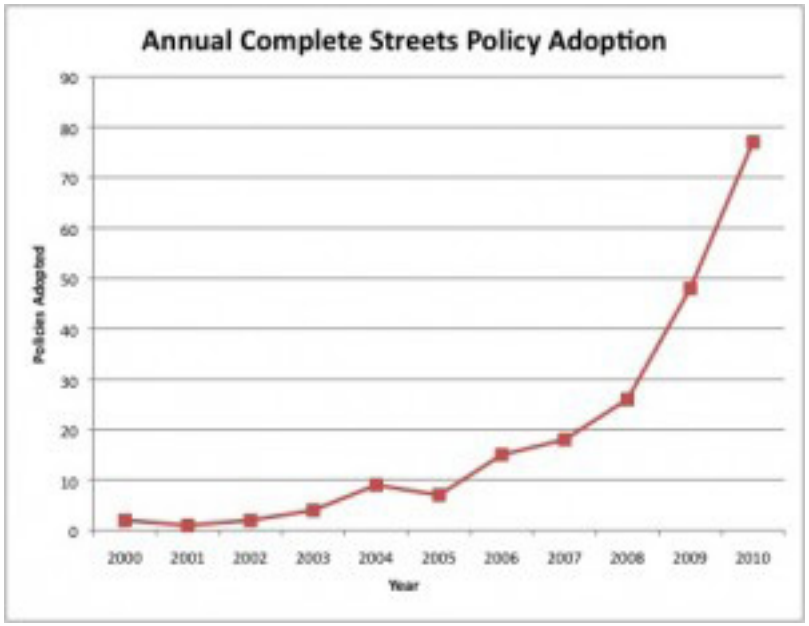


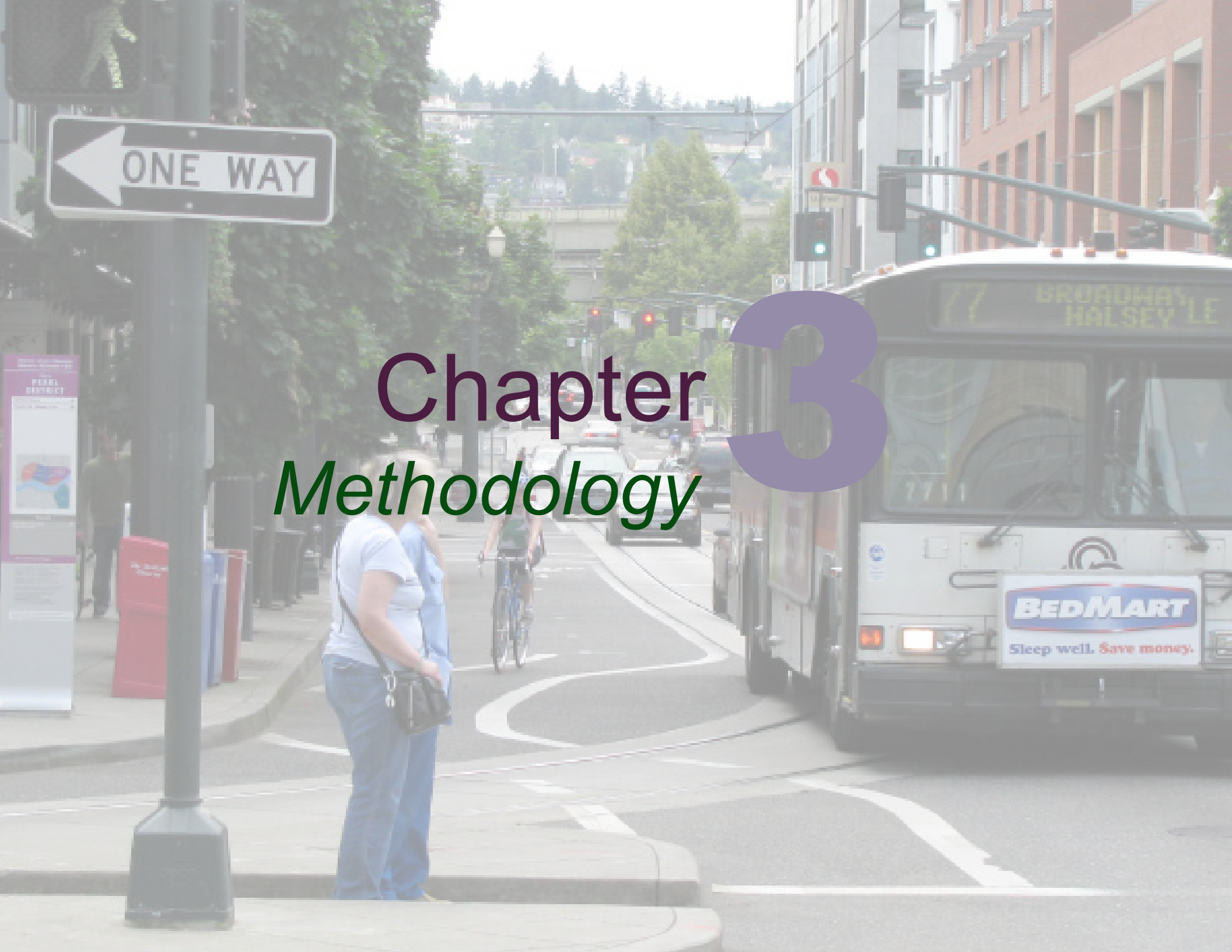
Figure 12: According to the National Complete Streets Coalition (2011), policy adoption is increasing laregly wihtin the past few years.

2.7 Conclusion

As seen throughout this literature review, America is an ever-changing nation and has continued to progress in its transportation networks. By learning about complete streets, people are made aware of the plan we need to be implementing to create a more livable future. We have seen a shift take place from suburban life, where cars were dominant, to a future where cars will not take as much precedence on the road. Street designs are quickly being changed, as other modes of transportation are being accounted for. Bicycle coalitions and public transportation authorities represent the good of the community, and make a huge impact in public policy. Overall, I believe the idea of complete streets benefits not only citizens today, but citizens of the future as well. Complete street policies remind agencies that everyone who uses our streets must be accounted for. As time progresses, I believe complete streets policies will become more widely used, ultimately improving the health and happiness of American communities.

As seen earlier, San Jose was greatly affected by the impacts of Urban Sprawl, and has had to increase efforts in order to reverse these impacts. The development of Santa Clara Valley Transportation was and is a major driver for increasing transportation diversity. This makes it possible to encourage people to think differently when it comes to transportation. This project also makes a great base for introducing more transit-oriented development. It seems as though most city officials are on board with the idea of implementing more complete street policies, yet working with different agencies has made it difficult to approve these projects. As long as there are proponents for complete streets, I believe San Jose will be greatly affected by the change in transportation networks.

Figure 13: The introduction of Santa Clara Valley Transportation has helped to increase public transit ridership.



Chapter 3

Methodology

Methodology

3.1 Introduction

The goal of this research project is to analyze the difference between complete and incomplete streets. In order to assess the difference, I spent time doing an on-site survey of four different streets. Each street I chose was designated either complete or incomplete, and I chose two sets of streets to analyze: suburban and urban. I then compared the complete to incomplete for each set. I conducted my assessment of each of the four streets during the same hours in order to achieve the best comparison of complete vs. incomplete. In the end, I was able to provide data counts for various street users. I compared the overall aesthetic appeal, street design, and safety of each street. This information has helped to relate how complete streets encourage a diverse range of users, and encourage safe, active living. Writing a policy can be difficult unless you know the behavior of people. By analyzing this information, we can be able to know if complete streets achieve what they want, and if more complete street policies should be implemented.

Methodology

3.2 Summary

The data was analyzed to examine the difference between the two sets of streets. I chose to analyze two sets of streets; urban and suburban, because complete streets come in many different forms. We must be able to apply complete street policies to all kinds of streets, no matter their location.

By analyzing the data, it shows how a complete street differs from an incomplete. Whether it is a significant difference, or just a slight increase in ridership or diversity of transportation. I expect that the complete street data will be significantly larger than the incomplete streets' data. Also, I expect there to be a significant difference in the mode of transit used on a complete vs. incomplete street.

FIgure 14: Suburban streets are relatively less congested, and are used to connected residential neighborhoods.

FIgure 15: Urban streets are usually centered around commercial and business uses. They are usually more congested than suburban streets.

Methodology

3.3 Participants

The participants observed in this demonstration were any pedestrians, motorists, or non-motorists using the streets selected for analysis. Many users of the suburban streets seemed to be San Jose State students and residents of the neighborhood. The urban street users mostly consisted of commuters, public transit users on First Street, and those in vehicles on Fourth Street.

FIgure 16: Bicyclists are seen on both suburban and urban streets.

FIgure 17: Motorists use both suburban and urban streets as well.

FIgure 18: Pedestrians are a large part of the data collection for this project as well.

3.4 Procedure

For obtaining data, I had help from a partner at each set of streets. This helped me to obtain the most accurate data at the same times. While I would collect data from one street, the other person would collect data from the paired steet. I chose a suburban and urban set of complete vs. incomplete streets, where the data would be collected. At each street, we sat for a total of two hours to count the number of people, and modes of transit that passed along the street. I chose two different time periods to collect data; one non-peak, and one peak hour. This took place at both sets of streets. I conducted all field research on Friday, May 15, 2011. Data from the suburban set of streets was collected from 7am-8am (peak hour), and 10am-11am (non-peak hour). Data for the urban set of streets was collected from 4pm-5pm (pre-peak hour) and 5pm-6pm (peak hour).

I also put together a checklist of characteristics and qualities related to; aesthetics, street design, and safety. San Francisco's 'Pedestrian Quality Index' was used to determine the specific criteria for data collection (SF Public Health Department, 2008). Under each topic I had a number of characteristics to assess for all four streets. This checklist will help to differentiate between what is considered complete and incomplete.

The survey was divided into the three categories: Aesthetics, Street Design and Safety.

Aesthetics

1. Landscaping	
Notes: Planters, pots, etc.	
Heavy Landscaping	
Average Landscaping	
Light Landscaping	
Notes:	

2. Street Trees	
Notes: Impediments, litter, etc.	
Continually Lined	
Sporadically Lined	
Notes:	

3. Comfortable/Assecible Transit Stops	
Notes: Clean, All people can get to them	
Above Average	
Average	
Below Average	
Notes:	

4. Public Art	
Yes	
No	

5. Street Furniture	
a. Public Seating	
Yes	
No	
b. Street Lights/Lamps	
Yes	
No	
c. Trash Cans	
Yes	
No	
d. Bike Racks	
Yes	
No	

FIgure 19: The aesthetics criteria include the visual and maintenance aspect of a street.

Methodology

Street Design

1. Presence of Median			
Yes		If Yes, width:	
No		>5'	
		6'-10'	
		<10'	
Notes:			

2. Sidewalk Width	
5'	
5'-10'	
<10'	
Notes:	

3. Sidewalk Maintenance	
Note: Impediments, litter, etc.	
Above average	
Average	
Below Average	
Notes:	

4. Street Maintenance	
Note: Impediments, litter, etc.	
Above average	
Average	
Below Average	
Notes:	

5. Driveway Cuts	
Note: Parking garage counts as two	
0	
>5	
<5	
Notes:	

5. Handicap Ramp	
Note: Lowered curb, actual ramp, etc.	
0	
>5	
<5	
Notes:	

7. Designated Bike Lane	
Yes	
No	

8. Designated Public Transit	
Yes	
No	

9. Two-Way Traffic	
Yes	
No	

Figure 20: The street design criteria include the physical componenets of the street.

Safety

1. Designated Pedestrian Crossings	
Note: Ex. How many are on 1st St. between San Carlos & San Fernando	
>3'	
3'-5'	
<5'	
Notes:	

2. Pedestrian Signal Time Intervals	
Note: Take note of actual time in 'notes'	
>5seconds	
5-10 seconds	
<5seconds	
Notes:	

3. Traffic Speed Limit	
Note: Take note of actual speed limit in 'notes'	
>25mph	
25-40mph	
<40mph	
Notes:	

4. Signage	
Note: Ex; bus stop sign, 'no turn on red' sign, etc.	
0	
>5	
<5	
Notes:	

5. Presence of curb along street	
Yes	
No	

6. Traffic Calming Measures	
Note: Check all that apply	
Bulbout	
Curb Extension	
Partial Closure	
Speed Bump	
Pavement Treatment	
Street Median	
Semi-Diverters	

FIgure 21: The safety criteria include components of the street that address safety concerns with street users.

Chapter 4
Site Analysis

Site Analysis

4.1 Introduction

Each street I chose to analyze had different qualities and characteristics making it unique. In this section I will go into detail about the location and characteristics of each specific street. I will start off with a map and summary to familiarize the reader of the location of the street. I will then go into detail about what I found according to the street survey. I will also be comparing the complete vs. incomplete street based on results from the street survey.

All four streets are located in and around the downtown area of San Jose, California. San Antonio and San Carlos Street are located towards the East part of San Jose, they make up the set of suburban streets that I will go into later. First and Fourth Street, located towards the West part of town, make up the set of urban streets I chose to analyze. Both sets of streets are located around the San Jose State University campus and are close to the 280, 87, and 101 Freeways.

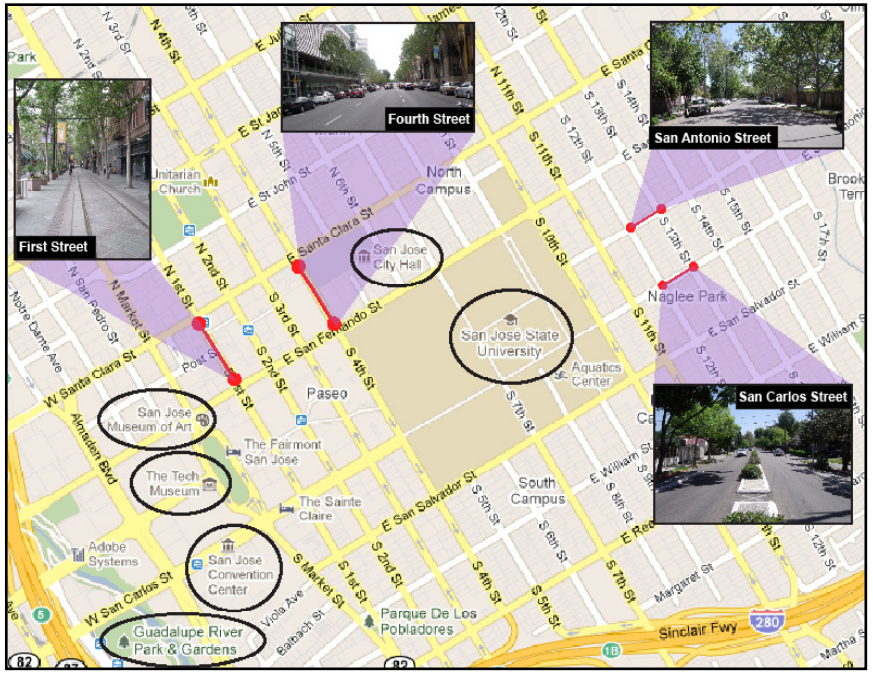


FIgure 22: This location map demonstrates the four street locations for analysis.

4.2 Suburban Street Set

A suburban street is one that is located outside of the major downtown, and is mostly surrounded by residential uses.

4.2.1 Incomplete Street: San Antonio

The first street incomplete street to analyze was San Antonio Street. This street is located just one street north from San Carlos (complete street). Like San Carlos, this street runs into San Jose State University. Surrounding uses residential homes with some being multi-family. The landscaping was good, with mostly lined trees on either side. Street parking is accessible to residents. There is no designated bike lane. This street was not very active with vehicles, pedestrians, or any other modes of transportation.

FIgure 23: Location of San Anotonio Street near Downtown San Jose.

FIgure 24: View of San Antonio Street.

Site Analysis

Land Uses

All land uses on San Antonio between 12th and 13th Street are residential homes. There are a few homes that look to be multi-family, with one house that has a small parking lot in the backyard.

FIgure 25: Single-family craftsman style homes on San Antonio Street.

FIgure 26: A mutli-family residential home on the corner of San Antonio and 12th Street.

Aesthetics

San Antonio is heavily landscaped with continually lined trees along the street. There is no public transit stop, and no public art. There is also no public seating, trashcan, or bike rack, but there is one streetlight on either side.

FIgure 26: Trees line the street, and residents have mostly maintained their portion of the sidewalk by maintaining the landscape.

FIgure 27: Streetlight on San Antonio Street.

Site Analysis

Street Design

There is no median present on San Antonio. The sidewalk is six feet wide, and in average condition with some warped areas. Street maintenance is average with no potholes. There are three driveway cuts along the street (one is the parking lot entrance behind a home). Only three of the four pedestrian intersections contain handicap ramps. There is no designated bike lane, no designated public transit lane, but it does indicate two-way traffic.

FIgure 28: Sidewalks and curbs are poorly maintained in some areas; they could be dangerous for pedestrians.

FIgure 29: This sidewalk ends with no handicapped ramp.

FIgure 30: Parking lot behind apartment complex.

Site Analysis

Safety

San Antonio has no designated pedestrian crossings and no pedestrian signals. The speed limit is 25mph, and most cars were going the average speed. There are more than five street signs; five parking signs, and one stop sign at 13th and San Antonio. There is a curb that runs along either side of the street, but there are not traffic calming measures.

FIgure 31: Parking sign on San Antonio Street.

Site Analysis

4.2.2 Complete Street: San Carlos

The first complete street I analyzed was San Carlos Street, located in the Southeast part of downtown San Jose, between 12th and 13th Street. This street runs into San Jose State University. It was obvious that this street is used as a route to school. Almost all single-family homes are located along the street. Landscaping was excellent, with lined mature trees, and plants in the median. Street parking was present on part of the street; a portion blocked off because of the concrete dividers. There was no designated bike lane, but the concrete dividers near the sidewalks act as barriers for bicyclists. This street was pretty active, with a mix of vehicles, pedestrians, bicyclists, and public transit vehicles.

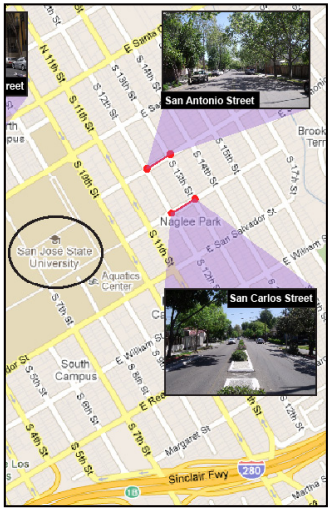


FIgure 32: Location of San Carlos Street near Downtown San Jose.

FIgure 33: View of San Carlos Street.

Site Analysis

Land Uses

All land uses on San Carlos between 12th and 13th Street are residential homes. Most are single-family homes, and a couple look to be multi-family. There is parking on some parts of the street on either side.

FIgure 34: Single-family homes along San Carlos Street.

Aesthetics

San Carlos is heavily landscaped with sporadically lined trees along the street. There is one public transit stop that looks to be fairly comfortable with tree shading and a trashcan, but no seat. No public art exists. There is also no bike rack but there is a trashcan and one streetlight on either side.

FIgure 35: Mature trees line the street on either side.

FIgure 36: Landscaping on the median.

Site Analysis

FIgure 37: The #72 bus stop runs along San Carlos Street.

FIgure 38: Public trashcan at the corner of San Carlos and 13th Street.

FIgure 39: Streelight on San Carlos Street.

Street Design

There is a center median present on San Carlos that is less than five feet wide. The median also has plants in the center. The sidewalk is six feet wide, and in average condition with a bit of deterioration on a part of the curb but mostly clean. Street maintenance is average with no potholes. There are four driveway cuts for residential homes along the street. All four pedestrian intersections contain handicap ramps. There is no designated bike lane or designated public transit lane, but there is a concrete paved area for the bus to pull of, and there is a small diverter to protect bicyclists. The street median indicates two-way traffic.

FIgure 40: Street diverter that helps to protect bicyclists and pedestrians.

Site Analysis

FIgure 41: Street median with landscaping.

FIgure 42: Concrete landing for public transportation.

Safety

There are two small breaks in the street median that allow pedestrians (even handicapped) to pass through. But there is no pedestrian signal present. The speed limit is 25mph, and most cars were going the average speed. There are more than five street signs; they include a parking sign, no left sign, stop sign, bus sign, and one way sign on the median. There is a curb that runs along either side of the street and there are two traffic calming measures: a street median and a couple concrete semi-diverters to protect bicyclists.

FIgure 43: Various signs help demonstrate safety to street users.

4.2.3 Suburban Streets: Comparison of Complete vs. Incomplete

Both streets are located just a couple blocks from San Jose State University. They're similarities include the following: presence of street parking, sidewalks, and residential homes line the street. The most obvious distinction is that San Carlos (complete) has a street median, which helps to slow traffic and separate directions. Also, there are two bus stops on either side on San Carlos Street. This created a more diverse range of traffic.

4.3 Urban Street Set

An urban street is a street that is located within the downtown core of a city. It is mostly surrounded by commercial and retail land uses.

4.3.1 Incomplete Street: Fourth Street

The incomplete street was 4th Street, between Santa Clara and San Fernando, which is located three blocks east of 1st Street. There is no bus stop located on this portion of the street. City Hall plaza is located to the northeast, and San Fernando parking garage is on the same side of the street (left in the picture above). A major apartment complex is located across the street from the garage (right in picture). Mostly cars use this street, and a lot of them took advantage of the linear parking on either side of the street. There were lined trees on either side, but no presence of any other landscaping. There is no designated bike lane on this street. This street was very active, with mostly cars and some pedestrians.

FIgure 44: Location of Fourth Street in downtown San Jose.

FIgure 45: View of Fourth Street.

Site Analysis

Land Uses

Fourth Street has a mixture of food, residential, and office space. There is a popular eatery on the southeast side, a large apartment complex on the west, and part of city hall. There is a parking garage located on the East side of Fourth Street as well. Street metered parking is seen on both sides of the street.

FIgure 46: San Fernando townhomes occupy a good potion of the West side of Fourth Street.

Aesthetics

Fourth Street has average landscaping with continually lined trees along the street, but no potted or hanging plants. There is no public transit stop along Fourth Street and just one banner on a streetlight that qualified as public art. There is a seating plaza outside city hall, and there is patio seating at Flames Eatery. There are an ample amount of streetlights and trashcans, but only two bike racks (located near Flames).

FIgure 47: Street trees along Fourth Street.

Site Analysis

FIgure 48: Patio seating outside of Flames Eatery.

FIgure 49: Bike rack outside of Flames Eatery.

Street Design

There is no median present on San Carlos. The sidewalks are 10 feet wide, and in above average condition with no obstructions and only light litter. Street maintenance is average with just a few cracks, and not too much trash. There are six driveway cuts(technically only three, but according to PEQI, parking garages/lots count as two). All four pedestrian intersections contain handicap ramps. There is no designated bike lane, no designated public transit lane, and the street is one-way only (Southeast).

FIgure 50: Sidewalks on either side are wide but do not have much landscaping.

FIgure 51: Handicapped ramp at Fourth and Santa Clara Street.

Site Analysis

Safety

Fourth Street has two pedestrian crossings (one at each intersection) and pedestrian signal crossings are more than 40seconds long, leaving ample time to cross. I could not determine the speed limit on this portion of the street, and it looked like most cars were going ~45-50mph. There are lots of parking signs, and a one-way only sign. There is a curb that runs along either side of the street, but there are not traffic calming measures.

FIgure 52: Pedestrian crossing at Fourth and San Fernando Street.

FIgure 53: Street signage on Fourth Street.

Site Analysis

4.3.2 Complete Street: First Street

The urban complete street I used to analyze was, First Street between Santa Clara and San Fernando. This is in the heart of Downtown San Jose, and is one of two streets downtown that contain a light rail track. This street is located in an area that contains various land uses; commercial, retail, and business. This location is just a few blocks from attractions such as; the Tech Museum, San Jose Museum of Art, Plaza de Cesar Chavez, and San Jose's convention center. There were a multitude of public transit users on this street; they used both bus and light rail systems. Landscaping was abundant, with mostly potted and hanging plants. Trees also lined the area. No street parking was available, and there were designated lanes for the bus and light rail systems. As mentioned before, complete streets come in many different forms. One important thing to note is that this street did not contain a designated bike lane. As I conducted on-site research, I noticed that over 90% of bicyclists used the wide sidewalks instead of biking in the vehicle lane. Riding alongside cars in a narrow lane poses a more severe threat to bicyclists. Fortunately there is enough sidewalk space to share with pedestrians, bicyclists, and all other miscellaneous ways to get around. First Street is very active street, with mostly pedestrians and public transit users.

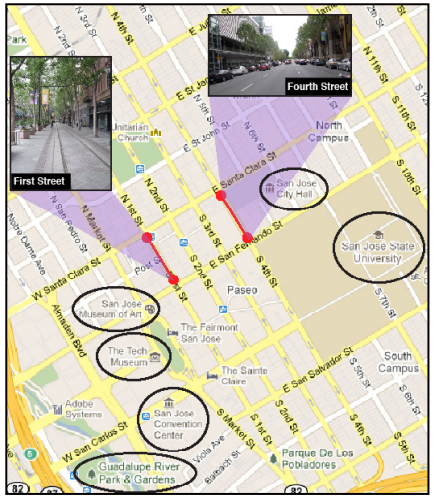


FIgure 54: Location of First Street in downtown San Jose.

FIgure 55: View of First Street.

Site Analysis

Land Uses

There are a variety of land uses along First Street including; retail, commercial, office, and residential. Lots of restaurants and shops line the street, and there are office spaces and residential spaces available on the second story and up. There is a parking garage on the West side of the street, and a small side street (Post St.) also contains retail and commercial uses.

FIgure 56: Commercial and retail uses along First Street.

Aesthetics

First Street is heavily landscaped with continually lined trees along the street. There is an abundance of potted plants and hanging plants along the street as well. There is one public transit stop that is clean for the most part, has plenty of seating, and is elevated for the light rail; contains handicap ramp. There is a large mural on the Southwest side of the street, and lots of hanging banners and flags on streetlamps. There is plenty of public seating, street lights/lamps, trashcans, and bike racks.

FIgure 57: Potted plants and trees line First Street.

Site Analysis

FIgure 58: Public seating is available along First Street.

FIgure 59: Public transportation platform with ample seating.

FIgure 60: A large mural, public art, seen on the West side of First Street.

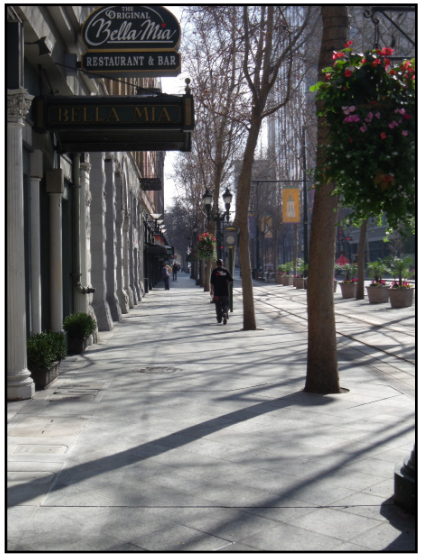
FIgure 61: Banners give the street character and bring aesthetic qualities.

Site Analysis

Street Design

There is a center median present on First Street in the form of a transit line. The transit platform is 10 feet wide and includes trees, signs, seating, etc. The median also has plants in the center. The sidewalk is 10 feet wide on either side, and in average condition with a few impediments such as tables/chairs, and some litter. Street maintenance is average with some cracks and litter. There is one parking garage, which counts as two driveway cuts. All four pedestrian intersections contain handicap ramps, and the transit platform has plenty of ramps as well. There is no designated bike lane, but there is a designated bus and light rail lane. The street goes one direction, which is Northwest.

FIgure 62: The transit platform acts as a street median.



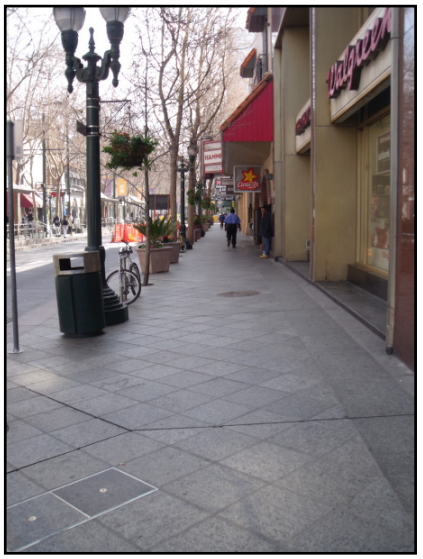


FIgure 63: Wide sidewalks encourage walkability.

FIgure 64: The two right lanes of First Street are dedicated to public transportation.

Site Analysis

Safety

Fourth Street has two pedestrian crossings (one at each intersection) and pedestrian signal crossings are more than 40seconds long, leaving ample time to cross. Crossing is easy because of the narrowness of the street. I could not determine the speed limit on this portion of the street, and it looked like most cars were going ~25-35mph. There are large amount of signs, including things such as; bus stop signs, street signs, and transit line signs. There are even a history walk sign and multitude of signs indicating outlying city directions. There is a curb that runs along either side of the street and plenty of traffic calming measures:

- Partial closure: East side is closed off for light rail and buses
- Pavement treatment
- Street Median
- Semi-Diverter
- Narrow vehicle lane

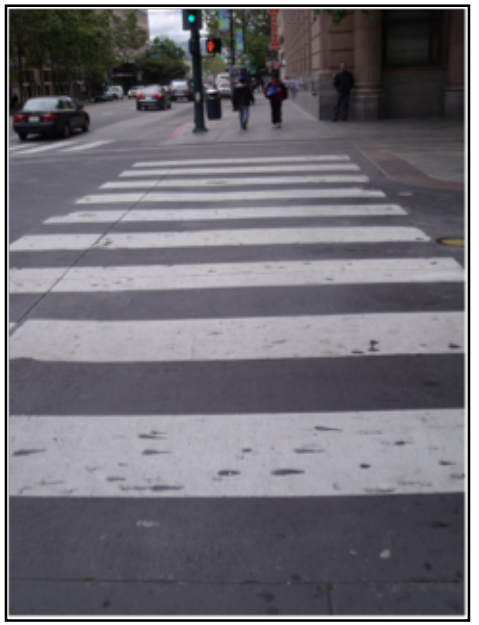


FIgure 65: Wide sidewalks encourage walkability.

FIgure 66: Narrow vehicle and bus lane are seen as a traffic calming measure.

Site Analysis

FIgure 67: Signs help citizens to affiliate themselves with the area and with transportation services.

FIgure 68: San Jose's history walk can be found throughout the downtown area, and is seen here along First Street.

4.3.3 Urban Streets: Comparison of Complete vs. Incomplete

First and Fourth street are both located within the downtown core of San Jose. Their biggest similarities were thing such as street maintenance, sidewalk width, and the pedestrian crossings. The biggest differences were that First Street (complete) has an abundance of storefronts at the street level, and there is a transit line on the street. Fourth Street (incomplete) had street parking, whereas First Street did not. Even though Fourth Street had some landscaping, and street signage, First Street had a much larger abundance of street landscaping and signage. As you'll see in the traffic counts, the amenities of First Street attracted many more pedestrians, while Fourth Street attracted more cars.

Chapter 5

Data Collection

Data Collection

5.1 Introduction

Data was collected while sitting on the streets at the pedestrian level. The four main topics for data collection are pedestrians, motor vehicles, public transit, and non-motorized vehicles. These are then broken down into subcategories to be more specific. The data count is reflective of the time and place, and the position for viewing traffic. In the next section are charts of the final data count after tallying and calculating them. They are separated by time, place, and by incomplete vs. complete.

Breakdown of the categories and sub-categories used for analysis:

1) Pedestrians: Non-transit users
   a. Disabled: People in wheelchairs, or people with walkers
   b. Elderly: People 80 years and older
   c. Children: People 10 years and younger
2) Motor Vehicles
   a. Personal cars
   b. Motorcycles
3) Public Transit
   a. Vehicles: Buses, light rail, shuttles
   b. Users: People getting on/off public transit
4) Non-Motorized Vehicles
   a. Bicyclists
   b. Skateboarders

*The counts seen in the main categories are a total of the subcategories as well.

Data Collection

5.2 Suburban Street Data Counts

Incomplete Street: San Antonio, between 12th and 13th	
7-May-11	
Peak Hour: 7am-8am	
Pedestrians	12
Disabled	0
Elderly	0
Children	0
Motor Vehicles	55
Vehicles	54
Motorcycles	1
Public Transit	3
Public Transit Vehicles	3
Public Transit Users	0
Non-Motorized Vehicle	6
Bicyclists	6
Skateboards	0

Incomplete Street: San Antonio, between 12th and 13th	
7-May-11	
Peak Hour: 10am-11am	
Pedestrians	10
Disabled	0
Elderly	1
Children	0
Motor Vehicles	40
Vehicles	40
Motorcycles	0
Public Transit	0
Public Transit Vehicles	0
Public Transit Users	0
Non-Motorized Vehicle	6
Bicyclists	6
Skateboards	0

Complete Street: San Carlos, between 12th and 13th	
7-May-11	
Peak Hour: 7am-8am	
Pedestrians	18
Disabled	0
Elderly	0
Children	0
Motor Vehicles	115
Vehicles	115
Motorcycles	0
Public Transit	10
Public Transit Vehicles	10
Public Transit Users	0
Non-Motorized Vehicle	10
Bicyclists	8
Skateboards	2

Complete Street: San Carlos, between 12th and 13th	
7-May-11	
Peak Hour: 10am-11am	
Pedestrians	34
Disabled	0
Elderly	0
Children	1
Motor Vehicles	84
Vehicles	83
Motorcycles	1
Public Transit	6
Public Transit Vehicles	6
Public Transit Users	0
Non-Motorized Vehicle	17
Bicyclists	16
Skateboards	1

Data Collection

5.3 Urban Street Data Counts

Incomplete Street: Fourth Street, between Santa Clara & San Fernando	
7-May-11	
Pre-Peak Hour: 4pm-5pm	
Pedestrians	18
Disabled	0
Elderly	0
Children	0
Motor Vehicles	115
Vehicles	115
Motorcycles	0
Public Transit	10
Public Transit Vehicles	10
Public Transit Users	0
Non-Motorized Vehicle	10
Bicyclists	8
Skateboards	2

Incomplete Street: Fourth Street, between Santa Clara & San Fernando	
7-May-11	
Peak Hour: 5pm-6pm	
Pedestrians	181
Disabled	0
Elderly	6
Children	7
Motor Vehicles	1053
Vehicles	1047
Motorcycles	6
Public Transit	1
Public Transit Vehicles	1
Public Transit Users	0
Non-Motorized Vehicle	34
Bicyclists	27
Skateboards	7

Complete Street: First Street, between 12th and 13th	
7-May-11	
Pre-Peak Hour: 4pm-5pm	
Pedestrians	420
Disabled	8
Elderly	15
Children	11
Motor Vehicles	241
Vehicles	239
Motorcycles	2
Public Transit	277
Public Transit Vehicles	37
Public Transit Users	240
Non-Motorized Vehicle	67
Bicyclists	59
Skateboards	8

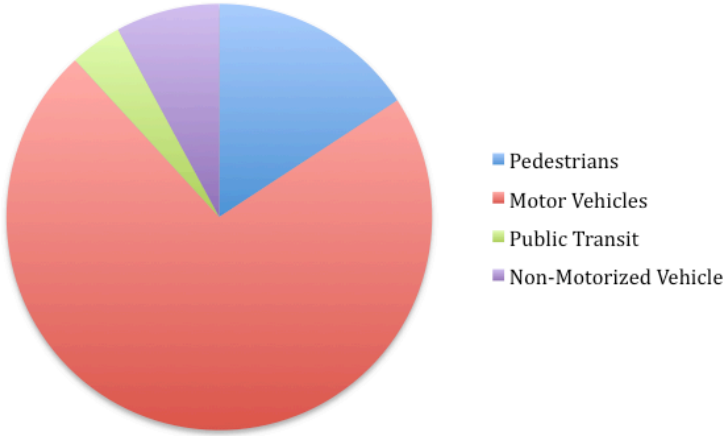
Complete Street: First Street, between 12th and 13th	
7-May-11	
Pre-Peak Hour: 5pm-6pm	
Pedestrians	603
Disabled	9
Elderly	14
Children	40
Motor Vehicles	230
Vehicles	229
Motorcycles	1
Public Transit	282
Public Transit Vehicles	50
Public Transit Users	232
Non-Motorized Vehicle	45
Bicyclists	44
Skateboards	1

Data Collection

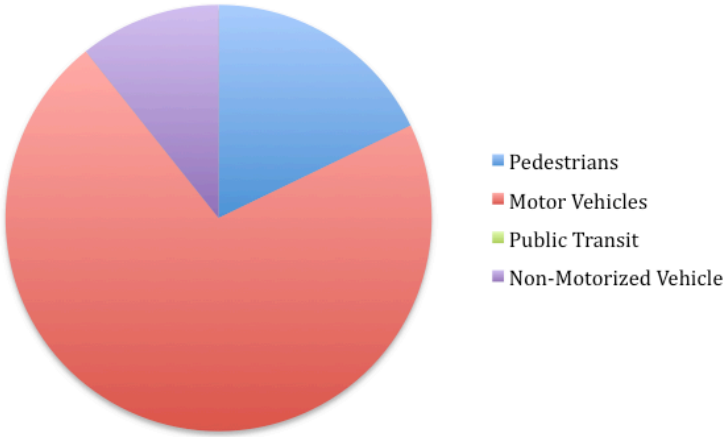
5.4 Suburban Street Data Counts

5.4.1 Incomplete Street: San Antonio Street

Peak Hour: 7am-8am



Non-Peak Hour: 10am-11am

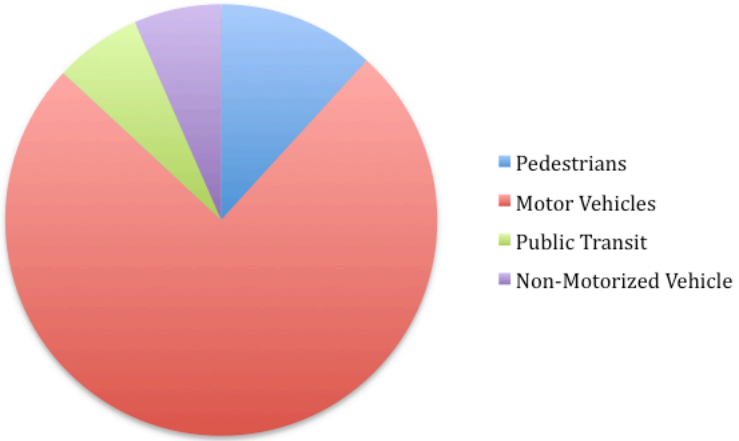


These charts show how motor vehicles dominate San Antonio Street. Both peak and non-peak hours had a majority of vehicle use. Pedestrians make up the next largest groups, with non-motorized and public transit making up just a small portion of street users. The non-peak hour did not even have public transit use on the street.

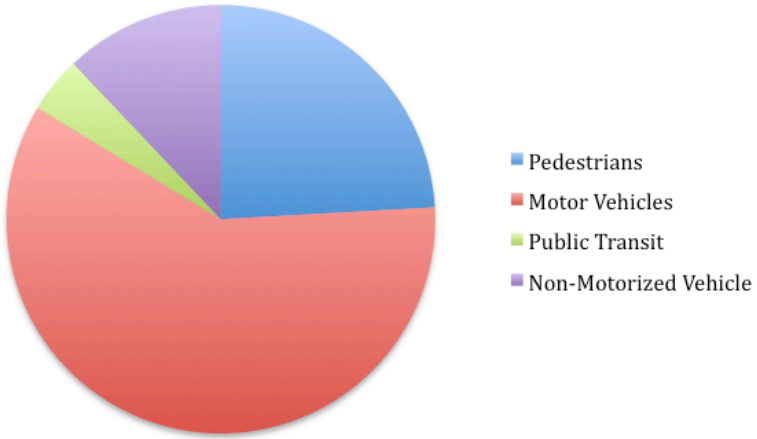
Data Collection

5.4.2 Incomplete Street: San Carlos Street

Peak Hour: 7am-8am



Non-Peak Hour: 10am-11am



San Carlos also had a higher number of vehicles than pedestrians, public transit, and non-motorized vehicles. But overall, the modes of transportation were more diverse than San Antonio (incomplete). Pedestrians made up almost a quarter of the total use of the street.

Data Collection

5.4.3 Comparison of Incomplete vs. Complete Suburban Streets

Judging from these charts it is obvious that suburban neighborhoods are dominated by the use of cars. Pedestrians and bicyclists make up a small portion of the number. Public transit is very seldom on both of these streets, but more common on San Carlos where there is a bus stop.

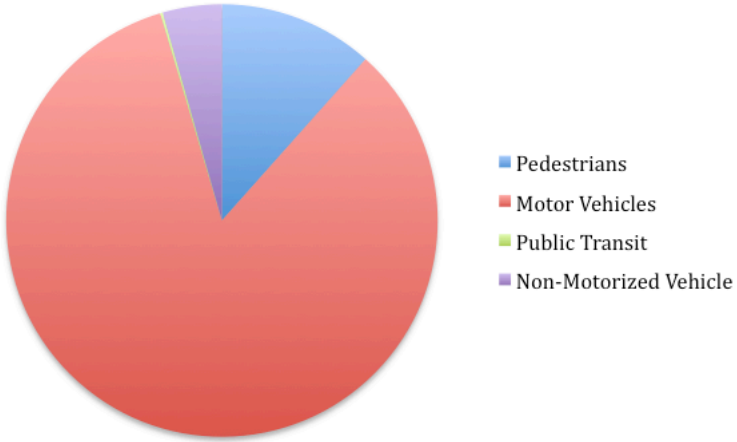
San Carlos (Complete) had more pedestrian and non-motorized vehicles users than San Antonio (Incomplete), which shows that people are more drawn to use this street. As seen in the street survey, San Carlos is more aesthetically pleasing, and safer. The street median helps to slow vehicles, which makes people feel safer when walking, biking, etc. The presence of retail/commercial uses one block away also attracts more visitors, which I think contributed to the higher number of street users on San Carlos.

Data Collection

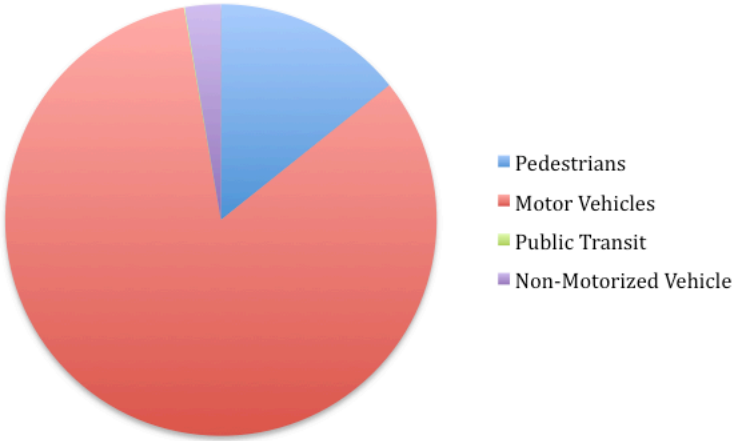
5.5 Urban Street Data Counts

5.5.1 Incomplete Street: Fourth Street

Pre-Peak Hour: 4pm-5pm



Peak Hour: 5pm-6pm

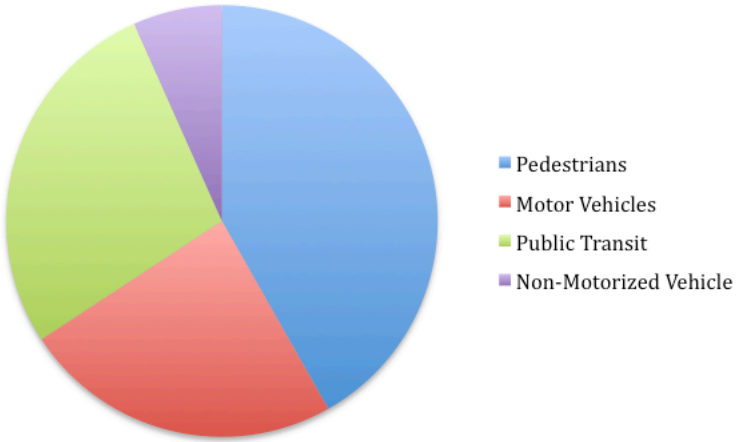


These charts show how many vehicles use Fourth Street, and how few pedestrians, non-motorized vehicles, and transit users do. The proportion of vehicles over everything else is even higher than in the suburban streets analyzed earlier. Public transit barely appear, with just two during the non-peak hour and only one during the peak hour.

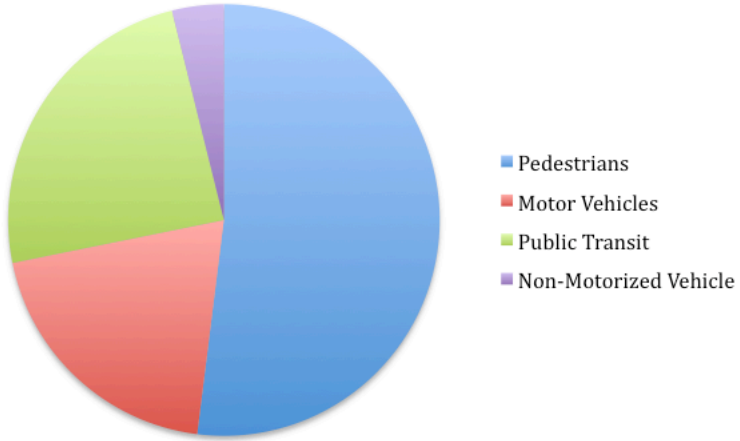
Data Collection

5.5.2 Complete Street: First Street

Pre-Peak Hour: 4pm-5pm



Peak Hour: 5pm-6pm



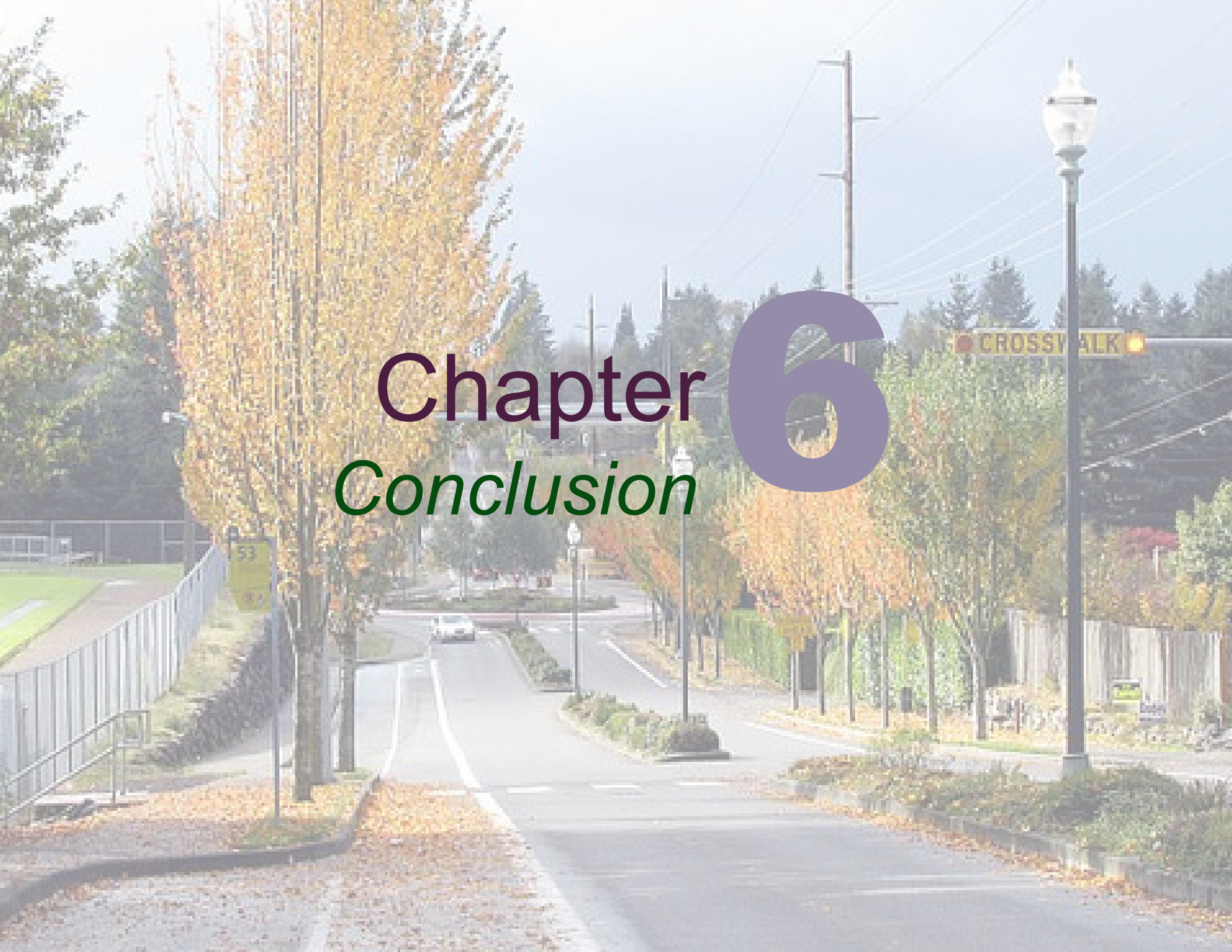
The graphs representing data from First Street are the most diverse of all the graphs seen earlier. There is fairly distributed number of pedestrian, motor vehicles, and public transit users/riders. A small number of bicyclists and skateboarders also make up the number of non-motorized vehicles seen on First Street.

Data Collection

5.5.3 Comparison of Incomplete vs. Complete Urban Streets

The charts used to display data from Fourth and First Street are very different from one another. It is obvious from the data that Fourth Street is much more car-oriented, whereas First Street is more pedestrian and public transit oriented. Also, a larger proportion of non-motorized vehicles were seen on First Street. This shows that people are more often willing to walk on this street than drive.

The fact that there are stores, restaurants and offices contributes greatly to the increase in pedestrians along First Street. Also, having a transit line on the street has largely increased the amount of public transit vehicles and users. Fourth Street was mostly automobile related, with wide street lanes and lots of street parking being utilized on either side.



Chapter 6

Conclusion

Conclusion

6.1 Conlcusion

From all of the literature and analysis I have done, I have come to see how much of a difference it makes to think more progressively about streets. In order to accommodate our future needs, we must design streets to suite all walks of life, diversify transportation, and make them safe for all that use them. The literature review helped me to understand the process of how streets were designed in the past, and how they have evolved since. As the years have passed we have seen a major shift in street patterns, and unfortunately it has caused serious problems for us. Thankfully, we are in an age where people are starting to reconsider how streets were built. Complete streets encompass a lot of the same principles as smart growth; promoting walkability, safety, and diversity. This is essential, and we must get citizens to expand their transportation options.

One of the most interesting things I learned from this was that land uses make much more of a impact than I had expected. Although complete street characteristics can alter street patterns, I found that it is ultimately what is on the street that identifies a place. This idea was much more relevant than I had anticipated or expected.

If you build it they will come. As silly as this sounds, it is true that incorporating complete street characteristics into existing and new streets will encourage more people to use and enjoy them. The walkability and non-motorized vehicle use which tells us that when complete streets, are developed they are utilized. To end this report, I decided to leave the reader with a bit of hope for what future streets may look like if we incorporate more

Conclusion

complete street characteristics. Because we are all very familiar with the street patterns of San Jose, I thought it best to incorporate the two street sets analyzed in this project to get a view of what they may look like in the future.

Conclusion

San Antonio Street: Incomplete before, complete after

Using Sketchup, I changed the overall physical componenets of San Antonio Street. A desigated four foot bike lane was added on either side, and the travel lanes were narrowed to 11 feet. There is desinated street parking on either side, and signs to notify residents of parking regulations. A designated 'ladder' crosswalk was implemented A bus stop was added, with a concrete paver to separate it from the travel lane. Street lights and trashcans were added, and landscaping the was increased.

Before

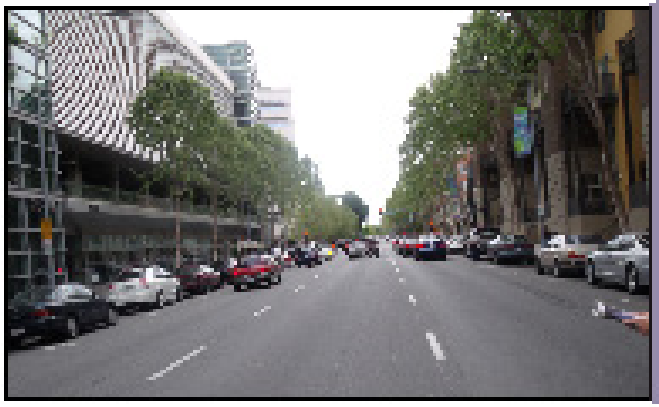
After

Conclusion

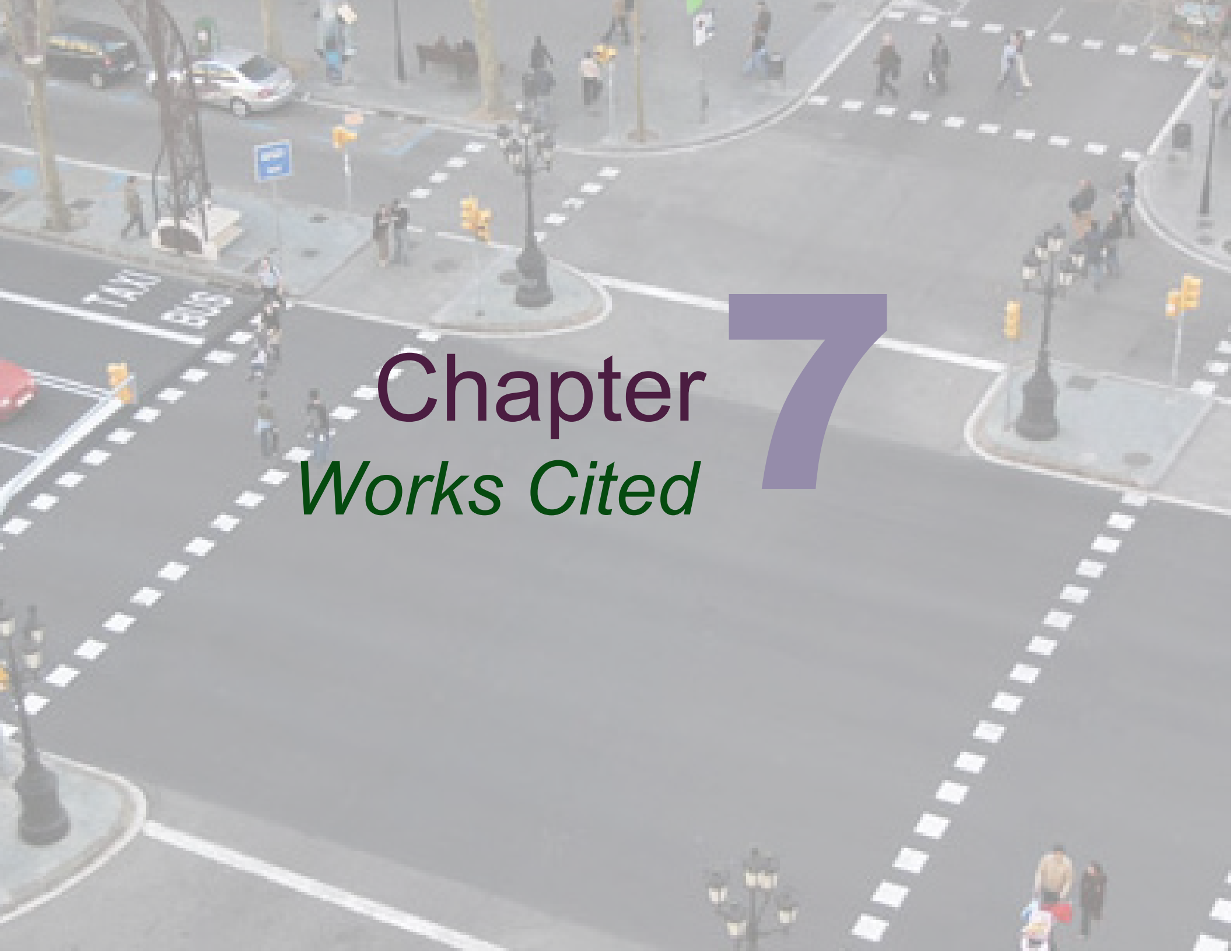
Fourth Street: Incomplete before, complete after

For Fourth Street, a designated bike lane was added as well. A 'ladder' crosswalk was also added here, and trashcans and streetlamps were added to increase safety and maintenance of the street. Street trees were increased along the street. This street should also incorporate a bus stop in order to promote public transit use. Signage and forms of public art would be incorporated to make the street more comfortable for citizens.

Before



After



Chapter 7

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