Policy Actions to Improve Safety and Comfort for Cyclists and Pedestrians in San Marcos, Texas

Tory Carpenter

An Applied Research Project

carpenter.torymac@gmail.com

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Oral Examination Committee Members:

Dr. Patricia Shields, Ph. D
Dr. Billy Fields, Ph. D.
Rebecca Miears, MPA

Abstract

Purpose: The purpose of this applied research project is threefold. First, it describes the ideal components of effective bicycle and pedestrian policy. Second, it assesses the City of San Marcos' policies using case study methodology (document analysis and direct observation). Third, it provides recommendations for improving bicycle and pedestrian polices at the City of San Marcos.

Method: This research uses three policy categories; legal protections, development patterns, and network design that are framed to evaluate the bicycle and pedestrian polices of the City of San Marcos. Each policy category is divided into multiple sub categories which have their own rating criteria. The study assesses the San Marcos' development codes, comprehensive plan, and code of ordinances.

Findings: This project finds that the City of San Marcos sufficiently meets most of the suggested policy actions outlined in the literature. The project also makes recommendations for the City of San Marcos to improve certain bicycle and pedestrian policies. Some specific examples of recommendations include; revisions to the existing complete streets policy by including retrofit projects; and additional public outreach via social media to inform the public of safe passing laws.

About the Author

Tory Carpenter grew up in Irving Texas in the Dallas / Fort Worth metroplex. His interest in urban planning was sparked after his senior year of high school during a month-long solo trip across the United States and Canada on the Greyhound Bus system. In 2012 Tory graduated from Texas State University – San Marcos with a Bachelors of Geography – Urban and Regional Planning. Since graduating, he has worked as a Planner for the City of San Marcos.

Acknowledgements

Contents

Chapter 1
Introduction

As the Interstate 35 corridor in Texas continues to grow, so does the strain on the region's transportation infrastructure. One component of this system, which has largely been neglected, is pedestrian and bicycle infrastructure. Furthermore, reliance on the private car as the only solution to transportation needs has further solidified the auto-dependent culture of much of the United States (Jacobs, 2011). Policies that promote an increase in pedestrian and bicycle use can alleviate the strain on existing infrastructure, improve public health and equity, and provide for an overall higher quality of life for those affected. The importance of effective bicycle and pedestrian policies is highlighted by the fact that San Marcos is one of the fastest growing cities in the United States (US Census Bureau, 2017).

San Marcos, TX

San Marcos boasts a perfect combination of natural beauty, preserved history, and vibrancy. This balance is illustrated with the fact that San Marcos made the lists of top 25 cities to retire (Forbes), and top 10 best cities for singles (Livaility.com). With the spring-fed San Marcos River running through the center of town, San Marcos has been a

Image 1.1: Tubers at Rio Vista Park, Courtesy of the San Marcos Visitors Bureau.

tourist destination for decades. This tourism industry is further increased by the neighboring

Tanger and Premium outlet malls, which have become an international tourism destination.

Additionally, San Marcos is the county seat of Hays County. With this designation, San

Marcos is home to Hays County's 1880's Courthouse which is the center of the historic square

and central business area. Adjacent to downtown sits Texas State University's main campus.

Image 1.2: San Marcos Bird's Eye View, 1881, Courtesy of the Texas General Land Office

San Marcos is an ideal city for expansion of bicycle and pedestrian policies. The

comprehensive plan for San Marcos states that bicycle and pedestrian facilities "are significant

mechanisms in building a sustainable transportation system" (A Vision San Marcos, 2013, p.

102). From 2008 to 2012, 4.5% of San Marcos' workforce regularly walked to work (US Census

Bureau, 2012), which is significantly more than the statewide average of 1.2 %. However, a

mere 0.8% of San Marcos' workforce regularly takes a bicycle to work. The pedestrian-friendly

and cycling culture may be partly caused by the City's significant number of young people. Even

though there is a deep-rooted elderly community, the median age in San Marcos is 23, which is

likely due to the large number of Texas State Students at Texas State University (US Census

Bureau, 2017).

Research Purpose

The purpose of this applied research project is threefold. First, it describes the ideal

components of effective bicycle and pedestrian policy. Second, it assesses the City of San

Marcos' policies using case study methodology (document analysis and direct observation).

Third, it provides recommendations for improving bicycle and pedestrian polices at the City of

San Marcos.

Chapter Summaries

Chapter two examines the scholarly literature on bicycle and pedestrian policies.

Chapter three describes the research methodology used to assess the bicycle and pedestrian

policies at City of San Marcos. Chapter four includes the results of the City of San Marcos case

study. The results chapter also reviews both document analysis and direct observation analysis.

Chapter five provides recommendations and conclusions based on the City of San Marcos case

study.

Chapter 2
Literature Review

Chapter Purpose

This chapter reviews the literature on pedestrian and bicycle transportation policy in cities. After examining the literature, this chapter provides categories used to organize possible bicycle and pedestrian policy actions. These categories can be found in the conceptual framework table (table 2.1).

Policy History & Context

Up until the popularization of the automobile in America in the late 1890s, walking and horse travel were the primary form of local transportation. During this time, cities were compact and most daily necessities were within a walking distance (Seiler, 2009). The bicycle became popular form of transportation after being introduced to New York City in the 1860's and its use soon spread nationwide (Herlihy, 2004).Conflict between cyclists and other road users is not a new phenomenon. As the figure 2.1 illustrates, even before the popularization of the car, there was still room for disagreement.

Figure 2.1: Cyclists attempting to overtake a horse-drawn carriage. Harpers Weekly, 1896

May 31st, 1880 marks the formation of the League of American Wheelmen (L.A.W). From its inception, L.A.W. acted as a well-organized lobbying group advocating for bicycle legislation, and in 1888 shifted its focus toward improving conditions of public roads. L.A.W.'s work was so influential in fixing the nation's crumbling road

network, that George E. Walsh, a writer for *the Automobile* magazine, wrote that "the bicycle practically paved the way for automobiling" (Reid, 2015).   With the rising use of the automobile in the United States between the 1920s and 1960s, national and local policies began adapting cities to car travel (Jacobs, 2011 p. 26). Given transportation policymakers' primary focus on the car, walking and bicycling became more difficult. For instance, the booming auto industry effectively lobbied for policies which directly, and indirectly, led to the demise of other forms of transportation, such as the cable car. Furthermore, the interstate system cut through American cities and became a barrier to pedestrians and cyclists (Seiler, 2009). Even with the "second bike boom" of the 1970's, these automobile-centric policies continued to have a lasting effect. (Longhurst, 2015).

However, land use and transportation policies have begun to shift in recent years. For instance, California requires the adoption of regional sustainable communities' strategies. This requirement is aimed at reducing the use of the automobile among other things (Cao & Chatman, 2016 p. 58). The state of Washing adopted a similar policy plan that encourages other transportation options other than the automobile (Frank & Pivo, 1994, p. 45).

The issues surrounding decades of automobile-centric policies are numerous. At the root of these problems, however, is the reality that pedestrians and cyclists

Figure 2.2 Cyclists being run off the road by an automobile. The Graphic, 1902

are without safe paths and street crossings. This lack of adequate infrastructure leads to other

problems, such as an uninviting public transportation system, parents driving their children

short distances to school, and older adults becoming homebound as soon as they are no longer

able to drive (Rynne, 2010).

Conceptual Framework

An examination of scholarly literature on bicycle and pedestrian policy identifies actions

that a local government can take to promote use of bicycle and pedestrian infrastructure. After

review of the literature, the following categories were identified to organize possible policy

actions:

1. Legal Protections for Pedestrians and Cyclists
   1.1. Liability Protections
   1.2. Safe Passing Laws
   1.3. Protection of Cyclists and Pedestrians from Harassment
   1.4. Implementation of Law Enforcement Countermeasures

2. Supportive Development Patters
   2.1. Smart Growth and Mixed Use Policies
   2.2. Design Standards & Form Based Codes

3. Network Design
   3.1. Complete Streets
   3.2. Connectivity

Legal Protection for Pedestrians and Cyclists (1)
Liability Protections (1.1)

In this research, the term "liability protections" refers to who is legally at fault when

there is a collision between a vehicle and pedestrian or cyclist. While Texas law does not

directly address liability in a pedestrian/vehicle or cyclist/vehicle collision, it does not prohibit

municipalities from adopting such ordinances. Texas follows a 51% modified comparative fault

rule, which means that an injured party cannot recover if it is more than 50 percent at fault for causing the crash. However, the injured party can recover if it is 50 percent or less at fault, but that recovery would be reduced by its degree of fault. Therefore, it is critical that an injured party in Texas demonstrate that his or her fault, also known as proportionate responsibility, was 50% or less if they hope to recover from another party for injuries suffered. Source: Tex. Civil Practice & Remedies Code §33.001, et seq.

It is important that that cities adopt clear, objective, and quantifiable standards so they can be easily enforced and held up in court (Cooley 2006, p. 38). The two common approaches to liability include comparative negligence and contributory negligence. While comparative negligence lets the injured collect damages proportionately to their fault in the collision, contributory negligence does not allow someone involved in a collision to collect damages if they are partially at fault (Louch et al., 2016). Take, for instance, a collision involving a motorist who ran a red light and a pedestrian who began crossing the street during "wait" signal. Under comparative negligence, the pedestrian would be able collect at least partial damages. Under contributory negligence, however, the pedestrian would be prohibited from recovering damages because he was not permitted to walk during the "wait" signal.

An example of a specific liability protection ordinance is the law criminalizing "dooring" passed by the City of Chicago. Dooring is the act of opening a car door in the path of a cyclists which can lead to serious injury. Any dooring incident that causes a collision results in a mandatory $1000 fine (Louch et al., 2016).

The Dutch, who are known for their bicycle-friendly infrastructure and policies, passed a strict liability law in 1994. Under the Road Safety Act of 1994, any motorist involved in a collision with a pedestrian or cyclist is presumed to be a fault (Maker, 2015, p. 487). Even if a driver can prove that the collision was a result of "circumstances beyond his control," he may only escape some, but not all, liability.

Safe Passing Laws (1.2)

Safe passing laws target the most common behavior that kills cyclists, i.e. unsafe passing. In America, 28% of cycling fatalities are caused by motorist overtaking cyclists (National Center for Statistics and Analysis, 2018).

States, counties, or municipalities can adopt safe passing laws to provide a legal framework for bicyclists who are hit from behind. While difficult to enforce, these laws create a less arbitrary standard and raise awareness of the importance of safe passing (Louch et al., 2016). Since many crashes involving bicycles and motorists
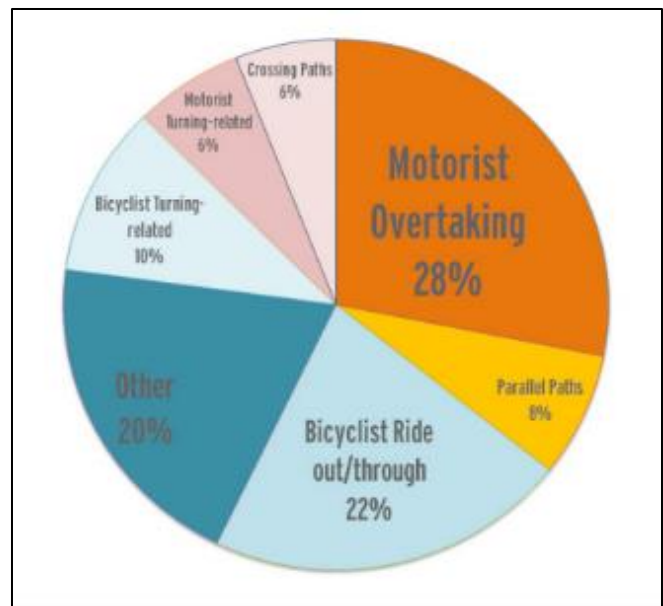

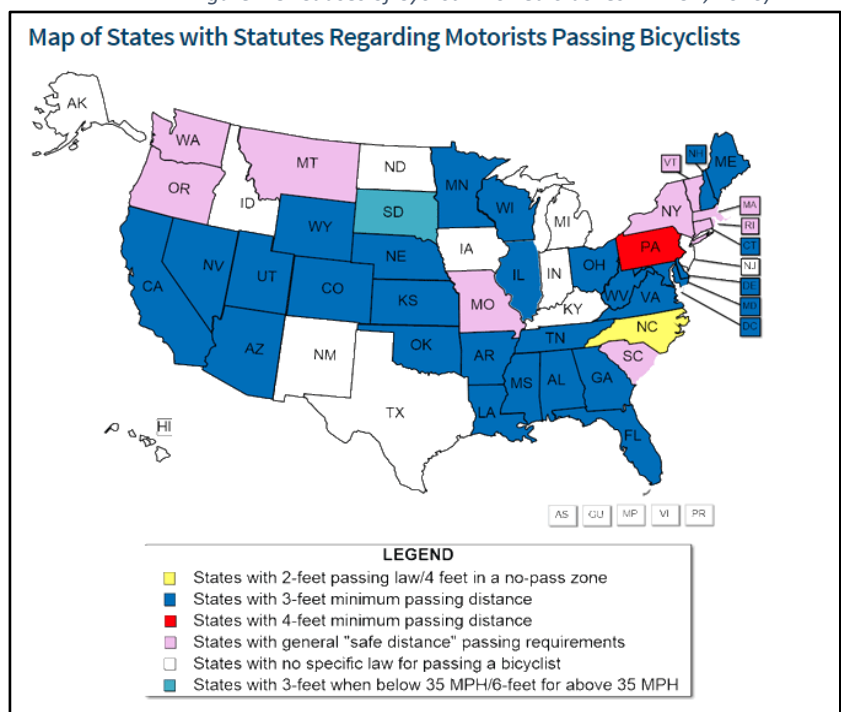*Figure 2.3: Causes of Cyclist-involved crashes. NHTSA, 2016)*

Figure 2. (National Conference of State Legislatures, 2018)

occur while travelling in the same direction, safe passing distances help protect these road

users (Debnath, et al. 2018).

As shown in figure 2.4, 26 states have a three-foot passing rule and two states exceed

the three-foot standard (National Conference of State Legislatures 2018). Texas, however, does

not have a statewide standard so it is up to local governments to create their own. As of 2012,

25 Texas Cities have adopted safe-passing ordinances, including Austin, Houston, and Fort

Worth.

According to the League of American Bicyclists, a good safe passing law is clear,

enforceable, and statewide. The League provides the following code language that state or local

governments can adopt:

When overtaking or passing a person operating a bicycle proceeding in the same direction,
the driver of a motor vehicle
shall exercise due care and:

1. *If there is more than one lane for traffic proceeding in the same direction, move the vehicle to the lane to the immediate left, if the lane is available and moving into the lane is reasonably safe; or*
2. *If there is only one lane for traffic proceeding in the same direction, pass to the left of the person operating a bicycle at a safe distance, which must be not less than 3 feet between any portion of the vehicle and the bicycle, and shall not move again to the right side of the highway until the vehicle is safely clear of the overtaken person operating a bicycle.*
3. *The driver of a motor vehicle may drive to the left of the center of a roadway, including when a no passing zone is marked, to pass a person operating a bicycle only if the roadway to the left of the center is unobstructed for a sufficient distance to permit the driver to pass the person operating the bicycle safely and avoid interference with oncoming traffic. This paragraph does not authorize driving on the left side of the center of the roadway when prohibited under [the state's equivalent to UVC sections 11-303 (Overtaking a vehicle on the left), 11-305 (limitations on overtaking on the left), and 11- 306 (further limitations on driving on left of the center of roadway).]*
4. *The collision of a motor vehicle with a person operating a bicycle is prima facie evidence of a violation of this section.*

Protection of Cyclists and Pedestrians from Harassment (1.3)

Harassment of cyclists can discourage people from bicycling; however, it can be difficult for law enforcement officials to target harassment without specific law defining it (Louch et al., 2016). The City of Columbia, MO created a law which protects pedestrians and cyclists from harassment, specifically instances where a person:

1. Throws an object at another person;
2. Threatens a cyclist or pedestrian;
3. Sounds a horn, shouts, or otherwise directs sound toward a cyclist or pedestrian in order to frighten that person;
4. Knowingly placing a cyclist or pedestrian in appreciation of physical injury; or
5. Engages in conduct that creates a risk of death or serious physical injury to a cyclist or pedestrian (Louch et al., 2016).

While the ultimate goal of the ordinance was part of a larger initiative to increase pedestrian and cyclists counts, it also improved overall safety (Sayers et al., 2012). The City of Los Angeles passed a similar ordinance in 2011 (Cohen, 2014).

Implementation of Law Enforcement Countermeasures (1.4)

Law enforcement officers play a vital role in maintaining safe environments for people cycling and walking. Law enforcement countermeasures can help educate motorist, cyclists, and pedestrians about safety issues (Louch et al., 2016). Countermeasures are meant to come into effect after passing the suggested laws listed above, and the most effective form is referred to as progressive ticketing (Pedestrian and Bicycle Information Center, 2018) which includes the following steps in order:

1. Educate the general public through public service announcements, signage, or other materials.
2. Issue warnings to offenders

3. Ticket offenders

This three-step process allows for a grace period where offenders are educated about the new laws instead of being ticketed.

Promote Supportive Development Patters (2)

Smart Growth & Mixed Use Policies (2.1)

Smart Growth can be described as "building neighborhoods and communities that widen opportunities for pleasant, hospitable, and economically beneficial conditions for living, working, and recreating" (Weitz & Waldner, 2002). Smart Growth policies assist in the creation of complete networks by establishing development patterns designed to shorten trip distances and encourage active transportation. (Louch et al., 2016; Cao et al., 2016). Mixed use zoning, for instance, allows for smart growth and promotes walkable and bikable communities (Louch et al., 2016). Frank et all found a significant positive relationship between employment density, population density, land-use mix and the use of transportation other than personal vehicles (Frank & Pivo 1994, p. 51).

Smart Growth policies help improve pedestrian and bicycle comfort by making walking and cycling trips more pleasant by providing shaded pathways, active building frontages, and it is all done in a logical manner. Some tools used within Smart Growth include mixed- use zoning, infill development incentives, and cluster development.

Design Standards & Form Based Codes (2.2)

The idea of using urban form to improve social diversity has been an important theme in urban planning since World War II (Talen, 2013). Some components of form-based codes which

help promote walkability and bikability include bringing buildings to the street and not allowing parking in front of buildings (Louch et al., 2016). This design makes access to buildings easier and reduces conflict with vehicles. Additionally, reducing minimum parking standards can be used to increase density and provide a larger mix of uses in an area (Louch et al., 2016). Two important aspects of form-based codes covered in this chapter are building placement and parking location.

Building placement is usually dictated by a standard minimum setback from the property line. Typical suburban-style codes provide large minimum setbacks of 20 feet or greater from the street. The void left within the large setback is often filled with surface parking lots, especially for commercial development. This development pattern creates an uninviting and unsafe environment for pedestrians who are put between a large parking lot and a busy street (Barnett, Russell, Greenberg, & Crawford, 2004). One method used to reduce this style of development is by reducing minimum setbacks or eliminate them altogether. It is also important to require parking in rear of the buildings.

Another method of making development more inviting to pedestrians is by requiring windows, or glazing, along the frontage of buildings. This aspect of buildings is essential for safe and inviting streets (Barnett et al., 2004) (Jacobs, 2011).

Network Design (3)
Complete Streets (3.1)

Complete streets policies are those that require streets to be designed for a variety of modes, including cars, cyclists, and pedestrians. Another important aspect of a complete streets policy is that streets should be designed to serve users of all ages and abilities, with the slogan 8

to 80 (years old) being frequently used (Smart Growth America, 2018; Louch et al., 2016 p. 25). The basis of the complete streets movement is the political, policy, and procedural changes (McCann & Rynne, 2010). Evidence of these changes can be seen in the design of new roads and the retrofitting of existing ones.

The term "complete streets" was coined in 2003 by America Bikes, an interest group of cycling and motorbiking enthusiasts. Shortly after the inception of complete streets, the Complete Streets Task Force (now the National Complete Streets Coalition) was founded with a goal of creating a federal complete streets policy. While this federal policy has yet to be adopted, the standards created by the task force served as the building blocks for various state and local policies which began adoption in 2008 – 2009 (McCann & Rynne, 2010).

While pedestrian safety is at the forefront of the complete streets movement, other benefits include public health, reduction in greenhouse gasses, and equity among the disabled. The obesity problem in the United States can be attributed to various causes; lack of exercise, poor eating habits, and limited healthy food options for many Americans. However, by providing more transportation options, a community will likely see an increase in the level of physical activity among its residents (Rodriguez 2009). This increase in connectivity can also give citizens more access to various food options.

Economic benefits can also be attributed to complete streets policies. For instance, with the City of San Francisco's redesigned Valencia Street using complete streets came an increase in sales to 40% of the businesses in the area. Furthermore, there was a noticeable increase in residents walking in the area (Drennen, 2003).

Retrofit of existing roads is an important aspect of a Complete Streets ordinance. While full redesign of roads is often necessary, a similar result can be achieved through a road diet. Road diets are a reconfiguration of an existing street, usually by reducing the number of travel lanes. This can be the cheapest and most effective way to improve road design in certain situations. Refer to figure 2.5 illustrating an example of a road diet.

Figure 2.5 Road diet example. Bike Information Center, 2009

As with most categories of public policy, there is not a one-size-fits-all approach to complete streets. However, according to the National Complete Streets Coalition, an effective complete streets policy has the following attributes:

1. *Includes a vision for how and why the community wants to complete its streets.*
2. *Specifies that "all users" includes pedestrians, bicyclists, and transit passengers of all ages and abilities, as well as automobile drivers and transit-vehicle operators.*
3. *Encourages street connectivity and aims to create a compressive, integrated, connected network for all modes.*
4. *Is adoptable by all relevant agencies to cover all roads.*
5. *Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right-of-way.*
6. *Makes any exceptions specific and sets a clear procedure that requires high=-level approval of exceptions.*
7. *Directs the use of the latest and best design standards while recognizing the needs for flexibility in balancing user needs.*
8. *Directs that complete streets solutions will complement the context of the community.*
9. *Establishes performance standards with measurable outcomes.*
10. *Includes specific next steps for implementing the policy.*

*(*McCann & Rynne, 2010)

It is important to note that the Complete Streets movement is a component of the broader Vision Zero movement. Vision Zero is a traffic safety project with the main goal of completely eliminating all road fatalities.

Network Connectivity (3.2)

As the name implies, network connectivity is the concept of how connected our roads are to each other. Connectivity standards can set a maximum distance between intersections or maximum block perimeter and restrict dead-end streets. The purpose of a street network is to connect spatially separate places and to enable movement from one place to another. Network connectivity influences a person's accessibility to all goods, services, and locations of a community (Handy, Paterson, and Butler, 2003). Furthermore, connecting people with the various nearby destinations in a reasonable amount of time is key to encouraging walking and cycling (Handy, et al.; Jacobs, 2011; Southworth, 2005).

From the mid-nineteenth century through the early twentieth century, American cities were typically designed in a grid pattern with a high level of connectivity. Since the automobile was not a primary mode of transportation during that time, quick and convenient access to get from one point of a community to another was logical. However, with the adoption of suburban-
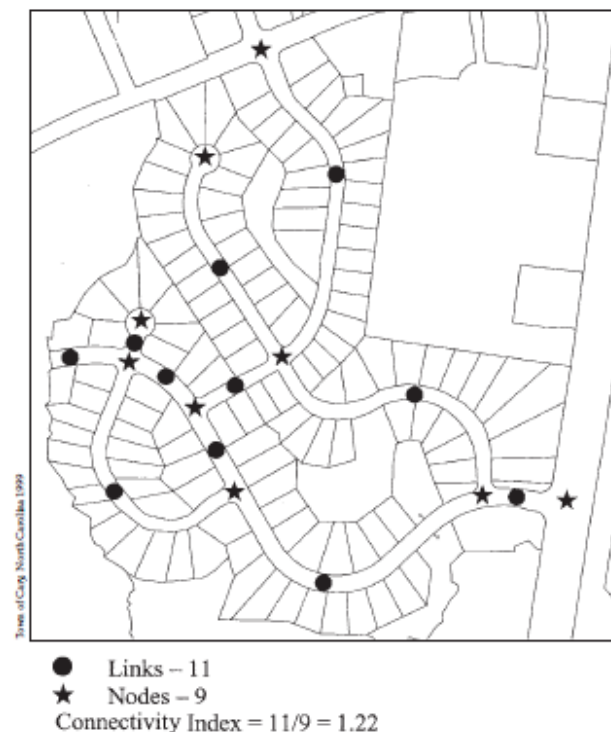

Figure 2.7: Connectivity ratio exhibit. Handy et al. 2003

style guidelines by the Federal Housing Administration in the 1930's connectivity standards

shifted to a road hierarchy system as recommended (Handy et al. 2003). With the goal of

maximum lot counts in residential neighborhoods and reduce traffic on local streets, these

guidelines promoted dead-end streets and minimal connectivity to adjacent arterial roads.

Network connectivity standards are typically measured using either block length or connectivity indexes. Block length measurements refer to the distance between local streets and can differentiate requirements between types of streets – refer to
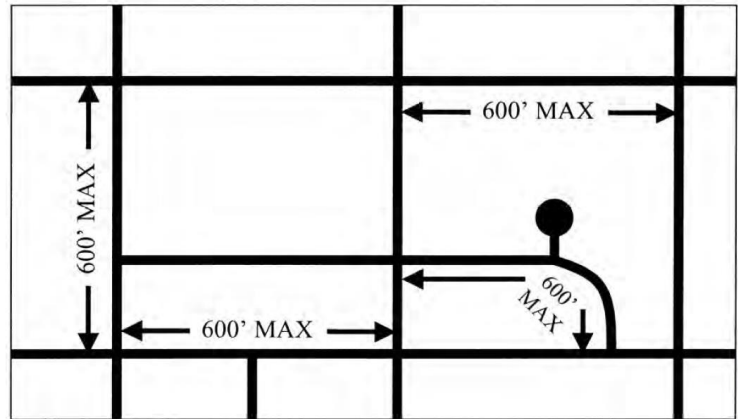
Figure 2.6 Block length exhibit. Handy et al. 2003

figure 2.7. Connectivity indexes are calculated by examining a networks number of road segments

compared to intersections – referred to as a link to note ratio (Handy et al. 2003)– refer to image 2.6

While both methods of measurement can be effective at increasing connectivity, the disadvantage of

the connectivity index is that it is not intuitive. This lack of relatability of the measurement can make

requirements "difficult to explain to local officials, citizens, and developers" (Handy et al. 2003, p. 48).

Block perimeters and block lengths, on the other hand, are a simpler concept for the general public to

understand. Connectivity standards should also consider quality of crossings, as those are critical

locations where cyclists and pedestrians must interact with automobiles (Louch et al. 2016).

For a requirement to be enforceable, it is important that the method used to measure

network connectivity is well-defined. This is often achieved with the use of diagrams showing

examples of connectivity standards. Refer to figure 2.6 illustrating how the city of Eugene,

Oregon measures block length.

One method frequently used to promote bicycle and pedestrian connectivity is by providing incentives for increasing connectivity for these users. This can be accomplished by providing a pedestrian path that breaks up a block, or a trail through the dead-end of a cul-de-sac (McCann, 2010).

Conceptual Framework Summary

This section examined of scholarly literature on bicycle and pedestrian policy identified actions that a local government can take to promote use of bicycle and pedestrian infrastructure. Categories outlined in this section include legal protections for vulnerable road users, supportive development patterns, and network design.

Conceptual Framework Table

Table 2.1: Conceptual Framework Table	
Title: Policy Actions to Increase Pedestrian and Bicycle Safety and Comfort in San Marcos, TX	
Purpose: This proposal develops a model to explore the City of San Marcos's bicycle and pedestrian policies by using case study methodology. The model first identifies key components of bicycle and pedestrian policy. Then, it uses these components to assess such policies and documents of the City of San Marcos. Ultimately the results of the study will be used to make recommendations to improve bicycle and pedestrian policy for San Marcos.	
Policy Actions	**Sources**
1. Legal Protection for Vulnerable Road Users	
1.1 Liability Protections	Cooley (2006); Louch et al. (2016); Maker (2015)
1.2 Safe Passing Laws	Debnath (2018); Louch et al. (2016); National Center for Statistics and Analysis (2018); National Conference of State Legislatures (2018); The League of American Bicyclists
1.3 Protection of Cyclists and Pedestrians from Harassment	Louch et al. (2016); Sayers (2012); Cohen (2014)
1.4 Law Enforcement Countermeasures	Louch et al. (2016); Pedestrian and Bicycle Information Center (2018)
2. Promote Supportive Development Patterns	
2.1 Smart Growth & Mixed Use Policies	Cao et al. (2016); Frank et al. (1994); Louch et al. (2016); Weitz & Waldner (2002)
2.2. Design Standards & Form Based Codes	Louch et al. (2016); Talen (2013)
3. Network Design	
3.1. Complete Streets	Drennan (2003). Louch et al. (2016); Smart Growth America (2018); McCrann & Rynee (2010); Rodriguez (2009)
3.2. Connectivity	Handy, Paterson, and Butler (2003); Jacobs (2011); Louch et al. (2016); Southward (2005)

Chapter 3
Methodology

Chapter Intro

The methodology chapter describes the assessment of bicycle and pedestrian policy for

the City of San Marcos. The chapter first operationalizes the conceptual framework and

explains the operationalization table. It then reviews the data collection methods used; case

study, content analysis, and direct observation, and explain the benefits of each. This chapter

ultimately describes the criteria for rating bicycle and pedestrian policies in San Marcos.

Operationalization Table

The operationalization table (table 3.1) is used to organize the conceptual framework in

order to assist in data collection. This table consists of five columns; policy actions, research

method, source, evidence, and rating criteria. The policy actions column organizes the table by

the policy categories found in the conceptual framework table. The research method column

indicates the method in which the data was collected; document analysis or direct observation.

The source and evidence columns provide the source of the data collected as well as the

evidence to be found within the data. Finally, the rating criteria column provides lists of specific

attributes that should be included in the source.

For example, policy action 1.2 refers to safe passing laws. The operationalization table

includes two types of data collection; document analysis and direct observation. The data

collected for direct observation is the City's safe passing ordinance. This table provides the four

separate attributes which should be included in any safe passing ordinance, including a safe

passing distance minimum of 3 feet.

Table 3.1: Operationalization Table				
Purpose: This applied research project develops a model to explore the City of San Marcos's bicycle and pedestrian policies by using case study methodology. The model first identifies key components of bicycle and pedestrian policy. Then, it uses these components to assess such policies of the City of San Marcos. Ultimately, the results of this study will be used to make recommendations to improve bicycle and pedestrian policy for the City of San Marcos.				
1. Legal Protection for Vulnerable Road Users				
Policy Actions	**Research Method**	**Source**	**Evidence**	**Rating Criteria**
1.1 Liability Protections	Document Analysis	San Marcos Code of Ordinances	Verification of existence of liability protections	1. Existence of a liability protections ordinance which favors cyclists and pedestrians.
1.2 Safe Passing Laws	Document Analysis	San Marcos Code of Ordinances	Verification of existence of a safe passing ordinance	1. Existence a safe passing law 2. The required safe passing distance is at least three feet 3. The required safe passing distance applicable to large trucks and commercial vehicles is at least six feet 4. The ordinance applies when vehicles pass cyclists as well as pedestrians
	Direct Observation	Existing Infrastructure, website, etc.	Evidence of existence of education for safe passing laws. Including signs, PSAs, etc. (photographs)	1. Street signage informing public of safe passing law. 2. Other forms out outreach informing the public of safe passing law.

Policy Actions	Research Method	Source	Evidence	Rating Criteria
1.3 Protection of Cyclists and Pedestrians from Harassment	Document Analysis	San Marcos Code of Ordinances	Verification of existence of a harassment ordinance	1. Existence of local law addressing harassment of cyclists and pedestrians. 2. The ordinance provides clear definitions or examples for what is considered harassment.
1.4 Law Enforcement Countermeasures	Document Analysis	San Marcos Code of Ordinances San Marcos Police Handbook	Verification of existence of countermeasures	1. Progressive ticketing is outlined in countermeasures.

2. Promote Supportive Development Patterns				
Policy Actions	**Research Method**	**Source**	**Evidence**	**Rating Criteria**
2.1 Smart Growth & Mixed Use Policies	Document Analysis	San Marcos Development Code San Marcos Comprehensive Plan	Verification of existence of Smart Growth and Mixed Use policies	1. Incentivizes residential density in specific areas. 2. Requires or incentivizes a mix of uses in close proximity to each other.
2.2. Design Standards & Form Based Codes	Document Analysis	San Marcos Development Code A Vision San Marcos	Verification of existence of design standards and form-based codes.	1. Requires a minimum amount of glazing on buildings. 2. Requires that buildings be in close proximity to the street.

3. Network Design				
Policy Actions	Research Method	Source	Evidence	Rating Criteria
3.1. Complete Streets	Document Analysis	San Marcos Code of Ordinances San Marcos Development Code	Verification of existence of a complete streets ordinance	1. Specifies that "all users" includes pedestrians, bicyclists, and transit passengers of all ages and abilities, as well as automobile drivers and transit-vehicle operators. 2. Applies to new and retrofit projects. 3. Well-defined exemptions to connectivity requirements.
	Direct Observation	Existing Infrastructure	Evidence of streets constructed using complete streets standards (photographs)	1. Complete streets policies are being practiced in the field.
3.2. Connectivity	Document Analysis	San Marcos Code of Ordinances San Marcos Development Code	Verification of existence of existence regulations	1. Includes minimum block length or connectivity indexes. 2. Well-defined connectivity measurement. 3. Well-defined exemptions to connectivity requirements. 4. Incentives or requirements for additional connections for cyclists and pedestrians.

Case Study

This research paper uses case study methodology to evaluate the City of San Marcos' bicycle and pedestrian transportation policies. A case study is defined as "a form of imperial inquiry that investigate a contemporary phenomenon within a real-life context" (Yin, 2017). Case study methodology can be most useful when the researcher is familiar with the case being evaluated. The researcher for this paper has lived in San Marcos since 2008 and worked for the City of San Marcos since 2011. Additionally, the researcher is a commuter cyclist and pedestrian and makes most of my daily trips without the use of a personal car. Researchers using case study methodology can draw from past experiences and have a context of the research problem, organization purposes, rules, and policies (Shields and Rangarajan, 2013).

Document Analysis

This study focuses on document analysis correlating to my various policy categories. One benefit to this data collection method is that these documents are readily available and free to use. Document analysis does have certain drawbacks, however. For example, a policy decision may just be that; a policy without any enforceable action (Brooks, 2017 p. 33). Also, as is common at any level of government, as policy makers rotate, so do their focus on certain policies. Even without formal action, it is not uncommon for existing policies to be abandon with a new City Council.
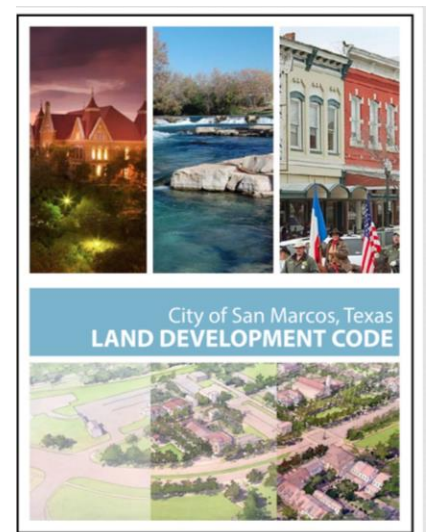

Figure 3.1: San Marcos Development Code

Existence of these policies is tested using the evidence from the documents as outlined in the operationalization table and explained in the literature review. The primary document source will be the City of San Marcos code of ordinances, specifically subpart B which includes the newly

Figure 3.2: San Marcos Comprehensive Plan

adopted Land Development Code. I will also examine the City's master plan; A Vision San Marcos.

Direct Observation

In an attempt to provide supporting evidence from different types of data, this research project also collected data through direct observation. This simple and primitive method helps identify real-word evidence of bicycle and pedestrian policies. The shortfall of direct observation, however, is the sheer amount of data and potential subjectivity of that data. Take, for instance, a researcher attempting to determine whether or not starfish exist on a certain beach. Even if the researcher searches the beach for days and does not find a starfish, he still cannot determine that there are not starfish on the beach. By using direct observation as a data-collection technique, this research looks for evidence that the City that San Marcos is implementing certain policies. As shown in the operationalization table, for instance, this paper searches for evidence of streets built under a complete street ordinance and safe passing ordinance categories. The findings section includes photographs of this evidence illustrating the existence of safe passing signs, bike lanes, etc.

Chapter Summary

This chapter gave an overview on the methods used in this paper to assess the City of

San Marcos' bicycle and pedestrian policies. It explained the operationalization table which

connects the conceptual framework with the data being used. The chapter ultimately weighed

the benefits and pitfalls of each data collection method and explains how they complement

each other.

Chapter 4
Results

Chapter Intro

This project has three main goals. The first goal is to provide a model of best practices for bicycle and pedestrian policy. Secondly, this project uses an operationalized framework to assess the City of San Marcos' bicycle and pedestrian policies. Ultimately, using the results of the research, this project provides recommendations on how to improve bicycle and pedestrian policy for the City of San Marcos. This chapter provides a summary of the results of the data collection from document analysis then direct observation.

Findings Tables

Along with an overview the findings, this chapter includes tables corresponding to each policy category listed in the conceptual framework and operationalization table. The tables include the specific policy action being researched, the criteria used to rate the policy action, and level of support of the evidence.

The three levels of support are; does not support, somewhat supports, and strongly supports. If a policy is identified as "does not support," it completely lacks the policy in question. If the policy is identified as "somewhat supports," it exists but lacks one or more of the rating criteria. If the policy is identified as "strongly supports," the policy exists and meets all or most of the rating criteria.

Document Analysis
Liability Protections (1.1)

As described in the chapter two, liability protections in the context of this project refers to who is legally at fault when there is a collision between a vehicle and pedestrian or cyclist. The City of San Marcos has not adopted any codes or ordinances which vary from the local government code regarding labiality protections for road users. For that reason, this policy action is identified as "does not support" (table 4.1)

Table 4.1 Summary of the Findings for Liability Protections		
Policy Actions	**Rating Criteria**	**Evidence Supports**
1.1 Liability Protections	1. Existence of a liability protections ordinance which favors cyclists and pedestrians.	Does Not Support

Safe Passing Laws (1.2)

The City of San Marcos adopted a safe passing ordinance (Ordinance No. 2014-05) in February 2014. In addition to establishing a safe passing distance, it also prohibits and establishes fines for parking in bicycle lanes and harassment of vulnerable road users. The safe passing ordinance applies to vulnerable road users, including motorcycles and horseback riders as well as cyclists and pedestrians. The ordinance dictates a safe passing distance of three feet for cars and light trucks and six feet for large trucks or commercial vehicles. A light truck is one that is rated to carry less than 2,000 pounds (Texas Transportation Code).

The safe passing ordinance appears to have been drafted based on recommended policy action found in the literature. Because of this, the City of San Marcos' is identified as strongly supports for each of the four rating criteria (table 4.2). Refer to figure 4.1 for an excerpt from the ordinance below regarding safe passing.

(a) In this section, a vulnerable road user means:
 (1) A pedestrian, including a runner, physically disabled person, child, skater, highway construction and maintenance worker, tow truck operator, utility worker, other worker with legitimate business in or near the road or right-of-way, or stranded motorist or passenger;
 (2) A person on horseback;
 (3) A person operating equipment other than a motor vehicle, including, but not limited to, a bicycle handcycle, horse-driven conveyance, or unprotected farm equipment; or
 (4) A person operating a motorcycle, moped, motor-driven cycle, or motor-assisted scooter.
(b) An operator of a motor vehicle passing a vulnerable road user operating on a highway or street shall:
 (1) Vacate the lane in which the vulnerable road user is located if the highway has two (2) or more marked lanes running in the same direction; or
 (2) Pass the vulnerable road user at a safe distance.
(c) For the purpose of subsection (b)(2), when road conditions allow, safe distance is at least:
 (1) Three (3) feet if the operator's vehicle is a passenger car or light truck; or
 (2) Six (6) feet if the operator's vehicle is a truck, other than a light truck, or a commercial motor vehicle as defined by V.T.C.A., Transportation Code § 522.003.

Figure 4.1: An excerpt from the safe passing ordinance.

Table 4.2 Summary of the Findings for Safe Passing Laws		
Policy Actions	**Rating Criteria**	**Evidence Supports**
1.2 Safe Passing Laws	1. Existence of safe passing law.	Strongly Supports
	2. The required safe passing distance is at least three feet	Strongly Supports
	3. The required safe passing distance applicable to large trucks and commercial vehicles is at least six feet	Strongly Supports
	4. The ordinance applies when vehicles pass cyclists as well as pedestrians	Strongly Supports

Protection from Harassment (1.3)

The above-referenced safe passing ordinance (Ordinance No. 2014-05) also includes language protecting vulnerable road users from harassment. The ordinance states that a person driving a car cannot maneuver their vehicle in a manner that "is intended to cause intimidated or harassment to vulnerable road users or threatens a vulnerable road user" (figure 4.2). While this language is relatively vague, it gives law enforcement officers the flexibility to enforce when there is a clear violation. Because if this vagueness, the evidence is identified as "somewhat supports" for the second criterion (table 4.3).

It is important to note a few aspects of the ordinance that are not outlined in the rating criteria. For instance, the ordinance also provides general safety requirements for driving near vulnerable road users, including prohibiting taking right-hand turns in front of a vulnerable road users. Additionally, the ordinance prohibits parking in a bicycle lane and establishes it as a level 3 violation, which is the same level as parking in front of a fire hydrant. While the section regarding parking in the bicycle lane does not directly support this policy action, it does provide a means to improve safe passage for cyclists.

(f) An operator of a motor vehicle may not maneuver the vehicle in a manner that:
  (1) Is intended to cause intimidation or harassment to a vulnerable road user, or
  (2) Threatens a vulnerable road user.
(g) An operator of a motor vehicle shall exercise due care to avoid colliding with any vulnerable road user on a roadway or in an intersection of roadways.
(h) It is an affirmative defense to prosecution under this section that at the time of the offense the vulnerable road user was acting in violation of the law.

SECTION 2. Section 82.159(a)(3) of the San Marcos City Code is hereby amended to read as follows (underlining indicates added text):

Level three violations 50.00

Commercial vehicle, semi-trailer, pole trailer, construction vehicle or farm equipment on street in residential area

Parked in fire zone

Parked within 15 feet of a fire hydrant

Parked in front or side yard or vacant lot

Parked in a bicycle lane

Figure 4.2: An excerpt from the harassment ordinance.

Table 4.3 Summary of the Findings for Protection from Harassment		
Policy Actions	**Rating Criteria**	**Evidence Supports**
1.3 Protection from Harassment	1.Existance of local law addressing harassment of cyclists and pedestrians.	Strongly Supports
	2. The ordinance provides clear definitions or examples for what is considered harassment.	Somewhat Supports

Smart Growth & Mixed Use Policies (2.1)

The City of San Marcos adopted its current comprehensive plan in 2013, "A River Runs

Through Us." An aspect of the public participation for this project was the design rodeo; a

multi-day public charrette in which participants were tasked with allocating where future

population growth will be directed within the City. This chip exercise utilized Legos, allowing

participants to stack blocks on top of one another representing different levels of density.

Ultimately, this exercise set the groundwork for the establishment of intensity zones within the

Comprehensive Plan.

Intensity zones are areas where the plan suggest focusing growth. The guidance

provided from the comprehensive plan helped lead to the adoption of a new development code

in 2018, Code SMTX. One goal of this code require was to accommodate future growth in well-

planned areas where people can meet their daily needs within a short walk, bike, transit trip, or

drive. This Code established "Character Districts," which are form-based zoning districts which

give flexibility to the use of the property while focusing on the form of the building and streets.

The densest character district (CD-5D) encompasses the majority of our downtown. This district

Figure 4.3: San Marcos Citizens participating in the Lego exercise, Courtesy of the City of San Marcos
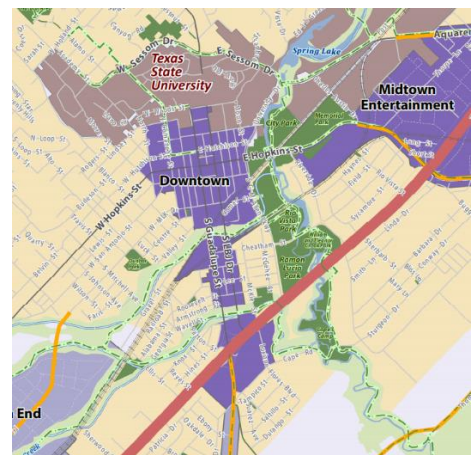

Figure 4.4: San Marcos preferred Scenario Map, Courtesy of the City of San Marcos

allows up to 5-stories by right with reduced parking requirements compared to elsewhere in town.

Residential density is incentivized by provided pre-entitled property that is ready to develop without the need for a lengthy and uncertain zoning process. However, a Conditional Use Permit is required for "purpose-built student housing." Given that the downtown intensity zone is adjacent to Texas State University, much of the housing need in the area can be attributed to the growth of the university and large numbers of students moving to San Marcos. Since the Conditional Use Permit requirement adds an additional process with no guarantee of approval, I found that the evidence "somewhat supports" rating criterion 1 from table 4.4.

USE	M - F	M - F	M - F	SAT - SUN	SAT - SUN	SAT - SUN
	8AM TO 6PM	6PM TO 12AM	12AM TO 8AM	8AM TO 6PM	6PM TO 12AM	12AM TO 8AM
RESIDENTIAL	60%	100%	100%	80%	100%	100%
OFFICE	100%	20%	5%	5%	5%	5%
RETAIL	90%	80%	5%	100%	70%	5%
LODGING	70%	100%	100%	70%	100%	100%
RESTAURANT	70%	100%	100%	70%	100%	100%
MOVIE THEATER	40%	80%	10%	80%	100%	10%
ENTERTAINMENT	40%	100%	10%	80%	100%	50%
CONFERENCE	100%	100%	5%	100%	100%	5%
CIVIC (NON-CHURCH)	100%	20%	5%	100%	60%	5%
CIVIC (CHURCH)	20%	20%	5%	100%	60%	5%

Figure 4.5: San Marcos Development Code Parking)

While Code SMTX does not require a mix of uses within a CD-5D zoning districts, it does allow for multiple uses within the same building, identified as mixed-use buildings or live/work

buildings. Additionally, Code STMX allows for flexible parking requirements when parking areas

area shared with multiple uses (figure 4.5)

Because Code SMTX merely inscentivises a mix of uses within close proximity and does

not require them in any instance, I found that the evidence somewhat supports criteria 2 from

table 4.4.

Table 4.4 Summary of the Findings for Smart Growth & Mixed Use Policies		
Policy Actions	Rating Criteria	Evidence Supports
2.1 Smart Growth & Mixed Use Policies	1. Incentivizes residential density in specific areas.	Somewhat Supports
	2. Requires or incentivizes a mix of uses in close proximity to each other.	Somewhat Supports

Design Standards & Form Based Codes (2.2)

An important clarification to make is that design standards and form-based codes are

focused at the pedestrian experience and does not necessarily improve bicycle conditions. As

mentioned in the smart growth and mixed use section of this chapter, San Marcos adopted a

new development code in 2018, Code SMTX, which includes form-based codes, such as the

Character Density "CD" zoning districts. The densest of these districts, CD-5D is described as

"intended to provide for a mixed use, pedestrian oriented development in downtown. To

promote walkability and to encourage street level retain activity, auto-oriented uses are

restricted" (San Marcos Development Code, p. 4:66). One method the code uses to promote

walkability is to make walking more comfortable and more pleasant.

One method used by the code to make walking more comfortable, is requiring a certain percentage of ground story transparency. The requirement applies to most commercial buildings and some residential buildings in certain zoning districts. The percentage of ground story transparency ranges from 30% to 70% depending on use, zoning district, and the type of building. As discussed in chapter 2, the "Eyes on the Street" concept described by Jane Jacobs encourages ground story transparency as it can encourage pedestrian comfort, as well as safety. Since this standard applies to all the downtown area and is open to multiple other zoning districts, the research shows that the evidence strongly supports the criteria 1 from table 4.5 below.

Another method the code uses to encourage a more comfortable walking experience is by establishing a "build-to zone," which is a setback range that the building must be placed in. Build-to zones are established in our downtown area with a range of 5ft – 12ft. Furthermore, if a building is being expanded upon, the expansion must meet this build-to requirement. Building placement is also affected by the code restricting parking in the front of the building. Seven of the eleven new zoning districts created with this code prohibits parking in the "first layer," i.e. anywhere between the building and the street. This helps support the "Eyes on the Street" concept mentioned above. The parking location restrictions also make the walk more interesting by bringing the activity close to the sidewalk. Since this parking location standard applies to the downtown area and most of the newly-created zoning districts, and the build-to zone is established in all downtown, the research shows that the evidence strongly supports criteria 2 from table 4.5 below.

There are multiple benefits of street trees on the pedestrian. They can; provide aesthetic value to the streetscape; protect pedestrians from car traffic; and provide shade. Street trees are required for all streets in development code is established by the type of street (figure 4.6). They are either planted when the street is constructed or when a property is developed. Maximum spacing standards are important to ensure that adequate

Figure 4.6: San Marcos Development Code Cross Sections.

shade is provided over sidewalks. Maximum spacing standards in the code range from 35 feet to 50 feet. The larger maximum standards are only allowed along larger arterial roads and corridors. Given that the maximum tree spacing is 50 feet and significantly less for most streets, the research shows that the evidence strongly supports criteria 3 listed in table 4.5 below.
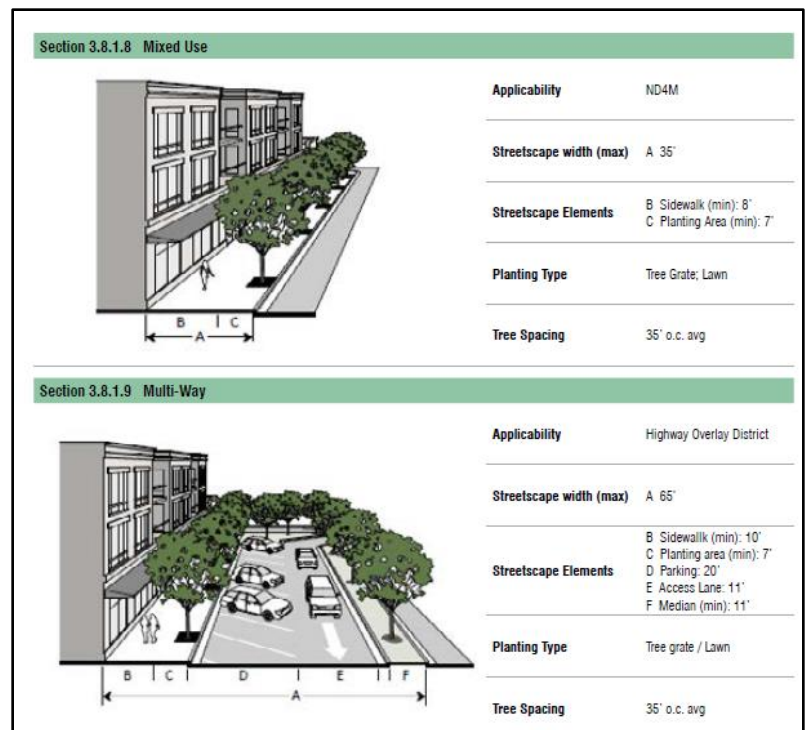
Table 4.5 Summary of the Findings for Design Standards & Form Based Codes		
Policy Actions	**Rating Criteria**	**Evidence Supports**
2.2. Design Standards & Form Based Codes	1. Requires a minimum amount of glazing on buildings.	Strongly Supports
	2. Requires that buildings be in close proximity to the street.	Strongly Supports
	3. Requires street trees at least every 50 feet.	Strongly Supports

Complete Streets (3.1)

Complete streets policies are those that require streets to be designed for a variety of modes, including cars, cyclists, and pedestrians. Following the adoption of the comprehensive plan, San Marcos adopted a complete streets ordinance November 2013.

For a complete streets ordinance to be affective, it is important that it apply to all road users. As stated in the ordinance, "the goal of the policy is to ensure that the design of public rights-of-way adequately accommodate all users, includes automobiles, bicycles, pedestrians, public transportation riders, people with various levels of mobility, freight providers, emergency responders, utility providers, and adjacent land users" (Ord. 2013-63). Given that the ordinance addresses pedestrians, cyclists, cars, and other forms of transportation, the research shows that the ordinance strongly supports criterion 1 from table 4.6 below.

Another important aspect of a complete streets ordinance is that it clearly applies to new and retrofit project. While the ordinance does not explicitly state that the policy applies to new and retrofit projects, the implementation section state that the City's Land Development Code and Transportation Master Plan shall implement these policies. Both documents regulate new and existing streets. Given that the applicability of retrofit projects is not identified in this ordinance, the research shows that the ordinance somewhat supports criterion 2 from table 4.6 below.

For an ordinance to maintain its validity, clearly-stated exemptions are important to ensure that it is reasonable and will not be replaced due to excessive requirements. According to the ordinance, the following situations are exempt from complete streets standards; streets where pedestrians and cyclists are prohibited; documented absence of need; and when

improvements would be excessively disproportionate to the need. the research shows that these exemptions in the ordinance strongly support criterion 3 from table 4.6 below.

Table 4.6 Summary of the Findings for Complete Streets		
Policy Actions	Rating Criteria	Evidence Supports
3.1 Complete Streets	1. Specifies that "all users" includes pedestrians, bicyclists, and transit passengers of all ages and abilities, as well as automobile drivers and transit-vehicle operators.	Strongly Supports
	2. Applies to new and retrofit projects.	Somewhat Supports
	3. Well-defined exemptions to requirements.	Strongly Supports

Connectivity (3.2)

Connectivity standards can set a maximum distance between intersections or maximum block perimeter and restrict dead-end streets and are meant to provide street network that is connects places together. Connectivity can either be measured using block length, block perimeter, or connectivity indexes. Code SMTX provides block perimeter standards and block length requirements based on the zoning district. Block perimeters maximums range from 2,000 in a downtown setting to 5,000 feet in an industrial setting. Dead end street maximums range from 200 feet to 500 feet. The research shows that these block perimeter and dead-end street maximums strongly support criteria 1 and 2 from table 4.7 below.

As with the complete streets ordinance, it is important for the vitality of a connectivity standard that there are well-defined exemptions to its requirements. Code SMTX allows an administrative waiver to be granted when the following are present; steep slopes, freeways, waterways, railroad lines, preexisting development, conservation areas, stream buffer,

cemeteries, or open space. However, the criteria for approval is open-ended, stating that a

waiver can be granted when the connection "does not advance the intent" of this code. While

there are clear exemptions to this requirement, the open-ended exemption of this section of

can put pressure on city administrators to approve waivers. Because of this, I have found that

this section somewhat supports criterion 3 from table 4.7 below.

One connectivity standards can improve bicycle and pedestrian networks, is by

providing more connections for cyclists and pedestrians than are provided for automobiles. This

is often achieved by providing mid-block

connections or trails and sidewalks through

dead-end cul-de-sacs. Code SMTX allows that

the block perimeter maximum can be

extended by 50% when there is a pedestrian

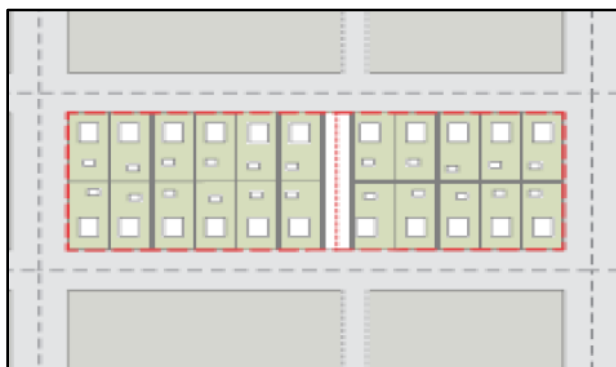passage, shared street, or alley connecting two

Figure 4.7: Pedestrian crossing illustration from the San Marcos Development Code

streets. Refer to figure 4.7 from Code SMTX which illustrates a mid-block pedestrian crossing.

the research shows that this incentive to provide additional pedestrian and bicycle connectivity

strongly supports criterion 4 from table 4.7 below.

Table 4.7 Summary of the Findings for Connectivity		
Policy Actions	**Rating Criteria**	**Evidence Supports**
3.2. Connectivity	1. Includes minimum block length or connectivity indexes.	Strongly Supports
	2. Well-defined connectivity measurement.	Strongly Supports
	3. Well-defined exemptions to connectivity requirements.	Somewhat Supports
	4. Incentives or requirements for additional connections for cyclists and pedestrians.	Strongly Supports

Direct Observation

Safe Passing Laws (1.2)

Given the difficulty of enforcing safe passing laws, public awareness is an important aspect of implementing such laws. This can be accomplished through signage, public outreach campaigns, and other means.

Street signage can be a cheap and effective way to inform the public of safe passing laws. The City of San Marcos has installed signage primarily near Texas State University and Downtown which informs motorists that cyclists may use a full lane; refer to figure 4.5. This sign directs motorists to change lanes to pass cyclists. While this sign is effective at informing motorist of a cyclist's ability to use the lane, it does not provide guidance to the safe passing ordinance as does the sign in figure 4.8.

The City of San Marcos generally follows the sign standards found from the Texas Manual on Uniform Traffic Control Devices (MUTCD). While the sign from figure 4.9 can be found in this manual, the suggested sign from figure 4.8 is not. This is likely due to the fact that Texas does not have a state-wide safe passing ordinance. Since the signage only informs motorists of a cyclist's ability to use a full lane and not what the safe passing distance is, the research shows that the evidence somewhat supports criterion 1 from table 4.8 below.

Figure 4.8: Recommended safe passing sign.

Figure 4.9: Bicycle signage. Photo taken on the 200 Block of Moore Street in San Marcos.

PSA's and other forms of public outreach can be an effective means of informing the public of a safe passing ordinance. Shortly after adopting the complete streets ordinance, the City of San Marcos filmed the "Steer Clear" PSA which outlined the rules around safe passing. While this PSA was posted to YouTube, it has a mere 140 views at the time of this report and there is no record of the video being

shared on social media platforms. Given the little outreach given to this PSA, the research shows that the evidence somewhat supports criterion 2 from table 4.8 below.

Figure 4.10: A screenshot of a Safe Passing PSA from the City of San Marcos (YouTube, 2014).

Table 4.8 Summary of the Findings for Legal Protections		
Policy Actions	**Rating Criteria**	**Evidence Supports**
1.2 Safe Passing Laws	1. Street signage informing public of safe passing law.	Somewhat Supports
	2. Other forms out outreach informing the public of safe passing law.	Somewhat Supports

Chapter Summary

This chapter provided the results of the case study of the City of San Marcos. The majority of the results were drawn from San Marcos City Code of Ordinances and the San Marcos Development Code (CodeSMTX). While most of the evidence supported or somewhat supported the criteria, some of the evidence did not support the criteria. Recommendations are included in the following chapter.

Chapter 5
Conclusion & Recommendations

Chapter Intro

This project has three primary goals. The first goal is to provide a model of best practices for bicycle and pedestrian policy. Secondly, this project uses an operationalized framework to assess the City of San Marcos's bicycle and pedestrian policies. Ultimately, using the results of the research, this project will provide recommendations on how to improve bicycle and pedestrian policy for the City of San Marcos. This chapter provides recommendations based on the results from document analysis and direct observation (table 5.1).

Table 5.1 Recommendations		
1. Legal Protection for Vulnerable Road Users		
Policy Actions	**Evidence**	**Findings / Recommendations**
1.1 Liability Protections	Does not support	**Findings:** Document analysis demonstrates that the City of San Marcos does not have liability protections for vulnerable road users.
		Recommendations: The City should consider adoption of a liability ordinance.
1.2 Safe Passing Laws	Somewhat Supports	**Findings:** Document analysis demonstrates that the City of San Marcos has an adequate safe passing ordinance. However, direct observation indicates that methods of informing the public of this law is lacking.

		Recommendations: The City of San Marcos should consider increasing awareness by providing adequate street signage and using social media as an outreach for the already created PSA.
1.3 Protection of Cyclists and Pedestrians from Harassment	Somewhat Supports	**Findings:** Document analysis demonstrates that the City of San Marcos ordinance regarding harassment of vulnerable road users lacks clear definitions of what should be considered harassment.
		Recommendations: The City of San Marcos should consider revising the ordinance regarding harassment of vulnerable road users by providing clear definitions of what is considered harassment.
1.4 Law Enforcement Countermeasures	Does not support	**Findings:** Document analysis demonstrates that the City of San Marcos does not have policy supporting for law enforcement countermeasures for the protection of cyclists and pedestrians.
		Recommendations: The City of San Marcos should consider adopting a policy regarding countermeasures.

2. Promote Supportive Development Patterns		
Policy Actions	**Evidence**	**Findings / Recommendations**
2.1 Smart Growth & Mixed Use Policies	Somewhat Supports	**Findings:** Documents analysis demonstrates that the City of San Marcos merely incentivizes and does not require a mix of uses within close proximity.
		Recommendations: The City of San Marcos should consider revising Code SMTX to require a mix of uses in certain situations.
2.2. Design Standards & Form Based Codes	Strongly Supports	**Findings:** Document analysis demonstrates that the City of San Marcos has adequate design standards and form-based codes.
		Recommendations: None
3. Network Design		
Policy Actions	**Evidence**	**Findings / Recommendations**
3.1. Complete Streets	Somewhat Supports	**Findings:** Document analysis demonstrates that the City of San Marcos has a complete streets ordinance. However, the ordinance does not explicitly state that it applies to new and retrofit projects.
		Recommendations: The City of San Marcos should consider revising the complete streets ordinance to state that it applies to new and retrofit projects.
3.2. Connectivity	Somewhat Supports	**Findings:** Document analysis demonstrates that the standards found within the connectivity standards of Code SMTX are adequate. However, the exemptions are overly broad.
		Recommendations: The City of San Marcos should consider revising Code SMTX to limit the Planning Director's ability to waive block standards by removing exemption of connections that "do not advance the intent of the code."

Future Research

This researched focuses on the policy surrounding bicycle and pedestrian comfort and safety. Chapter 3 establishes a model which can be used to rate the adequacy of bicycle and pedestrian policy. This project uses this model to review and make recommendations for the City of San Marcos. Future research can be performed by utilizing this model in other cities or jurisdictions.

This research is not meant to be a complete or conclusive study on all planning for bicycle and pedestrian planning. By researching almost exclusively the documents around these policies, this study researched very little on-the-ground conditions, nor did it research public perceptions on the topic. Future research may be performed to examine actual conditions. This could be done by analyzing crash data or information on existing and planned infrastructure in San Marcos. Future research could also include survey questions of City employees, policy-makers, and the general public.

Chapter Summary

This chapter discussed the conclusion and recommendations made by this study. The chapter first made recommendations based on the data gathered through document analysis and direct observation. The chapter then provided suggestions for future research about bicycle and pedestrian policy, and bicycle and pedestrian conditions in San Marcos.

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