

AN EVALUATION OF THE
2004 SAN MARCOS TRANSPORTATION MASTER PLAN

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by

Stephanie Bryant

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2004 SAN MARCOS TRANSPORTATION MASTER PLAN

Thesis Supervisor:

Greg Griffin, M.A.
Department of Geography

Approved:

Heather C. Galloway, Ph.D.
Dean, Honors College

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ABSTRACT

AN EVALUATION OF THE

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Stephanie Bryant

Texas State University - San Marcos

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SUPERVISING PROFESSOR: GREG GRIFFIN

The purpose of this study is to investigate the effectiveness of the San Marcos Transportation Master Plan and the progress of transit-oriented goals in this growing urban area. The guidelines of the Master Plan were analyzed to determine their effectiveness in addressing issues of transportation within the city of San Marcos and benefit to the varying population. Literature on transportation planning was used to make informative conclusions in reference to travel throughout San Marcos.

Another aim was to determine whether current travel options satisfied resident's expectations of San Marcos transit. By interviewing 5 city residents and 5 temporary student residents an overall public opinion towards

transportation throughout the city was gathered. This information aided in the evaluation of transportation planning and implementation throughout the City of San Marcos.

Professional opinion towards transportation within San Marcos was also examined in this study through 5 interviews with individuals in the areas of transportation and planning. Gathering this information assisted in determining whether the guidelines set forth by the San Marcos Transportation Master Plan were beneficial to the city's overall transit planning. This evaluation of the Transportation Master Plan for the City of San Marcos is a culmination of research pertaining to transportation planning and plan evaluation, as well as an investigation into the transit-related needs of a growing urban community.

CHAPTER I

INTRODUCTION

The Development of Transportation Planning

Transportation planning plays a key role in the dynamics of an urban area. Issues such as traffic congestion, air pollution, and travel time can be effectively addressed through an extensive transit plan. While a Transportation Master Plan is a document separate from a community's Comprehensive Plan, it is interwoven with a variety of land use decisions at the municipal level. Effective transportation planning helps facilitate a community to grow in a way that is beneficial to the quality of life for its residents.

The economic health of an area is greatly affected by its transportation planning. The transportation system provides for the mobility of people and goods, as well as influences patterns of growth and economic activity by providing access to land (Transportation Planning Capacity Building Program, Federal Highway Administration & Federal Transit Administration, 2007). Planners must adequately manage transportation decisions to ensure a community is developing in a way that best suits the needs of its citizens and businesses, as well as other local institutions, such as schools and hospitals.

Transit is closely linked to various aspects of a society, including environmental integrity, social equity, metropolitan growth, fiscal stability, and resident safety. To address the focal issues of transportation, one must use a holistic approach to achieve the most comprehensive answer. The planning process is complex in its workings as it requires development strategies for operating, managing, maintaining, and financing the area's transportation system in a way that advances the area's long-term goals (Transportation Planning Capacity Building Program et al., 2007).

The transportation planning process is highly integrative as it incorporates diverse viewpoints from different members of the community. In order to appropriately plan transit-related projects one must look to integrate necessities of many groups within a community, such as business owners, travelers, other municipalities, environmental organizations, freight operators, and the general public (Transportation Planning Capacity Building Program et al., 2007). To appropriately plan for a community's future, sufficient transportation planning must occur through comprehensive consideration and collaboration among relevant agencies, as well as incorporate significant public participation.

The goal of transportation planning is to assist governments in providing an adequate transportation system at an acceptable cost. This involves modeling the behavior of the present system, projecting future travel demand, and estimating how changes in the system will affect travel behavior and the operation of the transportation system in the future. Dividing metropolitan areas into zones allows for easier data collection. Both population data, such as the

number of housing units, residents, automobiles owned, as well as economic information, like the number of people employed in an area or type of land use, is gathered.

Transportation planning often follows a four-step process where first the trip generation is estimated by determining how many trips a place will generate regardless of where those trips are destined. For instance, people are more likely to stop in Austin than Lockhart due to factors such as location, attraction, and cultural significance. Next, the trip distribution is evaluated to distribute trips according to an area's makeup. The Gravity Model, which refers to how much pull factor a place has, is commonly used to determine what trips are going where.

The third step of this process examines where public transportation plays a role in an area's transit. If a locale only has more than one means of transportation, the modal split is approximated. It is important to consider such factors to accurately evaluate your traveling population. Lastly, a trip assignment is generated to predict how trips will be distributed from the original route to the alternate course. A local example would be the balancing of traffic between Hopkins Street and Aquarena Springs Drive. This procedure is often modeled a variety of times to evaluate various land use development and economic growth patterns to decide which would best facilitate the growing urban area.

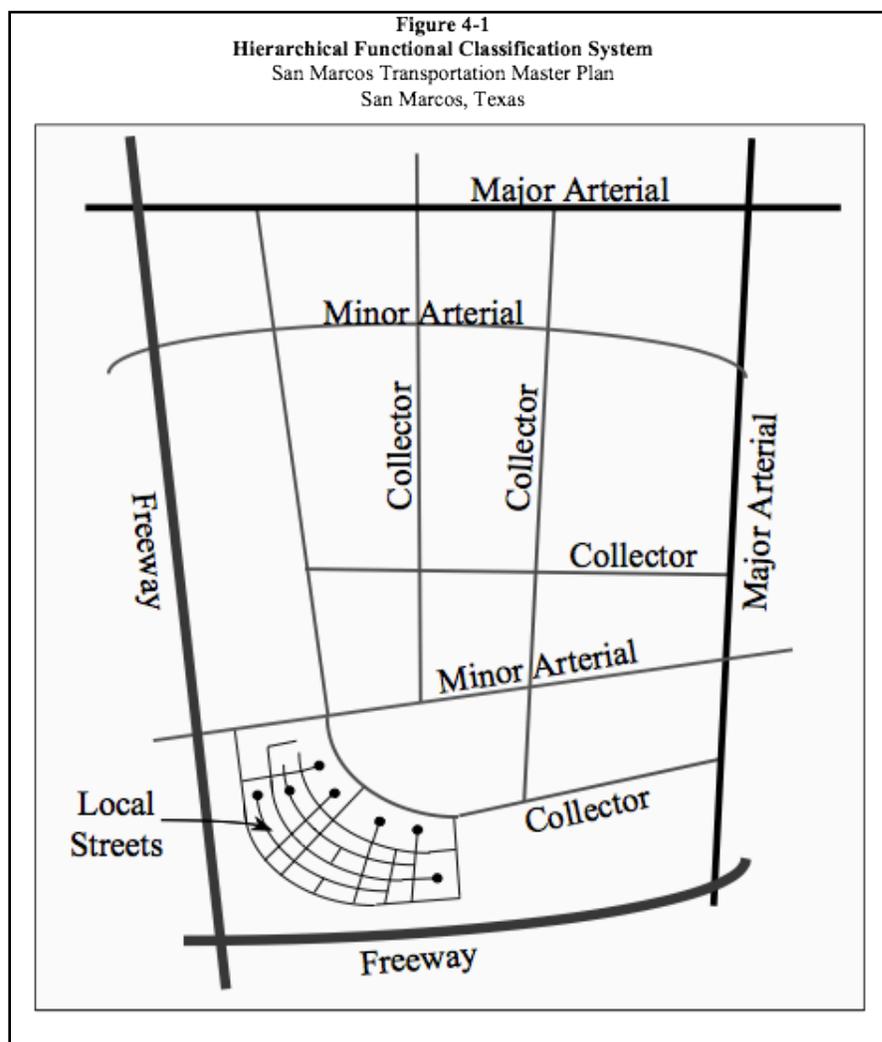
It is important to address the issue of cost when implementing any means of public transportation. With owners paying for the vehicle purchase, fuel, maintenance, insurance, parking, and other related costs, it makes private transportation largely self-financed (Levy, 2010). Along with the fiscal priorities associated with owning a vehicle, there are many more hidden costs that are levied on consumers. These include pollution of air and water; death and injury from accidents; sprawling land use; the increasing cost of public service; and, many others.

Currently, fares only pay one-third of transit expenditures, with the remaining balance paid for by non-fare revenues of transit agencies, including tolls and taxes, as well as various grants and subsidies from local, state, and federal governments (Levy, 2010). Roads and highways are mostly paid for by various taxes and charges applied to automobile users. These include, but are not limited to, registration fees, state and federal gasoline taxes, and licensing charges.

It is important to subsidize public transportation for many reasons. For instance, some people are unable to use private transportation due to factors such as age, handicaps, or financial hardships. Mass transit also improves circulation in urban areas by reducing the number of vehicles as well as preserves the environmental integrity of an area due to lower carbon emissions.

Some argue that subsidized public transportation is a means of income redistribution because providing low cost means of travel helps low-income individuals more so than high-income earners.

When considering a transportation plan, cities must not limit themselves to thinking solely about cars, trucks, buses and other automobiles. They must also examine ways of improving other forms of transit, such as bicycle routes and pedestrian walkways. Carpooling is also a consideration to take into account when assessing the best ways to travel a metropolitan area. All of these types of transportation must work in an integrative process to be successful in their execution. In addition to a variety of travel modes, a diverse mix of roadways also facilitates convenient means of transportation. Figure 4-1 serves as an example of the different street types.



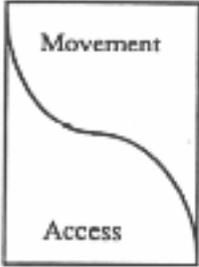
The functional classification system is a hierarchical organization of streets and highways that facilitates the safe and efficient operation of vehicles along different types of facilities and allows for a progressive transition in the flow of traffic (Wilbur Smith Associates, 2004, p. 91). An inverse relationship between access and mobility is evident in such a classification system and important to note when determining if a roadway accomplishes its intended function. Local streets are the first level of classification and provide the most access to property while also collecting and distributing traffic between individual properties and other roadways. With local streets often making up 65 to 80 percent of the total roadway system, it is important that they are designed in a way that is favorable to the community by limiting speeds and emphasizing accessibility (Wilbur Smith Associates, 2004, p. 95).

Collector streets are the next level in the categorizing of roadways. By providing for a balance of traffic movement and property access, collectors often internalize movement to local areas by connecting local streets to the greater travel network. Collectors are most often used for short distance trips between other street classifications, adequate spacing between them is necessary, and operating speeds should not exceed 35 mph (Wilbur Smith Associates, 2004, p. 94). Arterial roadways follow collectors and are classified as either major or minor depending on different factors.

Minor arterials serve less concentrated traffic generators than major arterials while providing a higher degree of local access (Wilbur Smith Associates, 2004, p. 93). With travel speeds ranging from 30 to 45 mph, minor arterials are able to effectively distribute medium traffic volumes for short distance trips. Major arterials provide a high degree of mobility, serve relatively high traffic volumes, have high operational speeds, and serve a significant portion of through travel or long-distance trips (Wilbur Smith Associates, 2004, p. 91). Varying from multilane roadways in urban areas, to two-lane thoroughfares in developing rural zones, major arterials serve high volume travel corridors that connect major traffic generators, as well as lower volume roadways that are continuous over long distances (Wilbur Smith Associates, 2004, p. 91). The primary goal of arterial roadways is to prioritize traffic movement while also providing accessibility throughout the area.

The final category in the functional classification system is freeways, which provide for the rapid and efficient movement of large volumes of traffic between regions and within one region (Wilbur Smith Associates, 2004, p. 91). Multiple lanes of traffic, speeds ranging from 45 mph and above, as well as a level of control regarding accessibility are all characteristics of freeways. The various functional levels of a roadway create a spectrum of travel that varies in its emphasis of accessibility or mobility. The successful integration of these classifications allows for effective travel that is organized based on the needs of the area. Figure 4-2 of the Transportation Master Plan shows the varying functions of the different classifications.

Figure 4-2
 Functional Classification System Hierarchy
 San Marcos Transportation Master Plan
 San Marcos, Texas

FUNCTION	FUNCTIONAL CLASS	DESIGN CLASS
	Arterial	Freeway Major Arterial Minor Arterial
	Collector	Major Collector Minor Collector
	Local	Local

Source: American Association of State Highway and Transportation Officials (AASHTO)

Effective transportation planning allows an area to grow in a way that is beneficial to the needs of its citizens. Evaluating a municipalities transportation services provides an accurate perspective of the community’s commitment to its future development. The Objectives of Effective Transportation Planning Table outlines the many goals and intentions associated with successful travel options. Transportation planning is used to satisfy an array of needs and desires related to the favorable growth of a community. The following table shows the objectives of successful transportation planning:

Objectives of Effective Transportation Planning

Maximizing mobility while minimizing the negative impacts of street widening and construction on neighborhood areas and the overall community by recognizing where future improvements may be needed and incorporating thoroughfare needs

Preservation of adequate rights-of-way for future long-range transportation improvements

Making efficient use of available resources by designating and recognizing the major streets that will likely require improvements

Minimizing the amount of land required for street and highway purposes

Identifying the functional role that each street should be designed to serve in order to promote and maintain the stability of traffic and land use patterns

Informing citizens of the streets that are intended to be developed as arterial and collector streets, so that private land use decisions can anticipate which streets will become major traffic facilities in the future

Providing information on thoroughfare improvement needs, which can be used to determine priorities and schedules in the City's Capital Improvement Program (CIP)

Providing an implementation program to prioritize improvements and identify funding sources

Despite transportation planning's relatively recent place in the scheme of urban and regional planning, there have been great strides in the evolution of travel-related concepts. Transportation planning has become a vital part of a city's fate as urban areas are increasingly faced with issues of mobility in the constantly developing design of metropolitan areas. Travel demands are influential factors in the way a city progresses and present opportunities for municipalities to guide the methods of growth. The expansion of transportation related planning and evaluation allows for progressive means of advancing a community's means of accessibility as well as its ability to adapt to future improvements.

Overview of the San Marcos Transportation Master Plan

The 2004 San Marcos Transportation Master Plan consists of the adopted strategies to guide transportation system improvement projects. The primary objectives of the Transportation Master Plan are to ensure the preservation of adequate right-of-way (ROW) on appropriate alignments and of sufficient width to allow the orderly and efficient expansion, as well as the improvement of the transportation system to serve existing and future transportation needs (Wilbur Smith Associates, 2004, p. 28). The evaluation of current transportation conditions and structures was of great significance in determining the current accessibility and mobility to effectively assess the plan and make the appropriate recommendations. With the focus of the plan being the planned and existing extensions of major highways, the plan outlines a classification system to

represent a the general location, alignment, and functional relationship for different roadways, such as freeways, expressways, arterial streets, collectors and local streets (Wilbur Smith Associates, 2004, p. 29). While the emphasis of the plan may be construction projects for various roadways, other aspects of transportation throughout the city are also explored in great detail.

The Transportation Master Plan focuses on the considerable population growth that occurred in San Marcos between 1990 and 2000 that was met with an increase in commercial and residential developments in the community. The city has continued to grow at an exponential rate following the completion of the 2004 San Marcos Transportation Master Plan. The purpose of the plan was to recommend roadway improvements to accommodate increased traffic demands as the population continues to grow through the year 2025 (Wilbur Smith Associates, 2004). This is done through an implementation program that is broken up into short-term, intermediate-term and long-range elements. The comprehensive nature of the plan accounts for needed improvements as well as their affects on traffic and mobility; environmental resources and land use, and engineering costs to be used by all involved agencies to prioritize future transportation-related projects (Wilbur Smith Associates, 2004). Potential sources of funding were also accounted for in determining the imminence of a project

The goal of the Transportation Master Plan is to reflect the vision statement for the community developed by the San Marcos Comprehensive Plan's Citizen Advisory Committee which envisions the city as a community that offers a

range of transportation options while maintaining a safe and efficient street system (Wilbur Smith Associates, 2004). The plan outlines nine objectives to fulfill the expectations of the prospective goal. Public involvement was crucial in the completion of the Transportation Master Plan, with over 20 public meetings being held to gather input from key stakeholders and the development of a project website to provide up-to-date information to the public (Wilbur Smith Associates, 2004). The goals of the 2004 San Marcos Transportation Maser Plan can be found in the following table.

San Marcos Transportation Master Plan Objectives
Develop a wide range of transportation alternatives that provide improved mobility and safety in the San Marcos community while preserving existing neighborhoods and parks and the environment in general;
Increase accessibility to both bicyclists and pedestrians by integrating non-vehicular facilities with other transportation improvements;
Identify multi-modal options for the San Marcos community;
Improve the downtown area’s transportation system to reduce congestion and delays while promoting pedestrian mobility;
Strive to balance mobility, quality of life and economic development while enhancing the efficiency of the existing transportation system;
Develop a priority system and funding recommendations to implement improvements (short-term, intermediate-term, long-term and long range);
Develop a Transportation Master Plan that coordinates proposed transportation improvements with future land use planning to promote economic vitality and neighborhood livability;
Develop and implement a Transportation Master Plan that engages and coordinates with all members and ages of the community including Texas State, Hays County, public officials, major traffic generators, and other various stakeholders during the plan development; and,
Promote landscaping and aesthetic design to enhance the visual character of right-of-way within the San Marcos community.

An evaluation of the existing transportation conditions aids in the identification of existing structures that are most highly travelled. The functional classification of said routes catalogs the gradation and supports the interaction between various types of roadways. Examining public transit and alternative means of transportation allows for a comprehensive outlook on the means of travel throughout the city. By observing the location of existing traffic signals and operations, as well as identifying potential generators of specific traffic conditions, the plan is able to provide extensive transportation recommendations for the City of San Marcos to consider.

In order to effectively evaluate existing travel conditions and successfully forecast future travel demand, the plan must use a transportation model that is sensitive to the many quantitative and qualitative parameters influencing the generation and distribution of trips (Wilbur Smith Associates, 2004, p. 75). A travel demand model is a useful tool in the transportation planning process. The regional transportation model, maintained by the Capital Area Metropolitan Planning Organization (CAMPO), was used as the basis for the San Marcos TMP model (Wilbur Smith Associates, 2004, p. 76). Utilizing an existing model provides a functional guide while also allowing for flexibility to alter means of collecting information.

The data used in the model aids in the accuracy of trip predictions and infrastructure assignments. By using the existing CAMPO zone structure, a more localized model was created by further subdividing zones to better represent the focus area, allowing the San Marcos model to work with the data contained in the

regional model, and resulting in a more accurate depiction of trips on both the local and regional realms (Wilbur Smith Associates, 2004, p. 76). The travel demand model used in the development of the San Marcos Transportation Master Plan used refined demographic assumptions to indicate development and growth patterns throughout the city.

Travel demand modeling requires the collection of data to process various factors in the travel process. Inputs, such as regional, socioeconomic, and demographic data; roadway and land use characteristics; person and vehicle trip data; travel time; and other impedance factors are all utilized in travel demand modeling (Wilbur Smith Associates, 2004, p. 76). The collection of demographic data and alteration of the Traffic Analysis Zone structure was the first step in the analysis of travel attributes throughout the city. Next, by refining the CAMPO transportation network to provide more focus on study area, the travel model provided stronger focus for analyzing transportation conditions throughout San Marcos (Wilbur Smith Associates, 2004, p. 78). This reproduction of travel demand contained an updated transportation network, accurate socioeconomic data, and projected demographics for future analysis. It was determined that the model acceptably replicated current conditions and was validated to continue with forecasting future travel patterns (Wilbur Smith Associates, 2004, p. 78).

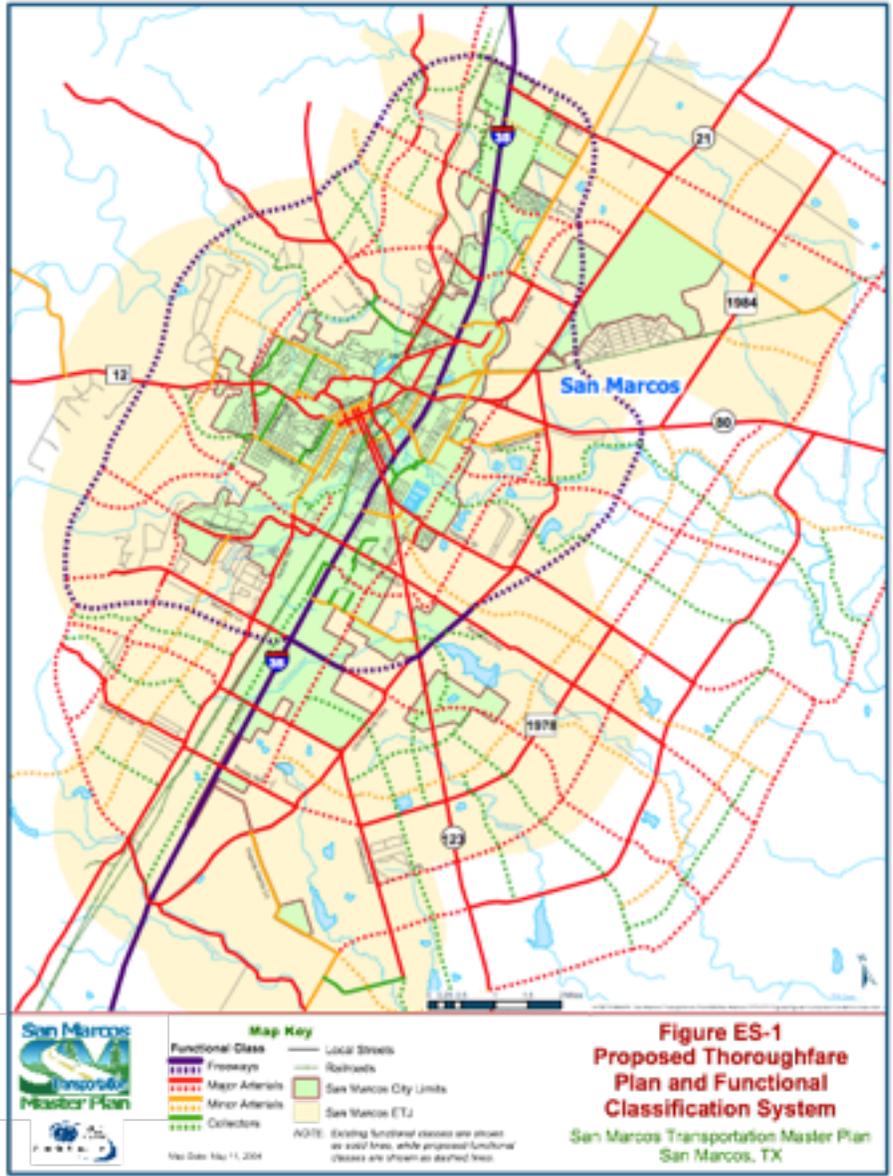
The San Marcos Transportation Master Plan examines a variety of factors to accurately analyze travel throughout the city. Traffic analysis zones, which define geographic areas and are used to relate travel demand to socioeconomic characteristics, were used to determine zone-to-zone travel times and a

simulation of the transportation network (Wilbur Smith Associates, 2004, p. 80). By evaluating the number of intersections, referred to as 'nodes', and examining the characteristics of street sections, referred to as 'links', traffic capacities could be determined. In addition to the determination of traffic analysis zones, existing planning data was evaluated to forecast changes in land use that would create new travel demand or modify existing patterns (Wilbur Smith Associates, 2004, p. 80).

Trip generation models were used to estimate the number of trips that begin or end in a zone without identifying where the other ends of these trips are located, which is the function of the trip distribution model (Wilbur Smith Associates, 2004, p. 80). Trip distribution models are then used to distribute the generated trips among attractions in other zones. Finally, the traffic assignment model shows what route is being taken to get from the origin zone to the destination zone and separates travel into three types: external-external; internal-external; and external-internal (Wilbur Smith Associates, 2004, p. 80). After developing and validating the base models, they were applied to existing transportation and planning data. It was determined that the San Marcos models could be used to reliably forecast travel patterns.

The San Marcos Transportation Master Plan uses a proposed functional classification system similar to the most common categorization of roadways. Using a variety of resources, key recommendations were made to change the existing Functional Classification System to include a consolidation of several

categories to simplify the public's understanding of the system (TMP 96). Changes seen in the proposed functional classification system include the



consolidation of parkways and freeways, as well as with all types of major or minor arterials. This allows for a more simplified representation of the various types of roadways throughout San Marcos. Figure 4-3 of the 2004

Transportation Master Plan shows proposed thoroughfares and future classification system.

To effectively plan for future travel demands impacts, an understanding of the study area characteristics and potential growth was necessary. Transit services, utilization of the transportation system, community acceptance, land use planning, and community objectives were all considered in the development of transportation plan alternatives (Wilbur Smith Associates, 2004, p. 98). Estimating daily roadway capacities, evaluating the level of service provided by a facility, and examining roadway characteristics all contribute to the establishment of traffic capacity criteria for the plan. Future traffic on existing and committed networks, projected traffic volumes, and potential deficiencies are all examined to help make recommendations for future transit development. Three test networks were generated to evaluate alternatives that would improve traffic operations throughout the city.

The San Marcos Transportation Master Plan addresses a variety of improvements that could be made to enhance the safety and attraction of bicycle and pedestrian transportation throughout the city. An emphasis on improving these facilities is apparent in the plan as vast community involvement was utilized to generate goals for the city's bicycle and pedestrian efforts. The goals for improved bicycle and pedestrian use include promoting bicycle and pedestrian travel by the Texas State University community, development of a Master Plan for pedestrian facilities, and improving bicycle safety and mobility in

San Marcos. Each goal was expanded upon to include various objectives that would enhance the pedestrian and bicycle infrastructure throughout the city.

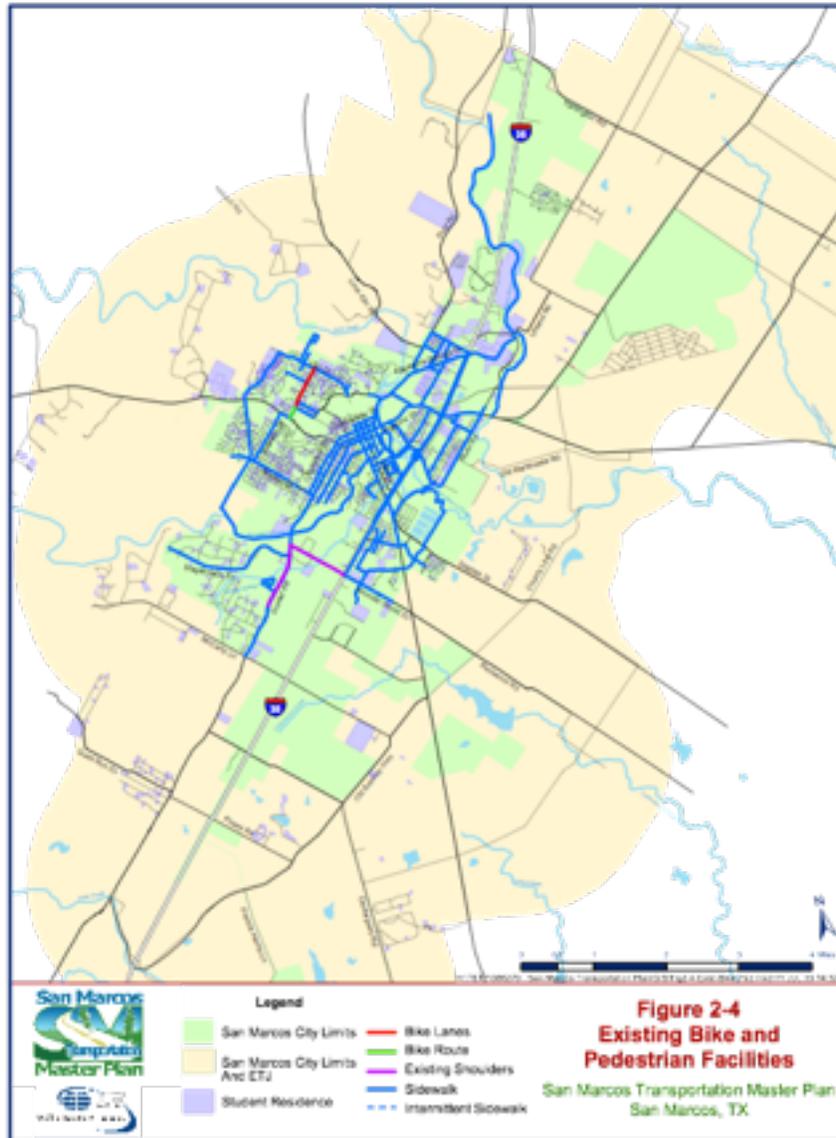
The goals of pedestrian and bicycle development call for advanced planning, the design of safe facilities, as well as adequate funding and implementation to be successful. System development criteria were established to assist in determining the proper type and location of bicycle and pedestrian facilities and include the following three categories: increase accessibility; promote the safe use of bicycles; and encourage the use of bicycle and pedestrian modes of transportation (Wilbur Smith Associates, 2004). The importance of each factor varies based on situational attributes that are appurtenant to an area.

The San Marcos Transportation Master Plan identifies origins and destinations that are significant to the bicycle and pedestrian community. Texas State University; Downtown San Marcos; the library, recreation center and city hall; City Park south of Hopkins along the San Marcos River; retail and restaurants along Aquarena Springs, Hopkins and Thorpe; the university athletic complex; safe routes to schools; and recreational bicycling corridors were all identified as attractions significant to bicycle and pedestrian activity.

Recognizing areas with potential increased interest in bicycling and pedestrian travel aided in the proposal of future infrastructure. The existing and proposed pedestrian and bicycle facilities were reported in the plan and outline the scope of such infrastructure throughout the city.

At the time the Transportation Master Plan was drafted, there was only one existing bike lane, two roadway shoulders designated for use by bicyclists,

and a wide sidewalk delegated as a shared use facility. While sidewalks were required to be built with any new development, older areas of the city are only



scattered with only some sidewalks or none at all. The lack of existing facilities creates a network that is incomplete with barriers preventing bicycle and/or pedestrian activity in some areas. Filling gaps, making connections between facilities, and crossing barriers are all necessary to form a functional network of facilities (Wilbur Smith Associates, 2004, p. 116). Figure 2-4 of the 2004

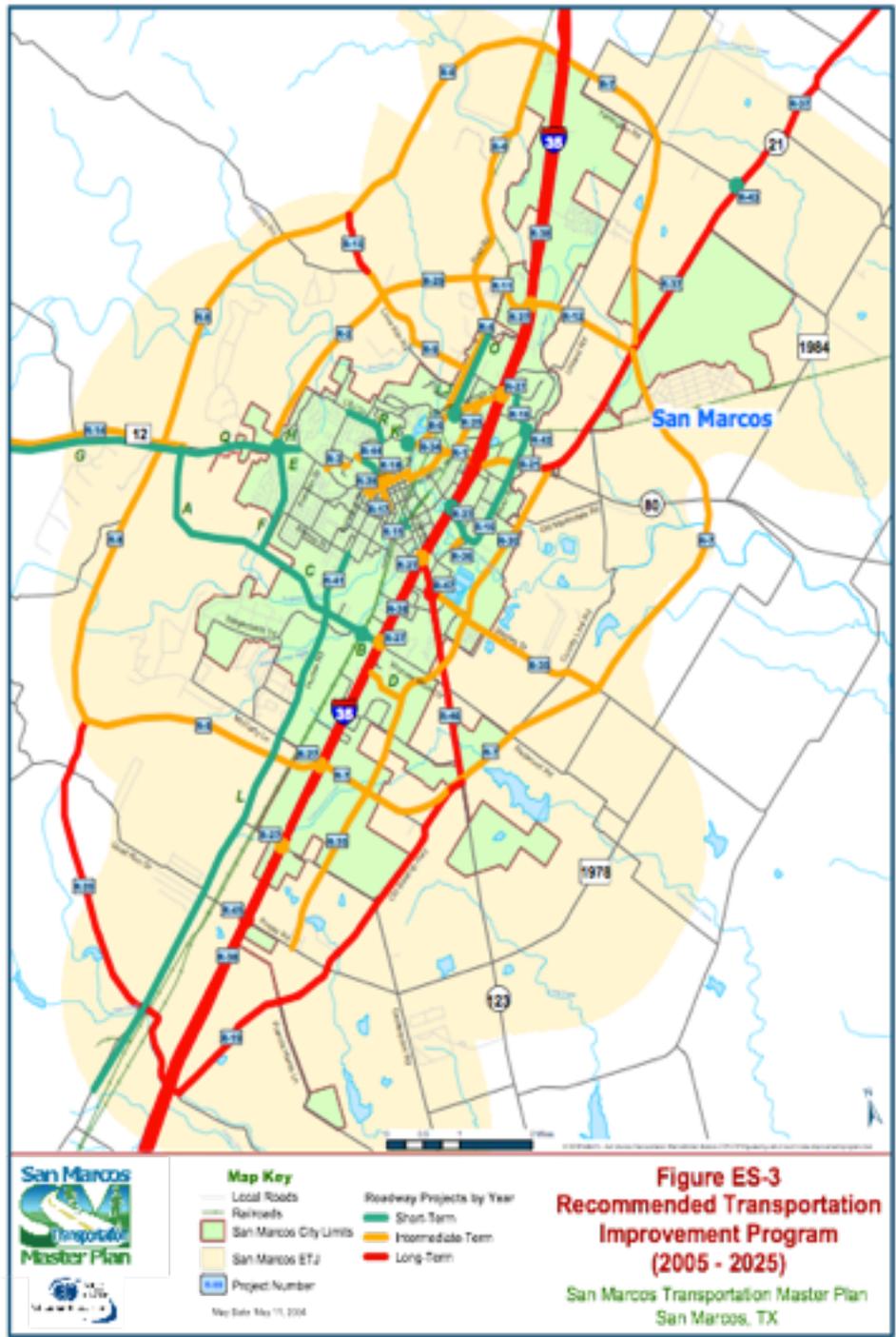
Transportation Master Plan shows the existing bike and pedestrian facilities throughout the city.

Target corridors are identified in the plan as areas suitable for development of pedestrian and bicycle facilities. The five natural and man-made corridors available in San Marcos to provide bicycle and pedestrian mobility are as follows: San Marcos River Corridor; Aquarena Springs Drive (Loop 82) and Post Road; Hopkins Road Corridor; Guadalupe/LBJ/CM Allen; and Greenspace Corridors. These areas allow for optimal growth of bicycle and pedestrian infrastructure due to a variety of factors, such as their demographic make-up, land use, and geographic features. While identifying these corridors aids in the planning of future provisions, mobility constraints were also identified. The San Marcos River, IH 35, railroads, and major arterial roadways were all determined to be barriers that limit a traveler's ability to travel throughout the city by way of bicycle or pedestrian facilities (Wilbur Smith Associates, 2004, p. 118).

A network of proposed bikeways and pedestrian facilities is provided in the plan. Bicycle facilities were designated as either multipurpose paths or on-roadway bicycle facilities. Multipurpose paths provide for travel separated from the roadway that can be used by cyclists or pedestrians (Wilbur Smith Associates, 2004, p. 120). Opportunities for trail development were identified in the plan as being along the San Marcos River; along Purgatory Creek from City Park to a proposed regional park west of the Wonder World Drive extension; along the Blanco River from Five Mile Dam to a new park near the intersection of River Road and US 80; and along Aquarena Springs in coordination with pending

development of the railroad overpass. Along with these major corridors, connector trails are also proposed to access various other destinations.

On-road facilities follow pathways that have been established to accommodate existing travel demand and should utilize the greatest extent of existing roadways to serve large numbers of users economically (Wilbur Smith Associates, 2004, p. 121). There are a variety of approaches outlined in the plan to improve bicycle facilities, such as wide curb lanes, designated bike lanes, and share-o lanes. The development of on-road facilities relies on various factors, such as the functional classification, to be successfully designed. Projects are recommended based on the time to complete and are indicated as Short, Intermediate or Long Term. Figure ES-3 of the 2004 Transportation Master Plan shows the recommended transportation improvement program in terms of the roadway project time frame.



The pedestrian facilities of San Marcos are discussed as lacking due to little regard in the past, but are now mandated by ordinance to be constructed in conjunction with all future development (Wilbur Smith Associates, 2004, p. 122).

Areas of the city where individuals are more inclined to walk to various destinations are outlined as Pedestrian Districts. The predisposition for walking is based on geographic, socioeconomic, and development conditions with criteria involving the presence of a public school within a residential area, existing transit stations, lower income demographics, and land use that accommodates walking (Wilbur Smith Associates, 2004, p. 122).

Pedestrian Districts serve as target areas for funding of pedestrian facilities and typically include an area within 0.5 mile of locales with desirable attributes (Wilbur Smith Associates, 2004, p. 122). Similarly to bicycle recommendations, projects are recommended based on time necessary to complete them, and are indicated as either Short, Intermediate or Long Term. The focuses of pedestrian improvements aim to satisfy connectivity, function and convenience by constructing or improving sidewalks, trails and other infrastructure (Wilbur Smith Associates, 2004, p. 122). The development of a bicycle and pedestrian network is noted as important to alternative transportation options throughout the city.

The Transportation Master Plan suggests the development for bicycle and pedestrian networks be implemented in stages due to fiscal and physical constraints, among other things (Wilbur Smith Associates, 2004, p. 124). The categorized approach towards development serves as a guide to future improvement projects. The National Bicycling and Walking study, developed by the Federal Highway Administration, has a recommended action plan for state and local governments to use in the process of creating bicycle and walking

compatible environments (Wilbur Smith Associates, 2004, p. 125). This basic framework was suggested and expanded upon to discuss the organization, construction, promotion, education and enforcement of a bicycle and pedestrian program in San Marcos.

According to the plan, “The City of San Marcos has formally established the Bicycle and Pedestrian Advisory Committee and designated participating agencies and groups to be on the committee” to include public input in the planning of future facilities (Wilbur Smith Associates, 2004, p. 125). It was suggested that this committee be formally established as a standing advisory committee by ordinance and that it meet regularly to oversee implementation and refinement of the plan (Wilbur Smith Associates, 2004, p. 125). The plan recommends that the Capital Area Regional Transportation Study and City staff be responsible for planning and implementing projects that have an impact on walking and biking in the community (Wilbur Smith Associates, 2004, p. 125). A number of responsibilities are to be assigned to one or more individuals, as outlined in the Bicycle/Pedestrian Program Responsibilities Table, as the plan outlines the importance of educating professionals and interagency cooperation to successfully carry out a program to improve bicycle and pedestrian services (Wilbur Smith Associates, 2004).

Growing the network of supportive professionals within government organizations and coordinating between transportation offices and public agencies are highly suggested by the Transportation Master Plan. These practices aid in the development of a program that satisfies the needs of bicyclists and

pedestrians both during the projects development, as well as when project improvements and maintenance are necessary ((Wilbur Smith Associates, 2004, p. 126). The incorporation of a variety of proficient individuals, public stakeholders and government officials is a key factor in successfully establishing alternative transportation options for those traveling throughout the City.

The coordinating and construction of needed facilities is a crucial element to the long-range transportation planning for San Marcos. It is suggested that the Bicycle and Pedestrian Plan be used as a guiding tool in the development of services as well as be referenced and assessed for future necessary facilities (Wilbur Smith Associates, 2004, p. 126). Additionally, the plan sites that projects may be developed in conjunction with roadwork and other transportation upgrades (Wilbur Smith Associates, 2004, p. 126). The coordination of alternative transportation projects will depend on various factors, such as funding, importance, and geography. Other supporting bicycle facilities and programs range from suggestions for improved bicycle infrastructure, to corresponding land use patterns with zoning for improved integrative transportation services.

Bicycle parking is outlined in the plan as a significant facility that should be encouraged throughout the city and potentially by ordinance at private facilities that serve as potential bicyclist destinations, such as shopping centers, Downtown, and other densely populated areas (Wilbur Smith Associates, 2004, p. 127). The plan also discusses the importance of connecting bicycle trips with transit, allowing for expansion of the service area as well as increasing commuter

cycling (Wilbur Smith Associates, 2004, p. 127). It was recommended that CARTS and the Bobcat Tram work to upgrade their services by providing cyclists with the necessary facilities.

Programs to educate riders and motorists are important in teaching bicyclists about the services as well as informing drivers of the appropriate ways to interact with cyclists, as well as pedestrians (Wilbur Smith Associates, 2004, p. 127). Promoting safe ridership is important in the success of bicycle programs and encourages a healthy community that encourages rider safety. Local land use patterns are fundamental to the number of trips that can easily be taken by walking or biking, whereas sprawling land use patterns generate lengthy trips and increase dependency on motorized transportation (Wilbur Smith Associates, 2004, p. 127). The coordination of transportation services and land development can have a range of favorable effects on a growing community. The plan encourages clustered patterns of development and mixed land use to enable walking or biking as well as allow for self-sufficient neighborhoods (Wilbur Smith Associates, 2004, p. 127).

Additionally, it is recommended that city planning officials review land use plans, zoning ordinances, and travel needs to determine the best approach towards an environment that encourages bicycle and pedestrian transit. Successful street layouts encourage safe bicycling and walking, as well as accommodate those using various means of transportation services (128). Urban development and design can play a critical role in the success of bicycle and

pedestrian initiatives in growing cities. Supporting facilities and programs are essential to the growth of bicycle and pedestrian travel.

The implementation of the various projects recommended is to help expand the bicycle and pedestrian network stem from diverse situations and needs. The necessity of projects varies from satisfying safety or connectivity demands, acting as opportunities for joint development, needing improvements and/or forecasting long range projects (Wilbur Smith Associates, 2004, p. 128). Prioritizing these projects and identifying potential funding is important in determining an appropriate timeframe for implementation.

As funding must be sought and budgeted for on an annual basis, the plan recommends the following criteria be considered to aid in determining the priority of various projects: connectivity of demand; public support and commitment; cost effectiveness; funding commitments; right-of-way; network development; cross barriers; and accident reduction (Wilbur Smith Associates, 2004, p. 128). The City can use these criteria to identify which project factors warrant the most immediate funding. In addition to determining project importance, the plan also recommends collaboration between the City of San Marcos, CAMPO, and TxDOT to discuss funding opportunities and achieve the implementation of planned bicycle and pedestrian facilities (Wilbur Smith Associates, 2004, p. 129). Various funding options are outlined in the Transportation Master Plan, such as seeking funds from programs, agencies, fundraising events, developer dedications and many other options.

Construction and improvement of facilities are vital aspects of planning for bicyclists and pedestrians as usable amenities must be in place in order for these to be viable transportation options (Wilbur Smith Associates, 2004, p. 129). The plan calls for the initial phase of facility development to include lower cost measures, ranging from bike route signage, sidewalk repairs, bike lane striping, removal of sidewalk obstructions, and intersection treatments (Wilbur Smith Associates, 2004, p. 129). Many low-cost developments are necessary to retain current cyclists and pedestrians, as well as encourage new ones. Funds should also be matched to seek higher cost development, such as hike and bike trails, extensive sidewalk construction/reconstruction, and street modifications, among others (Wilbur Smith Associates, 2004, p. 132). The larger projects will aid in generating an increased rider and walker populations throughout the City.

Bicycle parking was addressed as a major concern and various proposals were made to support this type of infrastructure development. The plan identifies the importance of the city's role in the development of bike facilities, but also notes that greater success would be met if these initiatives were also supported by the university and private business owners (Wilbur Smith Associates, 2004, p. 132). Having the necessary infrastructure to support cyclists and pedestrians is important in encouraging a healthy and active community.

Promoting biking, walking, and the incorporation of transit in these activities are necessary for the success of such programs. Providing the appropriate services is important for cyclists who also make use of public transit to travel throughout the area. "A coordinated approach of public information and

awareness programs to promote bicycling and walking yields the best results” (Wilbur Smith Associates, 2004, p. 132). The plan suggests various ways to encourage bicycling and walking, such as bike or walk-to-work days, advertisement in local publications and news services; employer incentives; involvement of community organizations; and the publication of maps or other informational literature (Wilbur Smith Associates, 2004, p. 132). Education and advocacy of bike and pedestrian programs and facilities allows for the successful development of such services throughout a city.

The enforcement of laws and regulations is important to maintain the safety of bicyclists, pedestrians and motorists. There are different levels of administration about the rules and regulations expected of those traveling within a community. While states can take steps to encourage bicycle and pedestrian enforcement at the local level, they can also examine vehicle codes that may have different effects on bicycling and walking (Wilbur Smith Associates, 2004, p. 132). Enforcement and regulation of bicyclist and pedestrian related actions occurs mostly at the local level as areas with higher likelihood of infractions can be identified much more easily by a community than be the state. The proper education of law enforcement is necessary to encourage safe riding and walking practices that are enforced in a consistent manner (Wilbur Smith Associates, 2004, p. 133).

Policy statements were proposed in the Transportation Master Plan that identifies the formal establishment of a bicycle and pedestrian program for the City (Wilbur Smith Associates, 2004, p. 134). Sidewalks are a fundamental part

of a city's transportation network, with pedestrian facilities serving as symbol of the community's prioritization of public health and vitality. As stated in the Transportation Master Plan, "The quality and continuity of sidewalks play a significant role in encouraging pedestrian activity" and these services have been disregarded in past years as a means of cutting development costs (Wilbur Smith Associates, 2004, p. 134). The policy statement for sidewalks serves as guiding testimony towards pedestrian facilities in the city.

The pedestrian policy statement of the Transportation Master Plan emphasizes sidewalks as the most basic transportation facility and suggests their presence along the majority of urban streets (Wilbur Smith Associates, 2004, p. 134). Needed Action Items are outlined in the plan to direct the improvement process. These suggestions include inventorying existing sidewalks, developing an annual budget program, updating sidewalk design standards, ensuring the safety and maintenance of pedestrian facilities, and mandating the continuity of sidewalks among new city development (Wilbur Smith Associates, 2004, p. 135). These objectives will assist in improving the walkability of San Marcos as city officials look to make upgrades.

The second policy statement addresses bicycle facilities as a means of promoting a community that supports the use of pedestrian and bike services. The Transportation Master Plan bicycle policy statement describes this means of travel as a low-cost and nonpolluting mode of personal transportation that should be encouraged as an adequate mode for various trip purposes (Wilbur Smith Associates, 2004, p. 136). The Needed Action Items for this contention are

to recognize and accommodate bicycles as vehicles on the roadway; facilitate hike and bike trails to serve both functional and recreational purposes; the development of bicycle storage for increased bike trips; the implementation of a bicycle safety education program that is closely coordinated with a follow-up enforcement program; and the initiation of bicycle encouragement programs (Wilbur Smith Associates, 2004, p. 136). These ambitions will help lead the development of more bicycle facilities throughout San Marcos.

The Transportation Master Plan looks at roadway transit and the element of rail in the city and evaluates recommended projects. Traffic, environmental, socioeconomic, and engineering conditions were all criteria that were applied the list of considered alternatives that were developed during the public participation process (Wilbur Smith Associates, 2004, p. 137). These criteria are discussed and expanded upon in association with the Transportation Master Plan. The social and economic interests of all geographic and population sectors of the community were reflected in the final planning document as input from San Marcos citizens was solicited extensively through various meetings and a skilled technical staff (Wilbur Smith Associates, 2004, p. 137). It is anticipated that the plan will affect the area, as various aspects of transportation throughout the city will be enhanced. Pedestrian and bicycle facilities are recommended to foster such activities as a means of travel to and from major destinations, improvement to air and water quality, and to increase mobility (Wilbur Smith Associates, 2004, p. 138).

Opportunities for increased public transit, as well as collaboration between CARTS and the University bus system would improve vehicle flow and coordinate transportation with land use (Wilbur Smith Associates, 2004, p. 138). The importance of protecting natural resources of San Marcos is expressed in the environmental criteria. “The TMP ensures the protection of existing neighborhoods, parks and the overall environment while developing transportation alternatives that will provide improved mobility and safety” while increasing accessibility to alternative means of transit by “integrating non-vehicular facilities with multi-modal transportation improvements throughout the community” (Wilbur Smith Associates, 2004, p. 138). The degree of impact on the land varies with the proposed projects, as some are limited to alterations of the built environment, while others have more planned development of the natural environment in rural landscapes. It is apparent that environmental integrity was of great significance in the drafting of the plan.

To address the issue of traffic, it was “recommended that traditional traffic operational practices and Transportation System Management techniques be employed at critical locations to alleviate deficiencies that may continue with improvements to the plan” (Wilbur Smith Associates, 2004, p. 140). In order to facilitate the most efficient means of operation, various intersections were examined to determine whether Transportation System Management (TSM) improvements were necessary. These upgrades are often cost effective and make better use of the existing system, with some examples being coordinated signal systems, lane channelization, turn restrictions, and on-street parking

prohibitions, among others (Wilbur Smith Associates, 2004, p. 140). The plan contains a complete list of recommendations to these corridors.

Upgrades to traffic signals, specifically with improvements to timing and synchronization, were a common theme discussed at public and stakeholder meetings, and a project to evaluate these services was conducted (Wilbur Smith Associates, 2004, p. 141). Additionally, development of the transit system was also addressed as the consensus revealed a lack of knowledge and need for public education about the CARTS transit services (Wilbur Smith Associates, 2004, p. 141). Various other suggestions were made in regard to improving the transit system and can be found in the Potential Transit System Improvements Table.

The Transportation Master Plan examines the potential for commuter rail service along the I-35 corridor from Austin to San Antonio and includes a Commuter Rail Vision to explore these goals. The City hopes the San Marcos Commuter Rail Station will serve as a transportation hub of regional significance a distinctive gateway for travel throughout San Marcos and the region (Wilbur Smith Associates, 2004, p. 142). Various goals are identified and explained in detail to evaluate potential transportation development, civic components, design character, financing, ownership and government structure for the site (Wilbur Smith Associates, 2004, p. 142). The goals for this project are to develop a multimodal transportation center; integrate urban design and neighborhood connection; study the feasibility of development; and implementation and governance of the facility (Wilbur Smith Associates, 2004, p. 142). Each goal has

various guidelines to serve as a means of attaining such an integrative public-private regional transportation service.

The affects of traffic on roadway construction, projected volumes of congestion, and levels of service were all examined. The level of operation varies with the type of roadway and predicted growth patterns, with most local roadways projected to operate at acceptable conditions, while some are anticipated to not meet such standards (Wilbur Smith Associates, 2004, p. 144). Tables and figures that model proposed projects of the Transportation Master Plan are meant to improve traffic conditions in their designated areas while addressing projected daily traffic volumes and levels of service.

Other recommendations for roadway, transit and rail improvements include corridor management; traffic calming; corridor preservation; access management and driveway access control. Corridor management practices range from preserving needed right-of-way in advance; minimizing development within the proposed right-or-way of a planned transportation facility; and, preserving the safety and efficiency of the existing facilities through access management. (Wilbur Smith Associates, 2004, p. 151). These techniques are a means of promoting the orderly development of a transportation network to assure that facilities will adequately serve existing and planned development. Traffic calming is another recommendation discussed in the Transportation Master Plan that involves eleven potential traffic calming policies that reduce the travel speeds of vehicles in residential areas and discourage traffic from cutting through neighborhoods (Wilbur Smith Associates, 2004, p. 151).

Corridor preservation is the first action in the corridor management process and involves techniques that serve as important tools for local, state and federal agencies to protect needed future right-of-way for proposed transportation facilities (Wilbur Smith Associates, 2004, p. 154). Having a transportation plan allows for corridor preservation to aid in identifying future transportation corridors that will need to be developed further in the future. Corridor preservation approaches include the prevention of inconsistent development; avoiding or minimizing environmental, social, and economic impacts; reduction of displacement; prevention of foreclosure of desirable location options; the permitting of orderly project development; and, the reduction of costs (Wilbur Smith Associates, 2004, p. 154). When identifying areas for potential corridor preservation it is important for the city to identify such areas to appropriately guide analysis of the area. The following criteria can be used in determining areas that serve as candidates for corridor preservation: importance of the corridor; immediacy of development; risk of foreclosing options; opportunity to prevent loss of the corridor; and, strength of local government support (Wilbur Smith Associates, 2004, p. 154).

Access management and driveway access control are also important aspects of corridor management. “Access management is defined as the protecting of the capacity of existing transportation routes and systems by controlling access rights from adjacent properties” to ensure traffic demands are adequately met (Wilbur Smith Associates, 2004, p. 155). There are various techniques that can be used in access management to ensure there are adequate

means to accommodate all types of traffic. Access management techniques are important for managing congestion and include reducing locations requiring vehicle deceleration, removal of vehicle turning movements through lands, creation of intersection spacing that facilitates signal progression, and provides adequate onsite capacity to accommodate ingress and egress traffic movements (Wilbur Smith Associates, 2004, p. 155).

Raised medians are suggested for all urban major and minor arterials with projected future volumes greater than 20,000 vehicles per day, which includes roadways such as Hopkins Street, Aquarena Springs Drive, and SH 80 East as the city looks to improve access management (Wilbur Smith Associates, 2004, p. 158). Driveway access control is the last corridor management suggestions presented in the plan and includes appropriate recommendations regarding the location, spacing, width, radius, and other design considerations for driveways on arterials, collectors, and local streets (Wilbur Smith Associates, 2004, p. 159). The aspect of roadway projects, the rail element and transit are important factors in the plan. A variety of Access Management Guidelines can be found in Table 7-4 of the 2004 Transportation Master Plan.

Table 7-4
Access Management Guidelines
 San Marcos Transportation Master Plan
 San Marcos, Texas

Strategy	Specifications	Application/Purpose
Signal Coordination and Signalized Intersection Spacing		
Signal Coordination	Traffic Signal Synchronization Programs and Actuated Signal Control	Improved progression on existing arterial streets.
Signal Spacing	Major Arterials - Consistent ½ mile Minor Arterials - Consistent ¼ to ½ mile	New signal installations and proposed arterial roadways.
Medial Access		
Median Type	Major Arterials - Raised Medians Minor Arterials - Raised Medians (future volume > 20,000 vpd) or CTWLTL (future volume < 20,000 vpd)	Develop designated major arterials with raised medians and minor arterials with appropriate median type.
Median Width	Major Arterials - Minimum 22 feet Minor Arterials - Minimum 16 feet	Median widths consistent with recommended roadway cross section standards.
Median Channelization (Left-Turn Bays)	Major Arterials - At cross streets and major mid-block median openings Minor Arterials - Primarily at cross streets	Left-turn channelization provided to remove turning vehicles from traffic stream to improve vehicle flow.
Spacing of Median Openings	Major Arterials - Minimum 600 feet Minor Arterials - Minimum 450 feet	Minimum median spacing needed to limit speed differential between vehicles and reduce accident rate.
Marginal Access		
Unsignalized Intersection Spacing	The number of unsignalized intersections should be limited to 12 to 15 per mile for Arterials (minimum of 350 feet between intersections).	Reduces speed differential between through and turning vehicles and reduces accident rate.
Right-Turn Bays	Provided at major intersections and major mid-block developments with high turning volumes (generally greater than 100 vph). Also, provided on stem of T-intersections with relatively high turning volumes.	Improved traffic operations and reduced delay at signalized and unsignalized intersections.

The last chapter of the Transportation Master Plan includes recommended plans for the City of San Marcos based on a variety of factors, such as future traffic volume forecasts, transportation network continuity, projected future development, environmental considerations, and other factors (Wilbur Smith Associates, 2004, p. 160). There were a variety of projects identified by the plan that are classified by their fiscal range-short term, intermediate term, and long term. The Transportation Master Plan calls for new major and minor arterials

and collector streets to guide development of the region's transportation system, as well as improvements such as roadway widening, new roadway facilities, transit improvements, as well as bicycle and pedestrian improvements (Wilbur Smith Associates, 2004, p. 160).

Project cost estimates were developed for the projects recommended for the Transportation Master Plan and included construction cost estimates, approximate right-of-way acquisition costs, as well as estimated professional services fees (Wilbur Smith Associates, 2004, p. 172). The recommendations do not account for inflation and only serves as a guide in comparing and prioritizing projects. The preliminary opinions of probable construction costs include paving; drainage; bicycle and pedestrian lanes; bridges and major culverts; railroad crossings; and, intersection signalization (Wilbur Smith Associates, 2004, p. 172). The means of evaluating cost are discussed in depth in the plan, addressing the typical unit costs of construction for bicycle and pedestrian facilities, as well as estimating total implementation costs.

The coordination among local and state officials is identified as an important aspect of transportation planning in San Marcos and as urban growth and traffic movement will require highway and planned agencies to have both direct and related roles (Wilbur Smith Associates, 2004, p. 175). The plan also identifies the understanding and support of the San Marcos population as being important to successful implementation (Wilbur Smith Associates, 2004, p. 175). The Transportation Master Plan is an integral document in the overall San Marcos Comprehensive plan as transportation needs often go hand-in-hand with

land use, economic growth, and various other aspects of planning. Successful implementation of the plan is an important element in improving and fulfilling the future mobility needs of the City of San Marcos and its environs (Wilbur Smith Associates, 2004, p. 175). The various recommendations for improvement can be found in Table 8-1 of the 2004 San Marcos Transportation Master Plan.

CHAPTER II

LITERATURE REVIEW

The Making of Municipal Plans

The making of plans is the keystone of the urban and regional planning profession. Plans are made for a variety of reasons, like to outline a plan of action, ensure financial investments, or propose development strategies. Despite the number of plans made overshadowing the number of plans implemented it is still worth noting that, “Plans have a special place in planners’ education and professional practice” (Balsas, 2012, p. 4). The nature of comprehensive planning includes a great deal of research, quantitative procedures, drafts, revisions, public involvement and scientific investigation before the publishing of any master plan. Plans can be made for a variety of reasons, such as to articulate a vision of action, bring stakeholders together, facilitate growth and development, secure financial resources or leverage prior strategies submitted in older plans (Balsas, 2012, p. 4-5).

Due to the ever-changing nature of the globalized world we live in, the conditions of the present day are constantly adjusting, making administrative policies concerning politics, economics and societal trends hard to predict, let alone plan for. As recognized by the American Planning Association (2006),

there are many different types of plans: urban design; economic development; neighborhood level; downtown; corridor; redevelopment; transportation; housing; economic development; community; facilities; parks and open space; hazard mitigation plans, among others (Balsas 5). While there has been skepticism about the effectiveness of plans, “There is a strong correlation between the perceived value of plans and the making of plans to help guide development of to help resolve a set of problems” (Balsas 5).

“Plan making involves a set of skills that range from critical thinking, data collection, data analysis, spatial and statistical skills, map making, drawing and illustration, writing, and public presentation skills” (Balsas 6). The assembly of a plan is a varied process that depends on what is being planned for. The evaluation of a plan makes use of many skills associated with plan making, but also requires a “higher level of critical and creative thinking as well as knowledge of evaluation methodologies” (Balsas 6). Knowledge of plan making goes hand-in-hand with the ability to evaluate plans as the individual must have an understanding of the theory behind plan making in order to analyze plans. According to Balsas, it is important for personal and professional detachment to distance oneself from facts, occurrences and events (2012, p. 6).

The Role of Evaluation in Planning

Literature on plan evaluation has increased over the years and has shifted from an approach focused on reason and logic to a more pragmatic and disciplined procedure that assesses plans from broad overlapping perspectives

(Balsas 5). The evaluation of plans has expanded with the increase of available literature on the subject. Evaluating plans is often viewed as a mechanical process involving the formulated technique to determine a plan's success or failure. Recent literature suggests intuition and feedback should be used to examine the many different efforts that went into making a plan and how lucratively the plan addressed concerns for a specific issue or area.

As discussed by Baer, "The relationship between plan concepts and evaluation methodologies can distinguish among plan as vision, plan as a blueprint, plan as a remedy, and finally plan as a process" (Balsas, 2012, p. 5). This reinforces the notion that plan evaluation can be useful in all stages of the planning process and relies on how the planner chooses to apply practical evaluation methods to the subject at hand. It is most common for plan evaluation to occur at the beginning of the plan making process as the previous document is studied and assessed to help guide the development of a new plan. In Balsas' article, he uses Baers' argument to make the point that plan evaluation has a place in many aspects of plan making.

Approaches to Plan Evaluation

The means of evaluating plans has progressed with the amount of literature that has become available as many professionals have different outlooks on the best approach to plan evaluation. As discussed by Alexander, "Planning and plan evaluation have adopted one of three distinct approaches: conformance-based, performance-based, or utilitarian [or modified-utilitarian]

evaluation“ (Balsas, 2012, p. 5). The type of planning document and context of the assessment are factors in deciding which type of evaluation method would best serve the research purposes. “Conformance-based evaluation means judging the success or failure of planning, using one or two criteria - the degree of conformance between the actual outcomes on the ground and the initial plan proposal, and the promotion of planning goals and objectives through the implementation of the instruments available” (Oliveira & Pinho, 2009, p. 37-38). By evaluating the degree of compliance with the plan one can determine the outcome regarding the application of the proposal.

According to Alexander (2006), performance-based evaluation flows from defining a plan as a decision framework. Oliveira and Pinho discuss how the plan performance approach emphasizes the usefulness in filling this role (2009, p. 38). As the name entails, this type of evaluation focuses on the measures taken on behalf of the plan. Emphasizing the use of the plan in implementing policy outlines the resolved actions. “Evaluation methods used in planning for the ex-ante assessment of plans, programmes, and projects are essentially based on utilitarian principles or a modified quasi-utilitarianism” (Oliveira & Pinho, 2009, p. 38). The modified-utilitarian approach to plan evaluation looks to gauge the functionality of a plan before a formal assessment. “Such methods can be and have been applied to ex-post evaluation of policies and programmes, but their intrinsic problems limit their usefulness” (Oliveira & Pinho, 2009, p. 38).

It is common for planners to focus on the outcomes of the plan while paying little attention to the planning process. With an outcome-oriented

emphasis being typical of the blueprint mindset of plan evaluation, Baer identifies 3 ways to evaluate plan outcomes: as components of anticipated outcomes, as elements of expected outcomes, and the effect on the outcome of unexpected circumstances (Balsas, 2012, p. 5). Another means of evaluating plans outcomes is recognized in the article as Berke et al. believes in a contrast between performance and conformance, where the latter is directly linked to how future outcomes conform to the plan and its guidelines, while the former is related to how the plan affects decision (Balsas, 2012, p. 5-6).

Further analysis regarding how these decisions affect outcomes that may resolve other plan issues is also important. This evaluation method relates compliance with a plan to its overall performance and success. It is thought that the closer a plan is followed the better it will function. As discussed by Alexander, practical evaluation criteria related to social equity dilemmas are commonly found in area plans and are based on: transparency, consistency, human dignity, equality, property, and public interest” (Balsas, 2012, p. 6). The application of experiential knowledge greatly aids the plan evaluation process.

There are a variety of different approaches and items to plan evaluation as the extensive nature of a plan makes for context spanning over a wide range of subject matter and topics. As discussed by Berke et al., evaluation can empower institutions to be more efficient by distinctively evaluating both the implementation and the outcomes of their plans at the organizational level (Balsas, 2012, 6). With the evaluation of plans providing assessment of the plan’s success, it also allows a chance for planners to reflect and improve on their

professional work. Plan evaluation is often dismissed due to limited funds or lacking understanding of its importance in the profession; however, it has been argued by Balsas, as well as others, that plan evaluation is essential in the future development of successful plans (2012, p. 6).

Evaluation enhances the planning practice and legitimizes planning before citizens, providing sustained appraisals on planning products, procedures, and results, throughout the whole planning process (Balsas, 2012, p. 36). Tracking the course and results of planning proposals helps public officials make informed decisions regarding complicated matters. The promotion of an effective planning dynamic leads to an atmosphere in which suggestions that can lead to change or review of the planning products or processes are supported by the results of evaluation exercises (Balsas, 2012, p. 36). Whether it is gaining feedback on a proposed plan or analyzing plans made for other entities, the evaluation process is extremely beneficial to those involved.

Plan evaluation allows for a continual learning process that can be applied to the planning practice. With the main challenge being the ability to convey the importance of plan evaluation to politicians and planners it is critical to promote an evaluation culture within institutional structures that undertake planning activities (Balsas, 2012, p. 36). While some municipalities and organizations may not have the resources to engage in a formal means of plan evaluation, it is still a process to be considered and studied by planning professionals.

Principles of Plan Evaluation

Plan evaluation is an important aspect of the planning process that includes various fundamentals to serve as a guide in assessment of such documents.

Oliviera and Pinho (2009) suggest a number of general principles that should guide planning evaluation:

1. Planning practice should be evaluated as well as plan documents.
2. The design of an assessment methodology must be clearly linked with planning evaluation theory.
3. The evaluation methodology should suit the object under appraisal.
4. The main elements of planning practice - policies, plans, programmes, processes, and results on the territory - must be subject to integrated evaluation.
5. Evaluation and planning processes should be developed together.
6. The evaluation methodology must have a balanced development in time.
7. The presentation of evaluation results and the analysis of their use within the planning system should be evaluated.

These guidelines to the plan evaluation process provide structure and standards to the critique of many different types of plans.

In evaluating the planning practice obtaining available literature is the first suggested step in the process. As discussed by Oliveira and Pinho, "The identification and dissemination of real cases where the evaluation practice is contributing for a better planning process should lead to the progressive adoption

to evaluation in other cases” (2009, p. 37). One must first assess the means of which a plan is created before looking to analyze the plan itself. Upon further investigation of the planning practice, the evaluator must design an assessment methodology that is clearly linked with evaluation theory (Oliveira & Pinho, 2009, p. 37). The technique used to assess plans should complement the evaluation of said plans to gain the most useful insight regarding the planning process and its results, while also linking evaluation theory with evaluation practice.

Oliveira and Pinho argue that, “Each methodological proposal should contain a view of evaluation, reflecting its position on a number of fundamental issues of the current debate on planning evaluation” and “ a continuous process with effective mechanisms enabling the permanent exchange of data between theory and practice should also be built” (2009, p. 37). This agrees with the third guideline that the means of evaluating plans should compliment what is being assessed in any particular plan. The type of evaluation should be adequate for the specific purpose in hand, or it risks arriving at false or unfair results as “the adaptation of the general evaluation methodology to a particular planning contexts requires the introduction of changes responsive to the most relevant specificities identified” (Oliveira & Pinho, 2009, p. 37). The way in which plans are evaluated should be specific to the type and scope of the plan being assessed. While there are limited methodologies available, the way in which they are utilized is what makes the difference.

The fourth guideline outlines how the main elements of planning practice (policies, plans programmes, processes, and results on the territory) must be subject to an integrated evaluation (Oliveira & Pinho, 2009, p. 37). With this guideline appearing similar to the first, it calls for a more extensive evaluation of the planning practice and its effects on the area in question. It is believed by Oliveira and Pinho that, “The different dimensions of planning practice must be considered in the general and specific criteria of evaluation, the indicators, the data sources and the assessment techniques” (2009, p. 37). This recommendation stems from a desire to incorporate plan evaluation in the planning process, continued evolution of planning theory, and to better serve the fundamental functions of evaluation - judgment, learning, and interaction with planning activity (Oliveira & Pinho, 2009, p. 37). Due to planning's varying nature, it is important to incorporate evaluation throughout the process and in a variety of ways.

Oliveira and Pinho discuss how the “evaluation and planning processes should be developed together, and not be seen as two discrete activities” (2009, p. 37). Evaluation most often occurs at the beginning of the planning approach and isn't revisited throughout the remainder of the process. The authors argue that the initial tasks should correspond to the definition of both the planning team and the evaluation team, as well as to the establishment of the mechanisms that should frame their relationships (Oliveira & Pinho, 2009, p. 37). While this may not be realistic for all planning institutions, evaluation could certainly be

used more during the planning process to determine a means that incorporates plan evaluation with plan making.

The sixth guideline discusses how the process of evaluating plans must have a balanced development over time (Oliveira & Pinho, 2009, p. 37). This allows the undertaking of plan evaluation is performed in a sufficient manner with adequate resources. “This continuous evaluation process may include different methods to assess difference relationships, with different purposes, in different moments of the planning process” to ensure future progress and improvement (Oliveira & Pinho, 2009, p. 37). By utilizing a long-range means of evaluation, the assessment is comprehensive to the goals and objectives of the plan.

The last guideline is “the presentation of evaluation results and the analysis of their real use in planning practice should be evaluated” (Oliveira & Pinho, 2009, p. 38). The demonstration of knowledge reassures the authenticity of evaluation. “At the end of the evaluation exercise, results must be presented to different audiences in an understandable way, reinforcing the main arguments and the fundamental recommendations for a responsive planning practice” in order to validate the planning efforts (Oliveira & Pinho, 2009, p. 38). The display of evaluation unifies communication and technical understanding of the research area.

Plan-Process-Results Evaluation Methodology

In addition to planning guidelines, Oliveira and Pinho also discuss the Plan-Process-Results (PPR) methodology to assess the production of a plan, including preparation, implementation and review, the related planning practice, and the contribution of both to the complex city building process (2009, p. 38). While there are many different approaches to evaluating plans, the PPR method looks to improve the planning process for future plan making. This methodology has a strong physical aspect, particularly evident in the dimension of physical conformance which leads one to believe that, if adequately applied, it will be able to improve the quality of the built environment through a number of proposals focused on improvement of continual planning practice” (Oliveira & Pinho, 2009, p. 38). An integral method of evaluating plans that involves assessment as an ongoing process offers various benefits to improve plan making.

The PPR model highlights the role of the plan, the processes and the results, and a set of key elements in the spatial development process - the city users, the local politicians, the planning framework and other plans prepared for the city (Oliveira & Pinho, 2009, p. 39). There are ten criteria that are derived from the interaction among the specified elements. The first criterion is the internal coherence of the plan as its assessment involves analyzing the strength of the linkages between plan objectives and different parts of the plan (Oliveira & Pinho, 2009, p. 40-42). Studying connections between land usage, urban systems or implementation mechanisms, and the objectives of a plan offer insight into whether a plan serves as a comprehensive document.

The second criterion is the plan's interpretation of the planning system it operates within by linking documents and presenting them in an appealing way to help explain contrasts between plans prepared at varying times and under various circumstances (Oliveria & Pinho, 2009, p. 42). Being able to use other planning documents offers a diverse perspective in the evaluation process. The third criterion is relevance, and its appraisal involves the reconstruction of the baseline situation for plan preparation (Oliveria & Pinho, 2009, p. 43). To effectively analyze a plan the needs of the community must first be studied to determine if the plan met said necessities effectively.

The fourth criterion is external coherence and involves having the plan be seen in the context of the planning system to which it belongs (Oliveria & Pinho, 2009, p. 43). This is important for a plan's success as it should be unique to the area's situation without competing with other projects. The fifth criterion is participation in plan making as the main information source is the population a plan is serving (Oliveria & Pinho, 2009, p. 43). Effective plans consider the opinions of their stakeholders, as they are the target audience of these documents. "The assessment of participation focuses on three different aspects, namely, participation in quantitative terms, participation in qualitative terms, and the role of the local authority in this process, encouraging, or not, public participation" (Oliveria & Pinho, 2009, p. 43). Adequate public participation aids in the drafting of a working planning document.

The sixth criterion relates to the way a plan is used by the relevant political authority as a methodology that integrates elements from decision-centered view

of planning and a performance-based approach to evaluation is critical (Oliveria & Pinho, 2009, p. 43). A well-written proposal is useless if it is not used by the administrative body in a way that is constructive to the community's development. The seventh criterion is the commitment of human and financial resources and has three main levels: the evolution of the availability of resources throughout a particular period of time, the type of available resources, and the effective relationships between planning performance and the allocation of resources (Oliveria & Pinho, 2009, p. 44). Assessing the application of resources is important in the planning process as it acts as an indicator of what any particular proposal requires for completion.

The eighth criterion is the assessment of participation during plan implementation, with the focus likely put on dynamic city districts rather than the city as a whole (Oliveria & Pinho, 2009, p. 44). Due to the extensive and continuous nature of the planning process, the timeline for different projects varies due to many factors, such as location, timing and funding, among others. The ninth criterion is the plan's effectiveness, which can be analyzed from two different perspectives: the direct intervention of the local authority and the process of development control (Oliveria & Pinho, 2009, p. 44). It is the ninth and tenth criteria that require a larger amount of data sources to ensure accuracy.

The last criterion is the evaluation of direction and involves the comparison of how a city is believed to be without the plan and how it is actually performing with it (Oliveria & Pinho, 2009, p. 45). This element of the methodology works to show the plan's successes as well as its shortcomings. "A

number of main themes in the process of urban development are approached, such as demography, transport and mobility, and housing” (Oliveria & Pinho, 2009, p. 45). While there is much to be learned from this element of plan direction, it often involves a low degree of confidence, even if a large number and higher quality of data sources are utilized (Oliveria & Pinho, 2009, p. 45). The ten criteria of the PPR methodology, when used in an integral way, allow for a comprehensive analysis of planning documents.

A variety of data sources can be used in the PPR evaluation method, with each criterion involving the use of one or more types of informational documentation. The local plan, other plans covering the whole or parts of the city, newspapers, interviews with actors involved in city planning, statistical information, national legal planning framework, the physical form of the city, cartographic material, and other official documents prepared by the local authority are examples of useful data sources in the plan evaluation process (Oliveria & Pinho, 2009, p. 45). Access to these documents may require some searching in municipal records but the information needed in assessing city plans is often available to the public. The PPR methodology offers an extensive appraisal of planning documents that examines various aspects of these municipal procedures.

Oliveria and Pinho go on to use the PPR methodology to evaluate the Plano Director Municipal de Lisboa (PDML) of 1994 and confirm its effectiveness. Using the ten criteria, the authors explore the different features of the plan and apply letter grades to each category. Assessment of the plan

concludes that it is an exceptional piece in various dimensions with great strengths. Despite the overall approval of the PDML, there were still some recommendations to be made with improving plan implementation, coordination of planning efforts, and transportation-related suggestions, along with a few others. The literature demonstrates that plan evaluation can be done in a way that is structured and allows for effective analysis of planning documents.

CHAPTER III

RESEARCH METHODS

Research Questions

Was the 2004 San Marcos Transportation Master Plan written in a way that effectively communicates the transit-related objectives of the community? To better understand this question, the study required the review of the plan in detail to determine the level of which information was conveyed. While the making of plans is the most notable aspect of the planning process, it is the evaluation of plans that allows for the continued growth of a community's economy, infrastructure and services. The review of plans allows professionals the opportunity to observe the ability of the project to convey goals, objectives and other valuable information. This study is a two-part process as it examines the plans ability to present complex proposals, as well as gauges the plan's success throughout the community by discussing the report in detail with various relevant parties.

Has the 2004 San Marcos Transportation Master Plan been successful in its goals of improving transit throughout the area? This research question refers to the implementation of the plan and its ability to be conveyed into projects that improve the transportation system throughout the area. Assessment of the plan

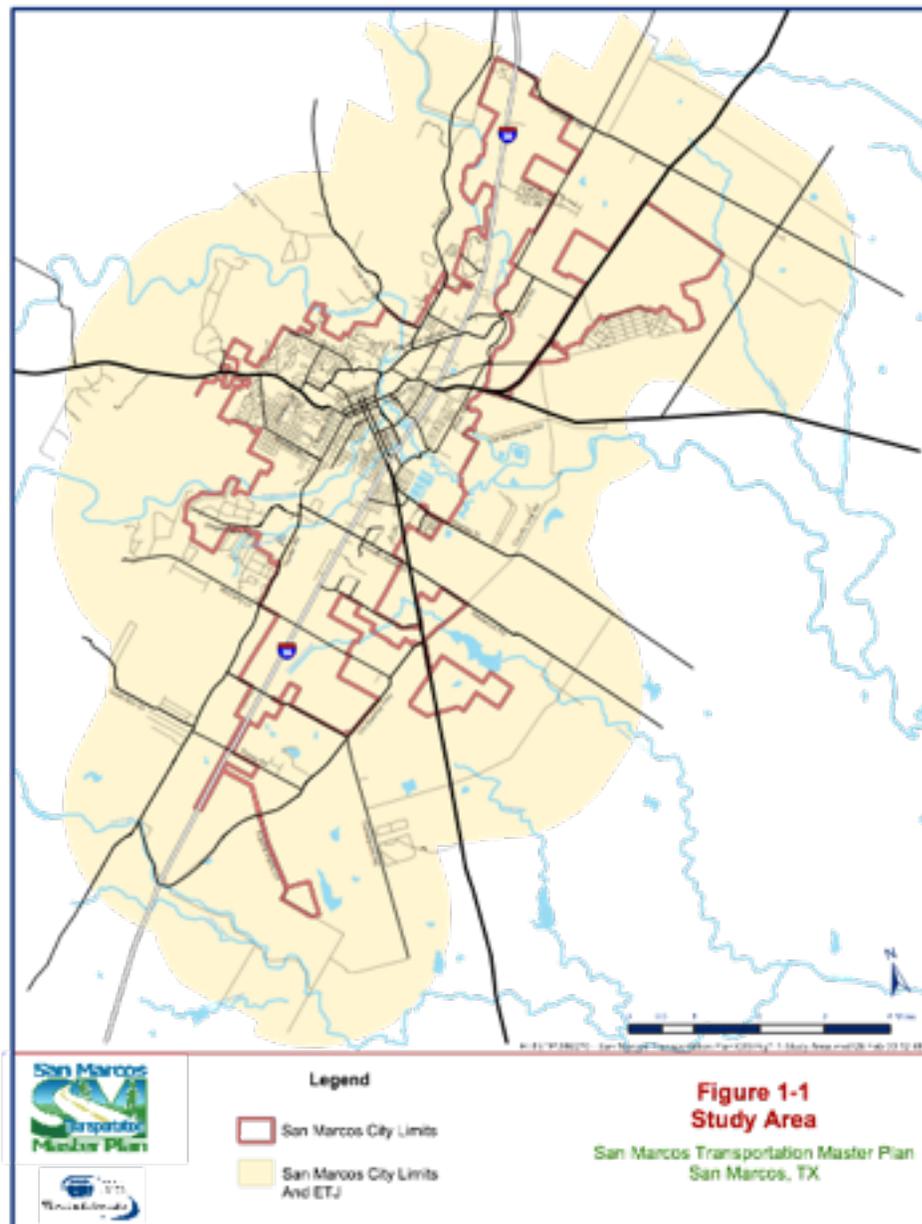
will aid in determining the plans ability to be utilized by the city and whether it is able to guide professionals in the transportation planning process. By interviewing a variety of involved groups, this study will examine the plans proficiency throughout the community.

Is the 2004 San Marcos Transportation Master Plan being carried out effectively and to the satisfaction of those living and working in San Marcos? The plan provides a diverse range of studies, projects and suggestions regarding transportation planning throughout the city to be utilized how city officials seem to be most beneficial. Issues such as funding, correspondence between many intergovernmental agencies, and changing demographics all affect the ability of officials to implement the projects outlined in an advantageous way. The execution of a plan plays a considerable role in community approval and overall success of the projects undertaken by a municipality.

Does the 2004 San Marcos Transportation Master Plan appropriately address transportation issues of the city? The goal of this study is to determine whether the plan adopted by the city was able to provide San Marcos with a transportation system that satisfied the needs of its residents. In order to answer these questions, the study must examine the research, review the data, and utilize the information gathered to determine the plan's outcome. Transportation planning is an intricate undertaking that incorporates the various aspects of a cities accessibility and mobility to determine the most effective course of action.

Study Area

In the Transportation Master Plan, the study area is defined as the City of San Marcos and an area that generally extends two miles beyond the city limits to include the City's extraterritorial jurisdiction. Figure 1-1 of the 2004 San Marcos Transportation Master Plan is a map of the study area.



A variety of state highways form the skeleton of San Marcos' transportation network and serve as major arterials throughout the city. The development of the plan was a collective effort that involved the City of San Marcos, the formation of a Technical Advisory Committee (TAC), members of the Transportation Advisory Board, various local government agencies and key community stakeholders. "Members of the TAC included representatives from the City of San Marcos, Texas Department of Transportation (TxDOT), Hays County, San Marcos Consolidated Independent School District (SMCISD), Capital Area Rural Transportation System (CARTS), Union Pacific Railroad, and Texas State University - San Marcos" (Wilbur Smith Associates, 2004, p. 28). Four meetings were held between January and October of 2003 that involved TAC and community stakeholders.

Methodology

To properly evaluate the 2004 Transportation Master Plan, this study will include the conduction of interviews with a variety of groups who may or may not utilize public transportation in San Marcos. The classification of individuals interviewed is as follows: residents, students, and professionals. The discussion of many transportation-related topics with an assortment of involved parties will allow for an educated outlook of the Transportation Master Plan for the City of San Marcos. The interview questions used in the research process are as follows:

Thesis Interview Questions

General

- What types of transportation do you utilize in San Marcos (i.e. – personal vehicle, bicycle, bus, carpool, etc.)
- Do you think traffic congestion is a concern for San Marcos?
- How long have you lived in San Marcos?

Automobile

- Do you own a vehicle in San Marcos? What kind? (Make, Model, Year)
- How often do you drive it in a week?
- What would you estimate your personal vehicle expenditures to be over the span of an average year?

Transit

- How often do you utilize public transportation in San Marcos?
- What kind of public transportation do you use?
- Does San Marcos public transportation satisfy your travel needs?
- If you do not currently use public transportation, what would make you more likely to in the future?

Bobcat Tram

- How often do you use the Bobcat Tram?
- What are your opinions or feelings towards the service?
- What are your ideas for improving the Bobcat Tram?
- Have you ever used the BTI service to travel to Austin or San Antonio
- If so, how was your experience with the service?
- How will cancellation of the BTI affect you?
- How do you plan to commute between San Marcos and other urban areas?

Thesis Interview Questions

Bicycle

- Do (or have) you utilize bicycle transit throughout San Marcos?
- If so, what kind of bike do (or did) you use? (i.e. – road, trail, hybrid, etc.)
- Do you feel there are adequate bike facilities throughout the city?
- If not, what would make you more likely to use a bike to travel throughout San Marcos?

Pedestrian

- How often do you utilize pedestrian facilities to travel throughout the community?
- Are there adequate pedestrian accommodations throughout San Marcos in your opinion?
- How could current pedestrian services be improved?
- What roads would you like to see become more walkable?

Transportation Master Plan

- Are you familiar with the 2004 San Marcos Transportation Master Plan?
- Do you have any recommendations to the current San Marcos Transportation Master Plan?
- What types of public involvement were used in the drafting of the Transportation Master Plan?
- Has the San Marcos Transportation Maser Plan been implemented in a successful way, in your opinion?

Conclusion

- What are your thoughts on a commuter rail between Austin, San Marcos and San Antonio?
- What are your thoughts on utilizing buses that run on alternative forms of energy (i.e. – Biodiesel, CNG, etc.)
- What changes in transportation have you seen since you first came to the City of San Marcos?
- How does transportation in San Marcos compare to other urban areas you've lived or visited?
- Any other thoughts, comments or concerns?

In addition to interviewing individuals, personal observation will be made as the researcher utilizes various transportation options to travel throughout the city in daily life. Access to a personal vehicle allows for examination of the many roadways throughout San Marcos. The use of the Bobcat Tram will provide a more student-oriented perspective in regards to the university's place in transportation throughout the city. Utilizing various pedestrian and bicycle facilities will provide a frame of reference regarding alternative means of transportation. Attempting to navigate CARTS allows for an informed opinion of the transit services provided by the city. Applying personal observation facilitates the evaluation of the planning process.

The analysis of maps, tables, and other figures is also important in the overall evaluation of the Transportation Master Plan. Examining the supporting documents helps researchers better understand the objectives of the plan. Along with analyzing the documents provided in the plan, bus routes and schedules will also be reviewed to gain an educated standpoint of transportation services throughout San Marcos. The incorporation of interviews, personal observation, and analysis of supporting documents will allow for an extensive assessment of the Transportation Master Plan.

The interview questions were established to address the many different means of transportation throughout San Marcos and probe the interviewee's thoughts regarding the city's various travel options. Questions were separated into the following eight categories: General; Automobile; Transit; Bobcat Tram; Bicycle; Pedestrian; Transportation Master Plan; and, Conclusion. Those

interviewed were encouraged to elaborate upon their answers and discuss any other transportation-related issues or concerns that weren't covered in the research questions. The interview consists of 29 questions and generally took one to two hours to complete depending on the extent of an interviewee's answers.

The questions were meant to gauge an assortment of transportation characteristics that varied with the individual, as well as gain perspective on the Transportation Master Plan and its effect on the community. Questions ranged from probing and individuals use of a certain service or travel option, to indicating their opinions on such transportation choices, as well as examining thoughts regarding alternative transit options. The interview questions served as relevant topics for analysis and provided insight from a variety of individuals. The interview process allowed for an intimate study of transportation's effects on the daily lives of citizens, students and professionals, as well as offered recommendations for future changes and developments.

Just as public involvement is important in the plan making process, it is equally useful in the evaluation of planning practices. While the interview process didn't allow for a sizable amount of input, the quality of data gathered from a thoughtful discussion process was valuable to the analysis of transportation in San Marcos. Including the knowledge of a variety of individuals offered a range of thoughts regarding the public opinion towards traveling throughout San Marcos. In finding those to be interviewed, it was important to have a span of individuals from different backgrounds, ranging from students,

professionals, and residents. While links existed in the classifications of interviewees, they all offered varying opinions and contributed in ways that were different from their counterparts. The interview process allowed for an extensive examination of the public viewpoint of traveling in San Marcos.

CHAPTER IV

FINDINGS

Synopsis of Interviews

Fifteen interviews were completed to be used in the analysis of the Transportation Master Plan. The group of interviewees encompassed a variety of interests throughout the community as a range of transportation methods and necessities was captured in the target group. Those included in the study span from individuals in the planning profession, students at the university and residents of the city, with overlap among various transportation-related interests. The information and opinions collected from the interviews provided relevant insight towards the plan and its impacts on the city.

Discussion of the interviews is organized based on the order of the questions asked. Beginning the interview with general inquiries regarding the individuals travel habits, it was identified that while most individuals use a personal vehicle in a great deal of travel throughout the city and surrounding area, a considerable number of individuals also take advantage of other forms of transportation. Of those interviewed, nine claimed to use a bicycle as a means of traveling throughout the city, and all of them agreed to utilizing pedestrian facilities to some extent. Some individuals use motorcycles or electric scooters as

means of traveling throughout the city. Additionally, students who were interviewed admitted to using the Bobcat Tram shuttle service provided by the university on a frequent basis during the school year. An array of transportation options applied to the individuals interviewed as they all took advantage of various travel situations.

When asked if traffic is a concern for San Marcos, the vast majority of those answered yes to some degree, citing various roads, times of day, and situations that contribute to congestion throughout the city. While traffic is recognized by most individuals who travel throughout the area, the degree to which it affects daily life was a matter that varied among those interviewed. The professional opinion acknowledges the various studied generators of traffic, like the studied growth throughout this section of the IH-35 Corridor, while students and residents note the more apparent rationales, such as the universities impact on traffic at certain times throughout the day.

Those interviewed were asked about the amount of time they have lived in San Marcos to gauge their familiarity with the 2004 San Marcos Transportation Master Plan in its drafting, as well as implementation. With the majority of those interviewed not having lived in San Marcos at the time of the plan's drafting or initial implementation, the results reflect a more recent outlook on the city's growth in relation to its transportation needs. However, the professionals interviewed for this study provide useful information regarding the plans earliest outlines, instruments and accomplishments.

Automobile use in San Marcos accounts for the bulk of travel by those interviewed. This is believed to be an accurate representation of transportation throughout the city as road development is of great focus throughout the city. With only two interviewed individuals not owning a car, the automobile is ever present in this growing city. A variety of commutes are carried out in San Marcos, as individuals travel for personal needs, academic obligations, employment opportunities, and regional commuting, among other reasons. The varying motivations for transportation throughout San Marcos result in fluctuating automobile costs that are relevant to the user's needs.

One commonality among the interviewees was the lack of public transit ridership. With only one individual interviewed making use of the cities bus service, it is to be determined that this public transit service does not meet the needs of most individuals in San Marcos. While many of those interviewed have used some form of public transit, it was the consensus that the CARTS service does not satisfy the needs of most customers. Professionals agree that public transit needs to be more convenient, increase frequency, coordinate services and create better connections in order for usage to increase. Residents and students had similar suggestions, and admitted to a lack of knowledge about the service, as well as uncertainties regarding reliability, schedules, routes and facilities. Public transit was an area identified as in need of various changes to improve transportation throughout the city.

Cycling as a means of travel was considerably popular among many of those interviewed. While professionals acknowledged the various improvements

to bicycle facilities throughout San Marcos, the general opinion suggested bike infrastructure was still lacking. A common sentiment among the transportation professionals was the desire to encourage a bicycling culture by providing the appropriate resources. Both residents and students noted the importance of safety and adequate facilities when using bicycle transit throughout the city.

Suggestions for how the current system could be improved were straightforward among students and residents. Furthermore, residents and students recognized a concern for rider safety, citing animosity towards cyclists as an area that could use improvement. Many called for more bike lanes, increased signage, and additional bike racks. Professional suggestions also included increased capacity for cyclists through infrastructure, connecting the transportation network by way of more multipurpose trails and paths, increases in signage, implementation of a bike share program, expansion of a regional bike trail, and alteration of road design to accommodate cyclists. Interest in bicycle facilities has grown considerably as the city's active students and residents look to utilize existing infrastructure and expect future bicycle accommodations.

Those interviewed expressed the need for continued investment in pedestrian amenities. With students relying on foot traffic to travel about the university and its surrounding areas, professionals and residents also convey interest in the resources available to those walking throughout the city. It was agreed by most of those interviewed that the city demonstrated a need for improved pedestrian facilities. While planning officials noted the importance of working with local business owners and community centers to create

environments people want to walk to, residents and students pointed out the need to fill gaps in the length of sidewalks at certain places in town.

Many of those interviewed discussed the dirt pathways present alongside various roadways throughout town and discussed the importance of developing pedestrian facilities in these high-traffic areas. With some individuals walking around town more than others, the level of awareness varies based on an individual's time spent traveling by foot. Many noted the importance of more sidewalks, crosswalks, and signals to improve pedestrian conditions. Various roads were named as being in need of better pedestrian facilities, including Aquarena Springs Drive, Hopkins Street, Guadalupe Street, Sessoms Drive, the IH-35 access roads, and North LBJ Drive, among others. Despite the acknowledgement of advances, many believe the city has more work to do in order to make the city a more walkable place.

Questions regarding the 2004 San Marcos Transportation Master Plan gauged those interviewed about their knowledge and opinions about the plan. While all professionals interviewed were acquainted with the plan, residents and students were much less familiar. Many citizens related construction projects to the plan, but few knew specifics. The professionals interviewed acknowledge recent updates to the plan accounting for growth and recommend a balanced approach to transportation planning.

Suggestions for improvement varied based on the individual asked. Professionals proposed various suggestions to improve the plan, such as more aggressive approaches to corrective measures, exploration of a bus partnership

between the university and the city, creation of a Trail Master Plan to better integrate bicycle and pedestrian facilities, consideration of transit-oriented development and the establishment of a commuter rail in the Central Texas area. While professionals recommended various expert opinions, residents and students proposed more information provided to the public, as well as improvements to pedestrian and bicycle facilities, as well as improved road infrastructure.

Various interests were reflected throughout the interviews as an individual's habits or needs shaped their advice. With so few residents and students around during the time of the plans drafting and initial implementation, information about this particular period in the plans history is most readily available through interviews with planning professionals. The general concurrence among planners was that of adequate implementation of the plan with some shortfalls. Because the original plan is cited as automobile-oriented, improvements have since been made to address a change in priorities that acknowledges the need for increased alternative transit options to improve the overall transit network.

The concluding questions gauged the interviewee's opinions towards miscellaneous transportation opportunities. When asked about thoughts on a commuter rail between Austin and San Antonio, the responses were those of great support interwoven with skepticism towards the possibility. While a commuter rail is mentioned in the plan, the funding for such a project is not readily available without financial action being taken by the municipalities it

would service. Professionals noted the need to plan for future travel demands throughout the Central Texas area, while students and residents reinforced the desire for such means of transportation. With various obstacles impeding the imminent forecasting of this project it is unlikely to undergo any sort of action to make such a plan possible in the near future.

Interviewee's reactions towards alternative fuel sources for buses and other vehicles were also supportive, yet unconvinced. Many professional planners cited issues of power and concern for whether the vehicles would be able to manage the hills of San Marcos. Others identified issues with potential supply options, as alternative fuel sources are not readily available and a fill station would need to be constructed. Students and residents, who were less aware of technical setbacks, also cited concern over reliability of such technology. While alternative fuel source may not be the right answer for San Marcos, the support of such technology is encouraging.

The final interview questions assessed the level of change individuals had observed during their time spent in San Marcos. Everyone interviewed discussed varying levels of noticeable change. Students and residents acknowledge improvements to roadways upon completion of construction projects and the observance of new pedestrian and bike facilities throughout the city. When asked to compare San Marcos to other urban areas the interviewee had been to, most agreed that the city has adequate transportation services but could benefit from improvements in transit, infrastructure, and alternative means of transportation. While opinions towards different aspects of transportation varied among those

interviewed, the general outlook acknowledged the continuing developments that are improving the city's travel needs as San Marcos continues to grow.

Evaluation of the San Marcos Transportation Master Plan

The 2004 San Marcos Transportation Master Plan, prepared by Wilbur Smith Associates with the assistance of other professionals, was submitted as part of the city's comprehensive plan at that time. The document was used to plan the growth of different travel needs throughout the community in the years ahead. At 257 pages long, the Transportation Master Plan included an extensive amount of research and data; budgetary information; graphics and maps; recommendations; and, other useful information regarding transportation throughout the growing urban area. Transportation planning is an essential aspect of city planning that directs the economic development and overall growth of a community.

In evaluating transportation planning in San Marcos, one looks to analyze the effectiveness of the document used to guide the process. The Transportation Master Plan was well written and easy to understand as it did not rely on excessive professional terminology to discuss various travel issues. In creating a successful planning document, it is important to utilize language that accurately discusses the topic but is also relatable and usable by the masses. While some aspects of the plan required some technical vocabulary that may be difficult for some to grasp, overall, the language was relatable and could be interpreted with attempted interpretation. Writers of the plan presented information and

suggestions in a way that could be related to the public without considerable confusion or uncertainty.

The organization of the Transportation Master Plan allowed for data to be presented in a structured way that was clear and uncomplicated. The comprehensible nature of the plans arrangement made for accessible information and complimentary graphics. The document was straightforward and easy to navigate, allowing readers to locate desired information without complication. The graphics allowed for information to be presented in a coherent way that was interpretable for many readers. Incorporating graphics with the text was helpful in relating written information with visual supplements. The way in which information was presented in the plan was relevant and understandable for the purposes of the document.

The Transportation Master Plan appeared to be well-researched with accurate data. The authors used an appropriate amount of detail as they looked to express information in a way that was decipherable, but still expressed an educated outlook on transportation throughout the community. An abundance of research regarding various aspects of traveling in San Marcos was used, providing an inclusive report on transport within the city. The document provided background information in addition to their studies to aid any reader's who may not have an extensive understanding of transportation planning in their use of the document.

One major criticism of the transportation master plan was its emphasis on automobile-oriented development. While improvements to roadways is critical

in maintaining services to citizens as they travel throughout the community, many could benefit from increased access to transit, as well as pedestrian and bicycle facilities. At the time this document was created, the city did not experience congestion to the degree it does now. Current traffic concerns have lead to reevaluating the focus of San Marcos' transportation needs as the city looks to improve the city's travel needs through a variety of measures.

Overall, the plan effectively communicates the various ways in which the city's transportation needs could continue to develop. While some aspects may no longer be in line with the way in which San Marcos plans to expand its transportation services, the author's provided a document that successfully compiled valuable research and presented it in a way that was pertinent to growth. The Transportation Master Plan provides city planners and officials, as well as citizens and other parties, with a document that outlines the many ways in which the community can exemplify its progress through transport. Serving as a record of guidance, the plan satisfied the needs of the city and supplied planners with adequate recommendations towards expanding the transportation network.

Analysis of Implementation of the Transportation Master Plan

Implementation of any city plan is paramount in the success of proposed improvement projects. The way in which a municipality approaches the recommended programs contributes to the development of the area. The Transportation Master Plan organizes proposals based on the amount of time necessary to complete a project. The city of San Marcos was then able to

prioritize their undertakings in a way that is most beneficial to the area and its citizens. The way in which plans are implemented has a great effect on the outcome of the planning process.

With the plan addressing the implementation of automobile-oriented development separately from the execution of bicycle or pedestrian facility construction, the city was able to direct more projects that improved vehicular mobility rather than focusing on transit as a whole. While the emphasis on expanding the road network was meant to accommodate the congestion associated with a growing population, the city could have benefited from more comprehensive transportation projects. As Texas State continues to attract more students and the city draws development, the community will proceed to increase and generate more traffic concerns. A concentration on complete streets, with a variety of travel means, would have allowed for greater types of use and aided in traffic build up. Offering citizens a range of options when making transportation decisions allows for increased economic opportunities, mobility, and health improvements, among other benefits.

In determining priority of pedestrian and bicycle projects, the plan presents various aspects of transportation to be used in assessing the necessity of an undertaking. The implementation priorities include the following considerations: connectivity of demand; public support/commitment; cost effectiveness; funding commitments; right-of-way; network development; cross barriers; and accident reduction (TMP 129). These criteria were used in determining the order in which pedestrian and bicycle facility projects would be

carried out. Identifying funding sources was another aspect of the planning process that affected the sequence in which proposals were acted upon.

Coordinating bicycle and pedestrian projects with other roadway improvements has been a key factor in the course of improving the city's alternative means of transportation.

In recent years, the City of San Marcos has shifted its focus from traditional means of development that creates a sprawling city, to growth that utilizes existing infrastructure and encourages the use of various modes of transportation. While the expansion of road networks is an essential aspect to the city's transportation planning, local communities are benefitting from increased walkability, bicycle-friendly atmospheres, and a transit service that satisfies the needs of a broader range of citizens. The economic success of many cities can be associated with the degree of mobility individuals have as they travel throughout an area. Without the appropriate accessibility, businesses struggle to attract a supporting customer base.

When planning for future travel demands, the examination of land uses is important in designing a service that satisfies the needs of an assortment of individuals with different needs. The city is continuing to facilitate economic growth as it also works to ensure that citizens aren't subjected to increased congestion. This is done by coordinating responsibilities and making use of the range of technological instruments available. In the age of developed industrial science, municipalities are met with various options when looking to accommodate increases in traffic.

As automated stop lights continue to turn up throughout the city, planners also look to address congestion caused by unconventional generators, such as graduation ceremonies, popular university activities, and other events that result in excessive amounts of traffic. The use of a live feed during the highly anticipated Texas State vs. Texas Tech football game that was played at Bobcat Stadium is an example of ways in which the city is looking to encourage the university's popularity without sacrificing the needs of citizens. The use of new technologies is important in planning for the needs of a growing area. As the city continues to grow, officials are attempting to ease into the appropriate changes with an anticipatory outlook on the community's expanding needs.

The City of San Marcos has recently updated its Comprehensive Master Plan, which has resulted in new transportation goals. These new objectives will aid in the implementation of future travel-related improvement projects as the city looks to strengthen its overall transportation network. In response to the reconditioned plans, city officials will soon be making changes to the Land Development Code in order to best administer regulations that are consistent with the Comprehensive Master Plan. Successful implementation of the up to date plans will be imperative in transportation developments that satisfy the diverse needs of the community.

CHAPTER V

DISCUSSION

Assessment of Findings

In researching San Marcos' 2004 Transportation Master Plan great information was obtained through interviews and observations. A range of opinions was expressed through different demographics, with varying amounts of time spent in the city, utilizing an assortment of transportation types to serve their unique circumstances. While the study didn't quite account for commuters to the same scale, it still incorporated insight to the scope of regional travel in the metropolitan area and throughout the state, as well as on a national and global scale, with residents and daily travelers. The types and number of different travel options used by individuals varied greatly among interviewees, offering a broad look into the opinions of those operating in the city.

The number of different types of transportation used by those interviewed ranged from two to five, with an average of 4.4 different travel options. Students appeared to have the greatest variety in their modes of travel with many utilizing four or five different transportation options. Residents and professionals saw a greater variety in their transportation decisions, with some individuals making use of various transit types and others only relying on a few. These quantitative

measures suggest that students have greater transportation opportunities, and that professionals are more likely to have an income that supports the ownership of personal vehicles. The range of interviewee's allowed for an extensive amount of information variation in data collection.

The variety of vehicle types, costs, and use often depended on the different personal situations of each interviewee. Due to the diverse nature of a college-oriented city, it was noted that these areas have other transportation-related problems unique from other municipalities, such as changing landscapes, inexperienced drivers, and unreliable traffic volumes. It was observed that most of those interviewed make great use of individual vehicles and often rely on them for their main travel needs. This can result in high personal expenditures, increased environmental concerns, and have effects on the character of a city.

In addition to a considerable amount of travel by personal vehicle throughout the city, many of those interviewed also discussed various reasons for travel throughout the greater metropolitan area, as well as throughout the county, region, and state. The expansive nature of Texas results in an active transportation network that currently supports travel by personal vehicle over alternative transit options. While college students often find more incentives to carpool than city residents, it isn't always seen as a viable option and is often underrated. The amount and ways in which people make use of their vehicles varies greatly to accommodate differences in lifestyles.

When addressing automobile-oriented issues, congestions was acknowledged as a serious problem associated with the increased traffic

throughout the city. While a few of those interviewed didn't feel congestion was a main concern for them because of their personal travel choices, the majority of interviewees felt congestion was a main concern for motorists. It was noted that particular areas in San Marcos are more prone to congestion, such as Wonder World Drive, Highway 80, Sessoms Drive, and many intersections along IH-35 frontage roads. Peak travel times have a significant effect on congestion-related issues in transportation. Individuals identified increased congestion during certain times during the day and throughout the semester. Additionally, it was noted how specific events that generate large amounts of traffic, such as graduation, trains, and game days.

Other interviewees related construction to the congestion concerns of the city. As San Marcos continues to grow and develop, the city will continue to make updates to the infrastructure, causing inconvenient travel situations for citizens, students and visitors. Interviews also revealed a relation between the increase in housing supply and the effects this has on the transportation network. Recent developments projects, such as The Vistas, Copper Beech, The Retreat, and The Avenue, among others, have served as significant traffic generators in various areas throughout the city. Those interviewed also acknowledged ways in which the university and businesses contributed to traffic conflicts throughout the city. As students, employees, and customers search for parking and travel throughout the community for institutional or economical purposes, they generate traffic and create congestion.

While there are a diverse range of factors that contribute to traffic and congestion, many professionals identify congestion as a choice. Travelers choose to make trips by modes of transportation that are susceptible to the unpredictable nature of transit. It was noted by both professionals and those who utilized pedestrian facilities that congestion has less of an effect on someone when they are walking. Individuals noted that congestion always has been and always will be an issue for the city to address in various efforts.

In addition to congestion, parking also serves as a huge concern to residents. Many residents addressed the issues of parking that were present in various areas of town. Individuals combat parking issues in various ways, with the use of two-wheeled motorized vehicles popular among students, residents and professionals. It is noted by Sabas Avilla, the Director of Public Services, that the Transportation Department spend a great deal of time addressing the overflow of student parking in neighborhoods around campus (personal communication, February 18, 2013). As the university goes about building parking garages and raising student fees, individuals will continue to search for cheaper means of parking as well as alternative means of transportation.

Mobility and connectivity are two important aspects of transportation that featured limited discussion among interviewees. While it was determined that general traffic mobility and connectivity wasn't bad, there appeared to be little consideration of these characteristics of successful transportation services. Individuals see updates to infrastructure as necessary and present. Observations show the city is working with existing conditions while trying to facilitate future

growth and improvement. Constraints include the different degrees of development roadways maintained by the state, such as Aquarena Springs Drive. Objectives of the city differ from those of the state as San Marcos' concern lies in a complete transportation network, while the Texas Department of Transportation is looking to facilitate state-wide travel.

Successful infrastructure management is also critical to the success of transit services in an urban area. The general observation was that CARTS is most often utilized by individuals of lower socio-economic status, who are disabled, or are otherwise unable to operate a personal vehicle. Patrons of the service deal with the limited service in order to complete various daily needs, such as grocery shopping, commuting to work, and with regional travel, among other aspects. While many of those interviewed did not personally need or utilize CARTS, many acknowledged its service and saw it as an option if their life circumstances were to change in the future.

Despite many travelers utilizing personal vehicles rather than public transit, CARTS has seen increases in ridership over the years, as well as a more diverse patronage. With funding often tied to ridership, the service is limited in its efforts to improve as the agency must prove a demand before receiving increases in funding. With the cancellation of the BTI resulting in an increase in regional travelers, CARTS is making great strides in citywide and regional transit. Limited knowledge of the service also contributes to low numbers, as various misconceptions were discovered in the interview process. Few students knew CARTS was a free service and other interviewees were under the impression that

the service was only for the elderly or disabled. Clearing these notions and improving awareness are actions that will increase usage.

The use of taxi services as a means of public transportation wasn't discussed by many of those interviewed, despite a demonstrated market among students and residents alike. Some interviewees expressed frustration with the lack of taxis available in the downtown area and throughout different times of the day. Improvements to taxi service could generate increased revenues, reduce congestion and improve motorist safety. Attitudes towards various travel options in Texas differ from those in other states as well as on a global scale, with differing dedication to research and less candid spending on upgrades to the transportation network.

When asked about feelings towards alternative fuel sources, many of those interviewed expressed support of buses and vehicles running on a renewable or reclaimed power base. While some expressed concerns regarding the hilly terrain, financial market constraints, and infrastructure concerns, there was an overall acceptance of alternative fuels that would reduce dependency on fossil fuels. Interviewees also noted the success of other cities in using alternative fuel, as well as the potential to take advantage of battery technology for short trips throughout the urban area. With limited knowledge and some unenthusiastic attitudes playing to the hindrance of such service, the city may choose to improve their environmental impact in different ways. As noted by Paul Hamilton, the Director of Transportation Services at Texas State University, diesel engines have

similar environmental benefits similar to compressed natural gas without the associate additional costs (personal communication, July 17, 2013).

While the city's public transit service has made considerable advances since the adoption of the Transportation Master Plan in 2004, many of those interviewed acknowledged more setbacks and downfalls than service success. A lack of knowledge regarding services was evident among students and residents, with many unaware of how CARTS worked and who it serviced. The bus was seen as inconvenient and obscure, without satisfying the needs of students, citizens, professionals, commuters or other travelers. Service information isn't easily obtained or advertised as CARTS has a limited presence in the city. With many students and citizens lacking incentives, individuals often choose university transit or personal means of transportation to travel throughout the community. The city's transit system is presented with countless obstacles, but could benefit from various improvements discussed later in this chapter.

In addition to the city's transit service, interviewees were also asked about their experiences with the university's Bobcat Tram. With a great deal of students living off campus, Texas State provides a shuttle service to mitigate congestion and parking concerns around campus. With great variations in how the service is utilized, it provides some degree of transit to a range of students. Use of the Bobcat Tram differs with the time of year and satisfies the needs of a range of students living off campus with its efficient service. While those with night classes or living in areas that aren't on a route may not benefit as much as

other students, the consensus was that those riding the university bus had positive views and were thankful for the service.

The types of riders on the Bobcat Tram range from off-campus students, commuters, faculty, staff, citizens, and even students living on campus. The Bobcat Tram is also utilized for various university-related events and can be rented for private service. Those using the service are presented with various options, such as service around town, to and from campus or parking lots, as well as travel around campus; however, the main use is to attend classes at the university. The Bobcat Tram has seen great improvements since it was first introduced to students. In recent years, Transportation Services has desegregated the hub from one transit point to three. Designated bus bays make navigation easier, schedules have been expanded, and routes have been added.

As discussed by Mr. Hamilton, cities in Central Texas are beginning to realize the cost of transit and the future of regional public transportation (personal communication, July 17, 2013). The Bobcat Tram Intraurban (BTI) ceased service in August of 2013. While some of those interviewed had positive opinions regarding the service, others were unaware of this regional transit option. Despite the service not being utilized by a majority of students, its cancellation had serious impacts on commuters, such as Paul Hamilton and Greg Griffin, an adjunct lecturer for the university, as well as students, such as Derek DeBruyn (personal communication, July 17, 2013, March 22, 2013 & March 31, 2013). The cancellation posed an incredible inconvenience to many daily travelers, forcing them to find other means of transportation. With many having

to increase reliance on a personal vehicle, the indirect effects could increase traffic and congestion.

Cancellation of the BTI affected regional mass transit as it was satisfying a broader range of students needs. While CARTS is trying to make up for the lost service, there is limited interest among municipalities and agencies to lead an increase of regional public transportation options. With the transit-dependent and choice riders being the most immediately affected, the university will look to organize other services to provide transit options throughout the metropolitan area. It is noted that other transportation services aren't as efficient or affordable as what the university offered with the BTI. Alternative options for regional commuters include carpool, vanpool, bicycling, driving, and ride match programs.

Despite the Bobcat Tram's improvement over the years, some downfalls were still noticed by those interviewed. Many agreed that the buses can be slow and back up around peak travel times. Crowding and the varying frequency of buses is also a deterrent to riders. Physical constraints can pose difficulties to the service, such as the winding nature of Sessoms drive and the small intersection at Mill and Uhland. Additionally, many people still drive to school and park on or near campus. While these setbacks are minimal, they are often leading causes of complaint among students. This leaves the university with the question of how much service should be provided to students in order to satisfy their travel needs and at what cost.

Another means of transportation that is receiving increasing interest throughout the community and in other metropolitan areas is the idea of bike ability. An increasing demand for bike lanes shows that many people are open to biking and support upgrades to the infrastructure that would facilitate this means of transportation. The support of bike lanes is often evident among both cyclists and motorists, and is preferred to attempts of integrating cyclists into the flow of traffic. As support for bicycle infrastructure grows, the City of San Marcos is looking to increase capacity for all travelers.

Cycling is often viewed as a lifestyle choice that boasts an enjoyable experience as well as a means of exercise and travel. Bicycles allow for varying degrees of commitment and cater to the youthful demographics of college towns as it is a cheap and convenient way of navigating. Individuals use bikes for a variety of reasons, including recreation, travel, and leisure. The unique needs of riders play a role in the selection of a bicycle, with many options available to consumers. Instilling a fondness towards bicycles can serve the transportation network in many positive ways.

Bike lanes are often noticed by cyclists and motorists, but other types of infrastructure, such as signage and sharrows, aren't as noticeable. There appeared to be a disconnect in knowledge regarding how to purchase a bicycle and where to bring it for maintenance. The Bike Cave was mentioned as a useful service, but little else was known about other bike shops in the area. Because of the difficulty in integrating bicycling planning on existing roadways, many cyclist-oriented plans are being coordinated with construction projects. Many

expressed interest in cyclist infrastructure improvements, individuals also noted improvements do occur over time. Those interviewed a desire for increased visibility of bike facilities such as bike racks, among other improvements.

A variety of factors can influence whether an individual chooses to utilize bicycle facilities in an urban area. Of these factors, safety and convenience are the greatest concern. Individuals felt biking on back roads could be just as dangerous as being on a roadway with high traffic volumes. The majority of those interviewed do not feel comfortable biking through the community due to limited infrastructure and motorist animosity towards cyclists. Aggressive and inexperienced drivers raise safety concerns for many of those using bicycles. Cyclists will avoid utilizing bicycle transit in certain areas and at specific times during the day because of perceived safety concerns. In addition to safety, the local weather and terrain can also discourage individuals from biking, as well as reoccurring thefts on campus and throughout the city.

Walkability is a major factor in decreasing congestion while increasing the health and vitality of a community. Of those interviewed, everyone noted utilizing pedestrian facilities to some extent. It was noted that individuals walk for a variety of reasons, including recreation, travel, and exercise, among others. With students often reporting the greatest use of pedestrian facilities, it should also be noted that most people enjoy walking when there are adequate accommodations. Individuals take notice of walkability and observe the existing infrastructure in their daily travels. While some interviewees claimed only

walking for limited spans of time, it is important to note that many people walk throughout San Marcos for a variety of reasons.

Due to limited pedestrian utilities, individuals who walk as a means of commute often must do so in less-than-ideal conditions because of limited transit options. As discussed by many of those interviewed, the need for sidewalks is real and visible as individuals travel throughout San Marcos. Dilapidated facilities and inadequate connectivity of services is frustrating to many of those interviewed, especially those who do not own a personal vehicle and rely more heavily on pedestrian travel. Transportation serves as a catalyst for development and by increasing the number of ways in which a person can travel to work often improves economic standing.

While some individuals only walk in limited quantities, others note the various ways in which people utilize pedestrian facilities, such as for exercise, travel, retail, socialization, and recreation. Certain areas of town, such as downtown, are serving pedestrians in greater ways than others. Interviewees note the importance of destinations and place-making in order to create an atmosphere that encourages walking. Individuals also noted various pedestrian uses for roadways, such as for physical activity and street fairs. Those interviewed were very responsive to the various improvements to pedestrian services and increasing the comfort of those who walk throughout the community.

Observations regarding the element of rail in San Marcos were examined in the interview process. It was found that support for a commuter rail spanning

the Central Texas metropolitan area was evident among all of those interviewed. Along with the unbridled support, there was also some skepticism as individuals addressed the need to make the proper assessments, as well as acknowledged the lack of necessary enthusiasm in the political spectrum. It appears that the city is invested in making progress, with various studies currently being conducted. Financial constraints and the dilemma of creating destinations also pose a problem to development of a commuter rail. However, the experience offered by rail, as well as the considerable impacts it could have on roadway congestion, serve to outweigh the complications.

With limited use of existing rail transportation options, arguments to expand the service can be troublesome. A limited commuter service allows for a deficient consumer supply to represent the area. When considering the success of other rail services in the state, such as the Austin Metro Rail or the Dallas Area Regional Transit (DART), there is considerable support of a proposed commuter service. Despite the various congestion-causing effects of rail in San Marcos, financial constraints such as payment for relocation of Union Pacific's freight line outside of the city, as well as the considerable price tag associated with the project, serve as serious barriers. A lack of municipality investment is a result as most cities want to benefit from the service without contributing towards the cost.

Familiarity with the 2004 San Marcos Transportation Master Plan varied considerably, with professionals being the most informed as residents and students had a much more vague general understanding. Citizens become most

aware of local governance through what is written about in newspapers or observed with projects. Many of those interviewed noted that progress, change and development that have occurred as a result of projects implemented from the plan. With the positive acknowledgements also comes some criticism as individuals noted limited transit, congestion, inadequate bike ability and objectionable pedestrian facilities as some of the plan's setbacks. However, recent updates to the Comprehensive Master Plan have allowed for shortfalls to be resolved and integrated into new goals and objectives.

Those interviewed felt that the City of San Marcos has identified the need to grow in a way that is complimentary to the aspirations of the community as a whole. Construction projects were associated with the objectives of planning efforts but also added to strained circumstances for many residents and students. Many of the interviewees recognized the improvements seen throughout the city and found transportation in San Marcos to be satisfactory. While these accomplishments are flattering, it is important to remember the continuity of planning efforts as change is inevitable.

With local news offering the greatest insight to the dealings of municipal government, it is noted by many professionals that informing the public of data-gathering events is often difficult. Limited knowledge of public outreach efforts can have serious adverse effects on planning endeavors. As people's expectations in the realm of city services increasing, there is increasing pressure for local governments to provide more amenities, often with little help from federal and state funding. Because drafting of the 2004 plan occurred before many of those

interviewed were living or frequenting the city, information regarding public input at the time was limited.

Mr. Sabas Avilla made the point that the 2004 Transportation Master Plan wasn't created in a vacuum and boasted great community involvement (personal communication, February 18, 2013). The first step was to plan task forces for different areas. Upwards of ten meetings were used to gather neighborhood input, with city employees attempting to make meetings convenient for citizens to encourage attendance. Avilla remembers the meetings with low-income housing residents to be an especially eye-opening experience (personal communication, February 18, 2013). One of the results of such meetings was the shared use path from River Road to Riverside, which came to light because of the demand for access to surrounding parks and facilities.

In addition to this useful insight, the Director of Transportation Services at Texas State also celebrated various types of good citizen involvement. Active user groups allowed for relevant data as the city gauged a variety of peripheral interests, such as the San Marcos River Foundation. The opinions of professional providers and developers were also gauged in mixed assemblies. Advertisement efforts by public interest groups engaged citizens in the scope of municipal planning efforts. Public meetings serviced as an arena to provide information as well as hear opinions.

Implementation of the plan occurred as it was designed, but it was acknowledged by the current Director of Planning, Matthew Lewis, that there were shortfalls with its concentration on automobile development (personal

communication, March 22, 2013). The focus of many projects did not benefit the community in all the ways it should have. Mr. Avilla saw implementation as a success and identified the variety of projects that have been completed since the plan's adoption (personal communication, February 18, 2013). The increase in bike infrastructure was noted, as well as many roadway projects that have improved the traffic network. Avilla goes on to note there are still many other projects to be completed and that future construction is inevitable (personal communication, February 18, 2013). Citing projects such as the widening of Hunter Road and addition of new bike infrastructure, Sabas' general regards towards the plan's implementation were positive, while those of Mr. Lewis were more critical (personal communication, February 18, 2013 & March 22, 2013).

Recent updates to the Comprehensive Plan also utilized a number of different public outreach efforts to address the downfalls of the original. The Kickoff Event began discussions as city employees gathered information from citizens. About halfway through the process, Design Rodeo was hosted by the city in order to obtain feedback regarding different growth scenarios. Upon completion of the updated Vision San Marcos Comprehensive Plan, the Planning and Development Services office coordinated an event held in the downtown area to unveil finished product to the public.

When asked what changes the interviewees had noticed in the time spent living in San Marcos, opinions ranged from thoughts of increased population being related to traffic problems, to the idea of how construction is a consistent aspect of growing cities, and even included displeasing transportation tactics.

Congestion from construction was also noted, as well as the various results of projects, such as increased sidewalks, crosswalks and bike lanes. Interviewees identified various improvement projects, such as increased bike infrastructure, road diets on roads like CM Allen and Thorpe Lane, the Wonder World Drive extension, and roundabouts in the Riverside neighborhoods. Roadway expansions, downtown redesign, increasing pedestrian facilities, narrower land widths, re-stripping of roads, and an overall more walk and bike able city, were also improvements mentioned by some of the interviewed individuals

The majority of those interviewed noted that congestion will always be an issue in San Marcos, and some called for improvements in the way the city needed to move traffic based on the projects. While some noted changes in transit options, such as new designs for buses, others felt the city had made few changes in their bus network. Various changes to the university's transportation services were observed by those involved with Texas State. While some students mentioned reductions in service, like the cancellation of SWAT, a designated driver program operated by the school; unreliable bus times as the semester progressed; and, the Bobcat Tram Intraurban, many of the comments discussed improvements to campus-related travel.

As mentioned by Paul Hamilton, the university is meeting the increasing demands of students by increasing service laps, reducing dependency on automobile commutes, and allowing for greater travel options to increase the scope of transportation amenities (personal communication, July 17, 2013). Changes to other student-related services outside the authority of the university

included the distinction of increased taxi service. This observation, however, was also coupled with a desire for extended competition among taxi services. In general, the interviewed revealed the fluidity of the travel experience for those without a vehicle.

When compared to other urban areas, it was hard to find many cities with relevant transportation situations. While interviewees often found that travel throughout San Marcos was better than in smaller, more rural communities, this sentiment was often met with the fact that other urban areas tend to provide more services and better destinations. Many of those interviewed compared the city's transportation utilities to those of Dallas, noting the better bus system, greater connections, existing commuter rail, increase in convenient hours, and more attractive destinations, as the major differences in travel characteristics compared to San Marcos. It was identified that other metropolitan areas let travelers accomplish more with a greater variety of transportation options.

It was acknowledged by many of the interviewed individuals that the city still has a long way to go regarding transit services and found that San Marcos is often considered below average compared to other places as, historically, the infrastructure has supported automobile-oriented development over a more complete transportation network. Limited focuses on regional transportation, as well as an insufficient presence of major bus services, such as Greyhound, are two noted shortfalls of San Marcos in contrast to other urban areas. The most drastic comparisons found that San Marcos was a sad comparison when looking at the East Coast, and even on an international scale in comparison to different

countries in Europe, with the more advanced rail and bus transit networks.

While these disparities do exist, the general expression was that San Marcos transit served many primary and travel needs, as well as some subordinate ones as well.

When comparing San Marcos to other college towns or cities without a university presence in the transit structure, Texas State's shuttle service was often considered highly commendable. Variations in comparisons were dependent on the other urban areas those interviewed had visited and the observations they made. Many noted the differences in services and infrastructure, with the structure of many physical utilities varying within the state, throughout the nation, and even on an international scale. As travel needs vary among urban areas, it was noted that San Marcos' transportation options would differ from other municipalities.

The overall position of those interviewed revealed that many felt cities, such as Dallas and Austin, were providing a higher level of service, while cities like Houston or Los Angeles didn't provide as much satisfactory transportation services as San Marcos. Individuals often cited the desire to travel in a reasonable amount of time without frustration as the key to a successful transportation network. In summary, it was found to be difficult to compare San Marcos to other urban areas because of the different magnitude of service. However, as stated by Mr. Avilla, while the degree of an issue may be different, the problem is still the same, despite the size of a municipality (personal communication, February 18, 2013). The concluding deduction found that the

City of San Marcos is planning for a sustainable city through a variety of measures and is looking to grow in a way that is beneficial to the environmental, economical and equitable aspects of the community.

Examination of Transportation Planning in a Growing Urban Area

As San Marcos continues to grow due to an expanding university and increasing economic opportunities, city officials will be responsible for accommodating the areas expanding travel demands. Establishing a reliable transit system will play a critical role in determining the way in which the city will grow. Additionally, the continued expansion of bicycle and pedestrian facilities will provide travelers with alternative means of transportation that have positive effects on congestion and environmental impacts throughout the area. The direction of new transportation goals approved by city officials will guide the development of travel services in a way that supports a range of options as citizens commute throughout San Marcos.

In regard to automobile-oriented improvements, the city has undertaken various efforts to enhance safety without sacrificing mobility. Improvements to the existing network are common projects as road conditions are easily observed and understood by citizens. While the city looks to continue bettering its infrastructure it is also working to make roads more advantageous for drivers through road diets. By redesigning roads to account for accessibility as well as mobility, city planners are creating an efficient travel environment that considers various uncertainties of driving. The concept of complete streets also has positive

effects on transportation as they provide services and facilities for a variety of commuters.

With congestion being one of the most common concerns of planners and commuters alike, growing cities can rehabilitate their transit services to increase ridership. Increasing the frequency of routes, adding more bus stops, improving the access to information, designating bus lanes, and expanding the hours of service are ways in which a municipality can improve their transit system. With funding often being tied to ridership, it is difficult to make drastic changes, leaving those involved in the transit sector limited in their developments. One option unique to the City of San Marcos would involve linking the city's transit system with the university's shuttle service.

The University of California, Davis is just one example of an urban area that has combined the city's travel network with that of the residing university. Interviews with various planning professionals revealed support in a combination bus service to maximize transit functions. Adding students to the ridership counts would help the city gain more funding while also addressing the various travel demands of students. Other colleges that have successful joint services include the University of Texas at Austin and Pennsylvania State University. Integrated bus services would allow for a more effective service and help bridge the town and gown gap that is present in many college towns.

Improvements to bicycle and pedestrian facilities create a healthier community with a range of travel options. Safety and convenience are main concerns in regard to bike ridership and pedestrian activity. The addition of the

appropriate resources is critical in encouraging citizens to walk or bike throughout the area. The construction of sidewalks and bicycle lanes is the first step to improving walkability, with the addition of signage, aesthetic features, and other amenities greatly improving the appeal. Giving individuals the necessary features to accommodate walk and bike ability, as well as connecting such areas with transit allows for a lesser dependence on personal vehicle travel and can help support local economy. Providing a range of options while also creating an enjoyable travel atmosphere can greatly improve a city's appeal as well as aid in transportation-related issues.

As Union Pacific tracks running through the City of San Marcos, rail has been an integral part of transportation in the area. Trains passing through the city pose various issues as they can back up traffic, disrupt residents, and don't provide an economic stimulant to the community. Support for a commuter rail connecting San Marcos to surrounding communities along the I-35 Corridor is widely supported but presents a challenge fiscally. Currently, Amtrak runs a limited service that only stops in Austin, San Marcos and San Antonio twice a day. An extensive commuter rail line would offer more travel times throughout the day and provide stops in other communities, such as Buda, Kyle and New Braunfels. A successful commuter rail would help alleviate highway traffic as well as provide a wider range of travel options throughout the greater Central Texas area.

Transportation is an integral part of the prosperity of a growing urban area that requires a homogenous planning effort to be effective. With no one solution

to solve the various issues associated with the urban commute, planners must examine all aspects of transportation to provide a network that supports its citizens. As a city grows it must anticipate the future needs of its residents and visitors to provide a valuable transportation network. By providing a range of services, a city can guide its success in a way that is equitable, environmentally sound and economically advantageous.

Recommendations for Improvement

The research conducted revealed an assortment of suggestions for improving future travel options throughout the city. The issue of congestion produced various recommendations, such as evening construction, the use of cameras to monitor real-time traffic, and alternate work schedules. With construction playing a critical role in traffic crowding, the idea of nighttime construction was suggested by some of those interviewed. While safety, cost, productivity, nuisance, quality, and traveler communication are all points of concern, the National Cooperation Highway Research Program (NCHRP) addresses these matters and identifies numerous objectives to ensure effective evening construction projects. Nighttime construction could allow for more efficient development in some areas of San Marcos.

The City of San Marcos has already benefitted from real-time traffic management during events, such as when the Texas State Bobcats hosted the Texas Tech Raiders in September of 2012. Using traffic cameras, the city's Public Services Department was able to view major roadways affected by the congestion

and make adjustments to reduce backed up intersections. This is an example of the ways in which cities can use transportation technology to effectively mitigate problems with transportation. As suggested by Professor Mark Carter, alternate work schedules at certain businesses throughout the city, such as the JC Kellam Administrative Building on Texas State campus or the Hays County Government Center, could alleviate traffic concerns during peak travel times (personal communication, September 5, 2013). By allowing employees to have a more flexible work schedule it reduces the number of vehicles on the road network during the busiest travel times of the day.

Additionally, increased carpooling initiatives, access to park and rides, vanpools, and car share programs could also offer congestion relief while also improving safety and expanding accessibility of San Marcos and other areas in the region. Offering commuters different travel options increases mobility and broadens the city's transportation network. With many individuals expressing frustration concerning the timing of traffic signals, the proposition to use sensory traffic lights rather than timed signals appeals to many travelers. Lights that utilize sensors improve the flow of traffic while still maintaining safety. Intersections, like the one at Post and Umland, could benefit greatly from sensory signals.

The conversion of one-way streets to accommodate through traffic would greatly improve connectivity and aid the city's travel needs. Because one-way streets are designed for high mobility, those running through the downtown area serve as deterrents to local business. Changing Guadalupe Street and South LBJ

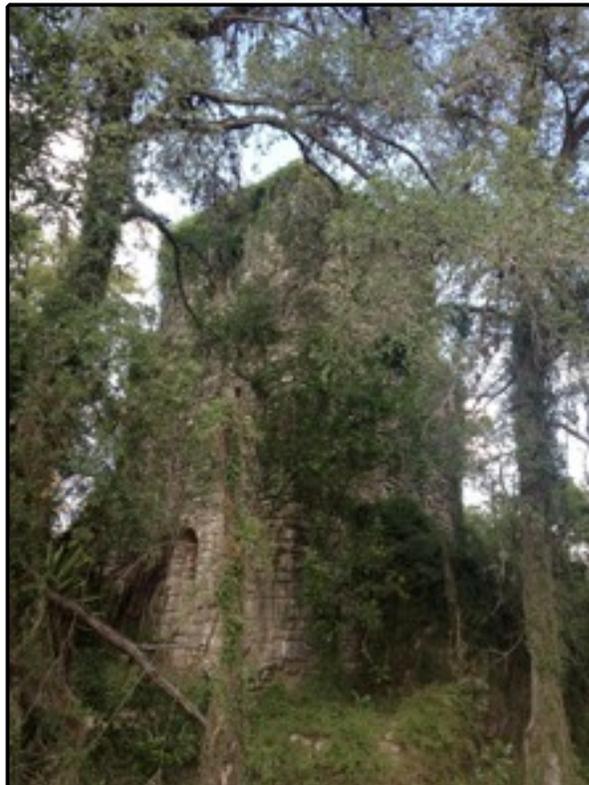
Drive would greatly increase connectivity as well as improve the economic viability of the downtown area. Along with changes in infrastructure, the city could also benefit in a greater range of service options. Creating a transportation culture that supports various modes of travel outside of the traditional personal vehicle could have significant impacts on traffic as well as add character to the community. Encouraging the use of two-wheeled vehicles, such as motorcycles, vespas, as well as other environmentally affable modes of transportation, like smart cars or hybrids, would have positive affects to environmental concerns and issues of congestion.

Moped rentals and scooter stores would pose new economic opportunities in a city that has a supporting demographic. An increase in these types of vehicles would also have a favorable affect on impervious cover by decreasing the demand for parking. Furthermore, other sustainable parking strategies include flexible parking regulations, neighborhood parking permits, smart parking, and an increase in structured parking. Municipalities that offer alternatives to parking regulations can have various positive effects on the overall quality of life. Smart parking options also provide convenience to the commuter while also maximizing parking facilities.

Incorporating the transit rich history of San Marcos and the greater Central Texas area could generate economic growth by capitalizing on travel-related aspects of the city's past. The settlement of the city holds an intimate story that can serve as an attraction to both residents and visitors. In 1689, the Spanish Conquistadors named the San Marcos river on St. Mark's Day after

observing the “bubbling springs”, and continued to explore the area, being met by other non-native settlers, like the Franciscan Monks, as well as Native American tribes, such as the Comanche Indians (The Daily Record & The Free Press, 2001, p. 22C). The San Xavier Mission still stands on the hillside above Aquarena Springs, along Ed J L Green Drive, but is currently inaccessible to the public. Beginning in the 1840s, Texas’ second president, Mirabeau B. Lamar, developed plans for a line of forts along 600 miles of frontier, which included the construction of a road from Austin to San Antonio along the El Camino Real, and led to the establishment of Post San Marcos (Texas Ranger Hall of Fame and Museum, 2009). This historic route has long-since served the City of San Marcos, as well as the greater regional area. Images of the San Xavier Mission are provided below.

San Xavier Mission

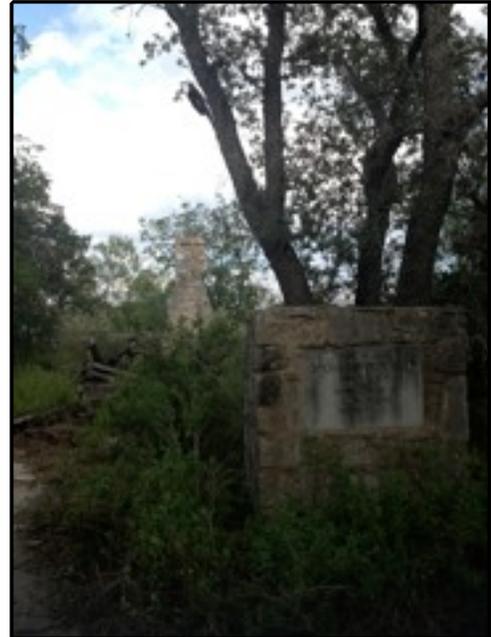


General Edward Burleson, a co-founder of the City of San Marcos, built his log cabin, dam, and gristmill near the San Xavier Mission in 1844-45 that created Spring Lake, sealing off 12,00 years of historical artifacts (The Daily Record & The Free press, 2001, p. 22C). These historic buildings, also located along ED J L Green Drive, are currently underutilized by the community, and could serve as educational historic markers as well as pose an opportunity for economic development. The Spring Lake Hotel and Golf Course was opened in 1929 by A. B. Rogers, and was later renamed the Aquarena Springs Inn & Resort by Paul Rogers, who developed the area into a popular tourist spot following the Great Depression (The Daily Record & The Free press, 2001, p. 22C). Both the original inn and golf course pro shop buildings still stand today and are currently in use. In 1994, Southwest Texas State, now known as Texas State University, purchased the property and created the Aquarena Center, which is known as the Meadow's Center today. The building is now being used for various research and educational purposes through Glass-Bottom Boat Tours, the Wetland's Project Boardwalks, Discovery Hall and the Aquarium Exhibit. The abandoned Bismark Fill Station on Post Road is a remnant of some of the first economic activities in the area. By restoring the building and turning it into a museum, the city would secure a great heritage marker that could serve various economic, cultural and historical purposes. Images of the remnants of General Edward Burleson's home, dam, and gristmill, as well as the Golf Pro Shop and Bismark Fill Station are provided on the following pages.

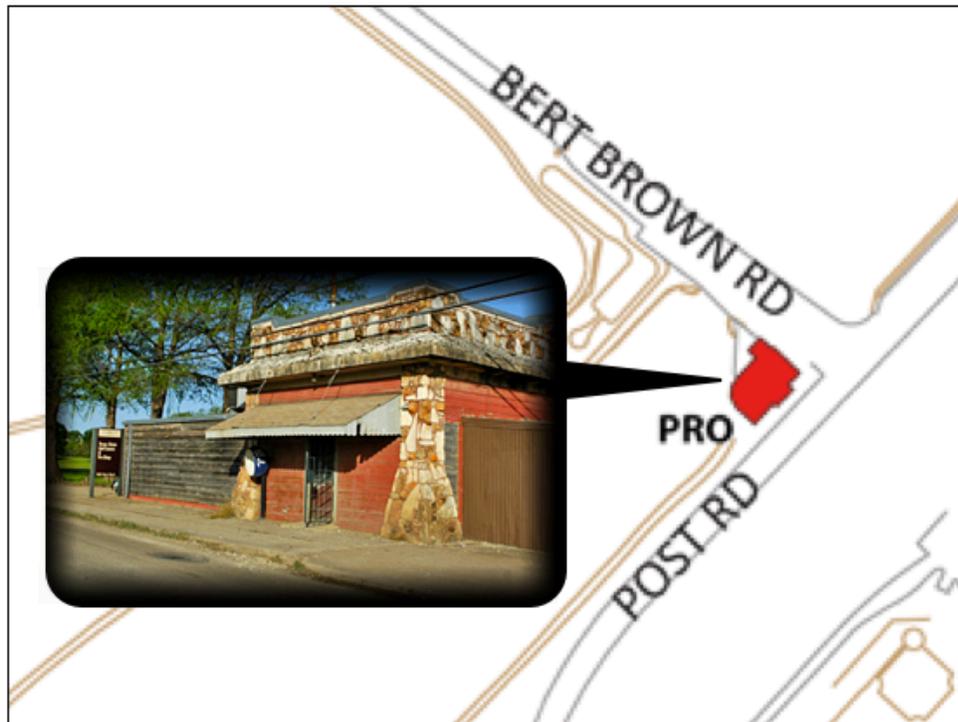
Edward Burleson's Dam & Gristmill



Edward Burleson's Log Cabin



Texas State Golf Pro Shop



Abandoned Bismark Fill Station - Post Road



The Commemorative Air Force Central Texas Wing is an example of the successful integration of the areas travel-related history with business opportunities that expand the scope of transportation in San Marcos. The Central Texas Wing hangar house holds 4 CAF aircrafts that are used for various air shows and exhibit purposes (Commemorative Air Force Central Texas Wing, 2014). The organization is non-profit, but is able to raise funds through various events, donations, and other fundraisers. Dick's Classic Car Garage is also an example of the role transportation plays in the historical community when combined with business ventures. Improving the areas access to travel-related

heritage points and historic markers solidifies the importance transit plays in the city while also supporting cultural stability and serving economic needs.

Metered parking and time limits increase the fluidity of parking situations while also offering a source of revenue for the city. Neighborhood parking permits and parking garages also offer similar financial advantages while also limiting the amount of space dedicated to parking. To encourage use of new parking structures, the city must work cohesively to limit the availability of free parking in areas surrounding garages. Neighborhood permits would also help lessen the impacts of student commuters in the communities surrounding the university. To further mediate environmental concerns associated with the impervious cover of roadways, the city could encourage the use of pervious concrete by offering incentives or changing regulations.

Planning for future congestion also includes an increase in thoroughfares to improve access of the city. The 2004 Transportation Master Plan includes an effective proposal to increase the transportation network, but doesn't include any lane designations. The appointment of high-occupancy vehicle (HOV) lanes encourages sustainable travel habits by encouraging individuals to carpool or take public transit (Caves & Cullingworth 2009). The designation of lanes for bus-rapid transit also improves the means of travel for those using public transportation.

The research found that many individuals would like transit services that better serve their daily needs, showing a demand for improved public transportation. Some of the suggestions made include more stops, enhanced

payment options, additional routes, predictable lead times, and an extended frequency of service. Increasing the convenience of CARTS can be done by making it more user friendly with a reliable schedule, distinguishable bus stops, transfer points, and accessible information. Increasing the hours of operation to later nights and weekends would accommodate the schedules of students and those working late nights.

Posting route information at bus stops and launching a smart phone application would increase awareness and add accountability to the service. Advertisements about CARTS in the form of billboards, radio, and television promotion would improve the service's presence around town. Improving the aesthetics with benches and covers can also encourage ridership. By creating a built environment that is walkable, citizens will be more eager to make use of public transportation. Moreover, the city must create better destinations by improving the 'sense of place' in locales throughout the city to persuade citizens to take public transit to the location.

Improving the 'sense of community' throughout the city, as well as in localized hubs, creates a society that prefers to engage in the area and reinforces the desire to walk, bike, carpool, and use transit. By capitalizing on the unique aspects of different sections of town, the city can guide the development of areas where people can live, work and play without having to rely heavily on a personal vehicle. Encouraging areas of mixed growth that boast different uses can become hot spots for development that attract new residents and increase economic activity in the area and throughout the city.

Providing access to entertainment and retail destinations can accommodate both residents as well as visitors, reinforcing tourist opportunities. By adding stops near local businesses and increasing the service area, the transit network can successfully contribute to the local economy. A river-oriented route would also serve visitors while adding to the character of the community. Transit-Oriented Development (TOD) also improves the economic viability of a city without compromising the transportation system and wasn't mentioned in the plan adopted in 2004. Tax increment financing could be combined with a TOD strategy to pay off debt and encourage development. Assuming the city was to adopt a bus system more complimentary of a growing urban area, it would be ideal to invest in larger buses that are more aesthetically suited to the traits of the City of San Marcos.

Improvements to the parks and recreation aspect related to transportation throughout the area would allow for different travel options. Increasing the connectivity of trails and parks can provide more access while also serving as an attraction of the city. Expanding the means of obtaining information about natural areas could be done through improved signage and more events that promote the various park locations and recreational activities. The San Marcos Parks and Recreation Department could benefit from increased funding that would serve as an investment to the future of the city's more natural thoroughfares. Communities that support an active lifestyle can help fortify efforts towards sustainable transportation development.

Alternative forms of transit are also limited in San Marcos, with only two taxi cab services operating in the area. Many of those interviewed suggested improvements in taxi services by encouraging more private providers to operate in the area, as well as increasing the resources of existing cab companies. With certain times and areas being more common for facilitating taxis, increases in these services would improve safety and increase transit options. Pedicabs are another alternative that has yet to be explored in any great detail in San Marcos. These bicycle-operated means of travel offer an environmentally conscious means of transportation that to the character of an area. The City of San Marcos could benefit significantly from a combination of improvements to the transit system.

Other popular suggestions included a joint bus service between Texas State and the City of San Marcos. According to a report provided by Texas Transportation Institute, San Marcos could benefit from increases in funding if the municipality and university were to work together in providing service for students and residents combined. Variations in the type of joint service to provide include a city operated university transit system, contracting with a private provider together, university operated city transit system, and two independent systems with coordinated services or shared facilities (Texas Transportation Institute 2012). Various case studies provide examples of each option. Ultimately, the task force that partook in the study found that a joint service would be the most desirable option.

The TTI study utilized regional resources, thus encouraging a broader range of services in the Central Texas area. With the cancellation of the Bobcat Tram Intraurban, the City of San Marcos was left with much more limited regional transit options. A bus service that travels between the different urban areas would better link the municipalities of Central Texas. Increasing the presence of major bus service providers is another way in which the city could improve regional transit options. Encouraging the use of private providers, such as Mega Bus or Greyhound, would aid in the travel of commuters.

While a combined bus system would be ideal in providing service to students and citizens, other suggestions for improving the Bobcat Tram were also mentioned. Similar to those for CARTS, many called for increased frequency of headways, improved scheduling of routes, increased communication among drivers, more bus routes, as well as additional buses on those that have more riders. Interviewees noted a displeasing service at times, and suggested drivers who provide better customer service, consistency in routing, increased communication between operators and customers, and a reliable schedule. Many individuals recommended increasing the scope of service provided by the shuttle to include stops and routes that allow for travel around town.

An increase in routes to shopping centers would allow the Bobcat Tram to serve an economic need as well as a residential one. Some of the individuals interviewed proposed a River Road route to serve the many neighborhoods along the roadway. Increasing service could call for the hiring of more employees, which can help stimulate the city's economy. Improvements to the smartphone

application and website would also improve customer satisfaction as many students rely on these technologies. Increased transparency of Transportation Services would also provide an opportunity to show students the goals set forth by the department. Improving relations between students and university services allows for a more affable transportation system.

Upgrades to pedestrian facilities tend to go hand in hand with transit improvements. Some of the most common suggestions included more crosswalks and sidewalks, upgrades to existing infrastructure, improved lighting for safer walking conditions, continuity across the transportation network, and greater compliance with ADA standards. Enhancing the aesthetics of pedestrian facilities through streetscapes, benches, and shade trees serves to encourage walking while also adding to the city's overall appeal.

Investing in infrastructure, like shared-use paths and pedestrian beacons, improves safety and increases foot traffic. Pedestrian facilities should be used as a means of connecting people with economic resources, recreational venues, and entertainment options. Using foot traffic to connect individuals with employment strengthens the stability of local economies while also improving enterprise opportunities. By linking pedestrian facilities with transit service, the city attracts a larger source of potential patrons traveling from different locales. Businesses must work with city planning services to obtain right-of-way easements to improve walkability. As discussed by Mr. Avilla, buy-in from local store owners is critical in the success of an integrated transportation network (personal communication, February 18, 2013).

The interviewed individuals were asked to identify roads they wished were more walkable and offer any suggestions for improvement. For each interview at least one road was named, with great overlap among interviewees and a range of viewpoints. The most requested road for pedestrian improvements was Aquarena Springs Drive, with seven of the fifteen interviewees making note of the need for improved infrastructure. One of the biggest obstacles in the establishment of pedestrian facilities along Aquarena is the maintenance of the roadway falling under state jurisdiction, which significantly impacts the city's ability to make upgrades. Visible dirt paths along this major thoroughfare, along with other frequently traveled roadways, shows the demand for more walkways along busy roads.

Other popular suggested roadways that could benefit from improved pedestrian facilities include Sessoms Drive, North LBJ, Hopkins Street, and the IH 35 Access Roads. The degree of walkability for each of these transit segments varies, but all demonstrate a need for improved amenities. Guadalupe Street, University Drive, River Road, North Fredericksburg Street, and North Bishop were also identified by interviewees as roadways that the city should focus pedestrian upgrade efforts on. One resident mentioned the importance of improving the walkability of large retailers, such as HEB and Wal-Mart. This concept could be further applied to the Tanger and Prime Outlet Malls, where they serve as a major employer for the city. Bettering the walkability of an automobile dominated area refines the character of the retail district and strengthens the significance of foot traffic.

Refining the pedestrian facilities of student-oriented areas like Sewell Park and Bobcat Stadium improves the walkability of the university and capitalizes on areas that often experience high volumes of foot traffic. Areas along the edge of town, like Craddock, Old Ranch Road 12, Hunter Road, and Highway 123, could also benefit from upgrades to pedestrian provisions. Attractions, like Texas State's Disc Golf course, lack the appropriate pedestrian resources, limiting the accessibility of the activity. Low-income areas, especially those on the east side of town, as well as aging neighborhoods, are at a disservice with limited walkable infrastructure, despite the demonstrated need for such amenities. Walkable urban areas boast stronger local economies, favorable standards of health, and improved community character.

Events that aim to reclaim the road for the people can also enhance the quality of life while also serving other economic and social needs. Street fairs, retail walks, outdoor shows, and fundraising events all offer an opportunity to reach customers in a unique way, while also providing a pedestrian experience. Other entertainment activities can also serve the needs of walking individuals. These occurrences include weekly markets, holiday parades, annual festivals, and temporary stands or shops. These alternative means of utilizing transportation infrastructure return portions of the roadway to pedestrians and cyclists for a period of time and instill gratitude for such community services.

Promotion of cycling in the community is also necessary to improve bike ability throughout San Marcos. Animosity from motorists towards bikers creates hostile travel environments that aren't conducive to a unified transportation

front. Cycling events sponsored by the university, city, or local cycling community would improve the relationship between those on bicycles and individuals in a vehicle. Increasing ridership in accordance with educational efforts and promotional marketing would help motorists acclimate to a significant bike culture. Amplified signage coupled with educational outreach aids in strengthening the bike culture of a city.

Adequate amenities and ensured safety serves as significant motivators in generating bicycle trips to travel throughout the municipality. The connectivity of physical infrastructure was one of the most cited bicycle-related improvements by those interviewed. Adding bike lanes, providing wide bike paths, and constructing shared use paths are improvements often supported for motorists and cyclists alike, as most travelers feel more comfortable when a physical separation between traffic types exists. Increasing the capacity of the transportation network to include a diverse mix of travel modes improves the overall transit experience.

Roadways that were identified as in need of improvement include Aquarena Springs Drive, North LBJ, University Drive, Comanche, and Sessoms Drive. Physical infrastructure is commonly supported by all types of travelers. With many of these areas currently under construction or scheduled for projects in the near future, it is expected that the associated improvements will occur simultaneously. The increase of amenities, such as bike racks and turn lanes would improve bike ability in San Marcos. Adjusting traffic signal timing, converting signalized intersections into roundabouts, and integrating a Trail

Master Plan with the planning of bike and pedestrian facilities are all means of upgrading the transportation network.

Creating places where people want to be, while also decreasing automobile dependence, contribute to thriving areas of the city where vitality stimulates growth and development. Bike Share programs serve as great opportunities to encourage ridership while addressing issues such as ownership. With bike shops only able to facilitate proprietorship to a certain extent, increased convenience would have considerable positive impacts on cycling culture in San Marcos. One suggestion, mentioned by Dr. Heather Galloway, would be a program which would provide a free bicycle for students willing to forfeit their ability to buy a parking permit (personal communication, November 13, 2013).

Once a bicycle is obtained, the issue of crime and theft become significant factors. Ways in which theft can be reduced range from the use of certain locks, to even the most basic of safety guidelines. To improve cyclist's safety, increased lighting could be available in more areas on campus and around town. The general outlook towards cycling has many interested individuals who would benefit tremendously from safer, and more convenient cycling options.

Establishing a regional commuter rail from San Antonio to Austin would serve a variety of travelers as well as alleviate congestion on IH 35. In addition to accommodating work schedules, the railway would also carry out other economic benefits by providing service to individuals looking to travel throughout the Central Texas region for pleasure. Rail offers an experience that is believed to be

superior to many other forms of transit. By working with other municipalities, the city can help secure the future travel needs of Central Texas residents.

Construction of the railway is only the first step. Matthew Lewis, among other professionals suggest that Urban Transit Districts, which follow the concepts of transportation-oriented development (TOD), are used to supplement the transit network (personal communication, March 22, 2013). To successfully connect riders to economic sectors for work or entertainment, municipalities must create an interconnected transportation network to facilitate various modes of travel. Evaluation of the railroads course shows three potential areas that would serve as effective Urban Transit Districts.

A commuter rail stop along Ranch Road 12 and the train tracks would be best served with transit-oriented development. The area is utilized by the influx of residents, assemble of staff employed by the hospital, and employees of the surrounding health professions, among other travelers. The Wonder World area is growing rapidly and currently suffers from considerable congestion. Improved transportation options would aid traffic problems while also encouraging continued economic growth. Examples of a commuter rail stop in a potential Wonder World transit-oriented development area are provided on the following pages.

Wonder World Commuter Rail Proposal No. 1



Wonder World Commuter Rail Proposal No. 2



Wonder World Commuter Rail Proposal No. 3



Transit-oriented development could also benefit the San Marcos Intermodal Station, located at 338 South Guadalupe Street. The establishment is situated in an area of economic expansion, and already serves a variety of commuter needs with Amtrak service, bus transfers, bicycle infrastructure and pedestrian facilities. San Marcos Station could boast a train stop in front of the building, or make improvements to existing structures on a neighboring lot. The station should serve as a major hub of the city with its centralized location and surrounding land use, and potential for improved services. An example of a commuter rail stop in a potential transit-oriented development area near the San Marcos Intermodal Station is provided on the following page.

Downtown Commuter Rail Proposal



The third commuter rail stop could be located at the Old Mill Business Park, located off Uhland Road. The development already serves various economic and community needs with businesses like Consolidated Rehab Therapies, DNP Photo Imaging America Corporation, and the Old Mill Station. Leasing space is still available and there is considerable open space available for additional development. The growing housing market is diverse and would support increased transit services while also encouraging a range of business owners. Examples of a commuter rail stop in a potential transit-oriented development area along Uhland Road and extending to Post Road are provided on the following page.

Uhland Commuter Rail Proposal No. 1



Uhland Commuter Rail Proposal No. 2



These stations serve a different locality of the city and are growing quickly. It would be advantageous for the City of San Marcos to focus transit-oriented development in these areas, as well as throughout the community. Various factors affect the feasibility of a commuter rail in the Central Texas area. Political

influences and limited regional interconnectedness are notable barriers in the development of these services. Improving regional relationships is absolutely necessary for the success of this significant commuter service. Ownership issues also pose as an obstacle to rail for transportation needs as existing tracks would have to be bought from Union Pacific, this project has unique financial hurdles. Structural constraints, such as the lack of consistency in two-way track, are also unfortunate. A variety of design options, such as elevated rail, subway systems, and monorail, should all be considered by the applicable parties.

Suggestions related to the Transportation Master Plan ranged from specific recommendations to universal goals. Many identified the need for the city to grow in a way that is equitable, unique, and conducive to economic development without compromising natural resources. Interviewed individuals expressed desires for more improvements at a quicker pace and increased availability of information regarding development. Some called for modeling development after European countries rather than state metropolis' because of their advanced understanding of transportation issues and greater available research.

In regard to construction, interviewees advised the city not be shortsighted in its planning by considering the growing interest in Texas State, San Marcos and the Central Texas area. Finding effective ways to improve transportation services will better serve the community in the future. Those interviewed proposed the consideration of less invasive construction techniques, diversity in utilized practices, and considerable study of the most opportune construction

options. The plan should look to serve the needs of all residents while inconveniencing travelers as little as possible.

Infrastructure improvements are constant and visible throughout the transportation network. Observations show the potential need for a traffic signal at the intersection of Mill and Uhland. This growing area services a range of transit options, including personal vehicle, CARTS, Bobcat Tram, cyclists, and pedestrians. Additionally, converting Guadalupe Street and South LBJ Drive into two-way streets would greatly increase accessibility to businesses and encourage a cyclist-supported and walkable downtown area. The installment of censored traffic signals at more strategic locations could also improve the flow of traffic. By acknowledging the growing traffic demand in areas of considerable residential development, such as the Wonder World area, the city can better plan for greater transit options to improve access to businesses and other important buildings throughout San Marcos.

The planning efforts should utilize many different public involvement opportunities to improve the support and feasibility of future development. The use of electronic reporting, online input, and location-based outreach were all suggested by those interviewed. Improvements to the city website, creation of a smartphone application, an improved presence on social networks, and flexibility in the use of online services are other ways in which the city could increase public participation. Identifying demographics and determining outreach strategies are important steps in obtaining public input. Successful citizen awareness

encourages public involvement while also providing a range of options to facilitate input from participants.

While some individuals called for continued automobile-oriented development, like wider lanes and improved road maintenance, the majority of those interviewed supported a greater range in transportation options. Safer pedestrian facilities, increased accessibility for those without a vehicle, and greater encouragement of bike ability were all suggested by interviewees. Those living and traveling throughout San Marcos want transit options that allow them to accomplish more and travel in a reasonable amount of time without frustration. Creating better public transportation, encouraging alternative means of travel, and improving the sense of place can all contribute to successful city transit.

Encouragement of alternative means of travel could have favorable impacts on transit throughout San Marcos while also encouraging a more diverse transportation network. Examples of unconventional travel options include hybrids, carpooling, electric bicycles and vehicles, mopeds, ride share programs, smart cars, and motorcycle, among other options. Supporting a range of transportation options improves accessibility, promotes equity, safeguards the environment, and enhances the economy.

The continuous nature of transportation upgrades makes planning efforts extremely important in the success of projects. The city will continue to grow and make improvements to facilities and services in an effort to develop effectively. The integration of government agencies can aid in the expansive demand for

better services. Increasing demand for services can be met more efficiently when a municipality is able to unite the efforts of city officials and employees.

Collaboration within government activity serves the area financially and extends credibility as city's look to maximize resources.

Cultural changes in the transportation thought process would aid in the development of a more holistic transit network. Professionals call for a change to the transportation environment that would include infrastructure changes, improved accessibility and increased mobility. The substantial growth of Central Texas has accelerated the need for better travel options and more transportation services. Transportation is a major economic driver, and by increasing travel options, the city will provide improved and diverse opportunities. The City of San Marcos must stay ahead of the game in its planning efforts to ensure growth that is sustainable and benefits citizens.

CHAPTER 6

CONCLUSIONS

Summary of Results

The 2004 San Marcos Transportation Master Plan is a comprehensive document that effectively analyzes the network of travel options throughout this growing urban area. The plan provided useful background information and included a considerable amount of research. In writing the plan, those involved took part in various public involvement efforts that had a positive effect on the outcome. Despite being slightly outdated when applied to today's data and standards, the plan did a commendable job of analyzing conditions and projecting future transportation-related growth of San Marcos

While the initial implementation of the 2004 plan was automobile-oriented, considerable improvements have also been made to the bicycle and pedestrian infrastructure of the city. Updates to the Comprehensive Plan have also shifted the focus from improving travel by personal vehicle, to a more all-inclusive approach that looks to better the transportation network as a whole. Increased efforts to ensure sustainable growth are a key theme in the development of San Marcos. By increasing the use of transit, encouraging

alternative means of transportation, and making upgrades to walk and bike ability have all had positive effects on travel throughout the city.

While there is limited input regarding the drafting and initial implementation of the plan, those interviewed were able to offer relevant and useful insight. The diversity of interviewees contributed significantly to research efforts and served as useful input. The overall views towards transportation in the city were generally positive, with constructive criticism offered by all of those interviewed. Many felt the city was benefitting from successful transportation planning as the City of San Marcos is accounting for future growth without forgetting the needs of current citizens.

Current city officials and employees are working tirelessly to assure the city grows in a way that embraces the diversity of San Marcos and encourages the appropriate development. Members of the Planning and Development Services office recognize the role transportation plays in the progress of the community. The City of San Marcos is at a cross-road and is presented with an opportunity to develop in a way that would benefit those of the municipality. The extensive nature of transportation planning can present numerous challenges, but when handled appropriately, a city is able to grow and thrive as a vital community. As San Marcos continues to attract a growing population it will be presented with various transportation-related obstacles. The 2004 San Marcos Transportation Master Plan provides a solid framework for future expansion and aims to assist in serving the travel needs of the city's citizens and commuters.

Opportunities for Further Research and Improvement

The continuity of planning efforts allows for many circumstances to facilitate enhancement. Because of the fast-changing nature of urban areas, the need to reflect on past planning efforts is imperative to successful development. Updates to the Comprehensive Plan allowed the Planning and Development Services Department the ability to redefine transportation goals in accordance with changing values. The versatility of the plan-making process allows for a successful collection of information and input that is useful in creating an effective planning document.

Updates to the Land Development Code (LDC) will solidify the purpose and objectives of the Comprehensive Plan. Ensuring that planning materials compliment the intentions of the city is important in many planning-related processes. Continued public involvement helps assure the needs of the citizens are being addressed and reinforces support of planning efforts. The citizens of San Marcos are engaged individuals that take pride in public involvement. This willingness complements efforts of city officials and employees to promote a community that is economically thriving, environmentally aware, and socially equitable in its development strategies.

The review of plans serves as a key tool to future improvements. Revisiting planning documents provides a view into past planning initiatives and assists professionals in making informed decisions. Plan assessment is a critical aspect of planning that can benefit growing communities considerably. Analysis of planning documents and past efforts provides opportunities for improvement

in future planning efforts. Examination of the 2004 San Marcos Transportation Master Plan served as a beneficial resource in assessing transportation in the growing urban area, and served as an opportunity to identify the shortcomings of the plan for improved future development. Plan evaluation is an important planning tool that facilitates the success of future planning efforts.

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