San Marcos Transportation Master Plan

prepared for

THE CITY OF SAN MARCOS

City of San Marcos, Texas

prepared by

ENGINEERS
PLANNERS
ECONOMISTS

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in professional association with

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July 30, 2004

Mr. Sabas Avila, P.E.
City of San Marcos
630 East Hopkins
San Marcos, Texas 78666

RE: San Marcos Transportation Master Plan

Dear Mr. Avila

We are pleased to submit this final report entitled: *San Marcos Transportation Master Plan*, which was prepared in accordance with our contract with the City of San Marcos, dated November 25, 2002.

This project included an analysis of existing conditions and travel characteristics in the area, projection of future travel demands, development of transportation improvement alternatives, and recommendations of a Transportation Master Plan for the City of San Marcos and its extraterritorial jurisdiction. This report concludes with a recommended implementation program that prioritizes the Transportation Master Plan improvements into short, intermediate and long-term programs. This plan also recommends short-term improvements as well as effective implementation strategies such as transportation system management (TSM), access management measures, and corridor preservation.

We wish to acknowledge the excellent cooperation and coordination provided by City of San Marcos staff and the Transportation Advisory Board during the development of the Transportation Master Plan. We appreciate the opportunity to have been involved in this important project and trust that the Transportation Master Plan will assist the City of San Marcos in improving mobility.

Sincerely,

WILBUR SMITH ASSOCIATES

Robert A. Hamm

STATE OF TEXAS
ROBERT A. HAMM
83923
LICENSED
PROFESSIONAL ENGINEER
7/30/04

Robert A. Hamm, P.E.
Project Manager

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Acronyms

ADT	Average Daily Traffic
CAMPO	Capital Area Metropolitan Planning Organization
CARTS	Capital Area Rural Transportation System
CAT	CARTS Around Town
CTWLTL	Continuous Two-Way Left-Turn Lane
FM	Farm-to-Market Road
IH	Interstate Highway
LOS	Level-of-Service
RM	Ranch-to-Market Road
SH	State Highway
TAB	Transportation Advisory Board
TLS	Traffic Light Synchronization
TSM	Transportation Systems Management
TxDOT	Texas Department of Transportation

Executive Summary

STUDY BACKGROUND AND PURPOSE

The City of San Marcos, in coordination with the other area governmental agencies and community stakeholders, has developed this Transportation Master Plan to guide the development of transportation in the area through the Year 2025. This Executive Summary outlines the key findings and recommendations from this study.

According to the U.S. Census Bureau, the population within the San Marcos study area has grown from 28,743 persons in 1990 to 34,733 persons in 2000. This represents an annual growth rate of approximately 1.9 percent per year. Significant commercial and residential developments have occurred over the past several years, which have and continue to increase traffic volumes on the study area's transportation system. By the Year 2025, the San Marcos area is projected to have more than 217,000 residents.

The purpose of this study was to develop a Transportation Master Plan for the City of San Marcos, which included recommended roadway improvements needed to accommodate travel demands though the year 2025. An implementation program that prioritized the recommended Plan improvements was also developed and included short-term (2005-2010), intermediate-term (2010-2015), long-term (2015-2025), and long-range elements (beyond 2025 or as development warrants). Potential roadway improvements considered included the widening of some roadways, extensions of others, or construction of new facilities. The study involved an evaluation of various roadway improvements and considered impacts related to traffic/mobility, engineering/costs, and environmental/ land use.

STUDY AREA

The study area for this project is the City of San Marcos, and an area that generally extends two miles beyond the city limits to include the City's extraterritorial jurisdiction.

STUDY PARTICIPANTS

The development of the San Marcos Transportation Master Plan was led by the Transportation Advisory Board (TAB), which is a 7 members board that advises City Council, other city boards, and City Manager on matters involving transportation in San Marcos, including transportation projects, standards, and transportation needs. TAB members involved in the development of the TMP include:

- Gaylord Bose, Chairman
- Patrick Cosgrove
- Allyn Gill
- Ralph Gonzales
- Jane Hughson
- Jeff Osborn
- Tom Wassenich

The development of the TMP was a cooperative effort between the TAB, City of San Marcos and other local governmental agencies, including the Texas Department of Transportation (TxDOT), Hays County, Texas State University at San Marcos, San Marcos Consolidated Independent School District (SMCISD), and Capital Area Regional Transportation System (CARTS).

PUBLIC INVOLVEMENT

A critical component of this study was input from key stakeholders in the study area. A project website was developed to provide up-to-date information to the public and project participants 24 hours a day. In addition, more than 20 public meetings have been conducted during the development of the Plan, ranging from community meetings held in each quadrant of the City to committee meetings and public meetings. Many citizens attended these meetings and provided valuable input to the development of the TMP.

GOALS AND OBJECTIVES

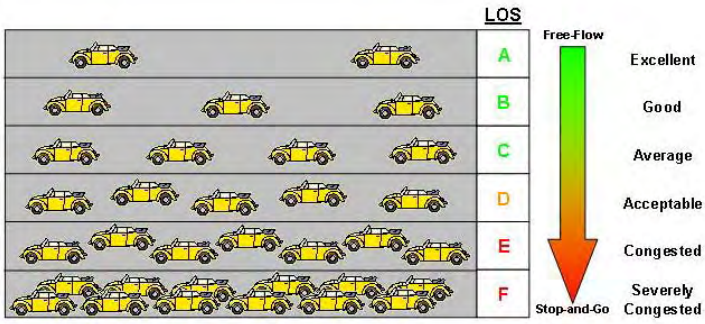
In 1996, the San Marcos Comprehensive Plan's Citizen Advisory Committee issued a vision statement for their community. The Committee envisioned San Marcos as "a community that offers a wide range of transportation options and has a safe and efficient street system." During initial public and stakeholder meetings, this transportation vision was adopted as the goal of the TMP, along with the development of the following specific objectives which strive to achieve this goal:

- Develop a wide range of transportation alternatives that provide improved mobility and safety 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 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; and,
- Promote landscaping and aesthetic design to enhance the visual character of right-of-way within the San Marcos community.

EXISTING TRANSPORTATION CONDITIONS

Many roadways in the City of San Marcos currently experience undesirable traffic congestion, including Aquarena Springs Drive, East Hopkins Street, Guadalupe Street, University Drive, Sessom Drive, and Ranch Road 12.

A more technical analysis is called Level of Service (LOS), in which engineers and planners give roads grades to rate their performance. These grades are much like a school report card and are depicted in the following figure.



At the present time, most of the roadways in San Marcos operate at LOS D or better. However, the following roads currently operate at either LOS E or F:

- Parts of Interstate 35 and the frontage roads;
- Guadalupe Street;
- W. Hopkins Street;
- Hunter Road;
- Wonder World Drive;
- Sessom Drive;
- SH 80 East of IH 35;
- Ranch Road 12;
- University Drive; and,
- Charles Austin Drive (formerly Bobcat Drive).

In addition to those roads, the following intersections operate at an unacceptable level of service during the morning or evening peak travel hours (or during both):

- Aquarena Springs Drive at Sessom Drive
- Ed. J. L. Green and Sessom Drive
- IH 35 East Frontage Road and Hopkins Street
- IH 35 West Frontage Road and Hopkins Street
- Thorpe Lane and Hopkins Street
- IH 35 East Frontage Road and SH 123
- IH 35 West Frontage Road and SH 123
- Staples Road/Hays Street and SH 123
- Broadway and SH 123

In addition, an evaluation of existing bicycle and pedestrian facilities was conducted. Existing bicycle and pedestrian facilities are limited throughout the City, with the exception of an existing bicycle trail system along the San Marcos River in the central section of the City and sidewalks provided in some locations, typically in the downtown square and near local neighborhood schools.

FUTURE GROWTH

During the next 25 years, the City of San Marcos is expected to experience significant growth in population with the study area. The population of the study area is projected to increase from 68,914 persons in year 2000 to more than 217,000 persons in year 2025, which is a significant growth rate of nearly 5 percent per year. In addition, employment within the study area is also projected to increase from 22,900 persons employed in year 2000 to more than 64,000 employed in year 2025 (slightly more than 4 percent per year). Given this high rate of projected growth, the need for transportation infrastructure improvements becomes increasingly important.

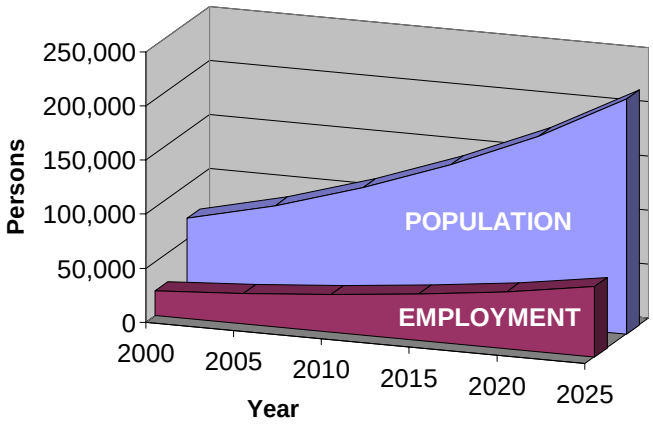
TRAVEL DEMAND MODEL DEVELOPMENT

As part of the development of the Transportation Master Plan, a travel demand model was developed to aide in forecasting future travel demands on the transportation system. For this study, the regional travel demand model maintained by the Capital Area Metropolitan Planning Organization (CAMPO) was used as the basis for the San Marcos TMP model. The modeling area around San Marcos was improved to provide much greater detail within the local area. The San Marcos model works in conjunction with the CAMPO model to provide forecasted trip information on both a local and regional level.

ANALYSIS OF ALTERNATIVE TRANSPORTATION SOLUTIONS

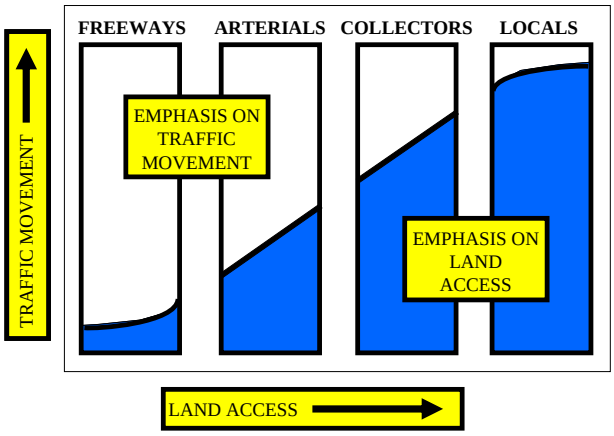
Using input from the Stakeholders, Technical Advisory Committee Members, City Staff, and the general public, 74 alternative transportation solutions were developed and evaluated for possible inclusion in the final TMP. Each alternative was evaluated against a set of criteria developed to ensure the proposed project satisfied the TMP Goals and Objectives, including mobility, traffic service, cost, safety, and environmental considerations. Based on this evaluation, projects were selected for inclusion in the TMP and prioritized for implementation in either the short term, intermediate term, or long term programs.

Projected Population and Employment Growth within the Study Area



FUNCTIONAL CLASSIFICATION SYSTEM

A 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. For the City of San Marcos, four major classes of facilities are provided. Freeway and arterial facilities are at one end of the spectrum, primarily providing the function of moving vehicles. Collector and local streets are at the opposite end of the spectrum, providing access to property. The figure below illustrates schematically how various street classifications relate to each other in terms of movement and access.



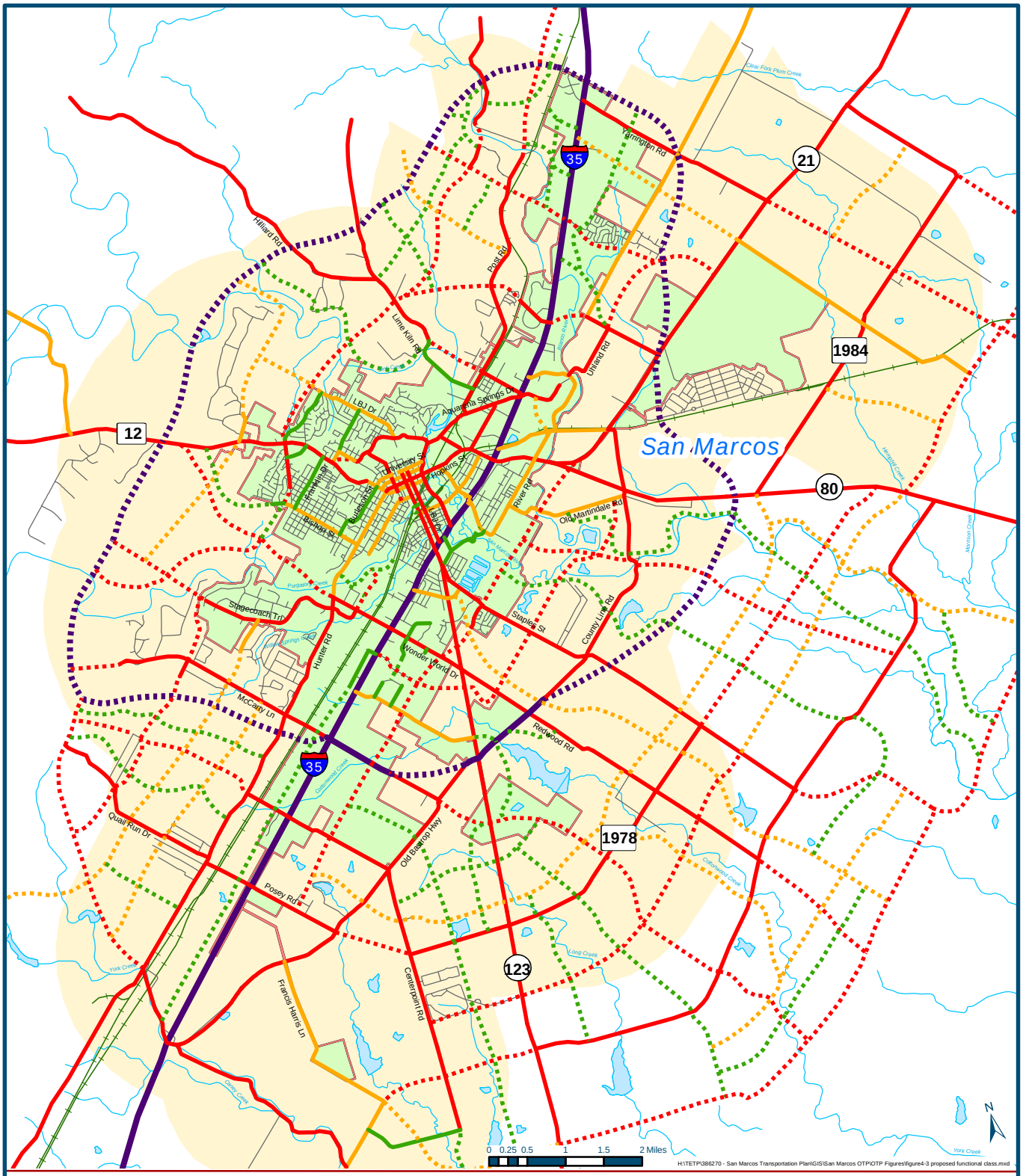
- **Freeways** - Freeway facilities provide for the rapid and efficient movement of large volumes of traffic between regions and within one region. Design characteristics support traffic movement by providing multiple travel lanes, a high degree of access control, and no at-grade intersections;
- **Arterials** - Arterials primarily provide for traffic movement, with a secondary function of providing direct access to abutting property. Major arterials typically serve as connections between major traffic generators and land use concentrations, and facilitate large volumes of through traffic. Minor arterials typically serve as connections between local and connector streets and the major arterials, and facilitate the movement of large traffic volumes over shorter distances within the community;
- **Collectors** - Collector streets provide for a balance of traffic movement and property access functions. Traffic movement is often internal to localized areas, with collectors connecting residential neighborhoods, parks, churches, etc. with the arterial system. As compared to arterial streets, collectors accommodate smaller traffic volumes over shorter distances; and,
- **Local Streets** - Local streets function to provide access to abutting property and to collect and distribute traffic between individual parcels of land and collector or arterial streets. Local streets include all other streets and roads that are not included in higher functional classes. They include internal and access streets that allow direct access to residential and commercial properties and similar traffic destinations. Direct access to abutting land is their primary role, for all traffic originates or is destined to abutting land.

PROPOSED FUNCTIONAL CLASSIFICATION SYSTEM

The City of San Marcos' existing functional classification system and Thoroughfare Plan were used as the starting point for development of the Proposed Thoroughfare Plan and Functional Classification System, which incorporates the recommended Transportation Master Plan projects as well as additional corridors for right-of-way preservation to serve future development. This proposed system was developed based upon field reconnaissance, physical characteristics, traffic volumes, and input from City Staff and the Transportation Advisory Board, Technical Advisory Committee, Stakeholders and the General Public. The primary change between the existing and proposed functional classification systems is the division of arterial streets into two categories – major and minor. The proposed functional classification system is shown in **Figure ES-1** on the following page.

Key recommended changes to the existing Functional Classification System involve a consolidation of several categories to simplify the understanding of the system. Freeways and parkways have been consolidated into "Freeways"; all types of major arterials have been consolidated, as have minor arterials, regardless of whether they are divided or not; and all collectors have been consolidated into a single category. Remaining roadways in the study area are classified as Local.

Interstate 35 is currently the only freeway facility in the study area. However, the Outer Loop Freeway is a major proposed component of the future system. Major arterials include Hopkins Street, Hunter Road, RM 12, SH 123, SH 21, SH 80 and Wonder World Drive. Examples of minor arterials include Bishop Street, LBJ Drive and River Road. Collector streets include roads such as Cape Road, Franklin Drive and Burleson Street.



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

Functional Class

- Freeways
- Major Arterials
- Minor Arterials
- Collectors
- Local Streets
- Railroads
- San Marcos City Limits
- San Marcos ETJ

NOTE: Existing functional classes are shown as solid lines, while proposed functional classes are shown as dashed lines.

Map Date: May 11, 2004

Figure ES-1
Proposed Thoroughfare Plan and Functional Classification System

San Marcos Transportation Master Plan
San Marcos, TX

Recommended Transportation Master Plan

The recommended transportation plan for the City of San Marcos was developed based upon future traffic volume forecasts, transportation network continuity, projected future development, environmental considerations/constraints, and other factors. The recommended Transportation Master Plan includes the implementation of new major and minor arterials to guide the orderly development of the region's transportation system. The Transportation Plan includes short term, intermediate term, and long term implementation plans. The plan includes four primary types of improvements: roadway widenings, new roadway facilities, transit improvements, and bicycle/pedestrian improvements. The Transportation Master Plan includes the roadway projects identified in **Figures ES-2** and **ES-3** and described in **Tables ES-1, ES-2**, and **ES-3** on the following pages.

Transportation Systems Management (TSM)

In addition to the major recommended roadway improvements, it is recommended that traffic operational practices and Transportation System Management (TSM) techniques be employed at critical locations to alleviate traffic operational deficiencies. These types of improvements are typically cost effective methods that improve traffic flow. Examples of these improvements include provisions of intersection turn lanes and other geometric improvements, coordinated signal systems that efficiently accommodate travel demands, effective utilization of traffic control devices, lane channelization, on-street parking prohibitions, and turn restrictions. TSM improvements are included in Table ES-1.

Bicycle and Pedestrian Plan

The Transportation Master Plan also includes a Bicycle and Pedestrian Plan. A review and evaluation of the existing bicycle and pedestrian infrastructure identified numerous deficiencies. Based on this analysis, along with input from the Bicycle and Pedestrian Advisory Committee (BPAC), stakeholders, and City staff, recommendations for bicycle and pedestrian facilities were identified, and are included in Tables ES-1, ES-2, and ES-3.

Transit Improvements

Transit recommendations focused on the existing CARTS and TxTRAM services currently provided in San Marcos. In addition, the potential for commuter rail service has been explored along the Austin to San Antonio corridor during the past few years. The City of San Marcos is included in the discussions and should continue to pursue the possibility of a commuter rail station within the City, with direct service to both the Austin and San Antonio metropolitan areas.

Financial Plan and Implementation

The implementation of the Transportation Master Plan will require the cooperation of numerous local agencies, including the City of San Marcos, Texas Department of Transportation, Hays County, and Texas State University. The cost of implementing the TMP totals to more than $686 million.

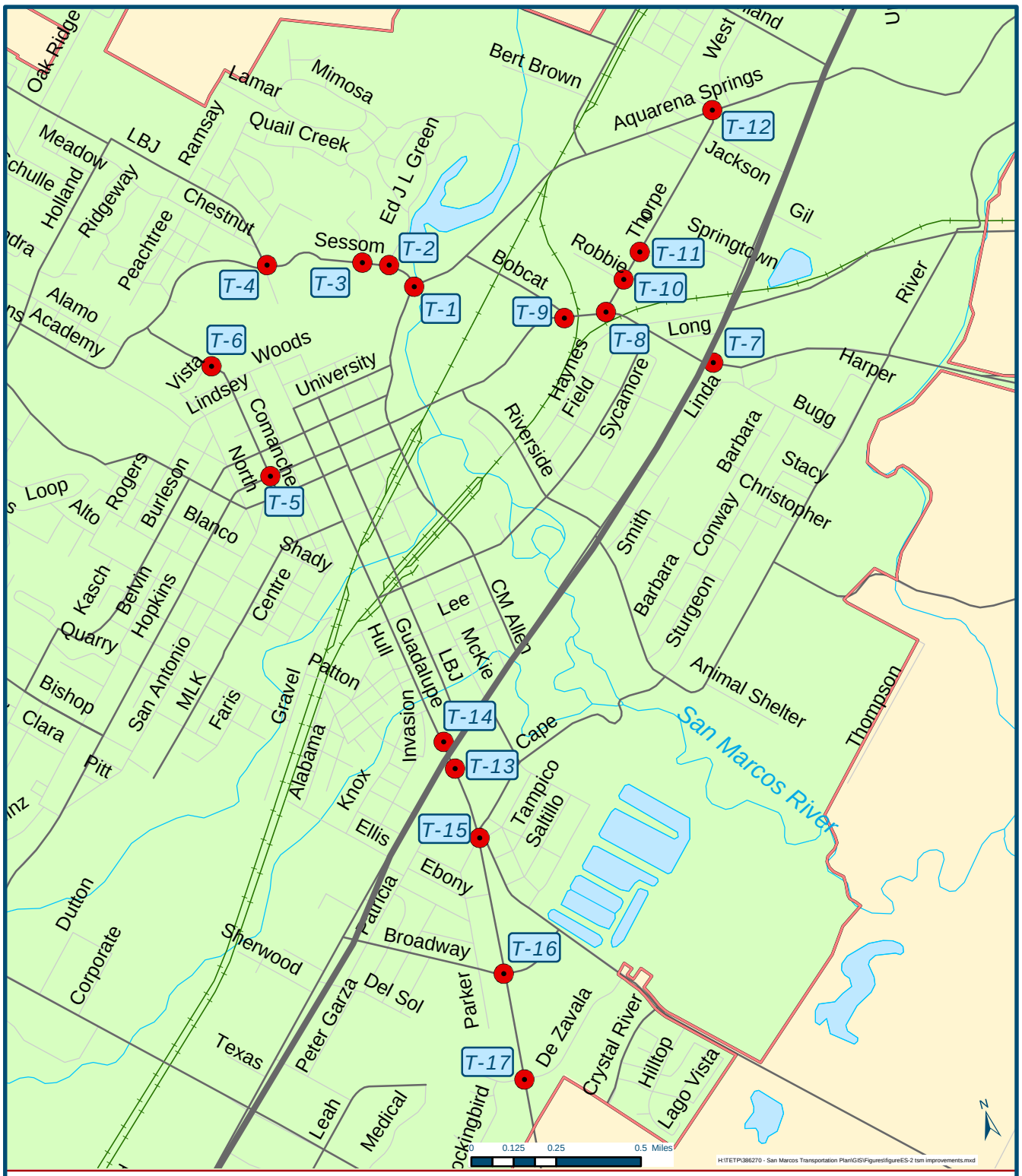
Coordinating Transportation Planning Activities

Improved coordination and cooperative efforts of local and state officials must be continued to fully realize the benefits of the San Marcos Transportation Master Plan. The extent to which future land uses follow the year 2025 development projections will determine, to a large degree, the actual implementation schedule of the Transportation Plan. Conversely, the extent to which major components of the future land use projections are realized will be dependent upon the adequacy of the transportation system.

Conclusions

The recommended San Marcos Transportation Master Plan provides a framework for rational development of an efficient transportation system as the City of San Marcos continues to grow and develop in future years. Implementation of the Transportation Master Plan will require the continued cooperation and coordination of local, state, and federal officials in making judicious decisions concerning the availability and use of roadway improvement funds. Implementation of the San Marcos Transportation Master Plan is an important element in improving and fulfilling the future mobility needs of the City of San Marcos.

The Transportation Advisory Board recognizes that unforeseen developments can and do call for periodic revisions to the San Marcos Transportation Master Plan. In some instances, such as Hopkins Street, the Transportation Advisory Board considered a number of alternatives. However, because of the impact on existing neighborhoods, the TAB chose to minimize added capacity projects at this time. The TAB is hopeful that the Wonder World Drive Extension and Craddock Street Improvements will help alleviate the Hopkins Street situation, however, alternative roadway improvements may still be necessary. Consequently, the recommended Transportation Master Plan will require continued updates as new circumstances justify them and after careful consideration of the impacts that may be caused by such revisions.



San Marcos Transportation Master Plan

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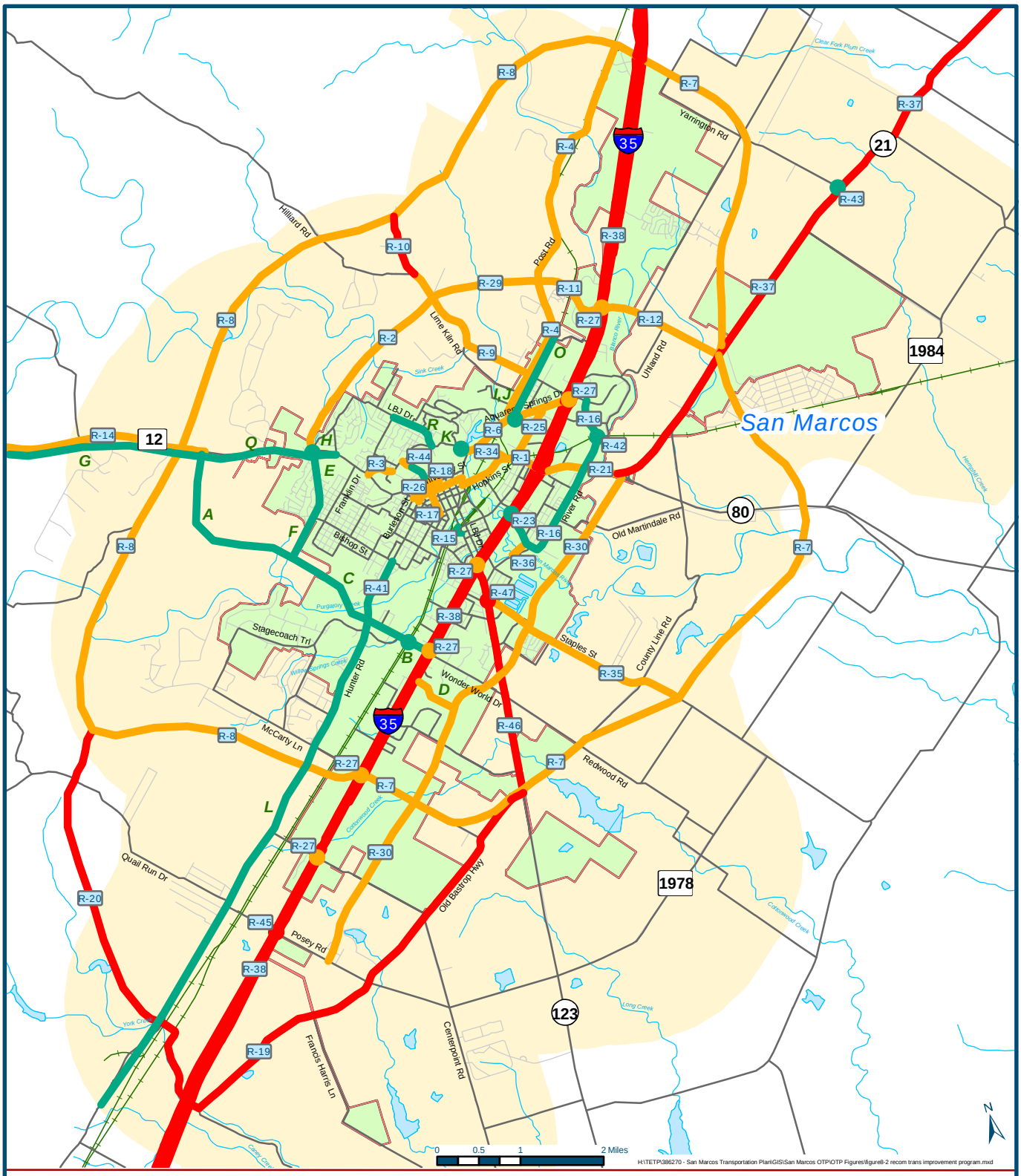
Map Key

- TSM Projects
- Local Roads
- Railroads
- San Marcos City Limits
- San Marcos ETJ

Map Date: March 4, 2004

Figure ES-2
Transportation System Management (TSM) Improvements

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

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Map Key

- Local Roads
- Railroads
- San Marcos City Limits
- San Marcos ETJ
- R-99 Project Number

Map Date: May 11, 2004

Roadway Projects by Year

- Short-Term
- Intermediate-Term
- Long-Term

Figure ES-3
Recommended Transportation Improvement Program (2005 - 2025)

San Marcos Transportation Master Plan
San Marcos, TX

Table ES-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Roadway Projects					
A,B,C	Wonder World Drive - Construct 4 lane bridge and 1 lane frontage roads at railroad tracks - Construct extension from Hunter Road to RM 12	IH 35	RM 12	$ 5,241,000[1]	City of San Marcos and TxDOT
E	Craddock Street - Widen to 4 lane divided	RM 12	Bishop	$ 1,600,000[2]	City of San Marcos
G, H	RM 12 -Widen to 4-lane undivided section with turn lanes on RM 12 at Craddock Street	Wonder World Drive extension	RM 32	$ 2,975,000*	TxDOT
I,J,K	Aquarena Springs Drive - Railroad Grade Separation (future traffic forecasts should have 6 ln bridge structure) - Realignment of Post Road intersection - Intersection improvements at Sessom (Dedicated right turn lane on Aquarena Springs and 2 left turn lanes on Sessom; 5 ft. sidewalks and pedestrian crossings) and bike lanes/trail	IH 35	Sessom Drive	$ 800,000[1]	City of San Marcos and TxDOT
L	Widen Hunter Road to 5 lanes	Wonder World Drive	Comal County Line	$ 2,150,000[1]	City of SM and TxDOT
R-41	Hunter Road - construct 5 lanes from Wonder World Drive to north of Purgatory Creek channel - transition from 5 to 4 lanes and continue 4 lanes to Dixon Street - transition from 4 to 3 lanes and continue 3 lanes to Bishop Street	Wonder World Drive	San Antonio Street	$ 700,000	TxDOT and City of San Marcos
O	Widen Post Road to 3 lanes with bike lanes and sidewalks	300' west of Bert Brown Rd	North City Limit	$ 2,445,000	City of San Marcos
R-42	Construct River Road RR Overpass	At RR Tracks		$ 1,800,000	City of SM
R-15	Add U-Turn Lane to Improve Transit Center Access	At Donaldson Street		$ 200,000	CARTS
R-43	Add Signage on SH 21 at Yarrington Road Directing Traffic to IH 35 via Yarrington	SH 21	At Yarrington Road	$ 5,000	City of San Marcos and TxDOT
R-16	River Rd -Extend existing River Road from SH 80 to Aquarena Springs) 4 Lane Section -Restripe/Stripe all sections of River Road to 3 lanes with bike lanes (South of SH 80)	IH 35	Aquarena Springs Drive	$ 5,535,000	City of San Marcos
P	Citywide Traffic Signal Upgrades	Various Locations throughout City			TxDOT

Table ES-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Q	Widen RM 12 to 3 lanes	Wonder World Drive	Hughson Street	$850,000	TxDOT
R	Resurface and restripe North LBJ Street to 2 lane section with bike lanes	Sessom Drive	Holland Street	$ 76,000	City of San Marcos
R-44	Widen Comanche Street to 5 lanes	Student Center	Woods	$250,000	City of San Marcos
F	Extend Craddock Street South as 4 lane divided section	Bishop Street	Wonder World Drive	$ 1,713,000	City of San Marcos
Transportation Systems Management Projects					
T-1	Aquarena Springs Drive - Construct an eastbound right turn lane and restripe the eastbound approach to provide three outbound lanes and two inbound lanes consisting of two left turn lanes and one right turn lane. - Restripe the southbound approach to provide two through lanes and one free flowing right turn lane.	Aquarena Springs Drive	At Sessom Drive	$166,000	City of San Marcos
T-2	Ed J. L. Green - Restripe the southbound approach to provide a double yellow centerline.	Ed J. L. Green	At Sessom Drive	$1,000	City of San Marcos
T-3	Peques Drive - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one right turn lane. - Install traffic signal equipment to control the northbound approach of the State Street and Sessom Drive intersection. This intersection approach will be operated as part of the Peques Drive and Sessom Drive intersection. - Optimize signal timing and phasing to provide a dummy signal phase, which will allow gaps for southbound left turning vehicles exiting the Ed J. L. Green and Sessom Drive intersection.	Peques Drive	At Sessom Drive	$102,000	City of San Marcos
T-13	IH 35 EFR - Construct a WB right turn bay.	IH 35 East FR	At SH 123	$37,000	TxDOT
T-14	IH 35 WFR - Construct an EB right turn bay	IH 35 West FR	At SH 123	$37,000	TxDOT

Table ES-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
T-4	N. LBJ Drive - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one left/through/right shared lane. - Construct a westbound right turn lane.	N. LBJ Drive	At Sessom Drive	$14,000	City of San Marcos
T-5	Comanche Street - Restripe the westbound approach to provide three outbound lanes and one inbound lane consisting of one left turn bay, one through lane, and one through/right shared lane.	Comanche Street	At Hopkins Street (RM 12)	$2,000	City of San Marcos
T-6	Comanche Street - Restripe the northbound and southbound approaches to provide for four-foot bike lanes on both sides. - Restripe the northbound and southbound approaches to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane.	Comanche Street	At Student Center Drive	$5,000	City of San Marcos
T-7	IH 35 East Frontage Rd. - Construct a northbound right turn lane. The right turn lane should extend to Bugg Lane. - Construct a westbound right turn lane. - Extend the existing east-west sidewalks beyond the east side of the intersection.	IH 35 East Frontage Rd.	At Hopkins Street	$114,000	City of San Marcos
T-8	Thorpe Lane - Construct a southbound right turn lane and determine the most appropriate lane use for the southbound approach. - Construct an eastbound through lane and restripe the eastbound approach to provide dual left turn lanes and two through lanes. The outer lane in the eastbound direction should merge east of Thorpe Lane. - Construct a westbound right turn lane.	Thorpe Lane	At Hopkins Street	$167,000	City of San Marcos
T-9	Hopkins Street at Charles Austin Drive - Convert the existing westbound shoulder into a right turn lane. Traffic currently utilizes this shoulder as a right turn lane.	Charles Austin Drive/ City Hall Drive	At Hopkins Street	$15,000	City of San Marcos

Table ES-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
T-10	Thorpe Lane - Relocate existing traffic signal at this intersection to the intersection of Thorpe Lane and Springtown Way. - Restripe the westbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane. - Restripe the eastbound approach to provide two outbound lanes and two inbound lanes consisting of one left turn lane and one through/right shared lane.	Thorpe Lane	At Robbie Lane	$102,000	City of San Marcos
T-11	Thorpe Lane - Relocate existing traffic signal at the intersection of Thorpe Lane and Robbie Lane to this intersection. - Restripe the westbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane.	Thorpe Lane	At Springtown Way	Included in T-10	City of San Marcos
T-12	Thorpe Lane - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane. - Provide a curbed median island for the westbound approach to physically prohibit left turn access into the first driveway, north of Aquarena Springs Drive and east of the intersection.	Thorpe Lane	Aquarena Springs Drive	$5,000	City of San Marcos
T-15	Staples Road/Hays Street - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left/ through /right shared lane and one right turn lane.	Staples Road/ Hays Street	At SH 123	$1,000	City of San Marcos
T-16	Broadway - Lengthen the existing southbound left turn bay.	Broadway	SH 123	$11,000	City of San Marcos
T-17	De Zavala Drive/Leah Street - Stripe the SB approach to two outbound lanes and one inbound lane consisting of one left turn lane and one though/right shared lane. - Stripe the NB approach to two outbound lanes and one inbound lane consisting of one left lane and one through/right lane.	De Zavala Drive/ Leah Street	At SH 123	$2,000	City of San Marcos

Table ES-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Bicycle and Pedestrian Projects					
BP-1	Wonder World Drive - Sign & stripe Shoulder Bike Lanes* - Improve at-grade crossings at RR tracks for bicycles	IH 35	RM 12	$ 100,000	City of San Marcos and TxDOT
BP-2	Cottonwood Creek Parkway - Sign & Stripe bike lanes as part of roadway	IH 35	Leah Drive	$ 144,000	City of San Marcos
BP-3	Craddock Street - Designate bike lanes as part of roadway development	RM 12	Wonder World Drive extension	$ 99,000	City of San Marcos
BP-4	RM 12 - Sign & stripe Shoulder Bike Lanes	Wonder World Dr.	RM 32 (Wimberley)	$ 500,000	TxDOT
BP-5	Aquarena Springs Drive - 5 ft. sidewalks and pedestrian crossings at Sessom* - 10-foot wide trail	IH 35	Sessom Drive	$ 500,000	City of San Marcos and TxDOT
BP-6	Hunter Road - Sign & stripe Shoulder Bike Lanes	Wonder World Drive	Comal County line	$ 50,000	City of SM and TxDOT
BP-7	Post Road - 5' bike lanes and sidewalks	Bert Brown Rd.	North City Limit	$ 610,000	City of SM
BP-8	Bike/Pedestrian crossings of San Marcos River on Hopkins and Aquarena Springs	On Hopkins	On Aquarena Springs	$ 64,000	City of San Marcos
BP-32	Construct Sidewalk via IH 35 underpass to River Road for Bike/Pedestrian access to IH 35/Cheatham improvements (2 lane underpass); bike lanes	River Road	Riverside	$ 39,000	City of San Marcos
BP-9	Designate and Sign the following Bike Routes:				City of San Marcos
	• Belvin Street	Dixon	CM Allen	$ 1,300	
	• Dixon Street	Belvin	Hunter/Hopkins	$ 500	
	• San Antonio Street	Dixon	CM Allen	$ 1,300	
	• ML King Street	Mitchell	San Antonio	$ 500	
	• Mitchell Street	Gravel	Quarry	$ 500	
	• Quarry Street	Mitchell	Prospect	$ 500	
	• Prospect Street	Quarry	Columbia	$ 500	
	• Columbia Street	Prospect	Franklin	$ 500	
	• Clara Street	Prospect	Belvin	$ 500	
	• Bishop Street	Hopkins	San Antonio	$ 500	
	• Bishop Street with Bike Lanes	Lisa	Hopkins	$ 1,000	
	• Hilyer Street	Columbia	Perkins	$ 500	
	• Perkins Street	Hilyer	Franklin	$ 500	
	• Blanco Street	RM 12	Gravel	$ 750	
	• Gravel Street	Mitchell	Blanco	$ 500	
	• Patton Street	Gravel	Armstrong	$ 500	
	• Armstrong Street	Patton	LBJ	$ 500	
	• Lee Street	LBJ	CM Allen	$ 500	
	• McKee Street	Lee	Cheatham	$ 500	
			Total Estimated Cost	**$ 29,238,850**	

Source: City of San Marcos 1. City of San Marcos Funding; does not include TxDOT portion 2. Includes cost for widening and extending to Wonder World Drive, which is contained in the Year 2010 Project List . * Only portion within City Limits, not entire length.

Table ES-2
Intermediate Term Improvement Program (2010 to 2015)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Roadway Projects					
R-1	Widen Hopkins to 6 lanes	CM Allen	IH 35	$ 3,522,000	TxDOT
R-2	Extend Craddock with 4 lanes	End Craddock	Lime Kiln Rd	$ 15,096,000	City of San Marcos
R-3	Realign Holland and Academy to provide Sessom connection to RM 12	Sessom	RM 12	$ 2,562,000	Texas State University
R-4	Widen Post Road to 4 lanes (6 lanes needed w/o Loop)	Aquarena Springs	Northern Study Area limit	$ 18,063,000	City of San Marcos
R-6	Widen Aquarena to 6 lanes	Sessom	IH 35	$ 7,519,000	TxDOT
R-7	Construct 4-lane freeway as E. Outer Loop	IH 35 North	IH 35 South	$ 122,940,000	TxDOT and Hays County
R-8	Construct 4-lane freeway as W. Outer Loop	IH 35 North	IH 35 South	$ 141,179,000	TxDOT and Hays County
R-9	Lime Kiln Widening from Hilliard east and realign to join Uhland as 4 lane divided section	Hilliard	Uhland	$ 8,718,000	City of San Marcos
R-11	Extend River Ridge Parkway west as 2 lane section	IH 35	Post Road	$ 2,743,000	City of San Marcos
R-12	Extend River Ridge Pkwy. (2 lanes)	IH 35	SH 21	$ 7,202,000	City of San Marcos
R-14	Widen RM 12 to 6 lanes	Wonder World Drive	RM 32	$ 42,144,000	TxDOT
R-17	Widen Comanche Street to 4 lanes (Sessom to Hopkins); improve 2-lane section (Hopkins to MLK)	Sessom	MLK	$ 1,642,000	City of San Marcos
R-18	Complete missing sections of University Drive (4 lane section) from Guadalupe to Comanche; long range complete section from Comanche to RM 12	Guadalupe	RM 12	$ 212,000	City of San Marcos
R-21	Widen SH 80 to 6 lanes (including underpass at IH 35)	IH 35	SH 21	$ 8,675,000	TxDOT
R-25	Widen Thorpe Lane to 5 lanes	Aquarena Springs Dr	Hopkins St	$ 1,617,000	City of San Marcos
R-26	Widen Hutchison to 3 lanes	CM Allen	Moore St	$ 718,000	City of San Marcos
R-27	Widen IH 35 underpasses to 6 lanes at SH 123, Aquarena Springs Drive, Wonder World Drive, Centerpoint Drive, River Ridge Parkway and McCarty Lane	IH 35	At SH 123 At Aquarena Spg At Wonder World At Centerpoint Dr At River Ridge At McCarty Ln	$7,000,000	TxDOT
R-29	Extend River Ridge Parkway (2 lanes)	Post Road	Lime Kiln Road	$ 4,615,000	City of San Marcos

Table ES-2
Intermediate Term Improvement Program (2010 to 2015)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
R-30	SH 21 extension - Construct 5 lane north-south arterial	Posey Rd.	SH 80/SH 21	$34,849,000	TxDOT and City of San Marcos
R-34	Widen Charles Austin to 4 lane undivided	Hopkins	Aquarena Springs	$ 897,000	City of San Marcos
R-35	Widen FM 621 to 3 lanes	SH 123	Old Bastrop Hwy.	$ 2,656,000	TxDOT
R-36	Realign and straighten Cape Road, including new bridge	SH 123	River Road	$ 1,285,000	City of San Marcos
D	Construct Cottonwood Creek Parkway (5 lanes)	IH 35	Leah Dr	$ 750,000	City of San Marcos
Bicycle and Pedestrian Projects					
BP-10	San Marcos River Hike & Bike Trail Extension	Hopkins	Linda	$1,100,000	City of San Marcos
BP-11	Complete the trail and sidewalk network along Hopkins	CM Allen Pkwy.	IH 35	$ 125,000	City of San Marcos and TxDOT
BP-12	Craddock North Extension - Sign and Stripe bike lanes/shoulders	Current Craddock Terminus	Lime Kiln Road	$ 303,000	City of San Marcos
BP-13	Post Road - Sign and stripe shoulder bike lanes	Aquarena Springs	ETJ	$ 610,000	City of San Marcos
BP-14	River Ridge Parkway - Sign and stripe shoulder bike lanes		Harris Hill	$ 186,000*	City of San Marcos
BP-15	RM 12 - Sign and stripe shoulder bike lanes	W. Outer Loop	RM 32	$ 1,380,000*	City of San Marcos and TxDOT
BP-16	Add sidewalks on Guadalupe	San Antonio	IH 35	$ 200,000	City of San Marcos
BP-17	River Rd. - Sign and stripe shoulder bike lanes	SH 80	Aquarena Springs	$ 71,000*	City of San Marcos
BP-18	SH 80 (including underpass at IH 35) - Complete sidewalks from IH 35 to River Road	IH 35	SH 21	$141,000	City of San Marcos and TxDOT
BP-19	Hutchison - Sign and stripe bike lanes - Repair and complete sidewalks both sides	CM Allen Pkwy	Moore St	$ 76,000	City of San Marcos
BP-20	FM 621 - Sign and stripe shoulder bike lanes	SH 123	Old Bastrop Hwy.)	$ 309,000*	City of San Marcos and TxDOT
			Total Estimated Cost	**$441,105,000**	

* This includes only construction costs; other elements, such as contingency costs, are included with the roadway cost estimates in Table ES-2.
** Estimated costs for these projects are already included in roadway construction cost contained in Table ES-2.

Table ES-3
Long Term Improvement Program (2015 to 2025)

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Roadway Projects					
R-10	Extend Lime Kiln Rd. (4 lane divided)	Hilliard Road	W. Outer Loop	$ 5,540,000	City of San Marcos
R-19	Upgrade Old Bastrop Hwy (4 lane divided) with interchange at Loop	South of E. Outer Loop	IH 35 South	$ 18,038,000	City of SM, Hays County, TxDOT
R-20	Construct 4-Lane divided arterial	Southwest corner of W. Outer Loop	Old Bastrop Hwy. (Proj R-19) at IH 35 S	$ 28,025,000	City of SM, Hays County, TxDOT
R-23	Reconstruct IH 35 underpass to provide connection between River Rd and Riverside across IH 35 (4 lanes)	River Road	Riverside	$ 1,704,000	City of SM, TxDOT and CAMPO
R-37	Widen SH 21 to 6 lanes	SH 80	Northern ETJ	$ 15,993,000	TxDOT
R-38	Widen IH 35 to 8 mainlanes/3-lane feeder roads	Northern ETJ	Southern ETJ	$ 135,932,000	TxDOT
R-45	Construct Posey Rd Overpass (6 lns)	IH 35	At Posey Road	$ 1,800,000	TxDOT
R-46	Widen SH 123 to 5 lanes	IH 35	County Line Rd	$ 1,200,000	TxDOT
R-47	Intersection Improvements at SH 123 and FM 621	FM 621	SH 123	$ 100,000	TxDOT
Bicycle and Pedestrian Projects					
BP-21	Construct Purgatory Greenway Trail	ETJ	San Marcos River Trail	$ 5,000,000	City of San Marcos
BP-22	Construct trail connection across RM 12 to connect to Franklin	Sessom	Franklin	$ 250,000	City of San Marcos
BP-23	Lime Kiln Road - Sign and stripe bike lanes	Post Road	Hilliard Road	$ 200,000*	City of San Marcos
BP-24	Lime Kiln Rd. - Sign and stripe bike lanes	Hilliard Road	W. Outer Loop	$ 144,000*	City of San Marcos
BP-25	River Ridge Parkway - Sign and stripe shoulder bike lanes	IH 35	Post Road	$ 103,000*	City of San Marcos
BP-26	Comanche Street - Sign and stripe bike lanes	Sessom	MLK	$ 101,000*	City of San Marcos
BP-27	Old Bastrop Hwy - Sign and stripe shoulder bike lanes	E. Outer Loop	IH 35 South	$ 696,000*	City of San Marcos
BP-28	New 4-Lane divided arterial - Sign and stripe shoulder bike lanes	W. Outer Loop	Old Bastrop Hwy. at IH 35 S	$ 624,000*	City of San Marcos
BP-29	Craddock South - Sign and stripe shoulder bike lanes	Craddock Southern Term.	Wonder World Drive	$ 99,000*	City of San Marcos
BP-30	Stagecoach Trail - Sign and stripe bike lanes	Craddock	W. Outer Loop	$ 200,000*	City of San Marcos
BP-31	Cape Road - Sign and stripe bike lanes, add shoulders as needed			$ 100,000	City of San Marcos
			Total Estimated Cost	**$215,849,000**	

* This includes only construction costs; other elements, such as contingency costs, are included with the roadway cost estimates in Table ES-3.

Chapter 1
Introduction

A Transportation Master Plan is one of the most important tools to facilitate orderly urban and rural development, as it guides the location and type of roadway facilities that are needed to meet projected growth within an area. It enables cities and counties to determine and plan for their existing and future transportation improvement needs and to acquire adequate rights-of-way. A Transportation Master Plan is a means of assuring that basic infrastructure needs and right-of-way will be available when travel demand warrants new or improved highway facilities.

STUDY BACKGROUND AND PURPOSE

According to the U.S. Census Bureau, the population within the San Marcos study area has grown from 28,743 persons in 1990 to 34,733 persons in 2000. This represents an annual growth rate of approximately 1.9 percent per year. Significant commercial and residential developments have occurred over the past several years, which have and continue to increase traffic volumes on the study area's transportation system.

The purpose of this study was to develop a Transportation Master Plan for the City of San Marcos, which included recommended roadway improvements needed to accommodate travel demands though the year 2025. An implementation program that prioritized the recommended Plan improvements was also developed and included short-term (2003-2007), intermediate-term (2007-2012), long-term (2012-2025), and long-range elements (beyond 2025 or as development warrants). The City of San Marcos is located in the middle of the fast growing Austin-San Antonio Corridor, and this area is projected to continue experiencing population and employment growth resulting in associated mobility and access improvement needs. Potential roadway improvements considered included the widening of some roadways, extensions of others, or construction of new facilities. The study involved an evaluation of various roadway improvements and considered impacts related to traffic/mobility, engineering/costs, and environmental/land use.

This Transportation Master Plan identifies needed transportation improvements as well as their traffic and land use impacts, which can be used by the City of San Marcos, Texas Department of Transportation (TxDOT) and other involved agencies in prioritizing and implementing roadway construction projects over the next 20-25 years. The City of San Marcos Transportation Master Plan is a comprehensive planning document that assembles required data, assesses existing and future transportation development needs, provides policy direction, recommends prioritization of improvements, and identifies responsible agencies and funding sources. Projects that are identified in this plan can then be submitted to City Council, the Transportation Advisory Board, Planning and Zoning Commission, CAMPO and TxDOT for their consideration, programming, funding and implementation.

GOALS AND OBJECTIVES

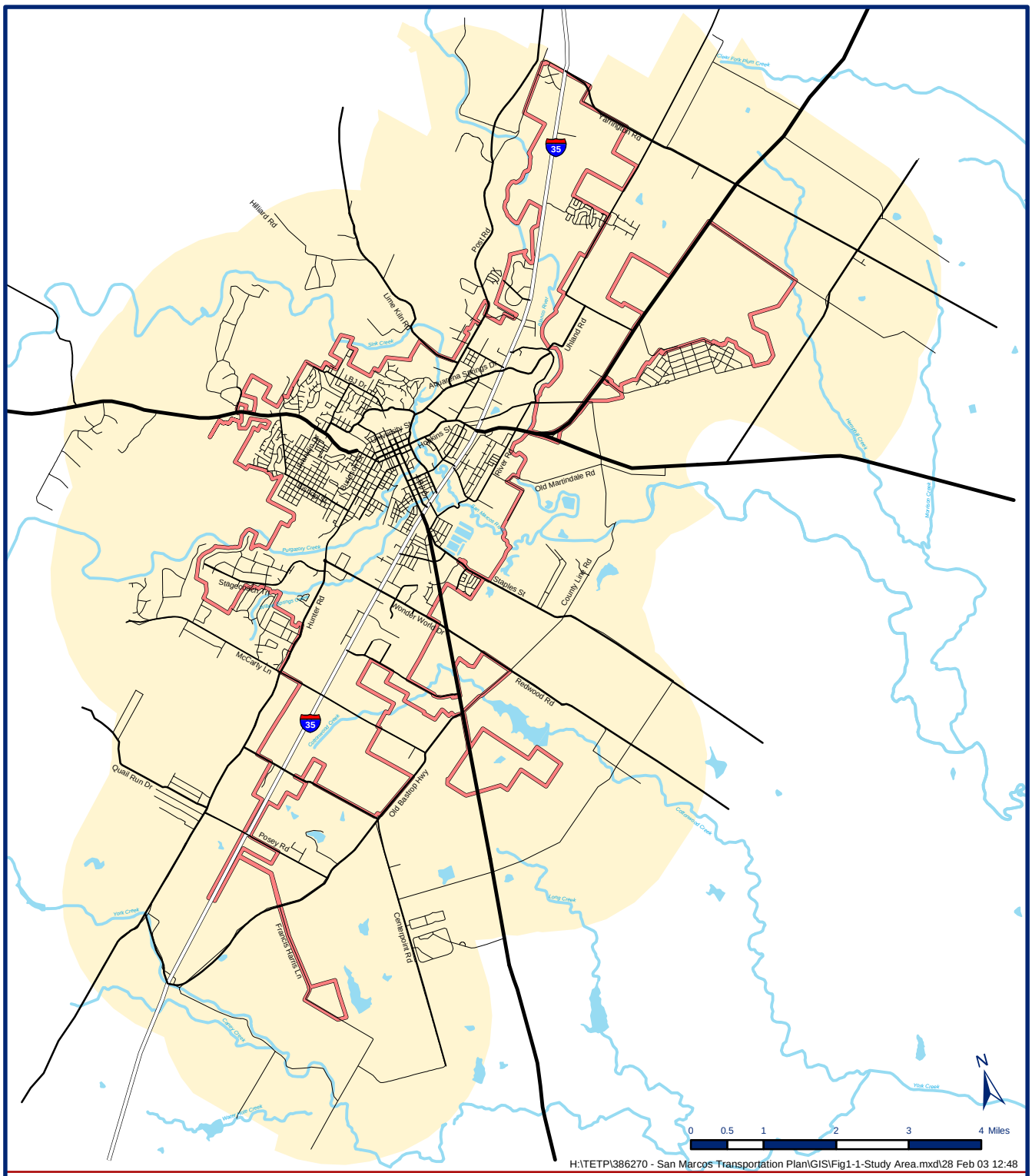
In 1996, the San Marcos Comprehensive Plan's Citizen Advisory Committee issued a vision statement for their community. The Committee envisioned San Marcos as "a community that

offers a wide range of transportation options and has a safe and efficient street system." With input from City Staff, Transportation Advisory Board members, Technical Advisory Committee and Stakeholders, goals and objectives were developed to guide the development of the Transportation Master Plan. The development of the Transportation Master Plan strives to achieve the vision goal by accomplishing the following 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.

STUDY AREA

The study area for this project is the City of San Marcos, and an area that generally extends two miles beyond the city limits to include the City's extraterritorial jurisdiction, as shown in **Figure 1-1**. Major state highways in the study area include Interstate 35, State Highways 21, 80, 123 and Loop 82, Ranch-to-Market Road 12, and Farm-to-Market Roads 3407 and 621. These state roadways form the skeleton of San Marcos's transportation network, and serve as major arterials as well. For instance, Loop 82 is also known as Aquarena Springs Drive, a major arterial connection between IH 35 and Texas State University-San Marcos. RM 12 is also known as Hopkins Street, another major arterial that links IH 35 with Downtown San Marcos. FM 3407 is also called Wonder World Drive. Other local streets are important to traffic circulation within the City, such as Sessom Drive and Post Road.



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San Marcos Transportation Master Plan

Wilbur Smith Associates

Legend

San Marcos City Limits

San Marcos City Limits And ETJ

Figure 1-1
Study Area

San Marcos Transportation Master Plan
San Marcos, TX

STUDY PARTICIPANTS

The development of the San Marcos Transportation Master Plan was a cooperative effort between the City of San Marcos and other local governmental agencies. A Technical Advisory Committee (TAC) was formed to provide guidance and technical expertise throughout the study process. 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. In addition to the TAC, the Transportation Advisory Board members took an active role in the Plan's development, and led Stakeholder meetings to gain public input from a broad range of key community stakeholders.

Four TAC and Stakeholder committee meetings were held throughout the course of the study. The first meeting (Project Kickoff Meeting) was conducted on January 15, 2003. The primary purpose of this meeting was to introduce the project and receive input regarding transportation issues in the study area. The second meeting, conducted on May 21, 2003, provided the opportunity for the TAC and Stakeholder members to review existing conditions, see future travel forecasts, review input from the first public meeting and to plan for the second public meeting.

The third TAC and Stakeholder meetings were held on August 20, 2003 and included a review discussion of Public Meeting 2, a review of the travel demand model status, and developed project concepts that could help improve mobility. The fourth meetings were held on October 22, 2003 and included a presentation of the preliminary draft Transportation Master Plan.

PURPOSE AND BENEFITS OF A TRANSPORTATION PLAN

Transportation planning is the process used by municipalities and other governmental entities to provide for the development of an efficient and appropriate transportation system to meet existing and future travel needs. The primary purpose is to ensure the orderly and progressive development of the urban and rural street system to serve the mobility and access needs of the public. Transportation planning is interrelated with other components of the urban planning and development process.

The Transportation Master Plan is the City's adopted general plan for guiding transportation system improvements, including the existing and planned extension of major highways. The transportation system is comprised of existing and planned freeways/expressways, arterials, collectors and local streets, which could require wider or new rights-of-way for needed improvements. The primary objective of the Transportation Master Plan is to ensure the preservation of adequate right-of-way (ROW) on appropriate alignments and of sufficient width to allow the orderly and efficient expansion and improvement of the transportation system to serve existing and future transportation needs.

The benefits provided by effective transportation planning are realized by achieving the following objectives:

- 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); and,
- Providing an implementation program to prioritize improvements and identify funding sources.

ELEMENTS OF A TRANSPORTATION PLAN

The San Marcos Transportation Master Plan delineates a system of thoroughfare classes, representing the general location, alignment, and functional relationship for different types of roadways, including freeways, expressways, arterial streets, collectors and local streets. It consists of an officially adopted thoroughfare system map, along with supporting design criteria and implementation policies. Typically, thoroughfare system maps indicate whether existing rights-of-way for thoroughfares have sufficient existing width or need to be widened, and show the planned extensions of thoroughfares on new alignments where right-of-way needs to be acquired in the future.

An implementation program was also developed, which prioritizes improvements for short-term, intermediate-term and long-term, and long-range projects. Order-of-magnitude construction costs were developed for the improvements, along with a listing of potential funding sources and responsible agencies.

PUBLIC INVOLVEMENT

A critical component of this study was input from key stakeholders in the study area. The public involvement plan created for the San Marcos Transportation Master Plan consists of a variety of activities and components, all centered on obtaining meaningful input from the public concerning transportation issues in the City.

Website

Throughout the plan development process, stakeholders and interested parties had access to a project website containing background about the project and the latest news. Accessible at the address www.wilbursmith.com/sanmarcostmp, this interactive tool allowed interested parties to provide input and feedback as well as learn about the Plan. The site was accessible via a link from the City of San Marcos's website.

Public Meetings

A total of 22 public meetings were held for this project. These included TAC, Stakeholder and TAB meetings held as part of the TMP's development; meetings with City Council and the Planning and Zoning Commission; three general public meetings, which were televised community-wide; and neighborhood meetings conducted in each quadrant of the City.

The first public meeting was held on March 5, 2003. Citizens viewed and commented on graphics of current transportation roadways, bike lanes, pedestrian areas, as well as railways. This input assisted the City and the consultant team in their transportation planning tasks. The second public meeting consisted of four separate focus community group meetings held in July 2003. Citizens identified alternative transportation improvements and their potential impacts. The meetings were held in different locations across the City to expand the participation by all citizen groups. The final public meeting, conducted on March 11, 2004, provided the public an opportunity to review the draft final recommended Transportation Master Plan, and to provide comments.

Chapter 2
Existing Transportation Conditions

This chapter identifies the existing transportation conditions of the City of San Marcos Extraterritorial Jurisdiction (ETJ), including the following:

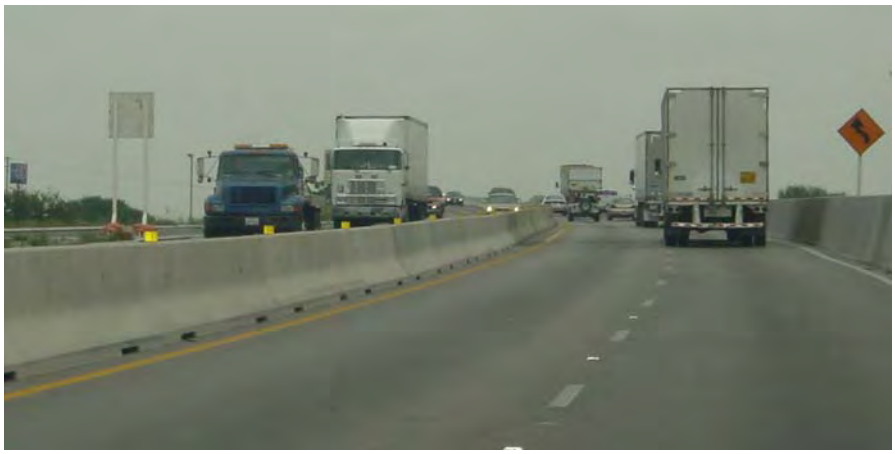
- Major Roadways
- Function Classifications
- Transportation System Operations
- Environmental Issues
- Proposed Transportation Improvements

MAJOR AREA ROADWAYS

The City of San Marcos is served by one interstate and several state highways that provide the basic framework of transportation facilities in the area. The Texas Department of Transportation (TxDOT) maintains the state roadways located in the area, and the City of San Marcos and Hays County maintain roadways that are not part of the state system. Study area roadways range from a six-lane interstate highway to two-lane local streets. Existing roadway travel lanes for the roadway network are shown in **Figure 2-1.**

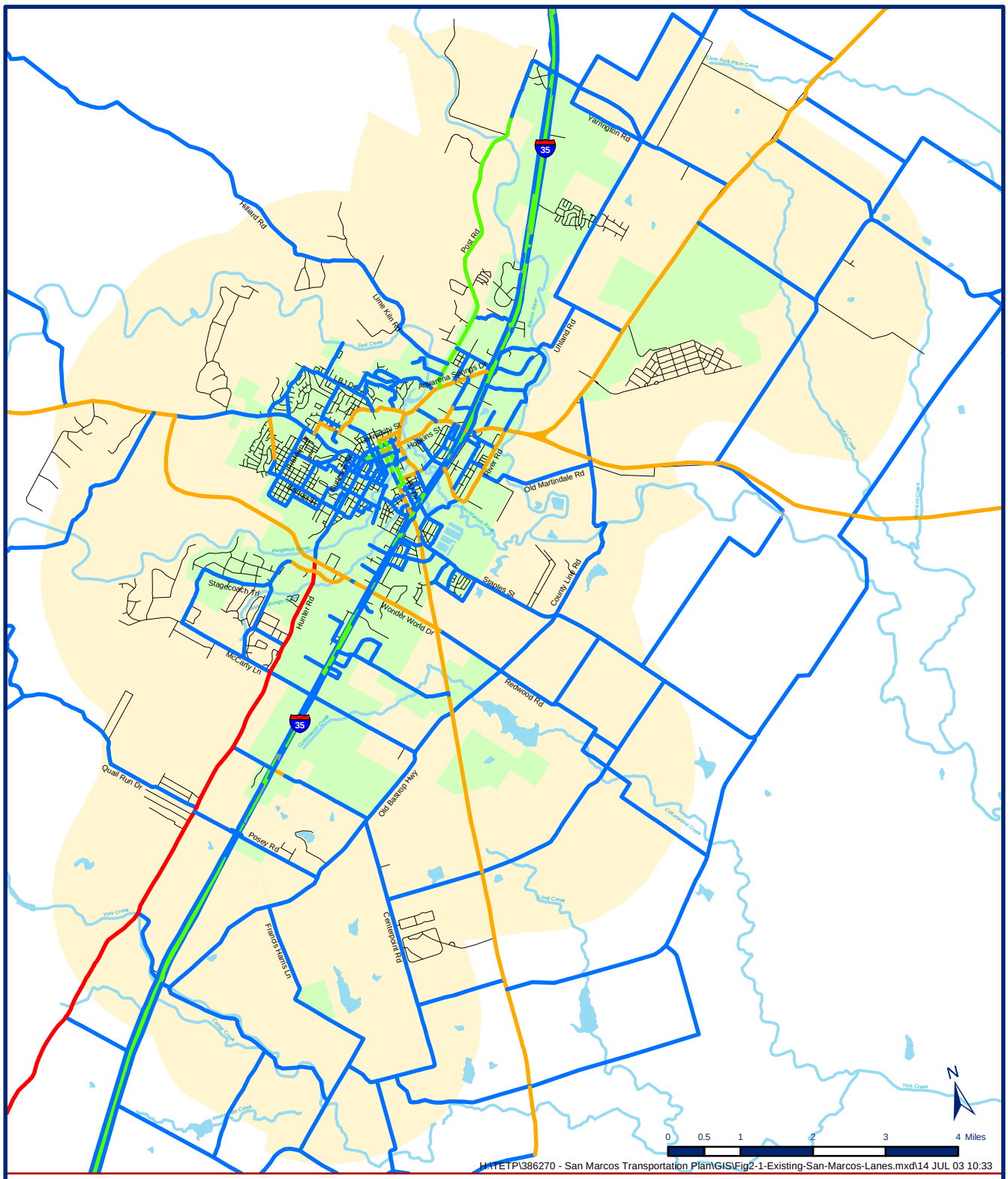
Interstate Highways

Interstate 35 is the only interstate highway facility serving the area, extending in a southwest to northeast direction. It is a controlled access facility that traverses the southeastern portion of Hays County. IH 35 connects San Marcos to the Austin urbanized area to the north, and to the New Braunfels and San Antonio areas to the south. Access to and from IH 35 is provided by grade-separated interchanges, and frontage roads on both the east and west sides of the freeway.



Construction on IH 35 will expand the freeway to six lanes throughout the study area.

IH 35 is a four to six lane divided roadway with a posted speed limit ranging between 55 and 70 mph within the study area. TxDOT is currently in the process of widening the remaining 4-lane sections of IH 35 to six lanes. It is an asphalt facility with shoulders barrier separated by a median. The frontage roads throughout most of the study area are one-way and 2-3 lanes in each direction; portions of the frontage roads remain two-way, two-lane facilities.



San Marcos Transportation Master Plan

Wilbur Smith Associates
ENGINEERS PLANNERS ECONOMISTS

Legend

San Marcos City Limits

San Marcos City Limits And ETJ

Number of Lanes:
- 2
- 3
- 4
- 5

Figure 2-1
Existing Roadway Travel Lanes

San Marcos Transportation Master Plan
San Marcos, TX

US Highways

No roadway in the San Marcos TMP study area is designated as a US Highway.

State Highways

There are four state highway facilities serving the City of San Marcos - State Highway 80 (SH 80), SH 123, SH 21, and Loop 82. TxDOT maintains these roadways. SH 80 is a four-lane roadway that intersects IH 35 near the center of the study area, and travels toward Luling. SH 80 is an important facility serving the east side of San Marcos, and connects to Ranch Road 12, Hopkins Street and downtown San Marcos on the west side of IH 35.

Construction at SH 80 and SH 21

SH 123 connects San Marcos to Seguin to the south, and Guadalupe Street in central San Marcos. It is a 4-lane facility, and has a posted speed ranging from 30 mph downtown to 65 mph near the study area boundary. SH 21 is a four-lane roadway that begins at SH 80 on the east side of San Marcos, and continues toward Bastrop County. The posted speed limit is 65 mph.

Loop 82 at Post Road

Loop 82 begins approximately 1.4 miles northeast of downtown San Marcos at IH 35, then travels through San Marcos to rejoin IH 35 south of downtown, a distance of approximately 3.1 miles. On its northern end, it serves as an access point to two important destinations, Aquarena Springs and Texas State University-San Marcos. It is a four-lane facility, with posted speeds ranging between 35 and 45 mph.

Farm-to-Market and Ranch-to-Market Roads

There are several farm-to-market and ranch-to-market highway facilities serving the San Marcos area that provide connections between major highway facilities and residential and commercial centers and recreational areas. TxDOT maintains these FM and RM roadways, including Ranch Road 12 (RM 12), FM 621, FM 2439 and FM 3407.

Ranch Road 12 traverses the center of San Marcos.

These FM roadways are generally two lane facilities. RM 12 provides an important link between IH 35 and the center of downtown, and connects San Marcos to Wimberley. FM 1984 intersects SH 80 at Martindale. FM 621 intersects SH 123 east of IH 35 continues toward Staples. FM 2439 travels from central San Marcos toward Hunter in Comal County. FM 3407 provides access to the Central Texas Medical Center and related facilities, and is an important crosstown route on the south side of the City, connecting FM 2439/Hunter Road west of IH 35 to SH 123 east of IH 35.

Sessom Drive through the campus of Texas State University-San Marcos

Local Roads

The local street network mostly consists of neighborhood streets, which are predominantly 2 lanes, and have speed limits of 30 mph. A few sections of the local non-state roads are 4 lanes. County Roads in outlying areas provide connections to the state system.

EXISTING FUNCTIONAL CLASSIFICATION

Functional classifications of transportation facilities are designed to describe the hierarchical arrangement and interaction between various roadways. These classifications may change over time, as the function of roadways changes to serve different land uses or other transportation facilities. As an area becomes more developed, roads that have previously been classified in one category may be reclassified to a higher category.

The City of San Marcos's current functional classification system, as shown in **Figure 2-2**, classifies the City's roadway network into the following categories:

Freeways/Expressways

These facilities include interstate highways, freeways, expressways, and loops and provide for the rapid and efficient movement of large volumes of traffic between regions and across the urban area. Direct access to abutting property is not an intended function of these facilities. Design characteristics support the function of traffic movement by providing multiple travel lanes, a high degree of access control, and few or no intersections at grade.

Parkways

Parkways are designed to provide for high-speed traffic movement, with minimal property access. This category provides a classification that combines higher speed travel (45 mph) and high volume movement of a freeway with limited property access, such as an arterial provides.

Arterial Streets

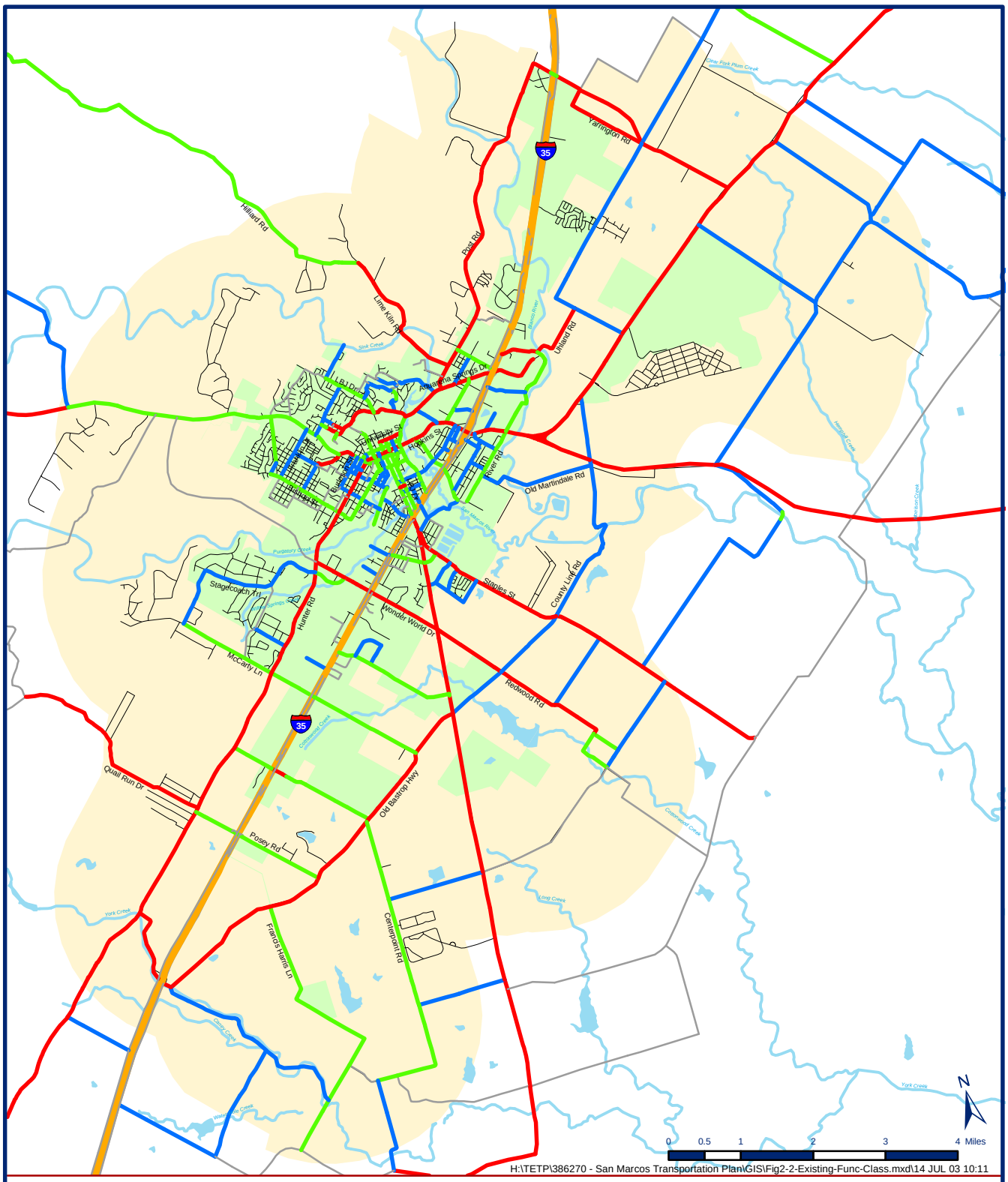
Arterials primarily provide for traffic movement, with a secondary function being the provision of direct access to abutting property. Major arterials typically serve as connections between major traffic generators and land use concentrations, and facilitate large volumes of through traffic traveling across the community. Minor arterials typically serve as connections between local/collector streets and major arterials, and facilitate the movement of large traffic volumes over shorter distances within the community. Because direct access to abutting property is a secondary function of arterial streets, access should be carefully managed to avoid adverse impacts on the movement function intended for these facilities.

Collector Streets

Collector streets provide for a balance of the traffic movement and property access functions. Traffic movement is often internal to local areas and connects residential neighborhoods, parks, churches, etc., with the arterial street system. As compared to arterial streets, collector streets accommodate smaller traffic volumes over shorter distances.

Local Streets

Local streets function to provide access to abutting property and to collect and distribute traffic between parcels of land and collector or arterial streets.



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San Marcos Transportation Master Plan

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- San Marcos City Limits
- San Marcos City Limits And ETJ

Roadway Functional Class:

- IH-35
- Major Arterial
- Minor Arterial
- Collector

Figure 2-2
Existing Functional Classifications

San Marcos Transportation Master Plan
San Marcos, TX

PUBLIC TRANSPORTATION

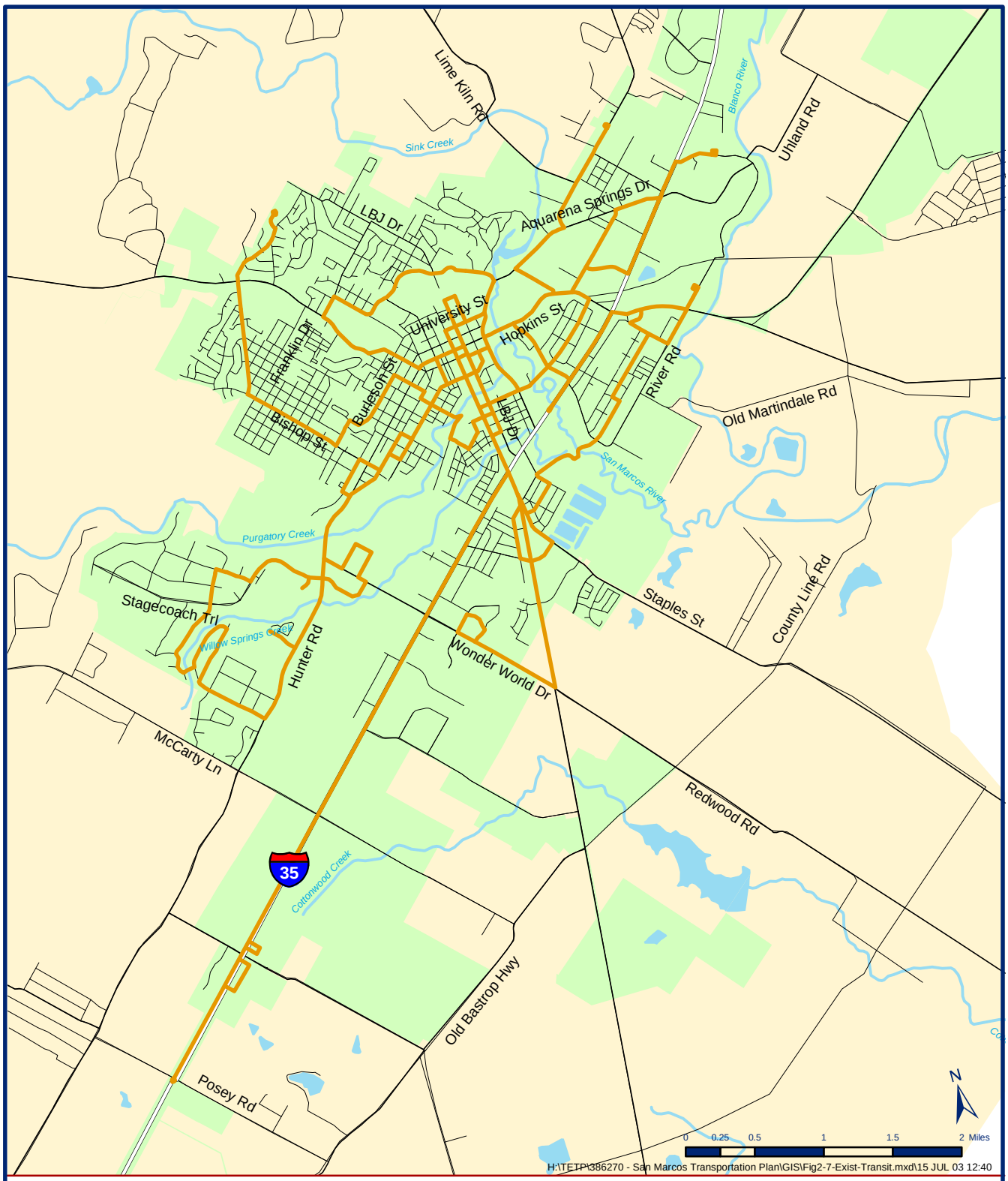
The CAT (CARTS Around Town) is operated by the Capital Area Rural Transportation System (CARTS). Partners in this service include the City of San Marcos and the Texas Department of Transportation (TxDOT). The fixed-route transit service is wheelchair accessible. Routes circulate every hour, Monday through Friday from 7 a.m. to 6 p.m., except for major holidays. A total of 10 routes operate throughout the City, and radiate out into the community from the San Marcos Station central hub.

There is the potential for a future intermodal transportation center, which could combine access by bus, commuter rail, bicycle, walking or by passenger vehicle, but the current intermodal site is not accessible by rail. In addition, sidewalks are needed in the vicinity of the current intermodal center.

One-way fares are 50 cents, with children under five riding free, and persons with disabilities, senior citizens over age 60, and students in high school and earlier grades riding for 25 cents each trip. Passes may also be purchased at the Station and local grocery stores. Paratransit service may also be arranged for those passengers unable to use the fixed-route system. Transit routes are contained in **Figure 2-3.**

San Marcos Station is a multi-modal transportation center developed and operated by the Capital Area Rural Transportation System (CARTS). This center serves as the hub for the CARTS Around Town (CAT) local transit service.

In addition to CARTS service, Texas State University-San Marcos operates its own shuttle system to serve students, called the TxTRAM Shuttle Bus System. The TxTRAM system is operated for students, faculty and staff, and is designed to alleviate campus parking and traffic congestion. The student fee is paid at registration, and the student body must approve any changes in the fee. In addition, faculty and staff members must pay for the system fees. The system is in full operation on all scheduled class and final exam dates. No service is provided on



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- San Marcos City Limits
- San Marcos City Limits And ETJ
- Existing Transit Service

Figure 2-3
Existing CARTS Around Town Transit Service

San Marcos Transportation Master Plan
San Marcos, TX

weekends or official university holidays, and there is no in-town (apartment) service during the summer months. All buses meet Federal Americans with Disabilities Act requirements.

There are 3 campus routes; Bobcat Stadium, Bobcat Village and Campus Loop. These routes service the commuter parking lots, as well as provide cross-campus travel. The Bobcat Stadium route runs from the Student Center Bus Loop to the Strahan Coliseum and Bobcat Stadium parking lots located on the east edge of campus.

The Bobcat Village route runs from the Student Center Bus Loop to the Strahan Coliseum parking lot and the new commuter parking lot adjacent to the Bobcat Village Apartments. The Campus Loop route runs from the Soccer field parking lot (Medina Parking Lot), located on the west edge of campus, to the Student Recreation Center, Science Building and Roanoke Street (Commons Hall), Lantana Hall, Sewell Park and LBJ Student Center.

In addition to the campus circulator routes, there are five routes serving the San Marcos area and one route to Austin. All off-campus routes originate at the Student Center, except for the Clarewood Route, which originates on Roanoke Street (across the street from Flowers Hall). All off-campus service ends at 6:00 p.m. on Fridays. Night buses make three runs originating from the Student Center at 8:35, 9:35 and 10:35 p.m. Monday-Thursday. The night bus is outbound only and will transport students to any authorized TxTRAM stop on campus or in the San Marcos area.

BICYCLE AND PEDESTRIAN INFRASTRUCTURE

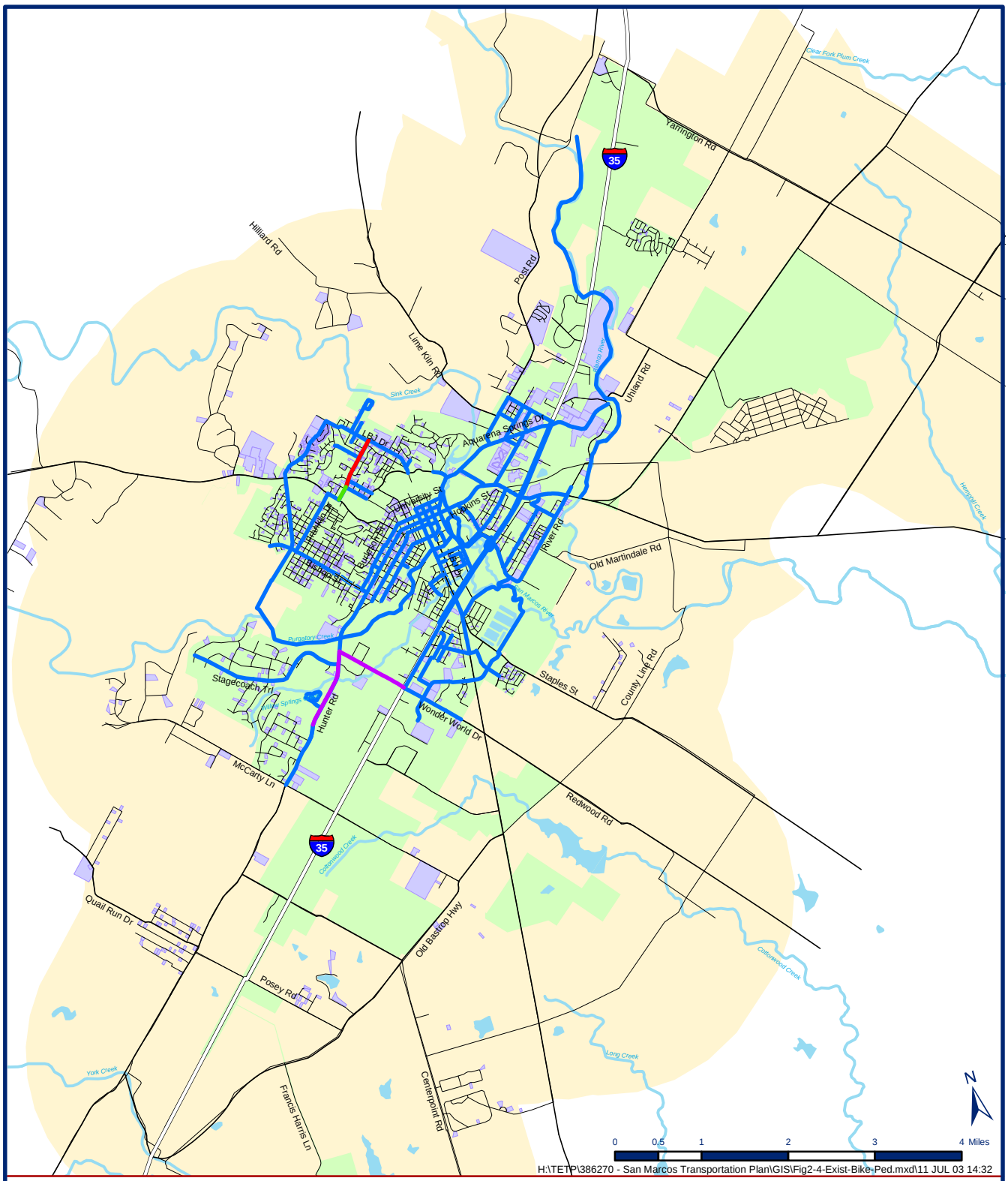
Background

Major arterial lane widths generally are not wide enough to allow bicycles to travel safely. There is an additional concern for pedestrians on thoroughfares without sidewalks. Only one thoroughfare, a portion of East Hopkins Street, has sidewalks on both sides of the street (except across the San Marcos River bridge). Collector streets are generally characterized by two-lane, two-way traffic. Most collector streets outside of residential neighborhoods do not have sufficient room for bicycles to travel safely outside the main lanes of travel. Collectors in residential neighborhoods are wider, especially in older neighborhoods, and allow more room for bicyclists and pedestrians. Many local streets are not wide enough to allow bicyclists and pedestrians to travel safely. **Figure 2-4** identifies major bicycle and pedestrian facilities.

Bicycle/Pedestrian Facilities Inventory

An inventory study of existing sidewalks and bicycling facilities was conducted by Wilbur Smith Associates during June 2003. All thoroughfares and collector streets were identified by the following criteria:

- Availability of sidewalks (yes or no and location, if applicable);



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- San Marcos City Limits
- San Marcos City Limits And ETJ
- Student Residence
- Bike Lanes
- Bike Route
- Existing Shoulders
- Sidewalk
- Intermittent Sidewalk

Figure 2-4
Existing Bike and Pedestrian Facilities

San Marcos Transportation Master Plan
San Marcos, TX

- Direction of travel (one way or two-way traffic);
- Number of lanes;
- Type of construction (improved or unimproved);
- Pavement condition;
- Availability of parking (yes or no and location, if applicable); and
- Comments.

This inventory, as well as a more in depth analysis of bicycle and pedestrian issues, is contained in **Chapter 6 – Bicycle and Pedestrian Element**.

Pedestrian and Bicycle Access to Schools

The majority of schools in the City do have sidewalks immediately adjacent to them. However, some schools do not have sidewalks on streets in the immediate neighborhoods that appear to serve as a pedestrian route to the schools.

Sidewalks are shown along Hopkins Street.

Thoroughfare Assessment

There are several major thoroughfares that bisect the City. The majority of the thoroughfares have no sidewalks. Further analysis is provided in a subsequent TMP chapter, including recommendations for potential improvements that would enhance mobility for bicyclists and

pedestrians. A neighborhood level assessment of pedestrian and bicycle facilities will be included in that chapter of the TMP.

Transit Center

Currently, there are no bicycle or pedestrian facilities leading to San Marcos Station.

Existing Trails

There is an existing trail system along the San Marcos River in the central section of the City. The trail network runs from the Tourist Information Center to City Park. The graphic below identifies the existing trail system.

Conclusions

The greatest concentration of sidewalks is located in the downtown area. Every street that surrounds the Hays County Courthouse has sidewalks and dedicated on-street parking facilities. The only other areas where sidewalks are concentrated are in new residential developments. Sidewalks are also located adjacent to new commercial development as well. There are

intermittent sidewalks on City streets adjacent to Texas State. One dedicated bicycle lane (in both directions) in the City was noted on Holland Street.

EXISTING TRAFFIC SIGNAL LOCATIONS

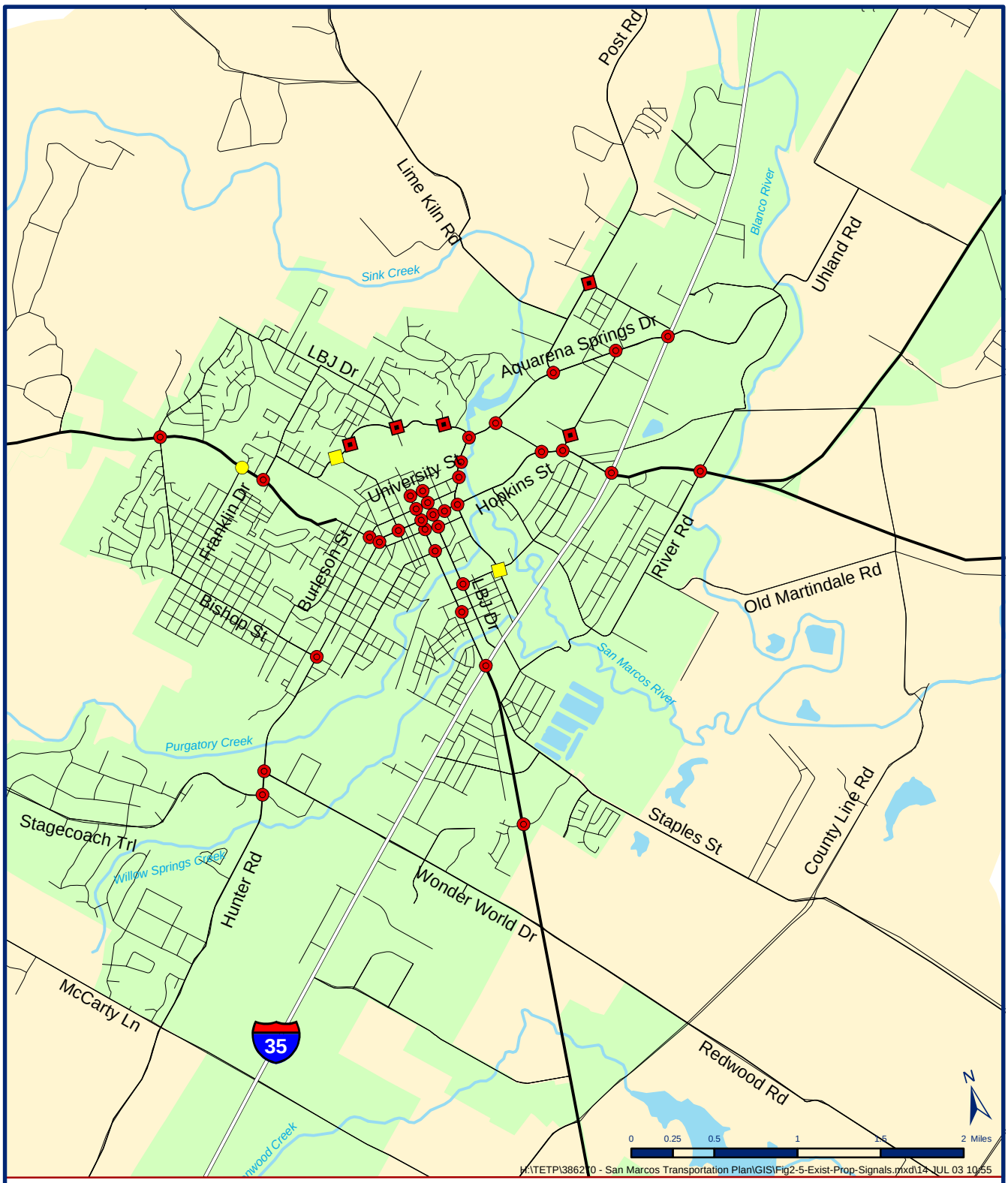
Facilitation of traffic flow on the roadway network is provided through the application of traffic control devices such as traffic signals, pavement markings, and traffic signs. Of these, traffic signals have the greatest impact on the traffic flow and roadway capacity. There are 39 existing signalized intersections within the City of San Marcos (5 with operated by the City and 34 operated by TxDOT), located at major intersections along arterials and collector streets. Locations of existing traffic signals in the City of San Marcos are shown in **Figure 2-5**.

EXISTING SPECIAL TRAFFIC GENERATORS

In reviewing the transportation system, the location and character of special traffic generators are considered, as they influence traffic volumes and flow patterns. Special generators within the study area include City of San Marcos and Hays County government offices, including City Hall and related offices; County Courthouse and offices; the San Marcos Municipal Airport; Texas State University-San Marcos; the Outlet Mall; Central Texas Medical Center; San Marcos Consolidated Independent School District facilities; park and recreation facilities, including Wonder World and Aquarena Center; the Central Texas Medical Center facilities; major employers; and major retailers. The locations of special traffic generators in the City of San Marcos are shown in **Figure 2-6**. A written description of special traffic generators is provided in the following sections.

Government Facilities

City of San Marcos City Hall
City Hall, located at 630 East Hopkins is a major traffic generator. With a high concentration of city offices, this is an important activity center.



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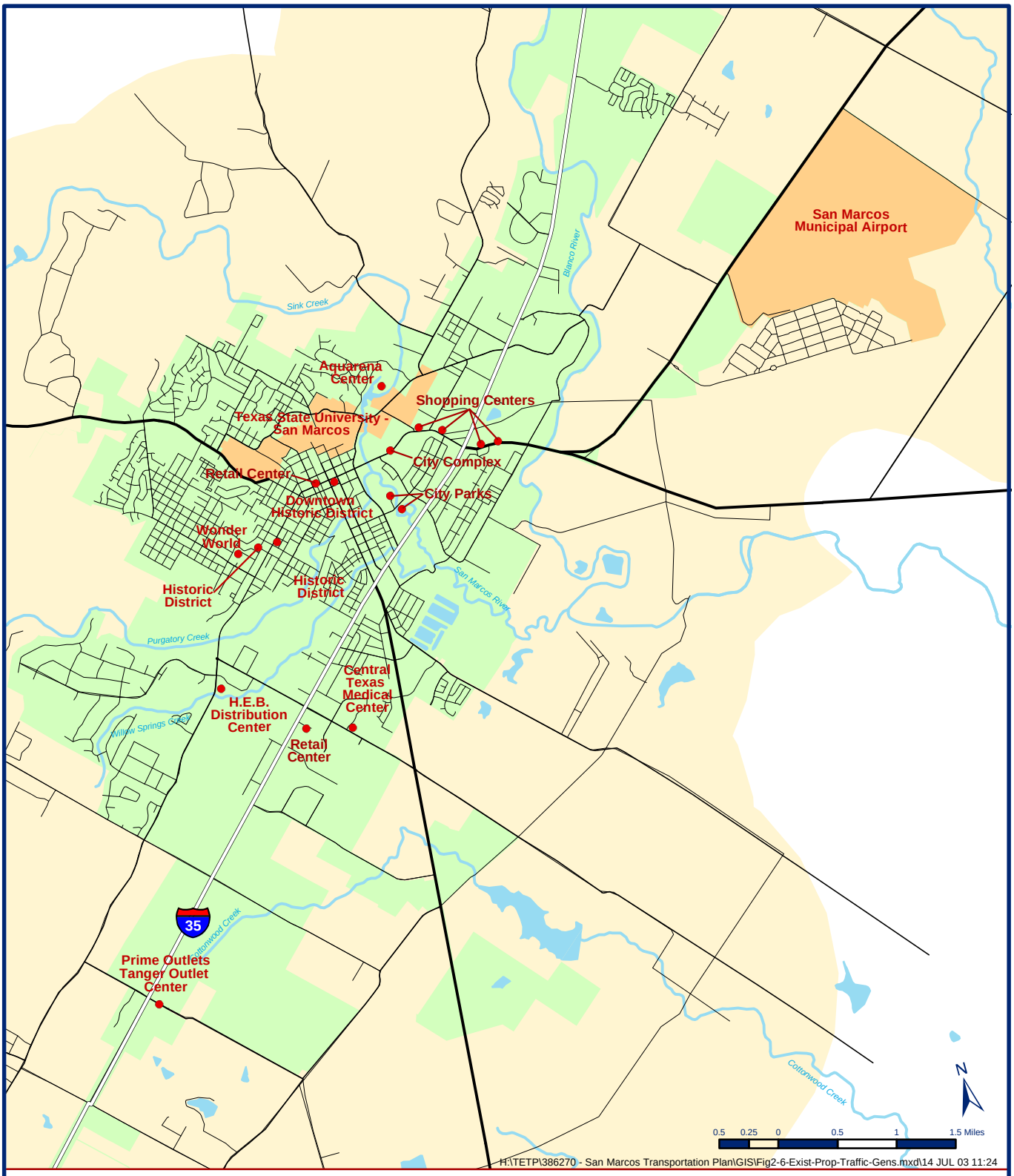
- San Marcos City Limits And ETJ

Traffic Signals:

- Existing - City of San Marcos
- Proposed - City of San Marcos
- Existing - TxDOT
- Proposed - TxDOT

Figure 2-5
Existing and Proposed Traffic Signals

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

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- San Marcos City Limits
- San Marcos City Limits And ETJ
- Special Traffic Generator

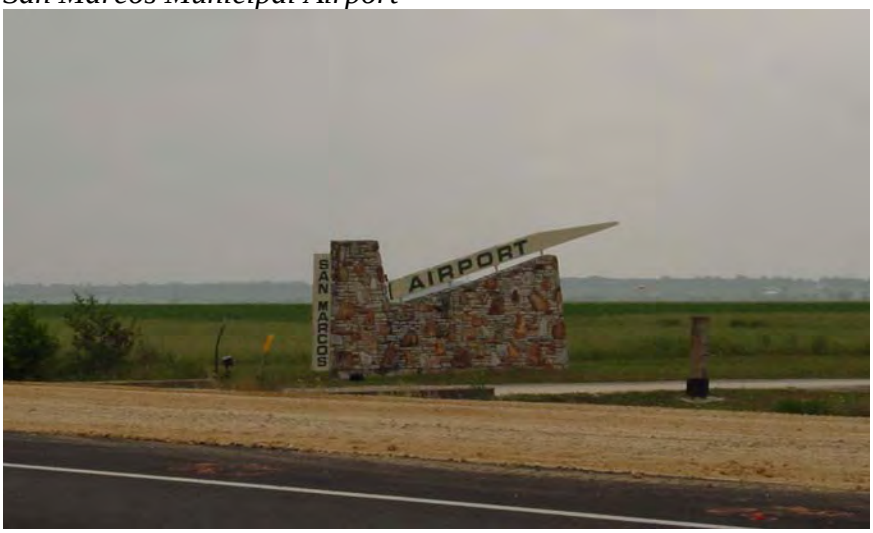
Figure 2-6
Existing and Proposed Special Traffic Generators

San Marcos Transportation Master Plan
San Marcos, TX

Hays County Courthouse and Historic Downtown National Register District

The center of the Courthouse National Register District, the Hays County Courthouse, completed in 1909, is a Texas landmark that has been restored to its original state with a copper dome, mosaic rotunda tiles and historic court room. The Hays County Courthouse square was placed on the National Register of Historic Places in 1992. The style of the building makes it an architectural tourist attraction, and the nature of its business makes it a large traffic generator.

San Marcos Municipal Airport



The San Marcos airport is located in a strategic location – it is near IH 35, three miles from downtown San Marcos, 25 miles from Austin and 45 miles from San Antonio. With this strategic location, it attracts pilots from all over Central Texas.

San Marcos Public Library
The San Marcos library is located by City Hall at 625 E. Hopkins Street**.** This important facility is also a major trip generator in the downtown area.

Recreational Facilities

City Park Facilities and the San Marcos River
The Parks and Recreation Department maintains 246 acres of park land in San Marcos. The San Marcos River winds through 150 acres of this parkland that includes jogging trails, playground equipment, picnic tables, basketball courts, and volleyball facilities. The river offers canoeing, snorkeling, scuba diving, swimming, fishing, and tubing opportunities.

San Marcos Activity Center
The San Marcos Activity Center offers exercise facilities, meeting rooms and art facilities to the community. This includes the Natatorium with its indoor pool, a 2,000 square foot weight room, game room, day care facility, gymnasium, ball courts, and an 1,800 square foot aerobics room. Many varied classes are offered in this facility for both recreation and education.

Greenhouse Nature Center
The Greenhouse Nature Center is located on Riverside Drive at the IH 35 frontage road.

Aquarena Center
Aquarena Center, located at 921 Aquarena Springs Drive, is dedicated to the protection and preservation of the San Marcos springs. Texas State University – San Marcos purchased the Aquarena Springs Resort in 1994 and began turning the old theme park into a nature center.

Wonder World
Wonder World Park is a Texas Historical Site, featuring an earthquake-formed cave, wildlife park and observation tower. It is located at 1000 Prospect Street, off Exit 202 of IH 35. Wonder World operates year round.

Educational Facilities

Texas State University-San Marcos
Texas State University-San Marcos began its life in 1903, and has undergone several name changes along with continued growth. Undergraduate and Graduate programs are available at TxState. It is a 12 month facility, but the primary school year, and associated traffic impacts, occur for nine of the 12 months. In 2002, approximately 23,500 students attend the University, making it the sixth largest public university in Texas.

Since Texas State is a large and unique traffic generator within the City of San Marcos, it is important to understand how Texas State students and staff travel to the University each day. Therefore, a survey was developed and administered on campus between March 19 and 20, 2003. Students and local residents assisted in distributing the survey at two stations on campus. The following list summarizes the key survey questions and responses from 568 total surveys collected. A copy of the survey and maps used during the survey process are attached in Appendix B. The survey was administered using the "Southwest Texas State University" name, which is used in the survey results. The name of the University officially changed to Texas State University-San Marcos on September 1, 2003.

Question 1 asked the respondent the day and date the survey was completed.

2. **Are you a SWT student or SWT staff?** Of those surveyed, 534 (94 percent) were students, 20 (four percent) were faculty and/or staff members, 10 (two percent) were student staff members, and four (one percent) were visitors to campus.
3. **What city do you live in right now?** Of those surveyed, 409 (72 percent) reside in San Marcos, 80 (14 percent) live in Austin, 15 (three percent) live in New Braunfels, 13 (two percent) live in San Antonio, and 51 (nine percent) live in locations other than those mentioned above.
4. **Please look at the zone map for the city that you live in. Which zone do you live in *(zone maps are provided in Appendix B)*?** Of those surveyed, 152 (27 percent) live within Map 1, seven (one percent) live within Map 2, Zone A, 370 (65 percent) live within Map 2, Zone B, and 39 (seven percent) chose not to respond to this question. Table 1 in Appendix B documents the number of respondents that live in each map and zone number.

5. **If you live in San Marcos, do you live on campus?** Of those surveyed, 288 (51 percent) said no, 124 (22 percent) said yes, and 156 (27 percent) chose not to respond to this question.
6. **How did you get to campus today?** Of those surveyed, 141 (25 percent) drove themselves to campus, 126 (22 percent) walked to campus, 118 (21 percent) rode a bus to campus, 16 (three percent) rode a bike to campus, 13 (two percent) were driven to campus by someone else, and 150 (26 percent) used more than one of the above mentioned methods to get to campus. Four people (one percent) chose not to respond to this question.
7. **If you arrived to campus by car, was the car parked in a University-owned lot?** Of those surveyed, 221 (39 percent) parked in a University-owned lot, while 73 (13 percent) did not park in a University-owned lot.
8. **If you arrived to campus by car, how many occupants were present in the car?** Of those surveyed, 228 (40 percent) were in a car with one occupant, 44 (eight percent) were in a car with two occupants, five (one percent) were in a car with three occupants, and five (one percent) were in a car with four or more occupants.
9. **If you typically arrive to campus by car, do you park in the same lot each time you drive to campus?** Of those surveyed, 224 (39 percent) park in the same lot every time they arrive on campus, while 70 (12 percent) do not.
10. **How many days a week, Monday thru Friday, do you come to campus?** The average respondent comes to campus 4.3 days per week.
11. **How many times today will you come to campus?** The average respondent comes to campus 1.6 times per day.
12. **If you will make more than one trip to campus today, will you use a car for more than one?** Of those surveyed, 142 (25 percent) will arrive on campus in a car multiple times during the day, while 174 (31 percent) will not.
13. **What time did you arrive on campus today?** Due to the variety of responses to this question, such as “9:00 am” or “this morning,” this question was not summarized.
14. **What time will you leave campus today?** Due to the variety of responses to this question, such as “2:00 pm” or “this afternoon,” this question was not summarized.

15. **Where was the last place you were at, before you came to school?** Of those surveyed, 475 (84 percent) came to campus from their homes and 32 (six percent) came from their dormitories. Approximately 61 (11 percent) came from other locations or chose not to respond to this question.
16. **Please look at the zone maps. What zone was the last place you were at, before you came to school?** Of those surveyed, 142 (25 percent) came from an area located in Map 1, 7 (one percent) came from an area located in Map 2, Zone A, 351 (62 percent) came from Map 2, Zone B, and 68 (12 percent) chose not to respond to this question. Attached Table 2 documents the number of respondents that arrived to campus from each map and zone number.
17. **Where will you go after you leave campus today?** Of those surveyed, 436 (77 percent) returned home after leaving campus and 25 (four percent) returned to their dormitories. Approximately 107 (19 percent) traveled to other locations or chose not to respond to this question.
18. **Please look at the zone maps. Which zone will you go to after you leave campus today?** Of those surveyed, 144 (25 percent) will return to Map 1, ten (two percent) will go to Map 2, Zone A, 343 (60 percent) will go to Map 2, Zone B, and 71 (13 percent) chose not to respond to this question. Attached Table 3 documents the number of respondents that will go to each map and zone number after leaving campus.
19. **If a light commuter rail system were built in the future, would you use it?** Of those surveyed, 479 (84 percent) would use a commuter rail system, 57 (ten percent) would not, six (one percent) responded "maybe," and 26 (five percent) chose not to respond to this question.
20. **If more sidewalks were built in the future, would you use them more than you do now?** Of those surveyed, 399 (70 percent) would use sidewalks more often, 139 (24 percent) would not, three (one percent) responded "maybe," and 27 (five percent) chose not to respond to this question.
21. **If more bike lanes were built in the future, would you use them more than you do now?** Of those surveyed, 255 (45 percent) would use bike lanes more often, 278 (49 percent) would not, and 35 (six percent) chose not to respond to this question.

From these survey results, it may be derived that the average person traveling to TxState arrives in a Single Occupant Vehicle, is most likely to live within the surrounding San Marcos area, and would be amenable to trying transportation alternatives in their commute, such as rail transit.

San Marcos Consolidated ISD
A total of 11 schools are part of the San Marcos Consolidated ISD, including 1 preschool, 4 elementary schools, 1 intermediate school, 2 junior high schools, 2 high schools, and an alternative education programs school. Most schools are major traffic generators nine months each year.

The Master's School
The Master's School is a faith-based education institution located at 329 North Street. The school serves grades Kindergarten through Six.

Hill Country Christian School
The Hill Country Christian School is located at 2001 River Road in eastern San Marcos. This facility serves around 100 students and grades Kindergarten through 12.

Texas State Preparatory School
This Charter School is located at 2801 Ranch Road 12 on the west side of San Marcos.

San Marcos Baptist Academy
This Academy is located at 2801 Ranch Road 12 on the west side of San Marcos.

Retail Facilities

Prime Outlets

Outlet Malls
The outlet malls together are the third most visited site in Texas. Two major outlet malls are located next to each other along the IH 35 frontage road in the southeastern portion of the City of San Marcos. Both the Tanger Outlets and the Prime Outlets have approximately 125 stores each. These major tourist attractions and trip generators are important to the City's economy, and generate large volumes of traffic, including visitors from as far away as Mexico.

Medical Facilities

Central Texas Medical Center
Central Texas Medical Center is a growing medical center located at 1301 Wonder World Drive. Like other medical centers, the areas surrounding the hospital building itself turn into activity centers of their own, with supporting facilities. CTMC is a 24-hour operation with multiple shifts and peak travel periods. This is a major trip attractor for residents of San Marcos and several surrounding counties.

EXISTING DAILY TRAFFIC VOLUMES

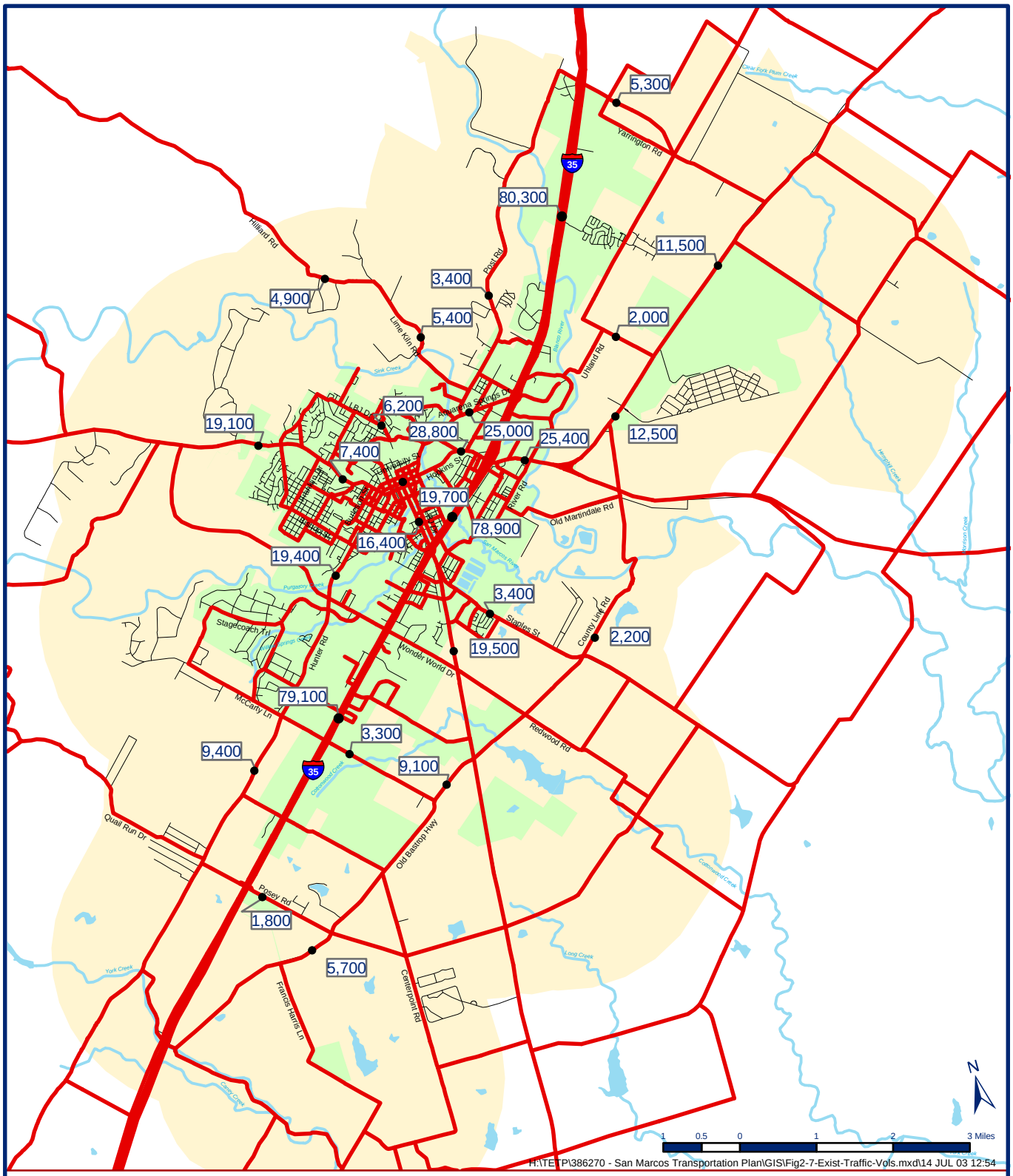
Existing daily traffic volumes within the study area range from approximately 90,000 vehicles per day (vpd) along IH 35 to less than 1,000 vpd along local roadways and rural facilities at the edge of the study area, as shown in **Figure 2-7**. Heavily traveled roadways include Aquarena Springs Drive (highest vpd of 28,200); East Hopkins Street (35,800); Guadalupe Street (33,200); University Drive (25,500); Sessom Drive (20,400); and Ranch Road 12 (19,500)

EXISTING TRAFFIC OPERATIONS

Roadways

Existing traffic operations are evaluated by conducting a capacity/level-of-service analysis. Roadway capacity is defined as the maximum number of vehicles that can be accommodated on a roadway facility during a particular time period under prevailing roadway, traffic, and control conditions. An important result of a capacity analysis is the determination of level-of-service.

Level-of-Service (LOS) is a qualitative measure of operating conditions at a location and is directly related to the volume-to-capacity ratio along roadways, as indicated in **Table 2-1**. LOS is given a letter designation ranging from A to F (free flow to heavily congested), with LOS D considered in most urban areas as the limit of acceptable operation. For example, LOS can be related to the grading scale of a report card: A = excellent, B = good, C = average, D = below average, E = needs improvement, and F = failing. Utilizing procedures identified in the 2000 Highway Capacity Manual and the available traffic data identified previously, level-of-service was determined for principal roadways in the San Marcos Transportation Master Plan study area.



San Marcos Transportation Master Plan

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- San Marcos City Limits
- San Marcos City Limits And ETJ
- 1000 Traffic Volume
- Traffic Model Roadway Network

Figure 2-7
Existing Daily Traffic Volumes

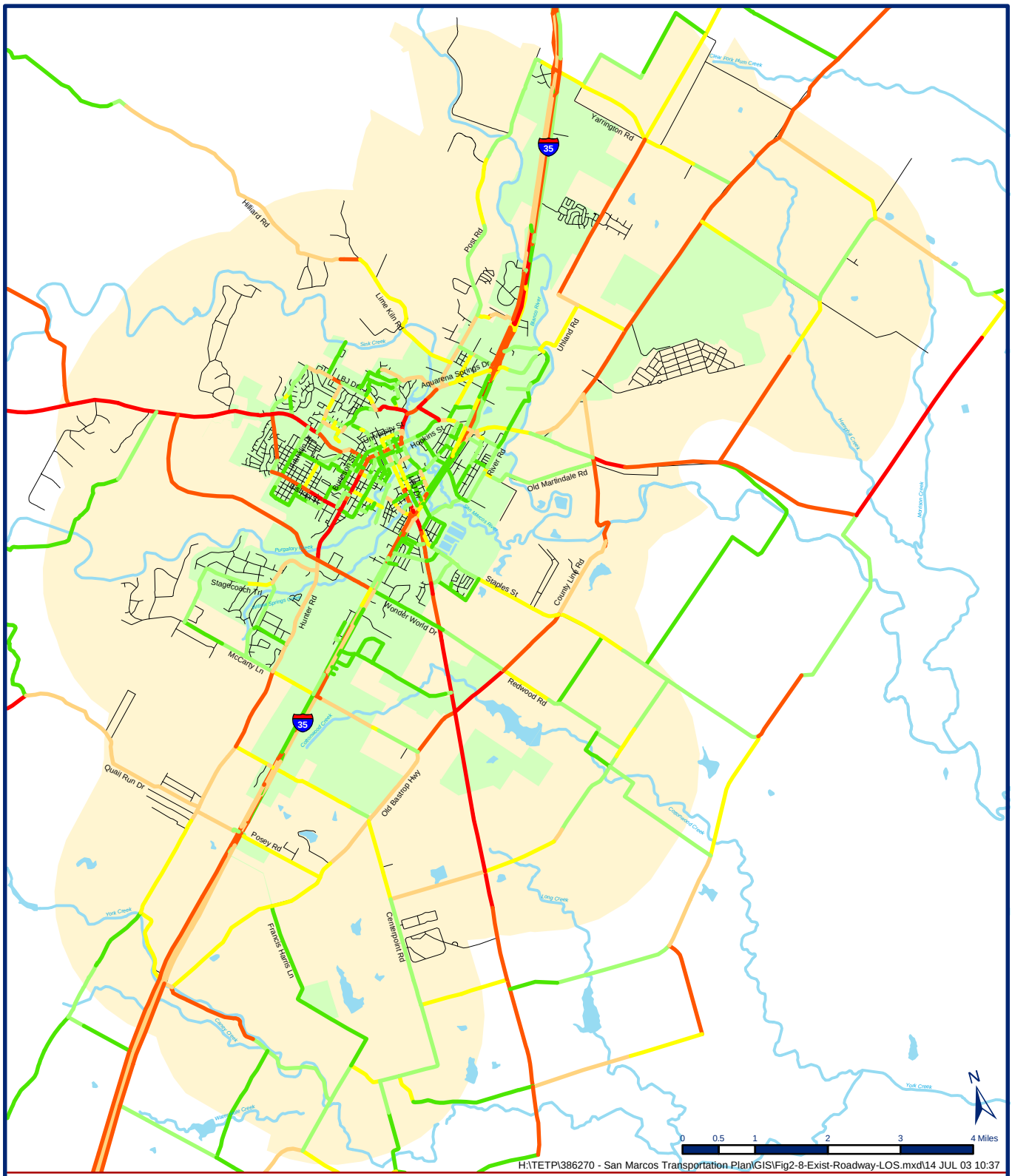
San Marcos Transportation Master Plan
San Marcos, TX

Table 2-1
Level-of-Service Definitions for Principal Roadways
San Marcos Transportation Master Plan
San Marcos, Texas

Level-of-Service (LOS)	Maximum Volume-to-Capacity Ratio (v/c)			Description
	Two-Lane Roadways	Multi-Lane Arterials	Freeways	
A	0.10	0.35	0.35	Very low vehicle delays, traffic signal progression extremely favorable, free flow, most vehicles arrive during given signal phase.
B	0.25	0.50	0.50	good signal progression, more vehicles stop and experience higher delays than for LOS A.
C	0.40	0.65	0.70	stable flow, fair signal progression, significant number of vehicles stop at signals.
D	0.60	0.80	0.85	congestion noticeable, longer delays and unfavorable signal progression, many vehicles stop at signals.
E	1.00	1.00	1.00	limit of acceptable delay, unstable flow, poor signal progression, traffic near roadway capacity, frequent cycle failures.
F	> 1.00	>1.00	>1.00	unacceptable delay, extremely unstable flow, and congestion, traffic exceeds roadway capacity, stop-n-go conditions.

Source: Highway Capacity Manual, Transportation Research Board, 2000

Most roadways within the study area currently operate at acceptable LOS D or better, as shown in **Figure 2-8**. Exceptions, which are operating at LOS F during peak periods, include portions of IH 35 and the IH 35 frontage roads; Guadalupe Street; W. Hopkins Street/Hunter Road; Wonder World Drive; Sessom Drive; SH 80 east of IH 35; Ranch Road 12; University Drive; and Bobcat Drive. Most of the roadways operating at LOS F are around the University, or feed into the University area.



San Marcos Transportation Master Plan

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San Marcos City Limits

San Marcos City Limits And ETJ

Level-Of-Service (LOS):

- A
- B
- C
- D
- E
- F

Figure 2-8
Existing Roadway Level-Of-Service

San Marcos Transportation Master Plan
San Marcos, TX

EXISTING INTERSECTION OPERATIONS

The WSA Team also performed an existing conditions analysis for 27 intersections on six corridors within the San Marcos area. One intersection within the study is a stand alone intersection, not included as part of a corridor. These corridors and intersection were selected through discussions with the City of San Marcos. The corridors and intersections evaluated are as follows:

1. Sessom Drive Corridor - Aquarena Springs Drive (Loop 82) and Sessom Drive, Ed J. L Green and Sessom Drive, State Street and Sessom Drive, Peques Drive and Sessom Drive, N. LBJ Drive and Sessom Drive, Thomas Rivera and Sessom Drive, and Comanche Street and Sessom Drive

2. Comanche Street Corridor – Comanche Street and Sessom Drive, Comanche Street and Students Center Drive, Comanche Street and Woods Street, and Comanche Street and Hopkins Street (RM 12)

3. Thorpe Lane Corridor - Thorpe Lane and Hopkins Street (RM 12), Thorpe Lane and Robbie Lane, Thorpe Lane and Springtown Way, and Thorpe Lane and Aquarena Springs Drive (Loop 82)

4. SH 123 Corridor - IH 35 East Frontage Road and SH 123, IH 35 West Frontage Road and SH 123, Staples Road (FM 621) / Hays Street and SH 123, Broadway and SH 123, and DeZavala Drive / Leah Street and SH 123

5. Wonder World Drive (FM 3407) Corridor - IH 35 East Frontage Road and Wonder World Drive (FM 3407), IH 35 West Frontage Road and Wonder World Drive (FM 3407), Stagecoach Trail and Wonder World Drive (FM 3407), and Hunter Road (FM 2439) and Wonder World Drive (FM 3407)

6. Hopkins Street Corridor - Thorpe Lane and Hopkins Street (RM 12), Bobcat Drive/City Hall Drive and Hopkins Street (RM 12), IH 35 East Frontage Road and Hopkins Street (RM 12), and IH 35 West Frontage Road and Hopkins Street (RM 12)

7. Stand Alone Intersection - Bishop Street and Hopkins Street (FM 2439)

Although the scope of work included only 25 intersections, it was necessary to add two additional intersections. Since the IH 35 West Frontage Road was included within the Hopkins Street Corridor, it was necessary to include the IH 35 East Frontage Road intersection. These intersections are interdependent due to the proximity of the spacing between the signals and the use of a single controller to coordinate the intersections. In addition, although the intersections of Peques Drive at Sessom Drive and State Street at Sessom Drive are closely spaced, the Peques Drive intersection is controlled by a traffic signal, while the State Street intersection is stop sign

controlled. Therefore, the two intersections were analyzed separately. It should be noted that several of the intersections listed above are included in two corridors. Forecasted condition models will account for optimization and progression along both corridors.

Data Collection

In order to document existing traffic conditions, traffic operations were observed on the study area network to note operational problems and traffic patterns. Detailed field data was collected at each intersection to obtain the existing intersection geometry, lane uses, and speed limits. AM and PM peak hour turning movement counts (7-9 AM, 4-6 PM) were collected at each intersection. The AM and PM peak hour counts were performed during the month of April 2003, prior to the end of school. In addition, the City of San Marcos performed turning movement counts at the intersections of Thorpe Lane at Hopkins Street and Thorpe Lane at Aquarena Springs Drive during September and October 2003. These counts were compared to the April counts. The City of San Marcos and the Consultant Team counts were consistent, with the Consultant Team counts slightly higher in most instances. Therefore, the counts were not incrementally adjusted for the analysis.

Intersection Analysis

Two types of intersections to be evaluated are signalized and unsignalized, which use different criteria for assessment of operating levels. The standard used to evaluate traffic conditions at intersections is level of service (LOS), which is a qualitative measure of the effect of a number of factors such as speed, volume of traffic, geometric features, traffic interruptions, freedom to maneuver, safety, driving comfort, convenience, and operating cost.

Signalized Intersection Level of Service

Signalized intersection LOS is defined in terms of delay, which is a direct and/or indirect measure of driver discomfort, frustration, fuel consumption, and lost travel time. The levels of service have been established based on driver acceptability of various delays. The delay for each approach lane group is calculated based on a number of factors including lane geometrics, percentage of trucks, peak hour factor, number of lanes, signal progression, volume, signal green time to total cycle time ratio, roadway grades, parking conditions, and pedestrian flows.

Because delay is a complex measure, its relationship to capacity is also complex. In general, overall intersection levels of service A to D are typically deemed acceptable, while an overall LOS of E or F is unacceptable. **Table 2-2** summarizes the levels of service that are appropriate for different levels of average stopped delay and total delay, and a qualitative description for each.

Table 2-2
Signalized Intersection LOS Measurement and Qualitative Descriptions
San Marcos Transportation Master Plan
San Marcos, Texas

Level of Service	Average Stopped Delay (sec/veh)	Qualitative Description
A	≤ 5.0	Very low vehicle delays, free traffic flow, signal progression extremely favorable, most vehicles arrive during given signal phase.
B	5.1 to 15.0	Good signal progression, more vehicles stop and experience higher delays than for LOS A.
C	15.1 to 25.0	Stable traffic flow, fair signal progression, significant number of vehicles stop at signals.
D	25.1 to 40.0	Noticeable traffic congestion, longer delays and unfavorable signal progression, many vehicles stop at signals.
E	40.1 to 60.0	Limit of acceptable vehicle delay, unstable traffic flow, poor signal progression, traffic near roadway capacity, frequent cycle failures.
F	> 60.0	Unacceptable delay, extremely unstable flow, heavy congestion, traffic exceeds roadway capacity, stop-and-go conditions.

The signalized intersections included within the intersection corridor study are as follows:

1. Aquarena Springs Drive (Loop 82) and Sessom Drive
2. Peques Drive and Sessom Drive
3. N LBJ and Sessom Drive
4. Thomas Rivera and Sessom Drive
5. Comanche Street and Hopkins Street (RM 12)
6. Thorpe Lane and Hopkins Street (RM 12)
7. Thorpe Lane and Robbie Lane
8. Thorpe Lane and Aquarena Springs Drive (Loop 82)
9. IH 35 East Frontage Road and SH 123
10. IH 35 West Frontage Road and SH 123
11. Staples Road (FM 621) / Hays Street and SH 123
12. Broadway and SH 123
13. DeZavala Drive / Leah Street and SH 123
14. Hunter Road (FM 2439) and Wonder World Drive (FM 3407)
15. Bobcat Drive/City Hall Drive and RM 12 (Hopkins Street)
16. IH 35 East Frontage Road and RM 12 (Hopkins Street)
17. IH 35 West Frontage Road and RM 12 (Hopkins Street)
18. Bishop Street and Hopkins Street (FM 2439)

Signal timing and phasing data for most signalized intersections were obtained from the Texas Department of Transportation. Most intersections are signalized with traffic signal controllers that are capable of providing multiple signal cycle lengths. These controllers are fully-actuated within minimum and maximum green phase times. Therefore, for the existing conditions analyses, the signal timing at the intersections was optimized within these ranges.

Signal timing plans were not available for the intersections of N. LBJ at Sessom Drive, Peques Drive at Sessom Drive, Thomas Rivera at Sessom Drive, and Thorpe Lane at Robbie Lane. The signal timing and phasing at these intersections were assumed to be operating at optimal signal timing.

Unsignalized Intersection Level of Service

Unsignalized intersection LOS is defined in terms of average total delay. Total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

The analysis method assumes that major street through traffic is not affected by minor street flows. Major street left-turning traffic and the traffic on the minor approaches will be affected by opposing movements. Stop or yield signs are used to assign the right-of-way to the major street. This designation forces drivers on the controlled street to judgmentally select gaps in the major street flow through which to execute crossing or turning maneuvers. Thus, the capacity of the controlled legs is based upon two factors:

1. The distribution of gaps in the major street traffic stream.
2. Driver judgment in selecting gaps through which to execute their desired maneuvers.

Table 2-3 shows the relationship between the average total delay and the LOS. The overall intersection LOS is computed as a weighted average of the vehicle delay for each movement; therefore, an intersection may have an overall LOS C or D and have individual movements, which are LOS E or F. In general, overall levels of service of A to D are acceptable, while an overall LOS of E or F is unacceptable.

Table 2-3
Unsignalized Intersections: Level of Service Definitions
San Marcos Transportation Master Plan
San Marcos, Texas

Level of Service	Average Total Delay (sec/veh)
A	≤ 5.0
B	5.1 to 10.0
C	10.1 to 20.0
D	20.1 to 30.0
E	30.1 to 45.0
F	> 45.0

The unsignalized intersections included within the study are as follows:

1. Ed J.L. Green Drive and Sessom Drive
2. State Street and Sessom Drive
3. Comanche Street and Sessom Drive
4. Comanche Street and Live Oak
5. Comanche Street and Woods Street
6. Thorpe Lane and Springtown Way
7. Stagecoach Trail and Wonder World Drive
8. IH 35 East Frontage Road and Wonder World Drive
9. IH 35 West Frontage Road and Wonder World Drive

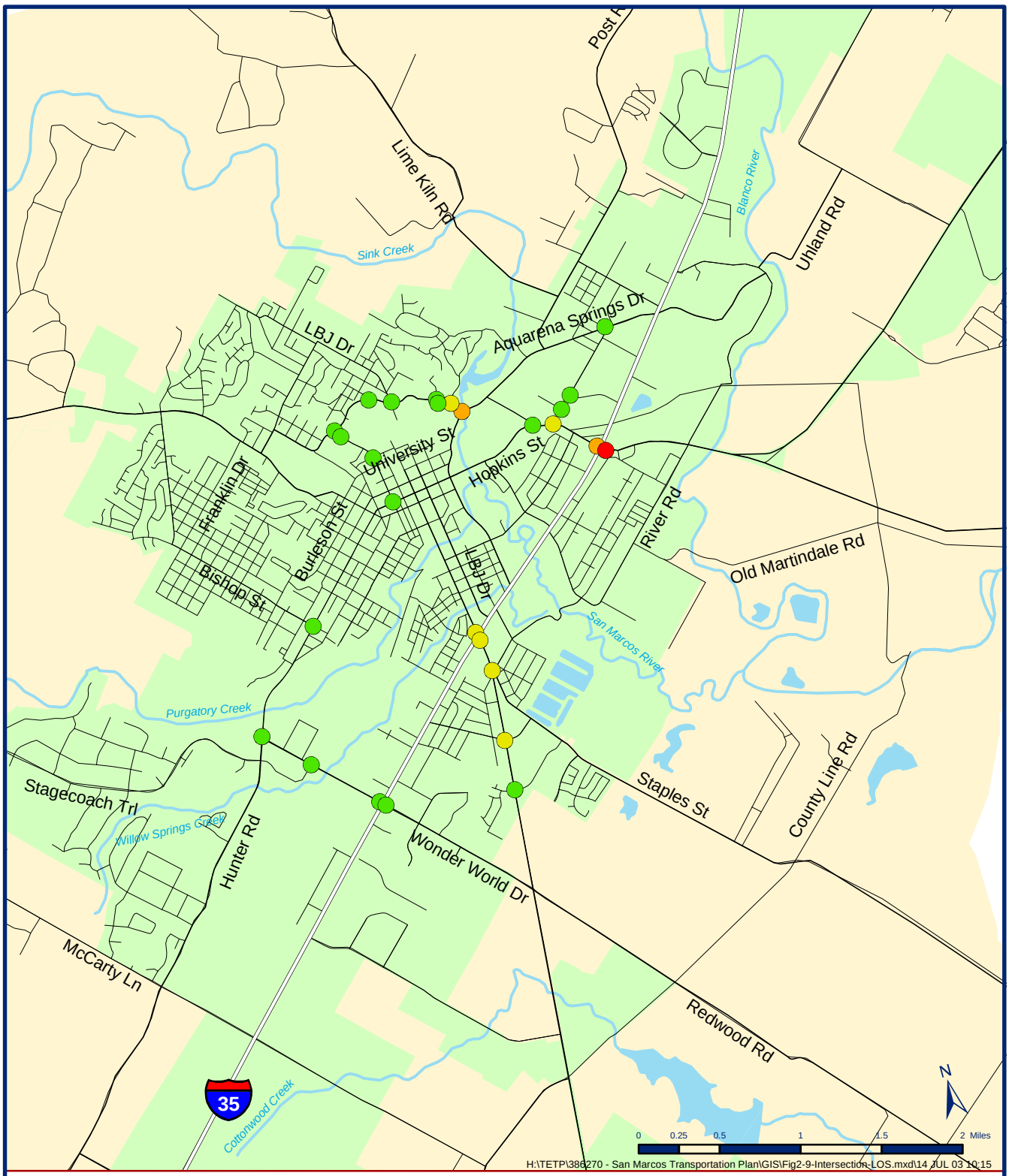
The analysis was performed initially using the microcomputer program "Synchro 5.0" by Trafficware, which is based on the procedures contained in the Highway Capacity Manual (HCM). A detailed review of the results and animation caused questions regarding the validity of Synchro and its related animation software, SimTraffic, for this project. Therefore, the Synchro results were imported into CORSIM, a more comprehensive microscopic traffic simulation model that is better at visually replicating real-world traffic conditions. The CORSIM model uses the progression plan developed in Synchro, and replicates implementation of that plan onto the roadway system. The overall and individual output statistics from Synchro and CORSIM are different.

Synchro calculates only the delays experienced by drivers at individual intersections. It does not consider the impact of upstream and downstream traffic queuing and/or congestion on intersections. CORSIM, on the other hand, evaluates the network as a whole, and accounts for the impact that a queue backing-up from a downstream intersection has on an upstream

intersection. CORSIM was not originally used for the analysis since Synchro is the appropriate tool for optimizing signal timing, which was necessary for corridors with actuated controllers and corridors with no timing information available.

Intersection Level of Service (LOS)

The results of the existing conditions analysis for the intersections are summarized in **Table 2-4** on the following page. The PM peak levels of service, which are typically the worst of the day, are shown in **Figure 2-9**.



San Marcos Transportation Master Plan

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San Marcos City Limits

San Marcos City Limits And ETJ

Intersection Level Of Service (LOS):
[for PM Peak]

- A - C
- D
- E
- F

Figure 2-9
Intersection Level Of Service

San Marcos Transportation Master Plan
San Marcos, TX

Table 2-4
Intersection Level of Service
San Marcos Transportation Master Plan
San Marcos, Texas

Intersections	2003 Existing Conditions	
	AM Peak	PM Peak
Sessom Drive/Comanche Street Corridor		
Aquarena Springs Drive and Sessom Drive	D	E
Ed. J. L. Green/Sessom Drive/State Street	A	D
Peques Drive and Sessom Drive	B	C
N LBJ Drive and Sessom Drive	C	C
Thomas Rivera and Sessom Drive	B	C
Comanche Street and Sessom Drive	B	B
Comanche Street and Students Center Drive	A	A
Comanche Street and Woods Street	B	B
Comanche Street and Hopkins Street (RM 12)	B	C
Hopkins Street/Thorpe Lane Corridor		
IH 35 EFR and Hopkins Street (RM 12)	F	F
IH 35 WFR and Hopkins Street (RM 12)	E	E
Thorpe Lane and Hopkins Street (RM 12)	D	D
Bobcat Drive/City Hall Drive and Hopkins Street (RM 12)	C	C
Thorpe Lane and Robbie Lane	C	C
Thorpe Lane and Springtown Way	A	A
Thorpe Lane and Aquarena Springs Drive	C	C
SH 123 Corridor		
IH 35 EFR and SH 123	D	D
IH 35 WFR and SH 123	D	D
Staples Road/Hays Street and SH 123	C	D
Broadway and SH 123	C	D
DeZavala Drive/ Leah Street and SH 123	C	C
Wonder World Drive Corridor		
IH 35 EFR and Wonder World Drive	C	C
IH 35 WFR and Wonder World Drive	B	B
Stagecoach Trail and Wonder World Drive	B	B
Hunter Road (FM 2439) and Wonder World Drive	C	B
Stand Alone Intersection		
Bishop Street and Hopkins Street	C	C

Intersection Corridor Conclusions

Based on the results of the existing conditions analysis, several intersections in the Hopkins Street/Thorpe Lane and Sessom Drive/Comanche Street corridors and operate at unacceptable LOS. It was noted that the Hopkins Street/Thorpe Lane corridor operates at better LOS than previously observed in the field. Because of optimizing the signal timing within the minimum and maximum green times provided by TxDOT, the LOS shown in Table 2-4 is slightly better than the field observations. In addition, this corridor only evaluated signalized intersections and did not include unsignalized driveways and roadways. Significant congestion was observed due to turning movements in and out of the multiple driveways along Hopkins Street. We recommend that this corridor be studied further for improving traffic flow, specifically considering access management principles to consolidate driveway cuts.

TRAFFIC ACCIDENT ANALYSIS

According to the San Marcos Police Department, a total of 2,206 accidents occurred between July 2002 and July 2003. **Table 2-5** identifies the 10 highest locations for accidents during this time period (the number of accidents at each location is also shown):

Table 2-5
Accident Location Ranking by Number of Accidents
San Marcos Transportation Master Plan
San Marcos, Texas

Rank	Accident Location	# of Accidents
1	1015 Hwy 80	**52**
2	641 E. Hopkins St.	**37**
3	Sessom Dr/Peques St.	**34**
4	Hwy 21/Hwy 80	**32**
5	900 Hwy 80	**31**
6	2300 South IH 35	**29**
7	205 North IH 35	**28**
8	1635 Aquarena Springs Dr.	**27**
9	204 South IH 35	**26**
10	934 North IH 35	**26**

Source: San Marcos Police Department

Approximately 776 of the total crashes occurred on IH 35 or the frontage roads, accounting for 35 percent of all accidents within the SMPD jurisdiction, ranking it first in number of accidents. Hopkins Street was second in accidents, with 13.3 percent of total accidents in the one-year

period; and SH 80 was third, with 11.6 percent of all accidents. The top 15 roadways for accidents are identified in **Table 2-6**.

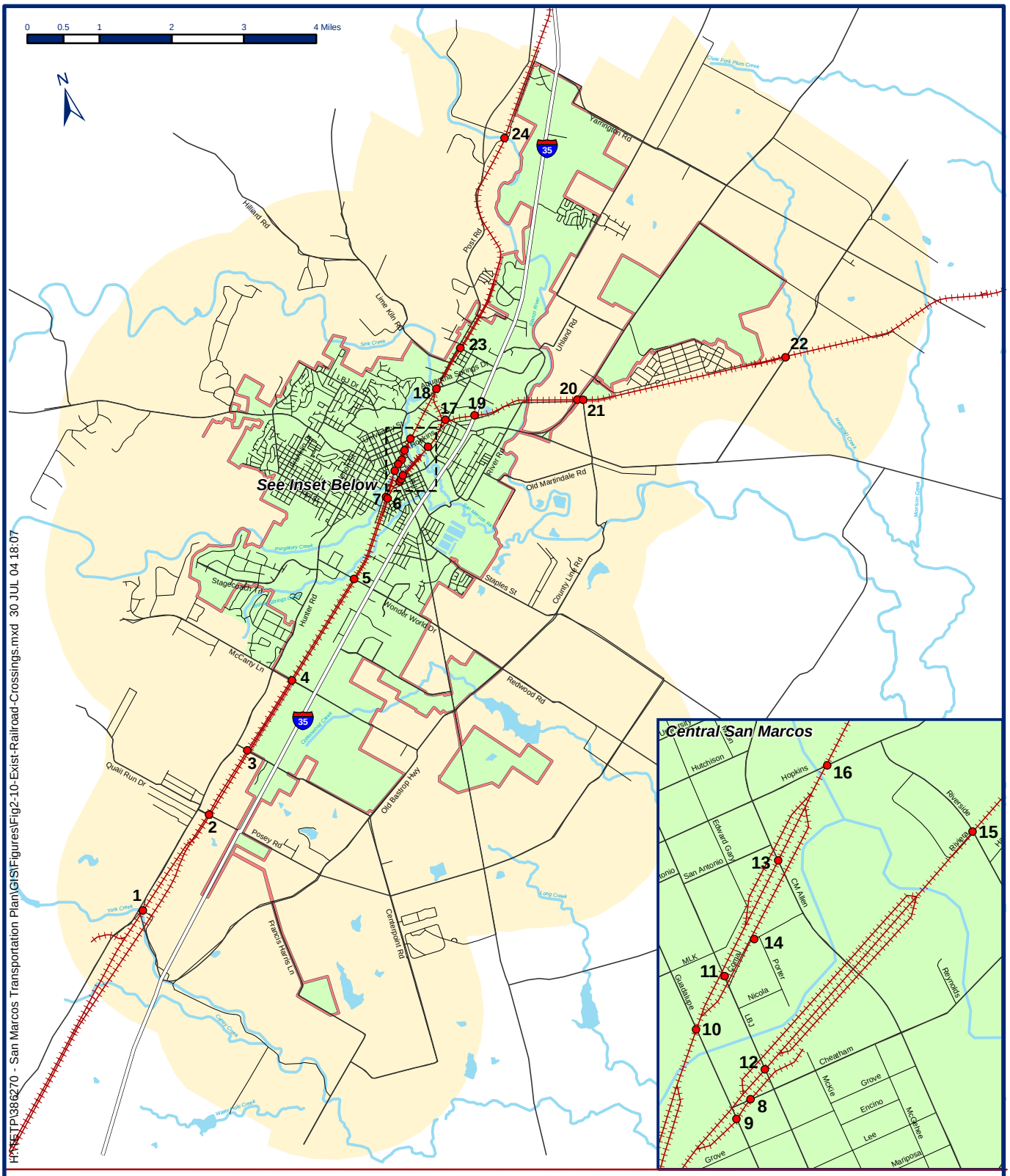
Table 2-6
Accident Roadway Ranking by Percent of Total Accidents
San Marcos Transportation Master Plan
San Marcos, Texas

Rank	Roadway	% of Total Accidents
1	IH 35	35.2
2	Hopkins Street	13.3
3	SH 80	11.6
4	Aquarena Springs Drive	8.7
5	Guadalupe Street	4.9
6	LBJ	4.4
7	Sessom Drive	3.8
8	SH 123	3.5
9	Wonder World Drive	3.2
10	Outlet Malls	2.3
11	Thorpe Lane	2.3
12	University Drive	1.9
13	CM Allen Parkway	1.8
14	Hunter Road	1.8
15	RM 12	1.1
	Total %	**99.7**

Source: San Marcos Police Department

EXISTING RAILROAD CONFLICTS

The City of San Marcos is literally divided in two by railroads. A north-south line extends through town parallel to IH 35, and an east-west line begins near the center of town and extends east between SH 21 and SH 80, as shown in **Figure 2-10**. Based on available railroad crossing data and existing daily traffic volumes at roadway crossings, the estimated daily impact of the railroad system on vehicular traffic was determined. Railroad crossing data provided by the Federal Railroad Administration were utilized to identify the average delay per day at each railroad grade crossing in the San Marcos area. These calculations for each crossing were calculated by utilizing the Total Average Daily Delay model.



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- San Marcos City Limits
- San Marcos City Limits And ETJ
- At-Grade Railroad Crossings

Figure 2-10
Existing At-Grade Railroad Crossings

San Marcos Transportation Master Plan
San Marcos, TX

The total average daily delay model is a 5-step railroad crossing delay model used to estimate the average total vehicular delay at each railroad crossing per day. This model was developed by the Houston-Galveston Area Council (H-GAC) to estimate vehicle delays at railroad crossings for air quality analyses in compliance with the Environmental Protection Act.

The primary factors contributing to higher daily vehicle delay at crossings include factors such as daily train movements, long train lengths, low train speeds, and high daily vehicle traffic along the intersecting roadways. The total daily vehicular delay is the sum of the delay incurred by all automobile traffic at the crossing between 6AM and 8PM.

Each of the 24 major at-grade railroad crossings in San Marcos were analyzed to estimate the total average daily delay experienced by automobile traffic due to the daily train traffic. The results of this analysis are summarized in **Table 2-7**.

Typical train speeds through San Marcus range from 10 to 45 mph, according to data provided by the Federal Railroad Administration. Slower train speeds of 10 to 20 mph generally occur in the center of town and increase to about 45 mph as the rail lines extend further away from the core area of the City.

Daily traffic volumes at the railroad grade crossings range from 130 vehicles per day (vpd) at the Cheatham Street railroad crossing to 28,800 vpd at the Hopkins Drive / FM 12 railroad crossing. Daily train traffic ranges from only 10 trains per day on segments within the city and up to 25 trains per day along double tracked UP line on the Southwest region of San Marcos.

Existing traffic control at the railroad crossings are also shown in Table 2-7. Advanced Warning signs are provided at all of the crossings, with pavement markings provided at all locations except the Cheatham Street railroad crossing. Flashing lights exist at 13 out of 24 crossings and automatic gates exist at 19 of the 24 railroad crossings.

The total train delay for all 24 crossings was 39,377 minutes per day, or 656 vehicle hours per day. The delay at each crossing ranged from 23 minutes per day (Cheatham Street railroad crossing) up to 5,367 minutes per day (CM Allen Parkway railroad crossing).

Table 2-7
Impact of Railroad Crossings on Vehicular Traffic
San Marcos Transportation Master Plan
San Marcos, Texas

Crossing Location	Trains/Day	Speed (mph)	Length (ft)	Traffic Control	Crossing Traffic Vol AADT	Train Delay (min)	Vehicles Stopped /crossing	Queue Dissipation Time (min)	Train Delay /movement	Total Daily Veh Delay (min/day)
1 FM 1102	25	20	7,000	WFP	3,500	4.14	10	20	41	1,025
2 Posey Road	25	20	7,000	CWGP	3,000	4.14	9	17	35	879
3 Centerpoint Rd	25	20	7,000	WGP	6,900	4.14	20	40	81	2,022
4 McCarty Ln	25	20	7,000	WGP	3,400	4.14	10	20	40	996
5 Wonder World	25	20	7,000	WGP	10,600	4.14	31	61	124	3,106
6 Patton	10	20	7,000	WGFP	3,900	4.14	11	22	46	457
7 Patton Street	15	20	7,000	WGP	3,900	4.14	11	22	46	686
8 Cheatham St.	15	20	7,000	CW	130	4.14	0	1	2	23
9 Guadalupe	10	20	7,000	WGFP	9,400	4.14	27	54	110	1,102
10 Guadalupe	15	20	7,000	CWGFP	9,400	4.14	27	54	110	1,652
11 LBJ	15	20	7,000	WGFP	4,000	4.14	12	23	47	703
12 LBJ	10	10	7,000	CWGFP	11,800	8.12	67	133	403	4,034
13 CM Allen Parkway	10	10	7,000	WGFP	15,700	8.12	89	177	537	5,367
14 Comal Street	10	10	7,000	YARD TRACK	8,000	8.12	45	90	273	2,735
15 Riverside	10	10	7,000	WFP	1,100	8.12	6	12	38	376
16 Hopkins	15	20	7,000		14,700	4.14	42	85	172	2,584
17 Hopkins FM 12	10	20	7,000	WGFP	28,800	4.14	83	166	338	3,375
18 Loop 82	15	20	7,000	CWGFP	27,500	4.14	79	158	322	4,834
19 IH 35 Frontage Road	10	20	7,000	WGP	5,400	4.14	16	31	63	633
20 SH 21	10	20	7,000	WGFP	10,600	4.14	31	61	124	1,242
21 County Line Road	10	20	7,000	WGP	2,200	4.14	6	13	26	258
22 FM 1984	10	20	7,000	WGFP	3,200	4.14	9	18	38	375
23 Uhland St	15	20	7,000	WGFP	2,200	4.14	6	13	26	387
24 Post Road	15	20	7,000	WGP	3,000	4.14	9	17	35	527
Total										**39,377**

C= Cross Bucks
W = Advanced Warning Signs
L = Flashing Lights
G = Automatic Gates
P = Pavement Markings

ENVIRONMENTAL ISSUES AND DEVELOPMENT CONSTRAINTS

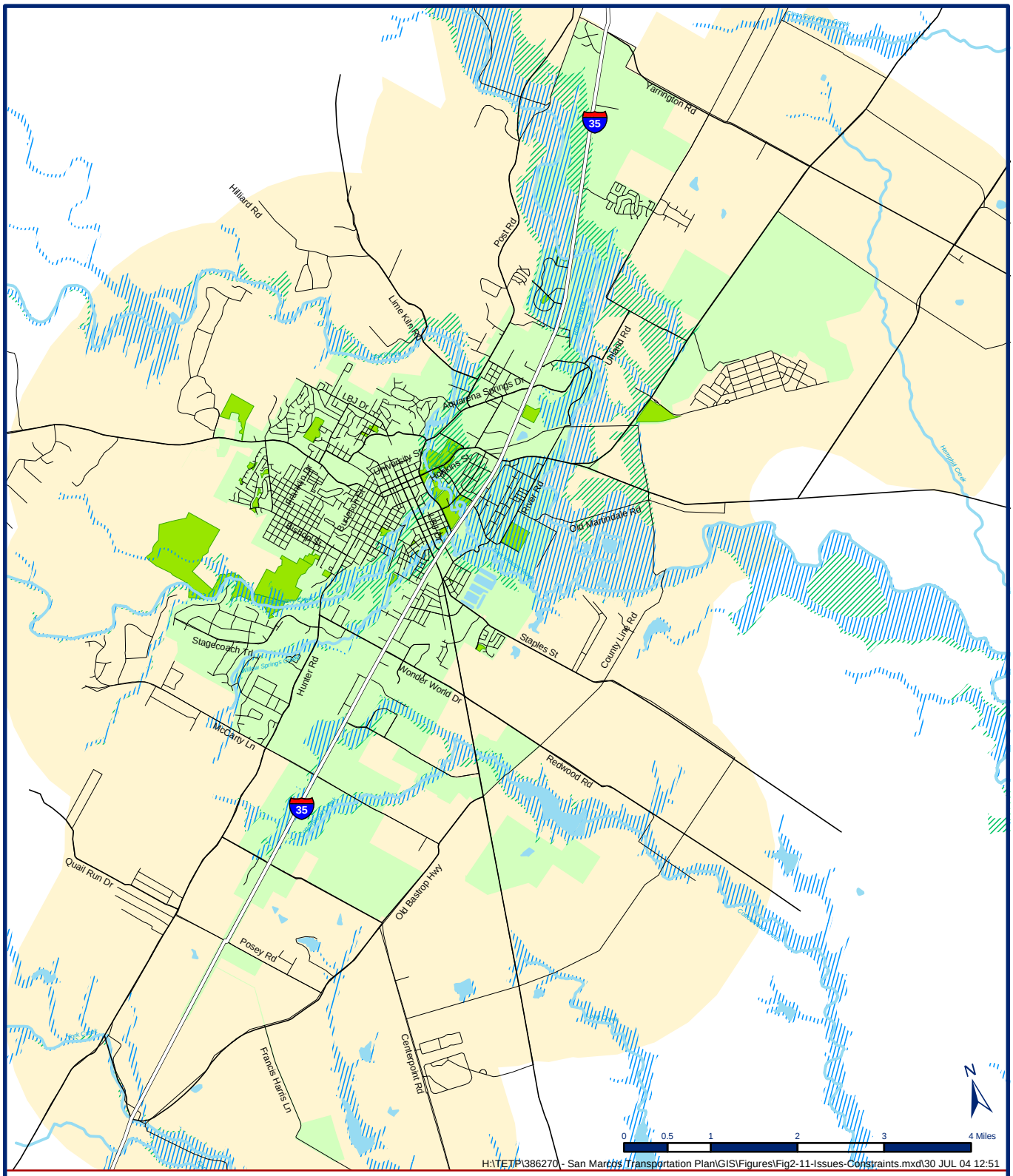
For the most part, the environmental issues within the San Marcos study area involve flood plains and major water features. This includes the many rivers and creeks within the area and the recharge zone. These water features are contained in **Figure 2-11**. Any potential transportation improvements must account for these constraints. Many of these water features also coincide with parks and recreation areas.

In addition, some karst features exist within the study area, which must be taken into account when considering future recommendations. Karst features are geological features, such as caves, springs, and sinkholes. The majority of these are located east of IH 35.

PLANNED TRANSPORTATION IMPROVEMENTS

Three major agencies currently plan and implement transportation improvements within the San Marcos area – the City of San Marcos, Hays County and TxDOT. The following list of projects was provided by the City of San Marcos. Many of these projects, projected to be implemented within the next 3-5 years, are being constructed in partnership with TxDOT. These improvements, contained in the current CIP, are shown in **Figure 2-12**.

Corridor - Wonder World Drive (RM 12 to IH 35)
Situation – Traffic volumes are forecasted to exceed roadway capacity (12,800 to 19,500 vehicles per day); need additional east-west arterials
Projects
A. Wonder World Drive extension to RR 12
B. Railroad Grade Separation
C. Widen from 35 frontage to Hunter



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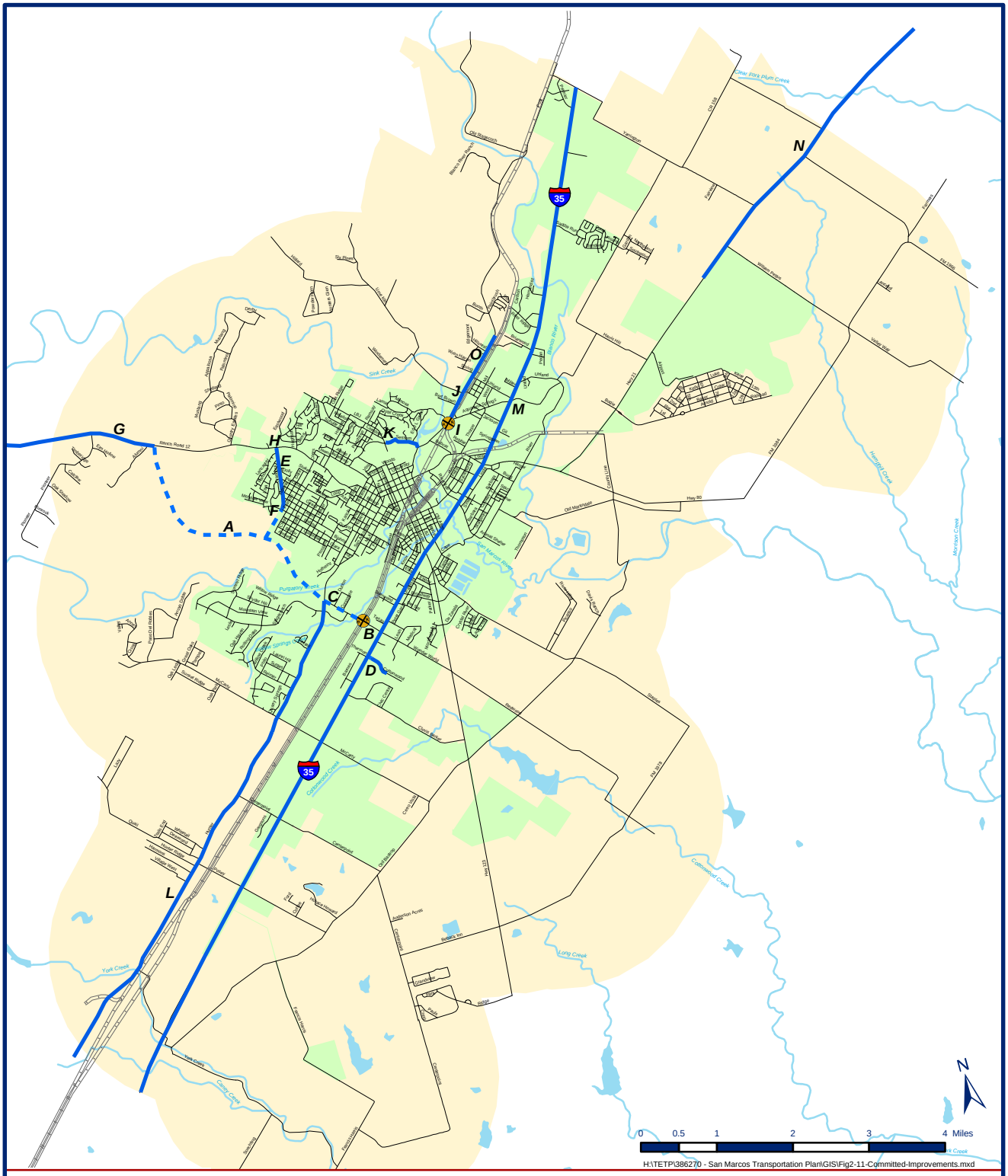
- San Marcos City Limits
- City Parks
- San Marcos City Limits And ETJ
- 100-Year Flood Plain
- 500-Year Flood Plain

Figure 2-11
Environmental Issues and Development Constraints

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

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- San Marcos City Limits
- San Marcos City Limits And ETJ
- Existing CIP Roadway
- New CIP Roadway
- RR Grade Separation

Figure 2-12
Current Capital Improvement Program Projects

San Marcos Transportation Master Plan
San Marcos, TX

Corridor - Cottonwood Creek Parkway (IH 35 to Leah Drive)
Situation – Roadway planned to serve new development; need to provide additional arterials east of IH 35
Projects
D. Connector from IH 35 to Leah Ave.

Corridor – Craddock (RM 12 to Wonder World Drive extension)
Situation – Blind hill is safety concern; volumes forecasted to exceed roadway capacity (16,800 vehicles per day); need additional north-south alternate routes
Projects
E. Widen from Franklin to RM 12 – 4 lane divided
F. Extension to Wonder World Dr. Extension (to occur by 2012)

Corridor – RM 12 (Craddock to RM 32 in Wimberley)
Situation – Safety and traffic congestion; volumes forecasted to reach 56,000 vehicles per day; improved east-west mobility
Projects
G. Widen from proposed Wonder World Dr. to Wimberley (Jct. RM 32)
H. Turn lanes at Craddock

Corridor - Aquarena Springs Drive (IH 35 to Sessom Drive)
Situation – Congestion and safety concerns; future volumes forecasted to reach more than 90,000 vehicles per day
Projects
I. Railroad Grade Separation
J. Realignment of Post Road intersection
K. Intersection improvements at Sessom (Dedicated right turn lane on Aquarena Springs and 2 left turn lanes on Sessom; 5 ft. sidewalks and pedestrian crossings)

Corridor – Hunter Road (Wonder World Drive to Comal County Line)
Situation – Existing and forecasted high traffic volumes (2025 – 54,000 vehicles per day; need additional and improved north-south arterials
Projects
L. Widen to 5 lanes from Wonder World Drive to Comal County line

Corridor – IH 35 (Comal County Line to Yarrington Road)
Situation – Currently under construction to complete widening to 6 lanes
Projects
M. Update transportation demand model to reflect 6 lanes in 2025 Existing Plus Committed Network

Corridor – SH 21 (SH 80 to Northern ETJ)
Situation – TxDOT is completing widening to 4 lanes
Projects
N. Update transportation demand model to reflect 4 lanes in 2025 Existing Plus Committed Network

Corridor – Post Road (Bert Brown Road to City Limit)
Situation – Current and future forecasted traffic volumes exceed roadway capacity. This is important arterial in northern part of the City where limited alternate routes exist.
Projects
O. Widen Post Road to 3 lanes with bike lanes and sidewalks from 300' west of Bert Brown Road to City Limit.

Chapter 3
Travel Demand Model

This chapter describes the development and calibration of the transportation model that was used for evaluating existing travel conditions and forecasting future travel demand for the City of San Marcos. The development of mathematical models capable of simulating existing traffic patterns and projecting future travel demand is one of the most important phases of the transportation planning process.

When transportation planning was in its infancy, simple trend-line analysis was performed to forecast traffic demands. However, such methods were based on the existing relationships between land uses and intensities of land uses. If land development patterns changed over time (and most do), forecasts were seldom reliable. Historical trend analysis also failed to account for the impact of construction of new transportation facilities, or even the improvement of existing facilities. To obtain reliable estimates of future travel patterns, both the travel simulation models and the projected land use data must be sensitive to the many quantitative and qualitative parameters influencing the generation and distribution of trips. These characteristics and patterns depend largely on the following factors:

1. Socioeconomic conditions affecting trip production and attraction;

2. The land-use pattern, including the location and intensity of use; and,

3. The type, extent, and quality of transportation facilities.

With these factors as input to travel demand models, forecasts of future travel patterns are made and used to test the adequacy of any proposed transportation system improvements to serve projected traffic demands. The evaluation of alternatives by use of the transportation model was a primary factor in developing a responsive transportation plan for the San Marcos area.

TRAVEL DEMAND MODEL DEVELOPMENT

The development of travel demand models can be divided into three basic steps—trip generation, trip distribution, and traffic assignment. The first step, trip generation, involves estimating the number of trip ends generated in (productions) and attracted to (attractions) each traffic analysis zone. Each trip on the regional highway system has both an origin (production) and a destination (attraction). In this fashion, each trip is defined by two trip ends, one being a production and one being an attraction.

The second step, trip distribution, involves the distribution of the trip ends between all possible zones, which is accomplished by a mathematical trip distribution (gravity) model. The gravity model is so named because its basic form follows the mathematical formula Isaac Newton developed to approximate the pull of gravity. In general terms, this model suggests that the frequency of trip interchange between zone pairs is directly related to the number of productions and attractions in each zone, and inversely related to the travel time between them.

The third step, traffic assignment, is the assignment of vehicle trips to the roadway network, which is accomplished by selecting the route with the lowest travel time. The travel demand models have two primary data elements: demographic characteristics (by travel zone) and a transportation network description.

SAN MARCOS TRAVEL DEMAND MODEL DEVELOPMENT

For this study, the regional transportation model, maintained by the Capital Area Metropolitan Planning Organization (CAMPO), was used as the basis for the San Marcos TMP model. Utilizing the CAMPO zone structure, zones were further subdivided to enable the model to be more focused on a local level. The San Marcos model works hand in hand with the data contained in the regional model, so it more accurately dealt with trips on both a localized as well as a regional level. Roadway capacities and speeds were derived from the CAMPO model to maintain consistency with the regional modeling efforts currently underway. From the base CAMPO model, the TAZ structure and roadway network were further refined to allow analysis of arterial and collector roadways within San Marcos. The relationship of the models and their inputs and outputs are illustrated in **Figure 3-1**.

Demographic assumptions contained in the regional CAMPO model were further refined, and better allocated to reflect actual development as well as growth patterns within the San Marcos ETJ. City Staff worked with the Consultant Team to develop the most accurate demographic allocations for the model, which, in turn, will result in more accurate model trip predictions and roadway facility assignments. The demographic data used in the model is consistent with the City's adopted future land use plan and comprehensive plan.

DATA ANALYSIS AND FORECASTING

In order to conduct the travel demand model process, regional transportation data was collected and processed as factors and inputs for the travel model analysis. The travel demand model requires such inputs as regional socioeconomic and demographic data, roadway and land use characteristics, person and vehicle trip data, and travel time and other impedance factors. A major portion of the data inputs came from the regional transportation model and network maintained by the CAMPO.

The CAMPO model and network contained population, household, and employment data for the MPO study area, which included the San Marcos region. First, demographic data was obtained from the City of San Marcos for their planning area, while CAMPO's demographic data was maintained for the rest of the model and network. Next, the Traffic Analysis Zone (TAZ) structure was refined within Hays County to include several new zones within the San Marcos study area; while the zones outside of Hays County were aggregated to center the focus of the model analysis on the San Marcos study area. With the revised TAZ structure for the travel model, the population, household, and employment data was then assigned to the respective zones. A summary of the study area's demographic data is provided in **Table 3-1**.

Figure 3-1
Transportation Modeling Process
San Marcos Transportation Master Plan
San Marcos, Texas

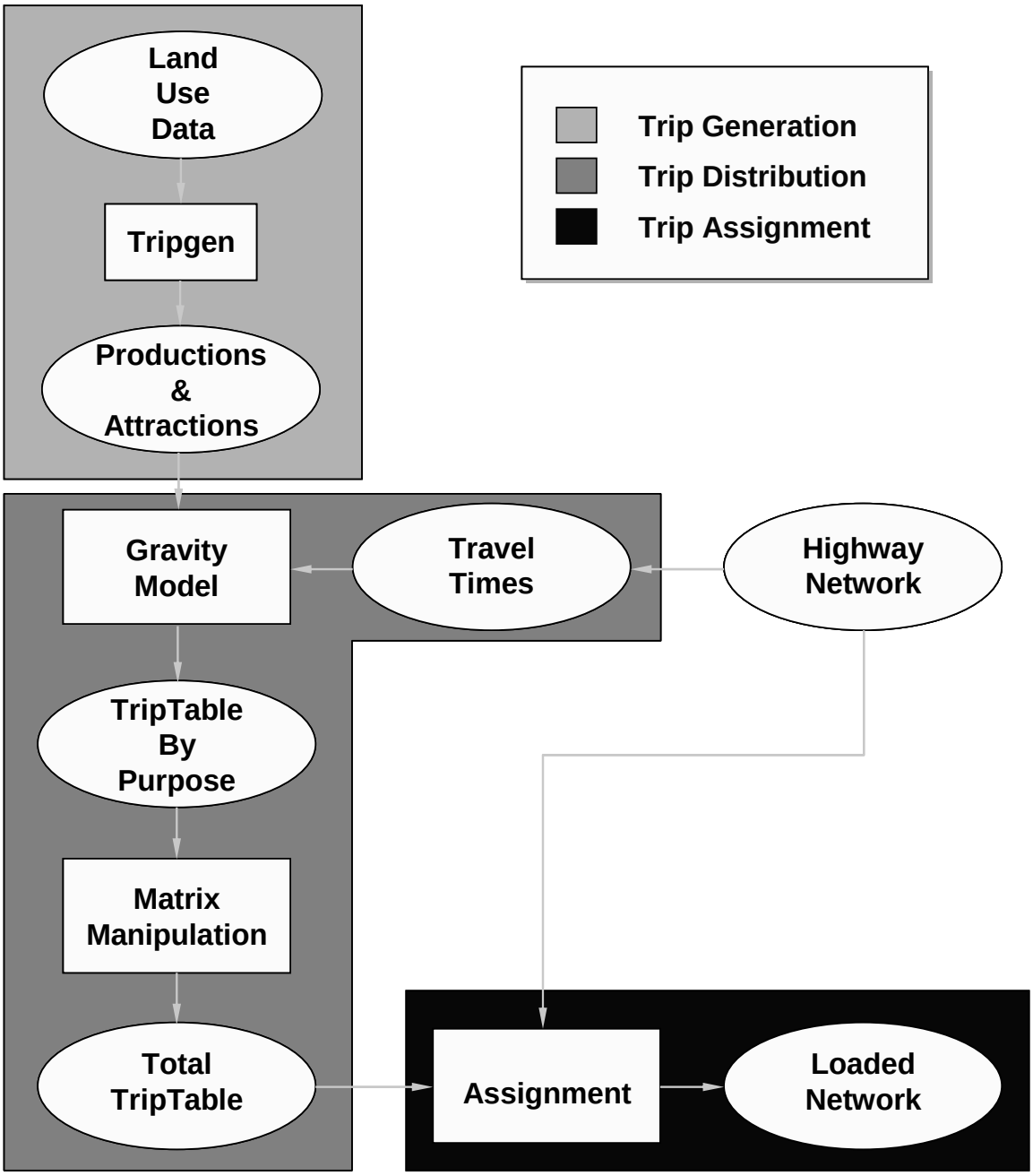


Table 3-1
Summary of Demographics within San Marcos Study Area
San Marcos Transportation Master Plan
San Marcos, Texas

Variable	2000	2007	2012	2025
Population (ETJ)	68,914	97,196	124,277	217,294
HH (Dwelling Units)	24,782	34,520	43,535	76,097
Employment	22,902	44,639	55,233	64,867

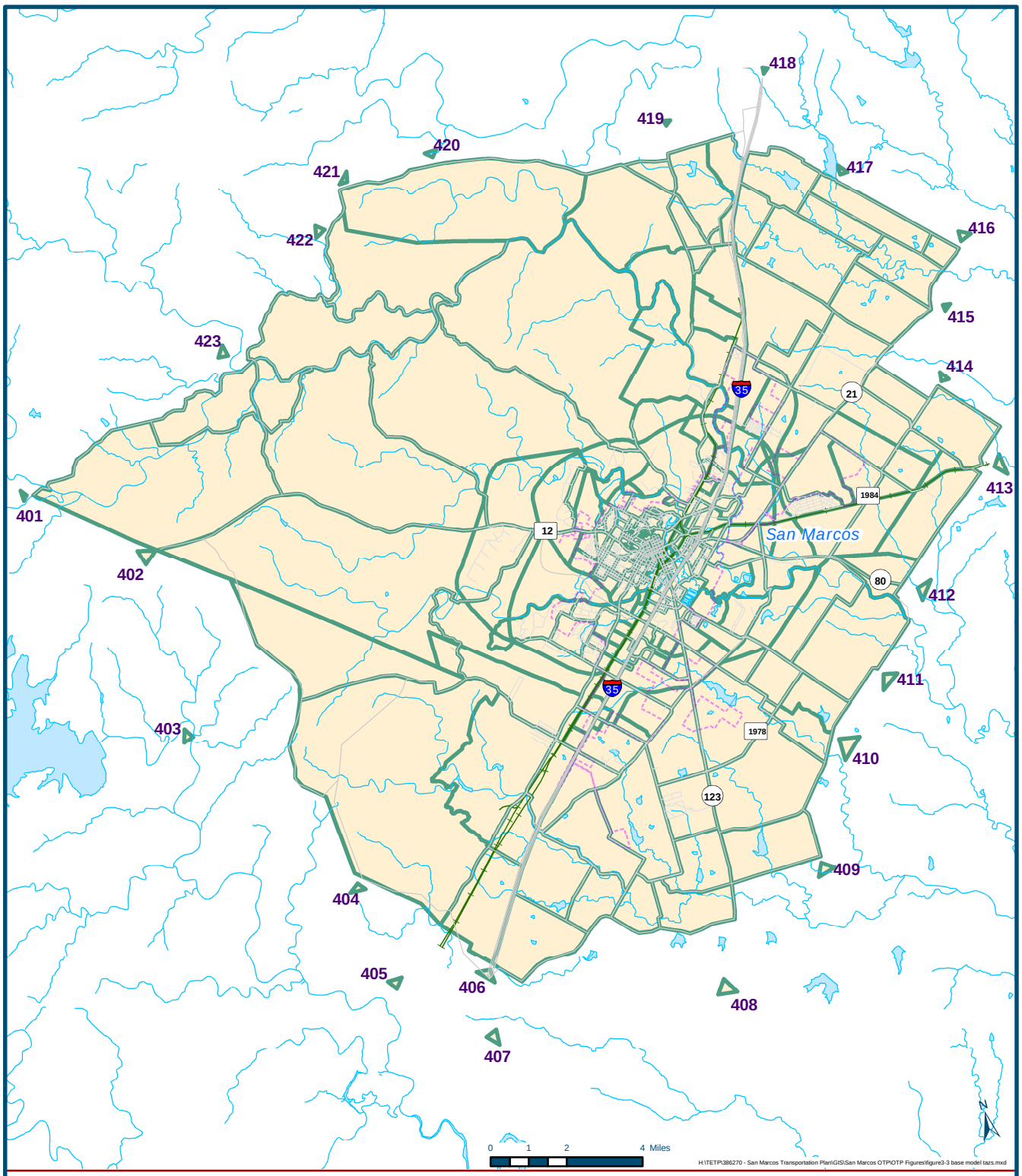
In addition, projected growth in student population at Texas State University-San Marcos was provided by the Texas State Facilities department. Enrollment is projected to increase from an estimated 29,200 students in the fall of 2005 to more than 39,400 students in the fall of 2015, which is equivalent to a compounded annual growth rate of approximately three percent per year.

The next part of the San Marcos travel model development was to refine the CAMPO transportation network to provide more focus for the San Marcos study area. The CAMPO network contains all primary freeways, arterials, and some collector roadways for the MPO study region. The network within the San Marcos study area was updated to include all freeways, arterials, collectors, and some regionally significant local roadways. Next, Wilbur Smith staff conducted a field verification of roadway lanes and posted speed limits within the study area (and also utilized aerial imagery in the verification). As a result, the San Marcos travel model provided a stronger focus for analyzing transportation conditions in their study area.

Therefore, a travel model for the San Marcos study area had been developed that contains an updated transportation network (ready for coding proposed transportation improvements) and population, household, and employment data based on CAMPO's and San Marcos' current statistics and projected demographics for future year analyses. An initial travel model run was then conducted and utilized to verify that the model was replicating current year conditions (i.e. demographics, traffic volumes, and traffic speeds). The model did replicate current conditions within a particular confidence interval (described later in this chapter), and was validated to continue with forecasting future travel patterns.

TRAFFIC ANALYSIS ZONES

Traffic Analysis Zones (TAZs) define geographic areas (Census block groups) which are used to relate travel demand to socioeconomic characteristics. For each TAZ, population, dwelling units, total employment, retail employment, and school attendance were developed for the base year of 2000. The resulting traffic zone system is shown in **Figure 3-2**. There are a total of 366 internal zones (within the study area) and 23 external zones (locations where traffic enters and exits the study area).



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Roads
- Railroads
- San Marcos City Limits
- 123 TAZ External Stations
- 2000 Base Nodes
- 2000 Centroid Connectors
- 2000 Base Streets
- 2000 Base TAZ's

Map Date: March 4, 2004

Figure 3-2
Year 2000 Base Model
Traffic Analysis Zones

San Marcos Transportation Master Plan
San Marcos, TX

EXISTING ROADWAY NETWORK

The determination of zone-to-zone travel times, as utilized in the travel demand model, and the assignment of traffic to a network of streets and highways, requires a simulation of the transportation network by describing roadway sections and intersections in numerical or digital terms. The City of San Marcos provided a digital city street network, which provided the basis for the San Marcos network. Each intersection, referred to as a "node", is assigned a unique number and is connected to adjacent intersections. The section of street between nodes is referred to as a "link". Each link in a network system contains information regarding distance, speed, number of lanes, functional classification, and capacity characteristics. For each network link, posted speed limits and number of lanes were field verified. Traffic capacity for each link was calculated based on the number of lanes and functional classification.

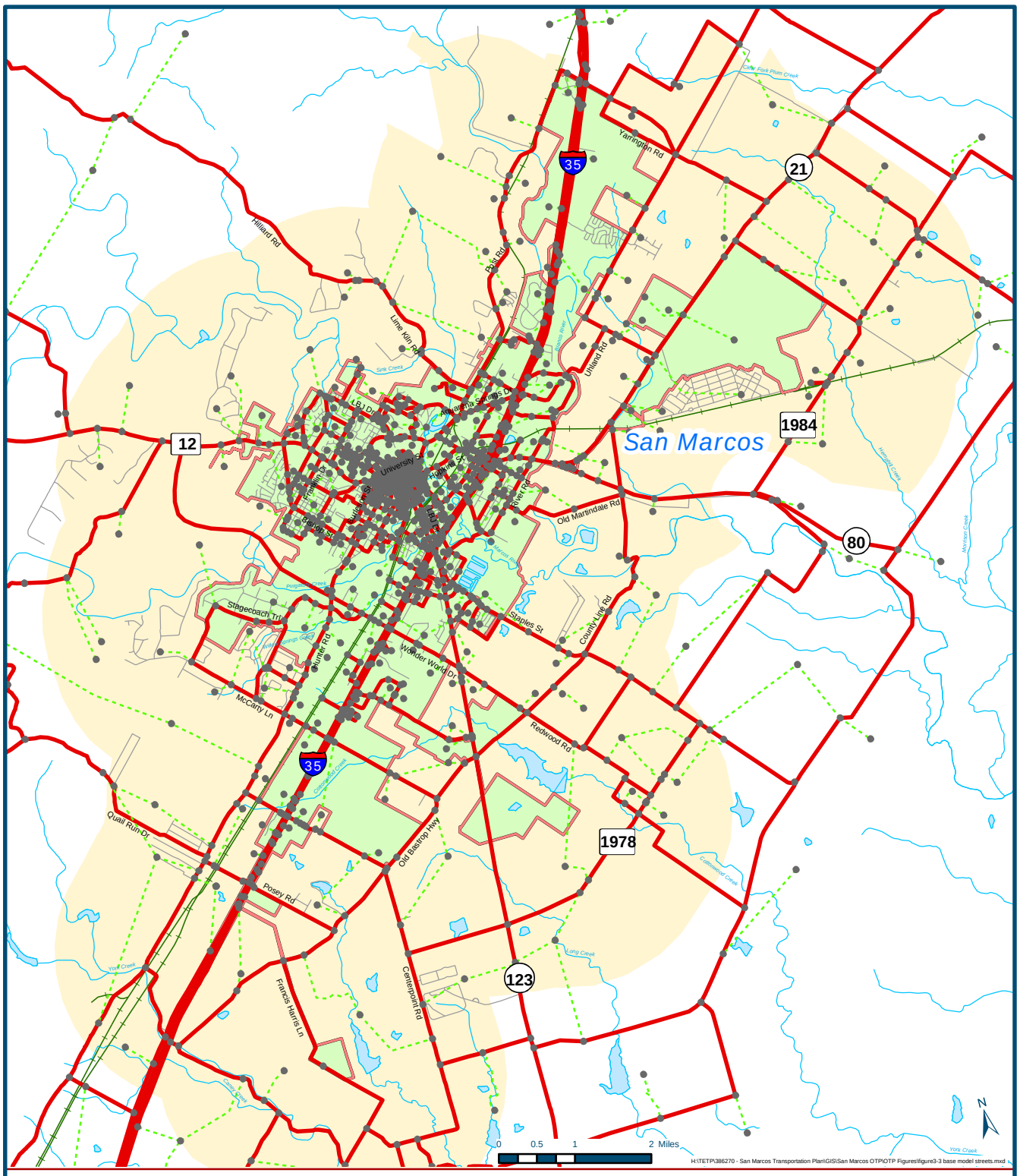
In addition, traffic analysis zones were represented by "centroids", and the connection between traffic zones and the road network are represented by special links called "centroid connectors." Total travel time between any pair of traffic zones consists of the sum of the travel times for all links traversed. **Figure 3-3** illustrates the link-node network map for San Marcos (without node numbers).

EXISTING PLANNING DATA

Travel demand is greatly influenced by the pattern of development or land use in the study area. Changes in land use will create new travel demand or modify existing patterns. A definite relationship exists between trip-making and land use and demographic data. Existing socioeconomic data, including population, number of dwelling units, total employment, retail employment, and school attendance, were used as input variables for the transportation model to estimate the number of trips produced by and attracted to the development within each traffic zone. This existing Year 2000 level of development in each TAZ is presented at the end of this chapter. Future land use projections were provided by City of San Marcos Staff, and are consistent with currently adopted future land use plans.

TRIP GENERATION

Trip generation models 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. Two types of trip generation models were developed: trip production models and trip attraction models. These models were stratified into three trip purposes: Homebased-Work, Homebased-Other, and Non-Homebased. For the two types of homebased trips, trip productions refer to the home end of the trip, and trip attractions refer to the non-home end of the trip. For non-homebased trips, trip productions and trip attractions refer to the origin and destination of the trip, respectively. Initial computer runs utilized multiple regression equations borrowed from travel demand models developed for other similar areas. Existing 2000 socioeconomic data including population, dwelling units, total employment, retail employment, and school attendance were used as independent variables to compute production and attractions.



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Roads
- Railroads
- San Marcos City Limits
- San Marcos ETJ
- 2000 Base Nodes
- 2000 Centroid Connectors
- 2000 Base Streets

Map Date: March 4, 2004

Figure 3-3
Year 2000 Base Model Streets

San Marcos Transportation Master Plan
San Marcos, TX

However, modifications were made to the equations during the calibration process, described in more detail in a following section of this report. Final trip distribution rates for all trip purposes are shown in **Table 3-2**.

TRIP DISTRIBUTION MODELS

Once the number of trips emanating from a zone has been estimated by the trip production models, distribution models must be developed to distribute them among the trip attractions in the other zones. Many models are available for this process. The one used for this study was the gravity model. This model employs two relationships, the first of which is indirect. The shorter the travel time to the destination zone, the greater the number of trips will be distributed to it from the origin zone.

The relative distribution rates (friction factors), the only unknowns in the equation, were taken from another study similar in size. Relative distribution rates express the effect that spatial separation has on trip interchanges. These factors are measures of the impedance to inter-zonal travel due to the separation between zones. In effect, they measure the probability of trip making at each one minute increment of travel time.

TRAFFIC ASSIGNMENTS

The traffic assignment model determines which route the trips take to get from the origin zone to the destination zone. Traffic assignments were made using an equilibrium capacity restraint technique. This technique consists of an iterative series of all-or-nothing assignments where travel times are adjusted to reflect delays encountered due to congestion. As a result of these time adjustments, the loading of different iterations may be assigned to different paths. Each assignment load after the initial iteration is combined with the previous load to minimize the impedance of each trip until equilibrium is reached. In summary, equilibrium occurs when no trip can be made by an alternate path without increasing the total travel time of all trips on the network.

External travel consists of three types of trips, external-external, internal-external and external-internal. External-external trips are trips that pass through the entire study area without making a stop. External-internal and internal-external trips are those having one end of the trip inside of the study area and the other end outside of the study area. The trips that have one or more ends outside the study area are captured by traffic counts at the study area boundary. These trips are represented in the model at External Stations, which are simply locations where major highways enter or exit the study area. **Table 3-3** identifies the 23 external stations developed for San Marcos including a summary of the split between external-external vs. external-internal trips.

Table 3-2
Relative Distribution Rates
San Marcos Transportation Master Plan
San Marcos, Texas

Travel Time (minutes)	Hombased Work	Homebased Other	Non-Homebased	External-Internal
1	400	460	620	133
2	380	465	640	93
3	275	390	480	71
4	189	262	281	57
5	140	165	167	48
6	109	113	113	40
7	89	82	83	35
8	74	62	65	30
9	63	48	54	26
10	54	39	47	23
11	48	32	42	20
12	42	27	38	18
13	38	23	36	16
14	34	19	34	14
15	31	17	32	13
16	29	15	30	12
17	26	13	28	10
18	24	12	27	9
19	23	11	26	9
20	21	10	25	8
21	20	9	23	7
22	19	8	22	6
23	18	7	21	6
24	17	7	21	5
25	16	6	20	5
26	15	6	19	4
27	14	5	19	4
28	14	5	18	4
29	13	5	18	3
30	12	4	17	3
31	12	4	17	3
32	11	4	17	3
33	11	4	16	2
34	11	4	16	2
35	10	3	16	2
36	10	3	15	2
37	10	3	15	2
38	9	3	15	2
39	9	3	14	1
40	9	3	14	1

Table 3-3
External Traffic Analysis Zones Traffic Patterns
San Marcos Transportation Master Plan
San Marcos, Texas

External TAZ ID	Location	Traffic Assignment	External-External	External-Internal	Internal-External
401	Ranch Road 12 (Western edge of study area)	871	719	0	152
402	FM Road 32	3,154	1,468	0	1,686
403	Purgatory RD & FM Road 306	2,959	0	1,506	1,453
404	Hoffman Rd	17,218	14,011	1,574	1,632
406	I35 at Southern Boundary of ETJ	92,361	56,207	16,726	19,427
407	FM Road 1101	839	810	5	24
408	State HWY 123	9,777	5,128	2,020	2,629
409	FM Road 3353	3,036	2,459	299	277
411	FM Road 621 & FM Road 1979	3,107	1,808	614	685
412	State HWY 142	10,337	3,686	3,916	2,735
413	State HWY 142 & FM Road 1966	4,470	3,155	759	555
416	State HWY 21	8,960	8,804	88	68
418	I35 at Northern Boundary of ETJ	74,863	48,913	13,899	12,051
419	Jack C. Hays Trail	13,733	9,303	2,291	2,139
420	FM Road 150	4,341	4,341	0	0
421	FM Road 3237	1,686	580	592	514
422	FM Road 3237	483	454	14	15
423	Ranch Road 12	5,221	2,817	1,195	1,209

In traditional travel demand models, traffic counts are collected at external stations to use in the calibration process. The traffic assignment values at the external stations in the San Marcos model used to calibrate the model are derived from the "super regional" model developed for the entire study area. A subarea analysis was conducted within TransCAD to identify which trips from the super regional travel demand model were traveling to which TAZs in the San Marcos study area. This subarea analysis was used to generate the E-E, I-E, and I-E splits in trips to and from the external stations.

Once all of the base models were developed, the models were validated using the following procedure:

1. Apply production and attraction models (including external-internal) to existing (2000) socioeconomic data to obtain zonal productions and attractions;
2. Distribute zonal productions and attractions with gravity model;
3. Add external-external trips to internal and external-internal trips resulting from gravity model distributions;
4. Assign total vehicle trips to base year (2000) network and compare model volumes to existing traffic counts;
5. Adjust trip production and attraction models if necessary;
6. Adjust external traffic models if necessary;
7. Adjust gravity model distribution rates if necessary;
8. Adjust highway network if necessary; and,
9. Repeat steps 1 through 8 until models are validated.

MODEL APPLICATION AND REFINEMENT

Following the above procedure, the models were applied with existing transportation and planning data and compared to these counts. Comparisons of the first model application to existing counts indicated that the models were over estimating traffic on a total basis by only 13 percent. However, even though comparisons were good on a total basis, there were many individual comparisons that were unacceptable.

Based on these results, it was obvious that some “fine tuning” of the models was required. These adjustments included some minor speed changes to various links on the network and trip generation modifications to account for special generators.

Comparisons of observed and assigned traffic for the final model run are shown in **Table 3-4**. Overall, the estimated trips are within two percent of observed traffic with a correlation (R2) of 0.99. The correlation coefficient, R2, is calculated from a linear regression analysis of assigned and observed volumes. An R2 value of 1.0 indicates a perfect correlation. *Note: Table 3-4 contains roadways that are within the model, but outside the City and its ETJ.*

Table 3-4
Comparison Of Observed Versus Assigned Traffic Volumes

Location	LINK ID	2000 AADT	Assigned Trips
ACADEMY ST	3187	6,865	7,345
AQUARENA SPRINGS	655	17,555	15,770
AQUARENA SPRINGS	3001	23,319	23,490
BEBEE RD	885	890	1,864
BUGG LN	3897	4,560	4,453
BUGG LN	3903	4,637	5,514
BUNTON LN	3106	381	1,493
BUNTON LN	850	630	1,785
BURLESON ST	816	1,545	1,606
BURLESON ST	808	3,905	4,072
CAPE ST	2292	6,525	3,425
CENTERPOINT RD	2366	1,034	2,006
CENTERPOINT RD	150	1,310	1,684
CENTRE ST	3003	1,429	502
CHEATHAM ST	4048	2,215	1,294
CLOVIS R BARKER	3475	381	429
CO LINE RD	482	1,010	3,504
CO LINE RD	3914	1,572	2,897
COMANCHE ST	411	3,000	2,442
COTTON GIN RD	853	132	364
COTTON GIN RD	856	366	719
COUNTY ROAD 158	2539	250	1,512
COUNTY ROAD 210	2574	617	116
CRYSTAL MEADOW D	1663	3,746	4,558
DAIRY RD	837	106	468
DE ZAVALA	341	1,938	572
DURE DR	691	209	1,583
E HOLLAND ST	4162	4,442	4,217
E HOPKINS	634	35,790	28,827
E HOPKINS ST	424	21,000	19,315
E LAUREL LN	1521	1,429	2,843
E MCCARTY LN	252	5,188	4,236
E MIMOSA CIR	4142	1,953	136
E SAN ANTONIO ST	3611	6,982	15,831
FARM TO MARKET ROAD 150	844	3,027	2,132
FARM TO MARKET ROAD 2439	3328	3,826	4,256
FARM TO MARKET ROAD 3237	674	3,314	1,874
FARM TO MARKET ROAD 621	366	4,442	4,401
FRANCIS HARRIS L	3241	315	296
FRANKLIN DR	543	787	803
FULTON RANCH RD	529	1,127	3,083
GOFORTH RD	688	2,280	2,132
GRIST MILL RD	836	381	959

Location	LINK ID	2000 AADT	Assigned Trips
GUADALUPE ST	2623	23,961	31,264
HARRIS HILL RD	1651	3,682	3,473
HAYS CO CIVIC CE	2195	2,464	704
HEIDENREICH LN	843	250	1,064
HIDDEN VALLEY RD	2569	1,139	1,550
HIGH RD	3102	563	499
HILLIARD RD	3861	1,507	1,444
HOPKINS ST	3026	13,979	11,934
HUNTER RD	3839	4,075	4,256
I 35 FRONTAGE	181	248	1,179
I 35 FRONTAGE	3700	250	1,167
I 35 FRONTAGE	821	1,992	2,286
I 35 N	930	42,784	43,545
I 35 N	731	43,334	42,541
I 35 S	144	40,000	40,192
JACK C HAYS TRL	880	5,855	9,821
JACKMAN ST	1912	394	1,648
KOHLERS XING	3159	617	531
LAUREL RIDGE	4123	1,953	3,871
LAVACA ST	3683	6,865	6,406
LEE ST	2287	2,608	709
LEHMAN RD	762	52	1,497
LIME KILN RD	639	5,162	5,453
LINDSEY ST	305	643	3,426
LIVE OAK ST	776	656	856
MCCARTY LN	3495	250	1,941
MCCARTY LN	3499	668	3,322
MOON ST	606	5,857	2,208
MOORE ST	3643	12,500	12,322
N BISHOP ST	2702	3,235	2,468
N BISHOP ST	264	11,686	11,725
N BURLESON ST	3143	4,560	5,071
N C M ALLEN PKY	433	7,167	15,999
N COMANCHE ST	4317	5,215	3,627
N EDWARD GARY ST	600	3,905	2,599
N GUADALUPE ST	585	3,263	2,418
N L B J DR	3573	5,071	4,351
N L B J DR	614	12,143	12,830
N OLD BASTROP HW	135	1,506	2,151
N OLD STAGECOACH	768	917	1,242
OLD MARTINDALE R	3354	537	528
PAT GARRISON ST	533	3,905	148
PEQUES ST	4121	3,525	4,760
PLUM CREEK RD	854	117	354
POSEY RD	139	3,826	3,006

Location	LINK ID	2000 AADT	Assigned Trips
POST RD	575	6,865	7,247
QUAIL CREEK DR	4117	263	174
QUAIL CREEK DR	612	263	317
RANCH ROAD 12	4077	19,466	19,147
REBEL DR	772	6,485	9,034
REDWOOD RD	2875	7,612	4,584
RIVER RD	12	1,822	3,473
RIVERSIDE DR	4029	2,737	1,086
ROANOKE ST	3583	5,857	2,333
S C M ALLEN PKY	404	6,707	7,407
S C M ALLEN PKY	3776	6,721	7,482
S COMANCHE ST	3603	1,311	513
S GUADALUPE ST	3747	22,939	22,359
S L B J DR	369	12,184	11,869
S OLD BASTROP HW	164	6,500	5,706
S OLD STAGECOACH	751	969	1,256
SCOTT ST	299	4,691	3,180
STATE HWY 123	3559	21,772	22,385
STATE HWY 21	2800	10,800	10,644
STATE HWY 80	3955	13,800	12,926
THORPE LN	626	6,747	5,374
TIMMARON TR	3865	5,359	1,674
UHLAND RD	2810	3,301	3,449
UNIVERSITY DR	3591	5,500	3,837
W CENTER ST	770	3,209	2,285
W HOLLAND ST	1477	4,244	4,205
W HOPKINS ST	313	11,300	11,822
W LAUREL LN	1519	1,429	2,838
W MARTIN LUTHER	410	1,049	348
W MARTIN LUTHER	3599	2,084	1,216
W MCCARTY LN	3969	1,141	353
W MCCARTY LN	211	2,031	1,493
W MCCARTY LN	2857	3,510	3,452
W MIMOSA CIR	4119	1,429	332
W SESSOM DR	2649	7,612	10,802
W UHLAND RD	3933	1,389	4,199
WONDERWORLD DR	2953	6,341	4,662
WONDERWORLD DR	285	12,708	10,396
WOODS ST	592	3,263	3,322
YARRINGTON RD	1631	825	0
Existing Traffic Volumes vs. Predicted Model Assigned Volumes		**Total Observed Trips**	**Total Modeled Trips**
		725,531	**734,375**

The calibration results are also illustrated graphically in **Figure 3-4**, indicating the percent deviation of assigned volumes to actual traffic counts for all locations. As can be seen, all locations fall below the curve of maximum desirable deviation as defined in the National Cooperative Highways Research Program (NCHRP) 255 report.

SUMMARY AND CONCLUSIONS

The comparison of estimated trips with observed traffic counts crossing various sections throughout the study area confirms that the model is in close agreement with actual Year 2000 conditions, and attest to the ability of the travel demand models to recreate Year 2000 travel patterns. Upon review of these results, it was concluded that the San Marcos models can be used to reliably forecast travel patterns.

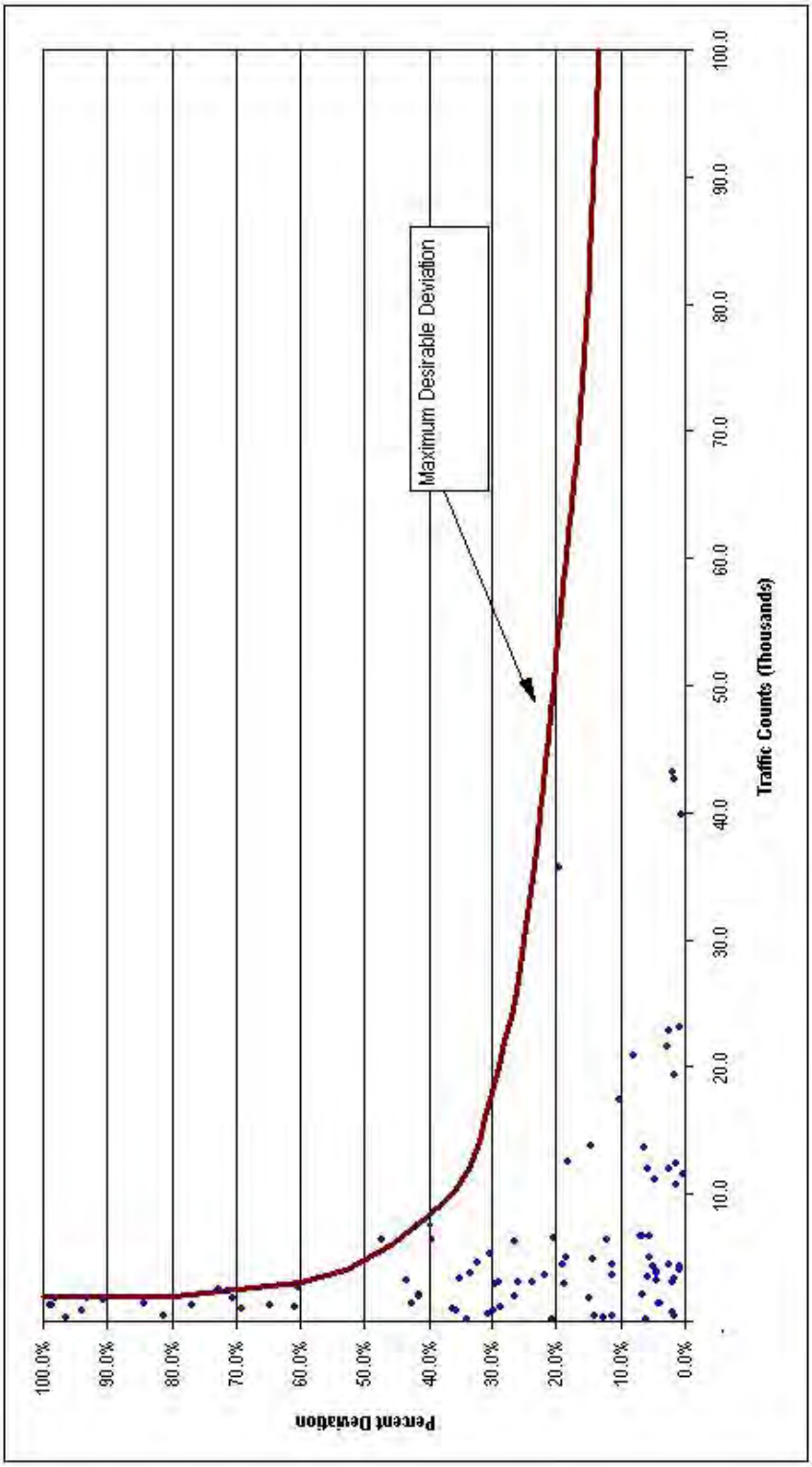


Figure 3-4
Percent Deviation for Calibration Links
San Marcos Transportation Master Plan
San Marcos, Texas

Chapter 4
Functional Classification System

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. As indicated in **Figure 4-1**, a functional roadway system facilitates a progressive transition in the flow of traffic from the provision of access to the provision of movement. Freeway and arterial facilities are at one end of the spectrum, primarily providing the function of moving vehicles. Collector and local streets are at the opposite end of the spectrum, providing access to property. **Figure 4-2** shows schematically how various street classifications relate to each other in terms of movement and access.

To enable streets and highways to accomplish their intended function, the planning and design of the facilities should consider those elements that support the intended functions. Descriptions of the various roadway functional types and related planning and design considerations are provided in the following section.

FREEWAYS

These facilities include interstate highways, freeways, expressways and parkways, and provide for the rapid and efficient movement of large volumes of traffic between regions and within one region. Direct access to abutting property is not an intended function of these facilities. Design characteristics support the function of traffic movement by providing multiple travel lanes, a high degree of access control, and no at-grade intersections.

ARTERIALS

Arterials primarily provide for traffic movement, with a secondary function of providing direct access to abutting property. Major arterials typically serve as connections between major traffic generators and land use concentrations, and facilitate large volumes of through traffic traveling across a community. Minor arterials typically serve as connections between local and collector streets and the major arterials, and facilitate the movement of large traffic volumes over shorter distances within the community. Because direct access to abutting property is a secondary function of arterial streets, access should be carefully managed to avoid adverse impacts on the movement function intended for these facilities.

Major Arterials

Major arterials are streets and highways that provide a high degree of mobility, serve relatively high traffic volumes, have high operational speeds (45 mph or greater), and serve a significant portion of through travel or long-distance trips. Major arterials serve as primary routes through the City of San Marcos and between major destinations within the area. They are continuous over long distances and serve trips entering and leaving the area as well as trips within it. These facilities generally serve high volume travel corridors that connect major traffic generators, but lower volume roadways that are continuous over long distances may also function as major arterials, particularly in fringe and rural areas. They may vary from multi-lane roadways with four to six lanes or more, down to two-lane roadways in developing fringe and rural areas, where traffic volumes have not increased to the point that more travel lanes are needed. Functional classification is not dependent on the existing number of lanes, since the functional role served

Figure 4-1
Hierarchical Functional Classification System
San Marcos Transportation Master Plan
San Marcos, Texas

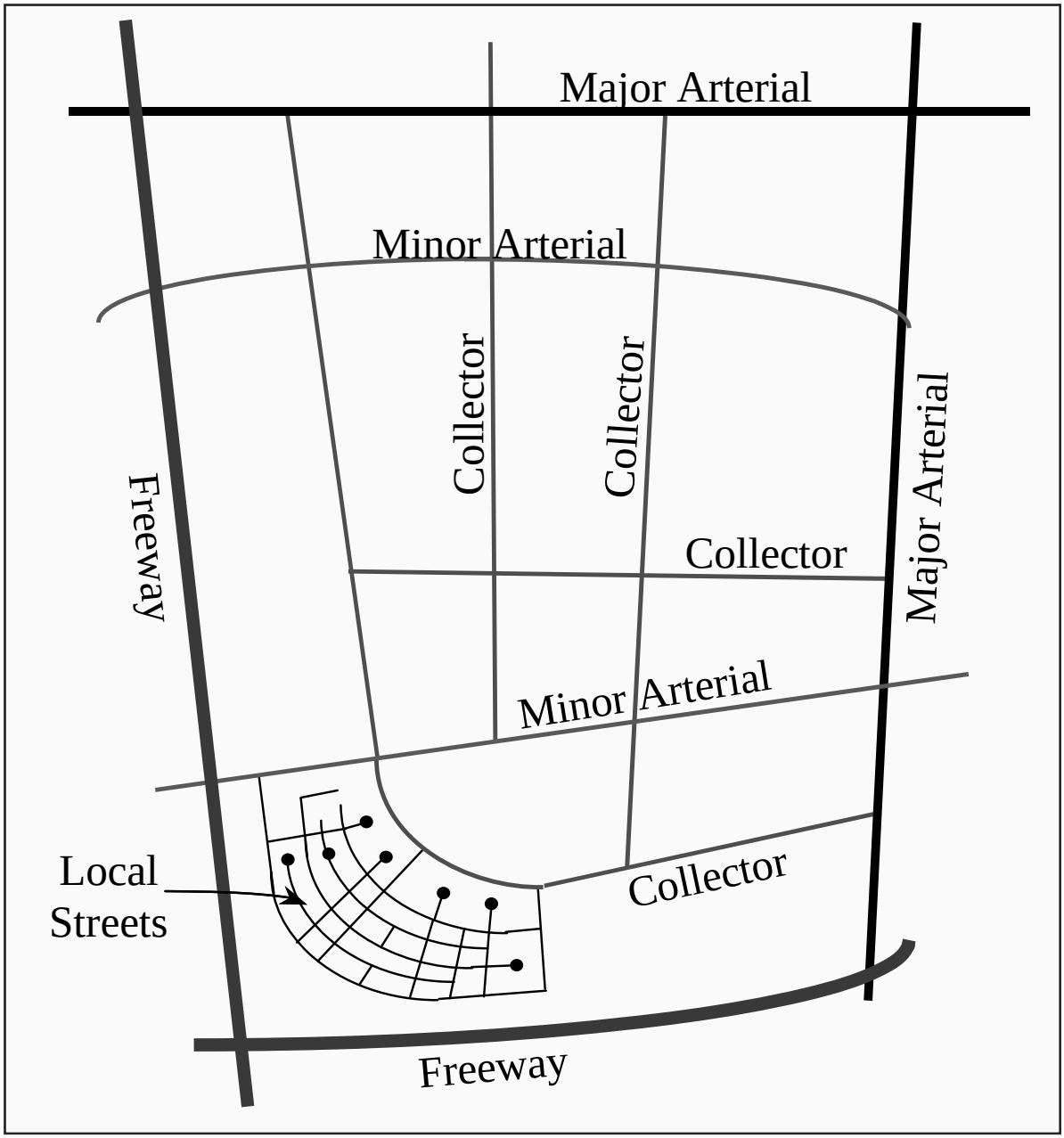
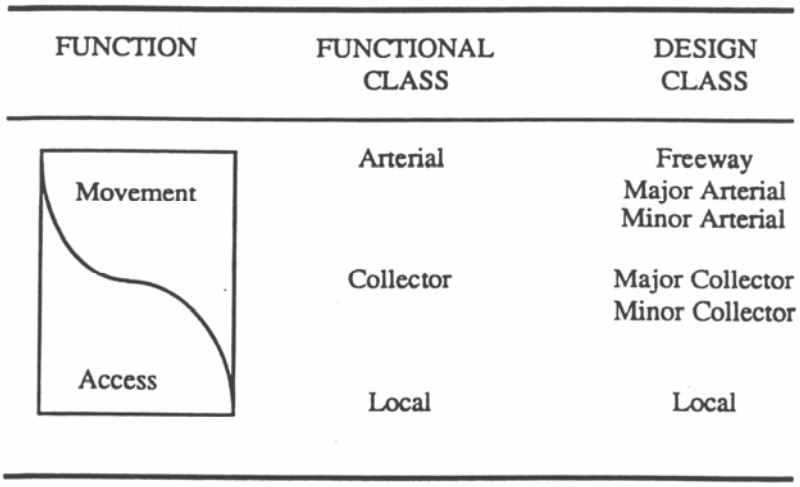


Figure 4-2
Functional Classification System Hierarchy
San Marcos Transportation Master Plan
San Marcos, Texas



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

by a roadway typically remains constant over time, while the roadway's cross section is improved to accommodate increasing traffic volumes. Major arterials form an interconnecting network for citywide and regional movement of traffic, including connections to freeways and expressways, and to minor arterials and collectors. A one to two-mile spacing is generally desirable between major arterials, with a one-mile spacing between a major arterial and a minor arterial or freeway.

Since traffic movement, not land access, is the primary function of major arterials, access management is essential. Driveways connecting directly onto a major arterial should be minimized to avoid traffic congestion and delays caused by turning movements for vehicles entering and exiting driveways. Off-peak travel speeds on major arterials are typically 40 to 55 mph, and peak period speeds are about 30 to 40 mph. Intersections with other public streets and private access should be designed to limit speed differentials between turning vehicles and other traffic to no more than 10 to 15 mph. Signalized intersection spacing should be long enough to allow a variety of signal cycle lengths and timing plans that can be adjusted to meet changes in traffic volumes and maintain traffic progression (desirably one-third to one-half mile consistent spacing). Also, major arterials should be constructed or retrofitted with raised medians where possible to increase roadway safety and improve traffic operations.

Minor Arterials

Minor arterials are similar in function to major arterials, except that they provide a higher degree of local access than major arterials. Minor arterials include all remaining arterial streets and highways in the urbanized area and serve less concentrated traffic generating areas, such as neighborhood shopping centers and employment centers. Although minor arterials are very similar in function to

major arterials, this class typically distributes medium traffic volumes for shorter distance trips than major arterials. In general, the projected future traffic volumes on minor arterials will be lower than the volumes carried by major arterials.

Minor arterials are generally continuous over shorter distances than major arterials. Travel speeds along minor arterials are typically 30 to 45 mph in off-peak periods, and 20 to 35 mph in peak periods. Minor arterials serve as boundaries to neighborhoods and collect traffic from collectors and local streets. Although a minor arterial typically provides more local access than a major arterial, the primary function is still traffic movement. Major and minor arterials are generally spaced at one mile intervals in an alternating grid pattern. In addition, any minor arterial that currently exceeds a daily ADT of 20,000 or is forecasted to reach that traffic volume should have a raised median for safety and to improve traffic operations. Specifications for the roadway cross section requirements are contained in the City's Design Manual.

COLLECTORS

Collector streets provide for a balance of traffic movement and property access functions. Traffic movement is often internal to localized areas, with collectors connecting residential neighborhoods, parks, churches, etc. with the arterial system. As compared to arterial streets, collectors accommodate smaller traffic volumes over shorter distances. Collector streets are the connectors between arterials and local streets that serve to collect traffic and distribute it to the arterial network. Collectors also serve to provide direct access to a wide variety of residential, commercial and other land uses, and their design involves site-specific considerations. They provide service to neighborhoods and other local areas, and may border or traverse neighborhood boundaries. Parking may be permitted on-street in residential areas.

Since collectors are used for short distance trips between local streets and arterials, they should be continuous in the spaces between arterials. Collectors may also extend across arterials. To provide efficient traffic circulation and preserve amenities of neighborhoods, collectors should desirably be spaced at about one-quarter to one-half mile intervals. Subdivision street layout plans should include collectors as well as local streets in order to provide efficient traffic access and circulation. Operating speeds for collectors are typically about 30 to 35 mph. Since speeds are slower and more turn movements are expected, a higher speed differential and much closer intersection/access spacing can be used than on arterials. On-street parking may be permitted in residential areas. Direct access to abutting land is essential; parking and traffic controls may be necessary for safe and efficient through movement of moderate to low traffic volumes at key intersections.

Collectors may be constructed with or without center turn lanes, and may permit or restrict parking, depending on the cross section design chosen. Roadway cross section details are contained in the City's Design Manual. Collectors serve an important role in collecting and distributing traffic between major/minor arterials and local streets. Their identification is essential in planning and managing traffic ingress/egress and movement within residential neighborhoods as well as commercial and industrial areas.

LOCAL STREETS

Local streets function to provide access to abutting property and to collect and distribute traffic between individual parcels of land and collector or arterial streets. Local streets include all other streets and roads that are not included in higher functional classes. They include internal and access streets that allow direct access to residential and commercial properties and similar traffic destinations. Direct access to abutting land is their primary role, for all traffic originates or is destined to abutting land. On-street parking may be permitted. Trip lengths on local streets are short, volumes are low, and speeds are slow, generally 20 to 30 mph. Local streets typically comprise between 65 to 80 percent of the total roadway system.

Through traffic and excessive speeds should be discouraged on local streets by using appropriate geometric designs, traffic control devices, curvilinear alignments, and discontinuous streets. Local streets should be designed for low speed traffic with an emphasis on providing access. One factor in the functional classification of roadways is their existing and proposed traffic volumes. **Table 4-1** shows ranges of vehicles per day along with the corresponding roadway functional classification.

Table 4-1
Traffic Volume Ranges by Functional Classification
San Marcos Transportation Master Plan
San Marcos, Texas

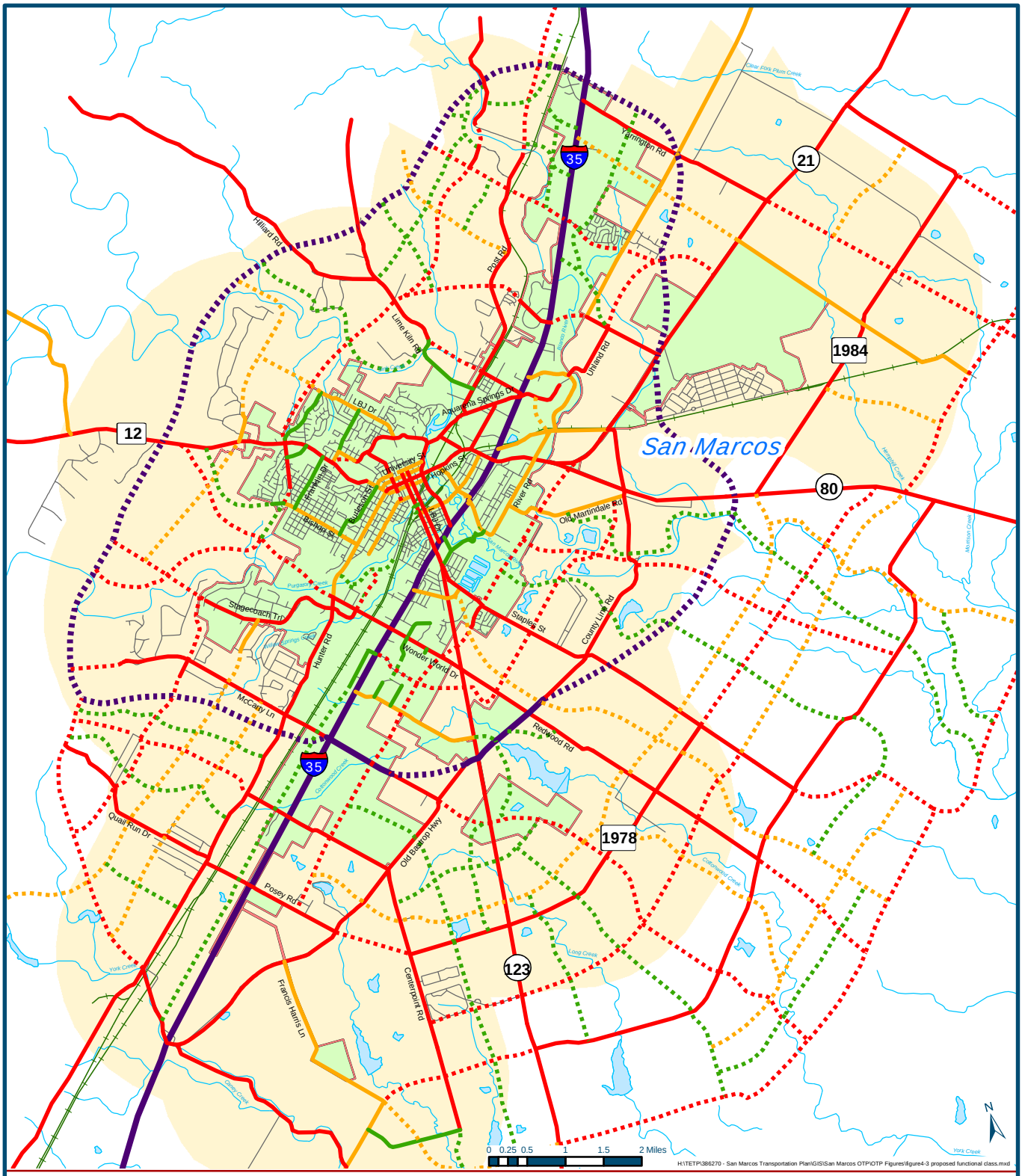
Functional Classification	Volume Ranges
Residential/Local Streets	500 vpd
Residential/Neighborhood Collector	500 to 3,000 vpd
Commercial Collector	2,000 to 10,000 vpd
Industrial Collector	2,000 to 10,000 vpd
Minor Arterials	10,000 to 28,000 vpd
Major Arterials	28,000 to 42,000 vpd
Parkways	> 42,000 vpd
Freeways	> 42,000 vpd

Source: City of San Marcos Roadway Design Manual

PROPOSED FUNCTIONAL CLASSIFICATION SYSTEM

After reviewing the existing functional classification system for the City of San Marcos against these criteria, a few changes to the existing classification system have been made. The proposed functional classification system is shown in **Figure 4-3**. The City's existing functional classification system is shown in Figure 2-2 in Chapter 2. This existing functional classification system and Thoroughfare Plan was used as the starting point for development of the Proposed Thoroughfare Plan and Functional Classification System, which incorporates the recommended TMP projects shown in **Chapter 8 – Recommended Transportation Master Plan**, as well as additional corridors for right-of-way preservation to serve future development. This proposed system was developed based upon field reconnaissance, physical characteristics, traffic volumes, and input from City Staff and the TAB, Technical Advisory Committee and Stakeholders. The primary change between the existing and proposed functional classification systems is the division of arterial streets into two categories – major and minor.

Key recommended changes to the existing Functional Classification System include a consolidation of several categories to simplify the public's understanding of the system. Freeways and parkways have been consolidated into "Freeways"; all types of major arterials have been consolidated, as have minor arterials, regardless of whether they are divided or not; and all collectors have been consolidated into a single category. Remaining roadways in the study area are classified as Local. Interstate 35 is currently the only freeway facility in the study area. However, the Outer Loop Freeway is a major proposed component of the future system. Major arterials include Hopkins Street, Hunter Road, RM 12, SH 123, SH 21, SH 80 and Wonder World Drive. Examples of minor arterials include Bishop Street, LBJ Drive and River Road. Collector streets include roads such as Cape Road, Franklin Drive and Burleson Street.



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Date: May 11, 2004

Map Key

Functional Class

- Freeways
- Major Arterials
- Minor Arterials
- Collectors
- Local Streets
- Railroads
- San Marcos City Limits
- San Marcos ETJ

NOTE: Existing functional classes are shown as solid lines, while proposed functional classes are shown as dashed lines.

Figure 4-3 Thoroughfare Plan and Functional Classification System

San Marcos Transportation Master Plan
San Marcos, TX

Chapter 5
Future Traffic Impacts

A detailed understanding of the study area's characteristics and its growth potential is important in the preparation of a Transportation Plan. Development of the City of San Marcos Transportation Master Plan involved an extensive evaluation of alternative transportation systems to determine their ability to meet future transportation needs and community objectives. An important factor in determining future transportation needs of the study area was the use of the transportation models to develop future travel demand forecasts based on projected land use and development patterns in the area. In addition to traffic service, factors such as maximum utilization of the existing transportation system, community acceptance, impact on land development, and conformance with growth policies and community goals and objectives were considered in developing and evaluating transportation plan alternatives.

TRAFFIC CAPACITY CRITERIA

The principal determinants of roadway capacity are the number and width of travel lanes. Other factors, such as the spacing and efficiency of signalized intersections, type and intensity of adjacent development, traffic composition, and traffic controls and regulations also influence the ability of a roadway to accommodate traffic. Additionally, the size of the city and motorists' driving habits influence the level of service that is experienced on the transportation system.

The level of service provided by any facility is a function of prevailing conditions along that facility as related to the demands exerted by traffic. A desirable level of service is attained when a stable flow of traffic is maintained at the desired travel speed. Increasing traffic densities beyond this level result in greater delays and lower travel speeds, which describe service levels below those accepted as desirable.

Estimated daily roadway capacities for the various facilities in the City of San Marcos are presented in **Table 5-1**. These values, generated by the TransCAD model, were used in the evaluation of transportation system alternatives through the comparison of assigned future traffic volumes to the traffic carrying capabilities of the roadway network facilities.

For the purposes of analyzing alternative transportation networks, roadway facilities were evaluated based on the level-of-service definitions and procedures identified in Chapter 2, Existing Transportation Conditions. Facilities with higher volume-to-capacity (v/c) ratios were considered to experience higher delays and congestion during peak periods than roadway facilities with lower v/c ratios.

Table 5-1
Estimated Roadway Capacities
San Marcos Transportation Master Plan
San Marcos, Texas

Facility Type	Number of Lanes	Daily Capacity (Vehicles per Day)
Interstate - Suburban	8 (4 per direction)	212,000
	6 (3 per direction)	159,000
Interstate - Rural	4 (2 per direction)	64,000
Freeway - Suburban	8 (4 per direction)	192,000
	6 (3 per direction)	144,000
Freeway - Rural	4 (2 per direction)	58,000
Major Arterial – Suburban	6	55,500
	5	41,250
	4 (Divided w/median)	37,000
	4 (Undivided)	33,000
	3	24,750
	2	16,500
Major Arterial – Rural	6	39,000
	5	28,750
	4 (Divided w/median)	26,000
	4 (Undivided)	23,000
	2	11,500
Minor Arterial – Suburban	5	25,000
	4 (Undivided)	20,000
	3	15,000
	2	10,000
Minor Arterial – Rural	6	24,000
	5	17,500
	4 (Divided w/median)	16,000
	4 (Undivided)	14,000
	2	7,000
Collector – Suburban	4	18,000
	2	9,000
Collector – Rural	2	4,000
Local – Suburban	2	9,000

Source: TransCAD Travel Demand Model, CAMPO Regional Model, and Wilbur Smith Associates.
Note: Model capacities are based upon area type, so model capacities are higher for roadways in the Suburban category than for those in the Rural category, even within the same Facility Type.

FUTURE TRAFFIC ON EXISTING PLUS COMMITTED NETWORK

The initial step in determining the study area's transportation improvement needs was the assignment of future year 2025 travel forecasts to a transportation system that includes the existing roadway network plus facilities under construction or committed (programmed) for implementation. This roadway network is referred to as the Existing Plus Committed (E+C) Network.

Committed improvements included various improvements either currently under construction or planned for construction within the next few years, by the year 2007. In addition, the committed improvements list included roadway projects that were completed since the year 2000 when the existing traffic count data was collected. The committed roadway improvement projects were identified previously in Chapter 2 under the section Planned Transportation Improvements.

FUTURE TRAFFIC VOLUMES AND PROJECTED DEFICIENCIES

Future traffic volumes were projected for the year 2025 on the E+C network using the travel demand model described in Chapter 3 – Travel Demand Model. Future year 2025 traffic volumes were highest along Interstate 35 (average daily traffic volume (ADT) between 129,700 and 144,200 vpd) and along Hunter Road (ADT between 35,400 and 43,900), as shown in **Figure 5-1**. Other heavily traveled roadways include Aquarena Springs Drive (ADT 36,700); SH 21 (ADT 35,900); SH 123 (ADT 26,200); Wonder World Drive (ADT 28,000); Hopkins Street (ADT 27,900); Post Road (ADT 27,000); RM 12 (ADT 27,100); Sessom Drive (38,100); Post Road (39,100); and Lime Kiln Road (ADT 35,400).

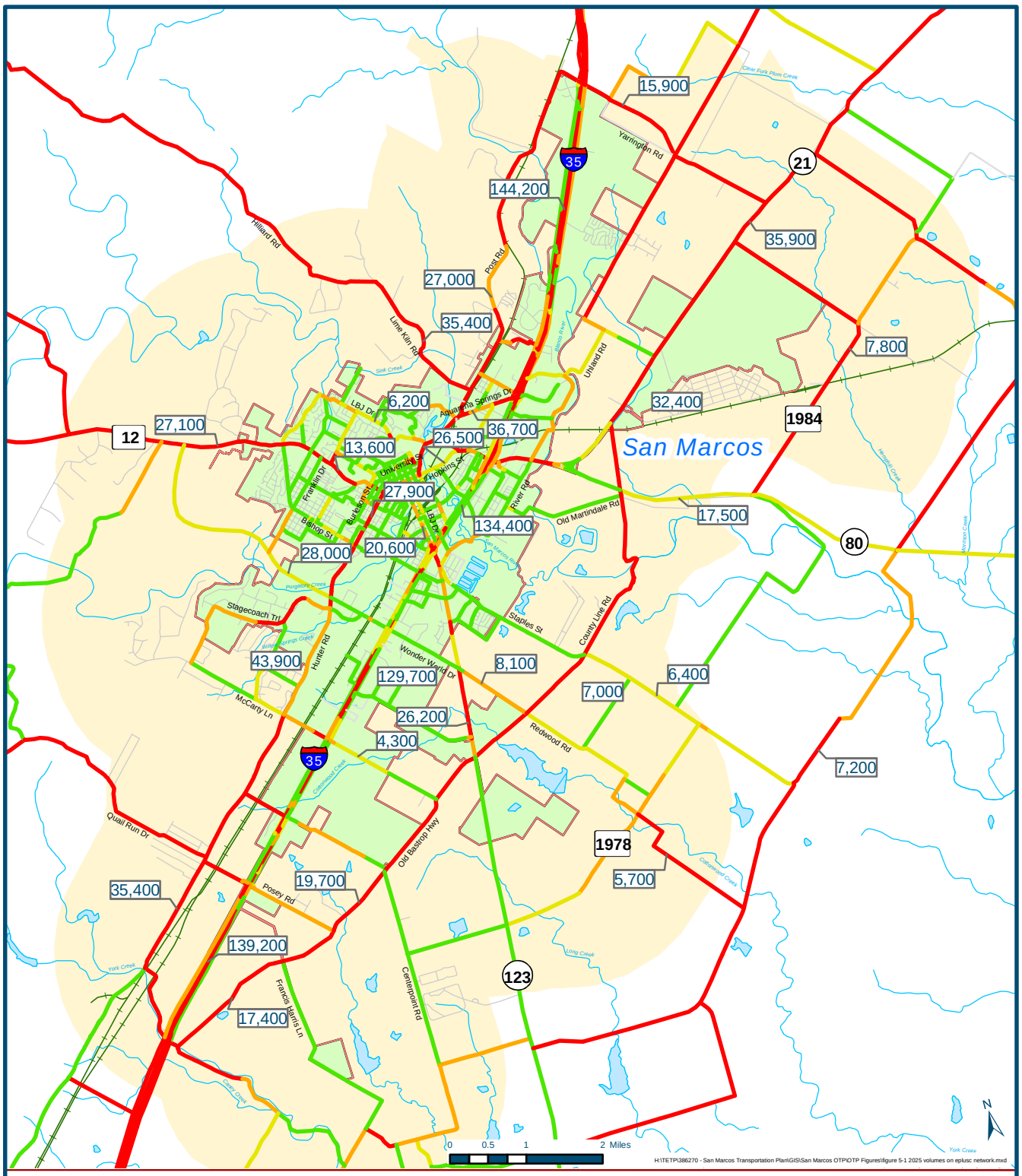
In addition to the roads mentioned above, other roadways also have significantly high projected volumes in the 2025 E+C model network, including: Old Bastrop Highway, SH 80 and Guadalupe Street.

Several corridors are projected to operate at unacceptable levels of service even with the committed roadway improvements. Some of the more critical routes projected to experience congestion include IH 35, RM 12, Lime Kiln Road, Post Road, Hunter Road, Hopkins Street, Aquarena Springs Drive, SH 21, SH 123, and Old Bastrop Highway.

EVALUATION OF ALTERNATIVES

Results of the year 2025 traffic assignments on the E+C network were analyzed in detail and used as a basis for developing alternative transportation systems. In developing the San Marcos Transportation Master Plan, three test networks were evaluated in terms of satisfying future travel demand needs and meeting established goals and objectives.

In the initial step of the evaluation process, a comprehensive list of all viable roadway improvement alternatives was developed, as shown in **Figure 5-2**. The Transportation Alternative Concepts were then divided into three test networks for evaluation purposes.



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Roads
- Railroads
- San Marcos City Limits
- San Marcos ETJ
- 1234 Volumes

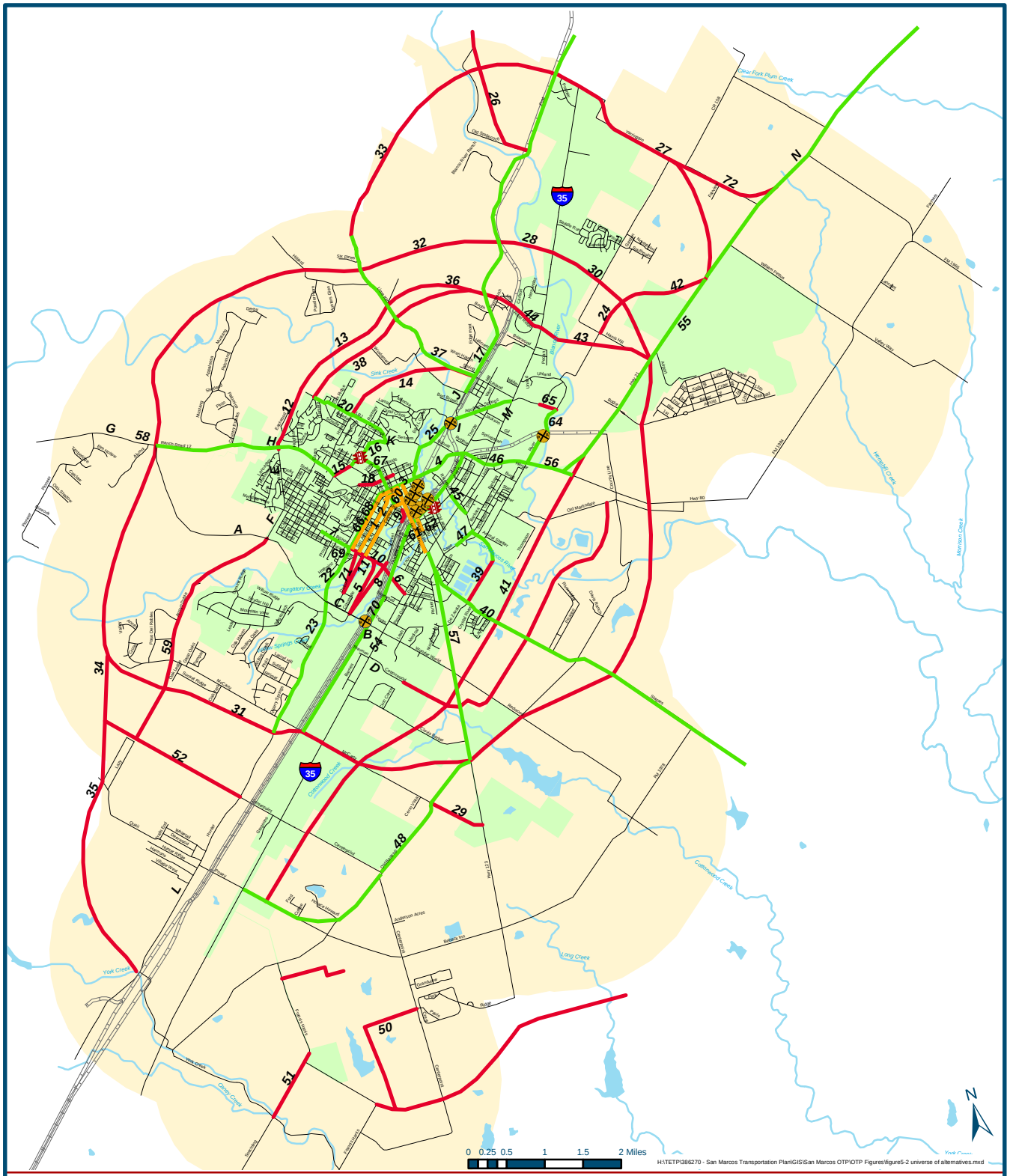
Map Date: November 25, 2003

LOS

- A
- B
- C
- D
- E
- F

Figure 5-1
Year 2025 Projected Daily Traffic Volumes and Levels of Service on the Existing Plus Committed Network

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Roads
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Map Date: November 25, 2003

Planned Improvements

- Operational Change
- Widen Existing Roadway
- New Roadway Construction
- RR Grade Separation
- Install Traffic Signals

Figure 5-2
Universe of Alternative Transportation Improvement Projects

San Marcos Transportation Master Plan
San Marcos, TX

Test Network A consisted of widenings and improvements to existing major roadways. Network A included the examination of many alternatives within the central part of the City. Test Network B consisted of new facilities and roadway widenings, primarily focusing on improvements on the east side of IH 35. Test Network C focused on new roadways and widenings on the west side of IH 35, away from the central city.

FUTURE TRAFFIC IMPACTS OF TEST NETWORKS

All three test networks provided improved traffic operations in most areas of San Marcos, with certain roadway improvements performing better than other alternatives. Level-of-service improvements and changes in future traffic volume forecasts varied between the various test networks, as shown in **Figures 5-3, 5-4,** and **5-5**. Note that all year 2025 networks modeled through Chapter 5 identify a shortage of major roadways in the northwestern portion of the region.

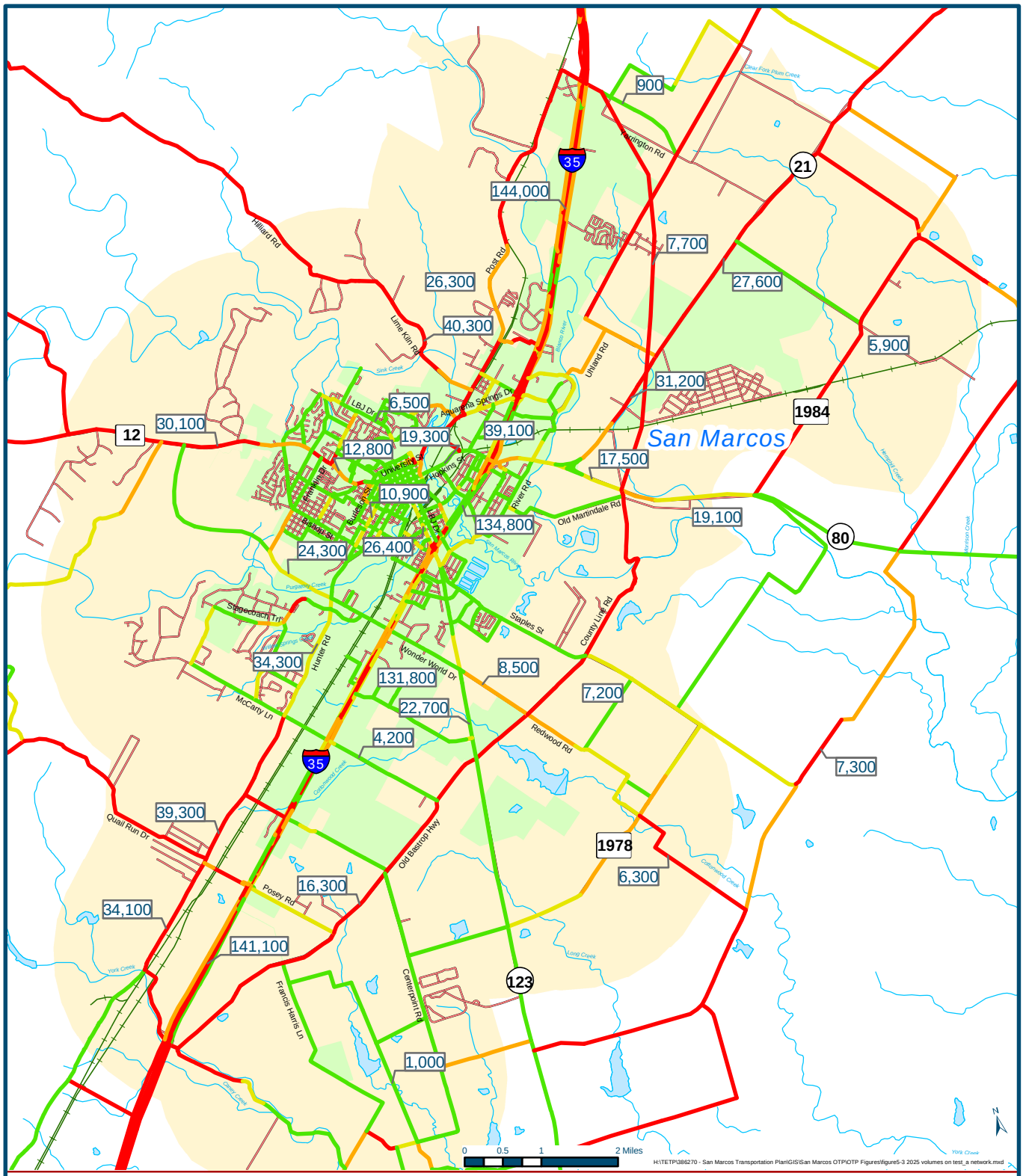
Test Network A

Improvements in Test Network A primarily focused on improving traffic operations in the central part of San Marcos. From the Universe of Alternative Transportation Improvements shown in Figure 5-2, the following projects were included in Test Network A:

2 – Convert Hopkins and MLK to one-way pair
4 – Widen Hopkins from CM Allen to IH 35
15 – Extend Sessom from Academy to RM 12
16 – Widen Sessom from Academy to Aquarena Springs Drive
18 - Complete missing segments to connect University Drive to RM 12
22 - Widen Hunter from Wonder World to San Antonio Street
25 - Widen Aquarena (Sessom to IH 35)
37 - Lime Kiln Widening from Hilliard east to join Uhland Road
40 - Widen FM 621 from E. Outer Loop to SH 123
46 - Widen SH 80 under IH 35 to provide 1 left turn lane for each direction
56 - Widen SH 80 to 6 lanes between IH 35 and SH 21
57 - Widen SH 123 to 6 lanes from IH 35 to E. Outer Loop

These projects were added to the E+C network, and a model assignment was run to determine their effectiveness in improving traffic movement. Overall, the improvements in Test Network A did result in mobility improvements. However, certain roadways remain over capacity, and have unacceptable levels of service. These include:

- IH 35
- Hunter Road (FM 2439)
- Old Bastrop Highway (CR 266)
- Hopkins Street (RM 12)



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

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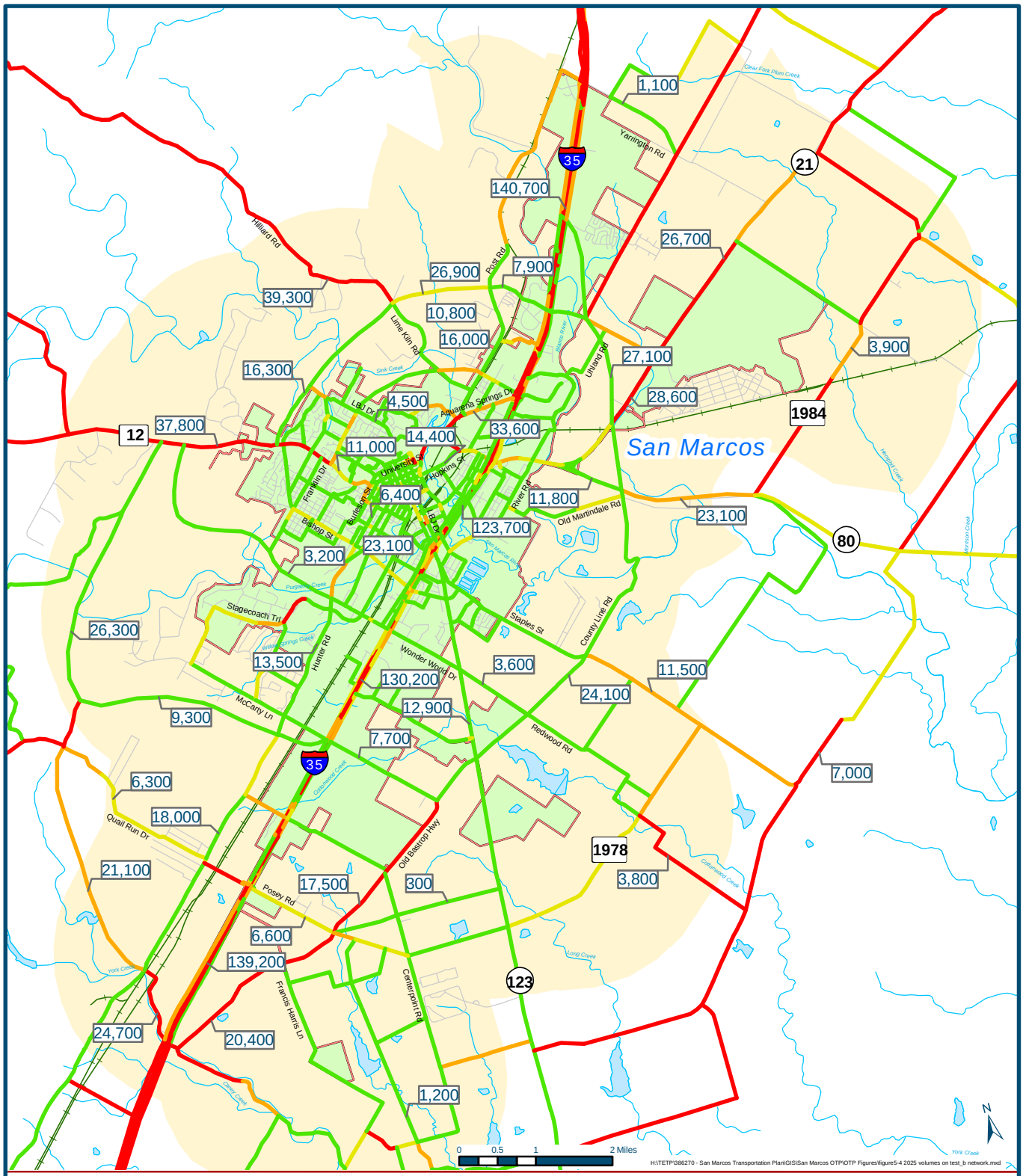
Map Date: November 25, 2003

Figure 5-3
Year 2025 Projected Daily Traffic Volumes and Levels of Service on the Test Network A

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Roads
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- San Marcos City Limits
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- 1234 Volumes

Map Date: November 25, 2003

LOS

- A
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- C
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- E
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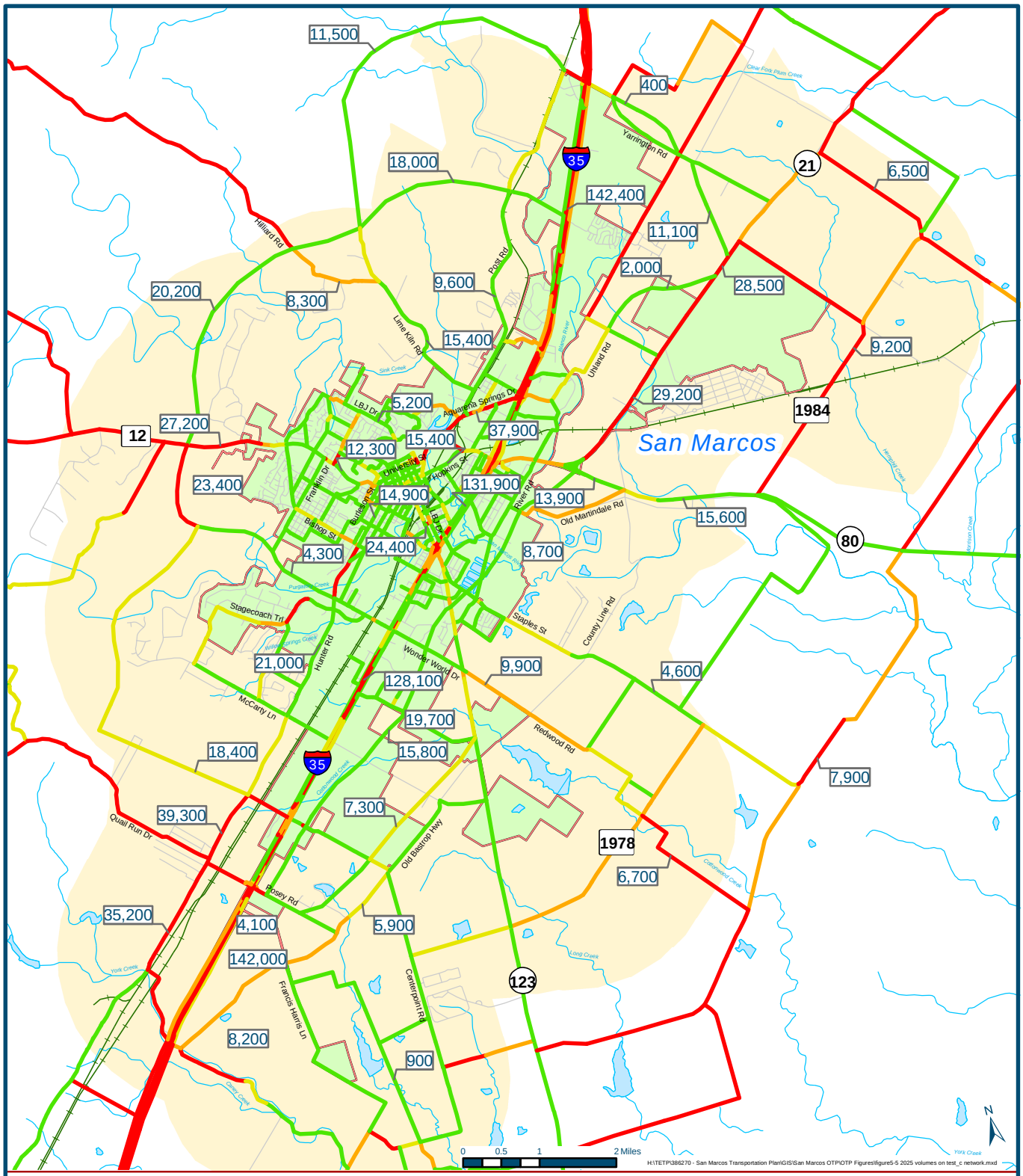
Figure 5-4
Year 2025 Projected Daily Traffic Volumes and Levels of Service on the Test Network B

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

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- Railroads
- San Marcos City Limits
- San Marcos ETJ
- 1234 Volumes

LOS

- A
- B
- C
- D
- E
- F

Map Date: November 25, 2003

Figure 5-5
Year 2025 Projected Daily Traffic Volumes and Levels of Service on the Test Network C

San Marcos Transportation Master Plan
San Marcos, TX

- RM 12
- Lime Kiln Road
- Hilliard Road
- Post Road
- SH 21

Test Network B

Both Test Networks B and C looked at potentially implementing improvements outside of central San Marcos. The purpose of this was two-fold – to protect historic neighborhoods within the central city, and attempt to steer traffic away from the core, where right-of-way is limited, to the outer areas, where right-of-way is more readily available or more easily acquired. The output from the Network B model assignment showed improvements over the E+C network, and also showed that it was possible to divert some traffic away from the center of town. The following projects were modeled in Test Network B:

6 - Bishop extension to IH 35 aligned with Broadway (including RR Grade Separation)
10 - MLK extension to Bishop Street extension
13 - Extend Craddock to Lime Kiln and IH 35
14 - Holland extension to Post Road at Uhland
15 - Extend Sessom from Academy Street to RM 12
16 - Widen Sessom from Aquarena Springs to Academy Street
17 - Widen Post Road form Aquarena Springs to northern study area limit
20 - Widen LBJ from Sessom to Tanglewood
30 - E. Outer Loop from IH 35/Posey Road to IH 35/McCarty Lane
31 - W. Outer Loop from IH 35/Posey Road to RM 12
37 - Lime Kiln Widening from Hilliard east to join Uhland
43 - Extend River Ridge Parkway to Harris Hill near Airport
44 - Extend River Ridge Parkway west to Craddock extension
70 - Construct new north-south arterial parallel to east side of railroad tracks

In this test network, three-fourths of the Outer Loop was modeled – the entire eastern half, and the southwestern portion from RM 12 to IH 35. Most network roads in this model assignment performed at an acceptable level of service, with the following major exceptions:

- IH 35
- Old Bastrop Highway
- Aquarena Springs Drive
- SH 21
- Hilliard Road
- RM 12
- Charles Austin Drive

Test Network C

Generally speaking, Test Network C incorporates many new roadway facilities into the San Marcos network, including the northwestern quadrant of the Outer Loop, and a major new north-south arterial east of and parallel to IH 35, in addition to some key roadway widenings.

The following projects were included in the analysis for Test Network C:

5 - Bishop arterial extension to Wonder World
17 - Widen Post Road form Aquarena Springs to northern study area limit
21 - Extend LBJ northward from Tanglewood to W. Outer Loop
28 - E. Outer Loop to Post Road
29 - Connector for E. Outer Loop (McCarty to Posey) – Collector
32 - W. Outer Loop Alt. A
33 - W. Outer Loop Alt. B
37 - Lime Kiln Widening from Hilliard east to join Uhland
41 - Extend SH 21 South to Posey
52 - Centerpoint extension west of IH 35 to W. Outer Loop
59 - New north-south arterial from Centerpoint extension to Wonder World Extension
72 – Realign and widen Yarrington Road from SH 21 to IH 35

However, even with the improvements made in this network, key deficiencies are still forecasted to occur, including the following key roadways:

- IH 35
- RM 12
- Wonder World Drive
- Hunter Road
- Hilliard Road
- Charles Austin Drive
- Aquarena Springs Drive
- SH 21

In addition to the roadways listed above, the model identifies a shortage of adequate roadways in the southwestern part of the City. As identified with all other networks modeled to this point, a shortage of roadways also occurs in the northwestern quadrant of the study area.

Based upon the travel demand model outcome of all future year traffic forecasts, including year 2025 traffic on the No Build, E+C, and three Test Networks, a recommended Transportation Master Plan was developed and tested to reduce the percentage of the roadway system that will operate at an unacceptable level of service. The components of this network and the projected traffic results are presented in **Chapter 8 – Recommended Transportation Master Plan**.

FUTURE TRAFFIC IMPACTS OF RAILROAD CROSSINGS

As discussed in Chapter 2, the City of San Marcos is literally divided in half by a major north-south rail line. Existing vehicular delay at the City's top 24 at grade railroad crossings is estimated at over 39,000 vehicular minutes per day, or 656 hours. Assuming rail traffic remains constant for the next 20 years, vehicular delay at the City's top 24 at grade railroad crossings is expected to increase to over 60,800 vehicular minutes per day in year 2025 (or over 1,000 hours), which is a 55 percent increase over present levels.

Chapter 6
Bicycle and Pedestrian Element

There are a wide range of facility improvements that can enhance the safety and attraction of bicycle and pedestrian transportation in San Marcos. Improvements can be simple and involve minimal design consideration (such as changing drainage grate inlets) or they can involve a detailed design (such as constructing a hike and bike trail).

With proper planning and design, roadway improvements for motor vehicles can also enhance bicycle and pedestrian travel, and, in any event, should avoid causing adverse impacts on bicycling and walking. A community's overall goals for transportation improvements should, whenever possible, include the enhancement of bicycling and consider the needs for pedestrian movement.

COMMUNITY INVOLVEMENT

During the development of the Bicycle and Pedestrian element, input was sought from the local community. Those persons that were advocates for bicycle and pedestrian mobility and safety in San Marcos were asked to serve as a member of the Bicycle and Pedestrian Advisory Committee (BPAC). In addition to the advocates, this committee consisted of representatives from various departments of the city including Planning, Engineering and Parks. Meetings were held with the BPAC at strategic points in the plan development process.

In addition, members of the BPAC and other interested bicycle and pedestrian advocates were invited to participate in two facilities planning and design workshops, one each for bicycling and pedestrian facilities. These workshops were conducted to familiarize city staff with pedestrian and bicyclist attributes and needs, as well at to examine access passageways to significant designations. The half-day Bicycle Workshop consisted of classroom instruction on bicycle planning and design followed by an on-bicycle tour of one of four potential off-street and on-street corridors, followed by a debriefing session to discuss reactions to the corridors and potential alternatives and treatments. The half-day Pedestrian Workshop was conducted in much the same way, with participants walking one of three sidewalk or trail routes. Some extremely detailed observations were made during these workshops which will be beneficial for future facility development endeavors by the City.

The Bicycle and Pedestrian elements were discussed at meetings with the general public in conjunction with presentations on the entire Transportation Plan. The Bicycle and Pedestrian elements were also presented to the open meetings of the Transportation Advisory Committee.

GOALS

Goals and objectives for the City's bicycle and pedestrian efforts were developed using input provided by the BPAC.

Goal #1 - Promote Bicycle and Pedestrian Travel by Texas State University community.
Objectives:
1.1 Provide safe access from off campus housing.
1.2 Provide safe access from on campus to the community.
1.3 Facilitate multi-modal bike/pedestrian/bus usage and to/from parking lots.
1.4 Provide for on-campus bike circulation and parking.

Goal #2 - Develop a Master Plan of Pedestrian Facilities.
Objectives:
2.1 Make sidewalks continuous within any corridor segment.
2.2 Connect residential areas to neighborhood services and key destinations for pedestrians.
2.3 Connect residential areas to other neighborhoods and parks/green spaces.
2.4 Cross (eliminate) barriers safely
2.5 Pedestrian connectivity within commercial areas.
2.6 Develop safe routes to schools within school service areas.
2.7 Plan for public facilities with pedestrian access in mind (especially schools/transit stops)

Goal #3 – Improve Bicycle Safety and Mobility in San Marcos.
Objectives:
3.1 Adopt a master plan of bicycle facilities.
3.2 Address general public attitudes toward bicyclist on roadways through education.
3.3 Provide safe facilities for bikes.
3.4 Promote proper bicycling practices through engineering/education/enforcement.
3.5 Provide continuity of bike facilities.
3.6 Connect neighborhood to neighborhood safely.
3.7 Connect to parks/green space corridors.
3.8 Provide bike parking at all public facilities.
3.9 Provide safer routes to school.
3.10 Coordinate dual usage of recreational facilities for mobility and access.
3.11 Coordinate with neighboring jurisdictional CAMPO for providing bike facilities.
3.12 Encourage commute bicycling to major employment centers.

These objectives fall into three work areas:

- Advance planning
- Design of safe facilities
- Funding and implementation

SYSTEM DEVELOPMENT CRITERIA

The factors to be considered in selecting the proper type and location of bicycle and pedestrian facilities were reflected in the goals and objectives developed for this plan. The system development criteria can be summarized into the following three categories:

1. **Increase Accessibility**
   a. Potential use can be maximized;
   b. Access points to and from the facility;
   c. Directness of route, minimize delay; and,
   d. Cross physical barriers to provide opportunities for bicycling and walking.

2. **Promote Safe Use of Bicycles**
   a. Minimize conflicts;
   b. Minimize potential for number and severity of accidents;
   c. Provide good quality pavement surface; and,
   d. Allow proper security of facility.

3. **Encourage Use of Bicycle and Pedestrian Modes of Transportation**
   a. Connect residential areas with major activity centers and recreational areas;
   b. Provide adequate coverage with proper facilities;
   c. Provide continuity of designated facilities; and,
   d. Provide connections to major transit facilities to promote intermodal travel.

Any one of these factors may be the dominant consideration depending on the prevailing situations such as location of activity centers, available street network and off-road corridors, and physical barriers.

SIGNIFICANT BICYCLE AND PEDESTRIAN ORIGINS AND DESTINATIONS

Bicycle and pedestrian activity should be accommodated within each residential subdivision, and between adjoining residential areas. There are particular activity centers within San Marcos that can be expected to attract significant bicycle and/or pedestrian activity.

Texas State University–San Marcos (Texas State) – With an anticipated enrollment of some 26,500 students, the University is the largest activity center in the region, and the one most likely to generate bicycle and pedestrian trips. The University central campus lies generally north of University Drive, south of Sessom, and east of Guadalupe and includes the park and adjacent

building along the San Marcos River south of Aquarena Springs. Significant student housing is located within two miles of campus along Aquarena Springs, LBJ and Post Road.

- **Residential Area North of Texas State** – North of Sessom Drive to Holland Street is a mixture of single and multifamily dwelling units while north of Holland Street is single family housing. All are within one mile of campus. Bike lanes and sidewalks are provided along Holland from Sessom to JFK.

- **Apartments along Aquarena Springs Corridor** – Apartments exist along Aquarena Springs Road and adjacent roadways from Post Road to IH 35 and have recently been constructed along essentially the entire length of Aquarena Springs from IH 35 to Uhland Road. The closest of the apartments, Bobcat Village, is approximately one-half mile from campus while the furthest apartment near Uhland Road is one and one-half miles from campus.

- **Apartments along Post Road Corridor**– North of Aquarena Springs, a string of apartments exists along Post Road within one and one-half mile of campus. The characteristics of these housing provisions indicate a relatively low income population, which would likely take advantage of walking and bicycling opportunities. The area is also likely to take advantage of the university transit service provided to this corridor.

- **Apartments along Hopkins Street** – A few apartments are located along Hopkins Street within one-quarter mile of IH 35 and between one mile and one and one-half mile from campus.

- **Other Apartments and Housing** – Other locations, such as the apartments near the medical center, may also attract students as may scattered rental houses. Many housing areas are either too distant from campus for a leisurely ride or walk, or lie along extremes of terrain that would be difficult to traverse except by automobile.

Currently, the University provides bus circulation service between significant housing areas and the central campus. Students should also be able to walk and bicycle between their nearby residence and the campus as well.

Downtown San Marcos – Immediately south of Texas State, across University Drive, is the San Marcos downtown area. The central core retail of San Marcos should be a very walkable place, and the central square has been improved with that in mind. But much beyond the central square, the sidewalk provisions become less adequate and then gradually non-existent. The Hopkins corridor southwest of downtown has good sidewalks along the north side of the street to the edge of the historical district near the intersection of RM 12 and FM 2439, and efforts have been made to complete a sidewalk along the south side of Hopkins to the intersection of RM 12

and FM 2439 and along the north side of Hopkins continuing west of the intersection of RM 12 and FM 2439. Some sidewalk also extends along one or both sides of San Antonio Street and Belvin Street for a distance westward away from downtown. The residential neighborhoods southeast of downtown do not have sidewalks connecting to downtown, in part due to the railroad corridor which lies between them and downtown.

Library and Recreation Center and City Hall – Wide sidewalks or paths have been provided in front of these city facilities, but connections are not made southwest across the San Marcos River to downtown or northeast across the railroad tracks to retail and apartment areas.

City Park South of Hopkins along San Marcos River – This regional park along a riverbank greenway provides recreational opportunities including a playground, baseball fields and an extensive hiking trail and accesses the east side of downtown. The existing trail consists of portions of gravel and portions of concrete trail, several side trail connections with stairs, some very steep sections and a discontinuity at the at-grade railroad crossing. The trail lacks a good connection to downtown. A nearby signalized intersection at CM Allen and Hopkins lacks pedestrian crossing signals and crosswalks for safe access to downtown.

Retail/Restaurants along Aquarena Springs – Between Post Road and IH 35, numerous restaurants and other retail stores along the Aquarena Springs corridor serve the nearby concentration of multi-family housing.

University Athletic Complex – Bounded by Aquarena Springs, Bobcat Road and the railroad, the athletic complex contains the university's football stadium and baseball diamonds the host evening and weekend events predominantly in the Spring and Fall.

Retail/Restaurants along Hopkins and Thorpe – Between the railroad west of IH 35 and River Road east of IH 35, numerous restaurants and other retail stores along Hopkins and Thorpe serve the nearby concentration of single and multi-family housing.

Safe Routes to School – Some school service areas have received sidewalks for their students to walk or bicycle to school, with needed pedestrian crossing signals provided at signalized intersections. However, there is not an established program for Safe Routes to School.

Recreational Bicycling Corridors – There are certain roadway corridors that are anticipated to be utilized by advanced bicyclists looking for exercise or recreational rides. These corridors include: Ranch Road 12 to the north, Post Road to the east, and Hopkins Road to the west.

EXISTING AND PROPOSED FACILITIES

Very few facilities have been designated for bicycling in San Marcos.

- There is an existing bike lane provided along Holland Street, between LBJ and Academy.
- The shoulders of Hopkins west of Wonder World Road and the shoulders along Wonder World Road north of IH 35 are designated for use by bicyclists.
- A wide sidewalk along Leah Road in front of an apartment complex one-quarter mile west of Wonder World Road has been designated as a shared use facility.

Sidewalks are required to be built as part of new development ordinances. However, older parts of the city have scattered or no sidewalks.

- Sidewalks are provided very well around the central square in Downtown, thanks to recent enhancements, though some of the handicap ramps are positioned improperly pointed at the center of the intersection. Pedestrian crossing signals are also provided on the square and to some extent a block or two beyond the square.
- Sidewalk provisions are generally provided though to minimal design standards and typically without curb ramps between downtown and the Texas State campus.
- Sidewalks are provided on either one side or the other for the most part along San Antonio, Hopkins and Belvin from Downtown to RM 12.
- Sidewalks have been extended recently along the north side of Hopkins from RM 12 westward to near the current city limit, with a one-quarter mile gap west of Bishop Street.
- A subdivision has placed sidewalks along one side of Stagecoach Road for the nearly one mile length through the subdivision, providing pedestrian access to the local elementary school along Stagecoach.
- Sidewalks existing along at least one side of Cheatham from Guadalupe to Hopkins, with a few missing segments.
- Wide sidewalks, or paths, have been provided along both sides of Hopkins in front of the City Library, Recreation Center and City Hall between Riverside and Bobcat Road, but not crossing the San Marcos River to directly access Downtown or across the railroad tracks to access the retail and residential developments along western Hopkins.
- Sidewalks are provided along the west side of River Road from just north of Hopkins to Barbara and along Barbara from River Road to Bugg. However there are no sidewalks along Bugg to connect to the retail development along Hopkins.
- Sidewalks are provided along Thorpe from Hopkins to Aquarena Springs. However, there is not a sidewalk connection from Thorpe to Cheatham.
- There are sidewalks along Uhland, Post and some local streets targeting safe routes to the elementary school on Post, but there are no further sidewalks along Post to connect the apartments along post to the retail along Aquarena Springs or for connection to the university campus or athletic complex.

- There are intermittent sidewalks along Aquarena Springs, mostly focused on getting sports attendees from remote lots to the football stadium, and along the front of campus buildings from Bobcat Road to Sessom. Some of the terminal points of the sidewalks at intersections point the curb ramp diagonally into Aquarena Springs, requiring avoidance maneuvers and gaps in Aquarena Springs traffic for continuation along the edge of the roadway.
- Intermittent sidewalk is provided, mostly in front of new development, along LBJ north of the university campus.
- Sidewalks are provided along Holland Street from LBJ to Academy.
- Sidewalks are provided along Broadway leading to the High School and along Peter Garza Street leading to the Middle School.
- Sidewalks are provided along Wonder World Road and Leah near the Medical Center.

These existing facilities form an incomplete network that will become more significant as gaps are completed, connections are made, and barriers are crossed to form functional network of facilities.

TARGET CORRIDORS AND FACILITIES

The natural and man-made corridors available in San Marcos for providing bicycle and pedestrian mobility include:

- **San Marcos River Corridor** – Beginning south of Aquarena Springs Drive, the corridor can support trails along its banks. Between Aqarena Springs and Hopkins, Texas State has developed a series of walkways and bridge crossings to establish a park along both banks for enjoyment of its students. Trails under Hopkins and under the railroad have been roughly prepared and do not provide adequate with or grades and require traversing of stairs in some locations. Through the City Park, a trail is provided that is discontinuous at the at-grade railroad crossing and has various loops and other discontinuities. The river crosses under IH 35, at which point the banks of the river are steep and concrete slope paved, but a service road U-turn is provided at the same bridge crossing of the river.
- **Aquarena Springs Drive (Loop 82) and Post Road** – Combined, these two corridors, inclusive of the area between them to Uhland Road, comprise the majority of apartment housing used by Texas State students. A pending project is proposed to reconstruct the intersection of Aquarena Springs and Post Road to create a grade separated crossing of Aquarena Springs over the railroad. This effort to reconstruct the roadway will allow the creation of a more bicycle and pedestrian friendly corridor.
- **Hopkins Road Corridor** – Hopkins Road is the east-west spine through the heart of San Marcos and contains much of the non-university points of interest in the city. It has the beginnings of a continuous sidewalk system in place. Its parallel roadways southwest of Downtown - San Antonio, MLK, and Belvin - carry less traffic than Hopkins and, being access ways into the center of San Marcos, should accommodate bicycle and pedestrian traffic. Northeast of Downtown, the pedestrian way is circuitous to cross the San Marcos

River, provided with wide sidewalks in front of the City Hall, Library and Recreation Center, discontinuous at the railroad tracks, intermittent to IH 35, discontinuous at IH 35 and intermittent east of IH 35 to River Road. Numerous bicycle and pedestrian trips can be much better served by addressing the discontinuities in the network of facilities.

- **Guadalupe/LBJ/CM Allen** – Pedestrian connections into Downtown and adjoining recreational, retail and employment opportunities would be beneficial to neighborhoods south of Downtown. These three streets each need the provision or completion of intermittent sidewalks, particularly at the crossing of the railroads.
- **Greenspace Corridors** – A Greenspace Committee has identified various corridors for retention of green space and a potential connection of linear green space in San Marcos. One such corridor is along the Purgatory Creek, which extends from the San Marcos River near City Park westward between Hopkins and IH 35 then crossing Hopkins and bending parallel and east of the Wonder World Drive extension. Other corridors include the Blanco River and Cottonwood Creek.

MOBILITY CONSTRAINTS

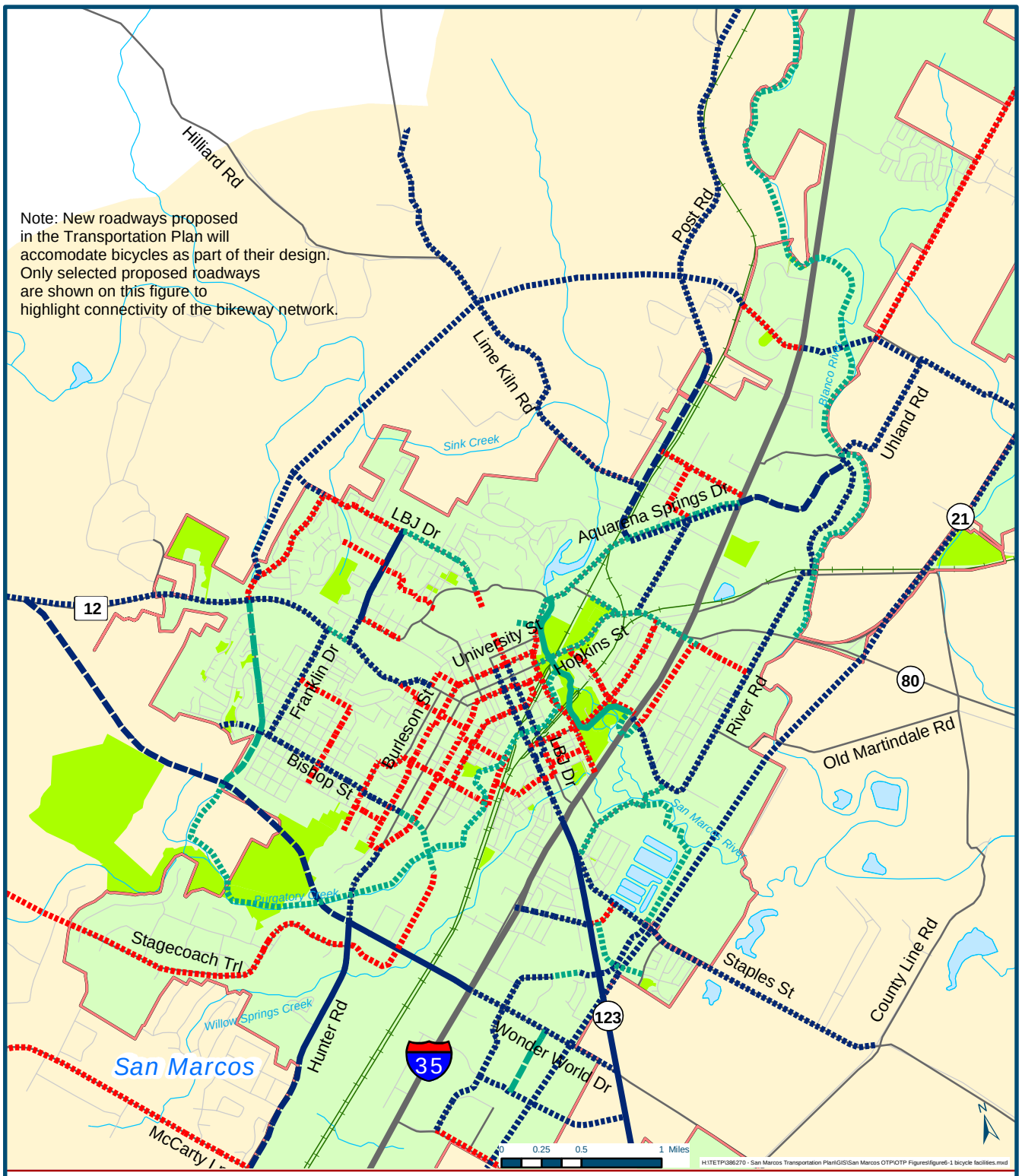
Constraints to the mobility of bicyclists and pedestrians are both natural and manmade. These constraints for barriers to the ability to traverse between origins and destinations on the opposite sides of the barrier. Often, the available accessible route is less desirable or inconvenient for pedestrian or bicyclists. In San Marcos, these barriers include:

- **San Marcos River** – The cost of building bridges results in few river crossings which focuses traffic at these locations. Older bridge designs provided only for automobiles.
- **IH 35** – The limited access and grade separated nature of the freeway results in few freeway crossings which focuses traffic at these locations, which even under current design applications often provide only for automobiles.
- **Railroads** – Railroads also restrict the number of crossings that are provided, though more local street crossing are often available in older parts of the city. Quite often, sidewalks along a street are discontinued at the railroad crossing.
- **Major Arterial Roadways** – Busy and higher speed arterials often discourage bicyclists from using the street for conveyance. These arterials are also intended to move traffic effectively, discouraging interruptions from traffic signals, focusing cross street traffic to few locations and resulting in long walking distances for pedestrians desiring to cross the street.

Crossing these barriers is one of the goals of the bicycle and pedestrian plan.

FACILITIES NETWORK DEVELOPMENT

The network of proposed bikeways is shown on the map in **Figure 6-1** and the pedestrian facilities plan in **Figure 6-2**. A detailed summary of the existing and proposed bikeways and sidewalks is included in **Appendix C**.



San Marcos Transportation Master Plan

Wilbur Smith Associates

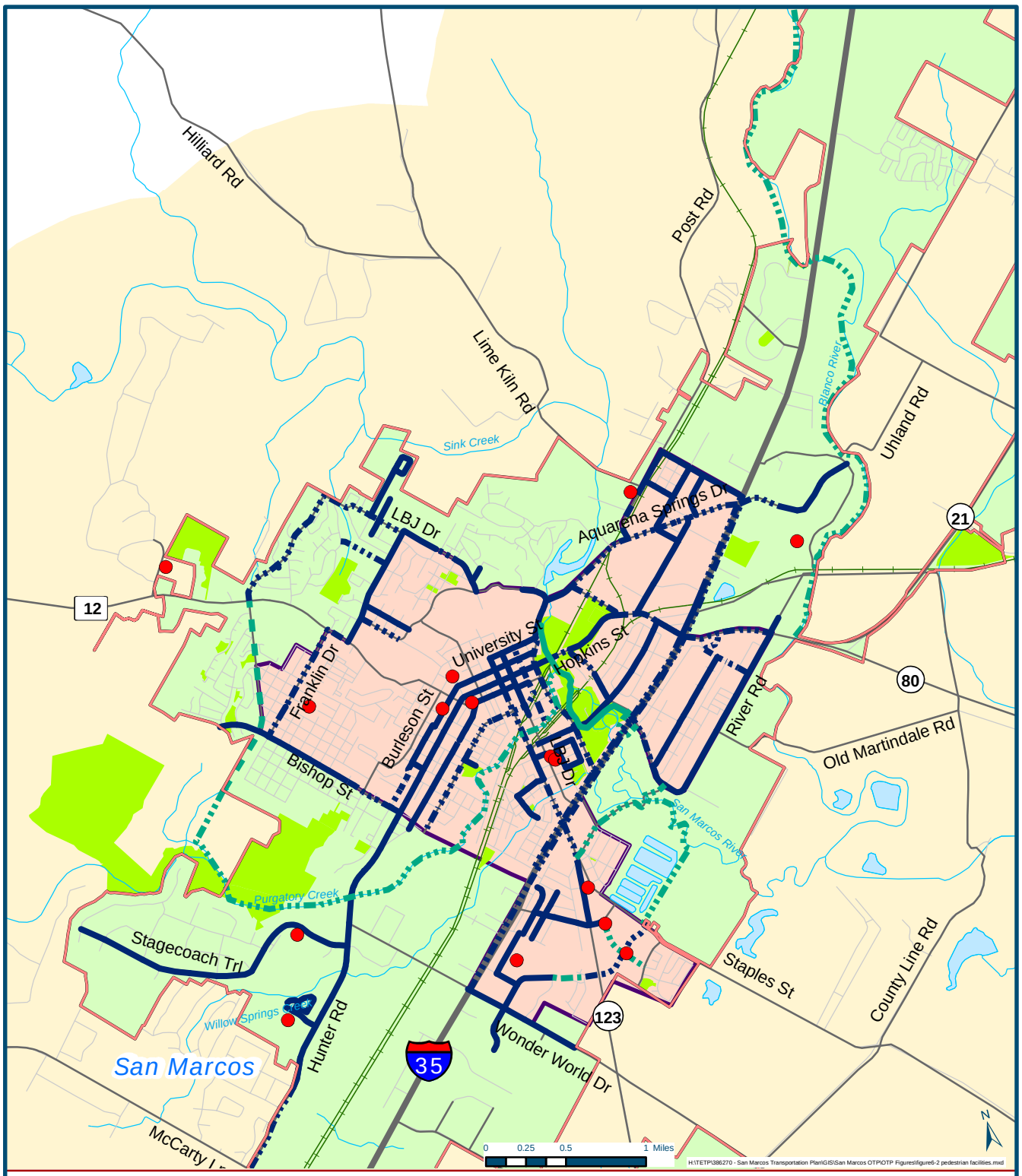
Map Key

	Existing	Committed	Proposed
Local Roads			
Railroads			
San Marcos Parks			
San Marcos City Limits			
San Marcos ETJ			
			Shoulder Or Lane
			Trail
			Route

Map Date: March 5, 2004

Figure 6-1
Bicycle Facilities

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Schools
- Local Roads
- Railroads
- San Marcos Parks
- San Marcos City Limits
- San Marcos ETJ

Existing Committed Proposed

- Sidewalk
- Multi-Purpose Path
- Sidewalk District

Map Date: March 5, 2004

Figure 6-2
Pedestrian Facilities

San Marcos Transportation Master Plan
San Marcos, TX

Multipurpose Paths

This type of facility provides a path of travel, separated from the roadway, which is for combined bicycle and pedestrian use. Many of the paths that have been proposed along waterways or greenway linkages can be expected to function as multiple-use facilities (hike & bike trails) by cyclists, pedestrians and skaters. High speed cycling should be discouraged along the more heavily utilized sections during peak hours of usage.

An important opportunity for trail development by the City of San Marcos is along the San Marcos River. Existing trails are provided along the river from Aquarena Springs to near IH 35. There are some gaps in the trail, including one at the railroad crossing, and some of the trail is not traversable by bicycle and some it is not accessible by persons with mobility impairments. In addition to upgrading the trail to meet current standards and make it continuous, the trail would be extended to continue under IH 35, connecting the residential areas east of IH 35 with the regional park and central city services and significant shopping and employment destinations.

A second green space trail corridor would run along Purgatory Creek from City Park to the proposed new regional park west of the Wonder World Drive extension. This greenbelt contains a shallow creek that runs through the neighborhoods south of Downtown, connects to crossing bike routes, and connects to neighborhoods and a regional park to the southwest. A crossing of Hopkins/Hunter will need to be created, either by bringing the trail to a control point or, preferably, by raising the roadway to allow the trail to cross under it.

A third green space trail corridor would run along Blanco River from Dudley Johnson Park (locally known as Five Mile Dam) to a new park near the intersection of River Road at US 80. This route would have undercrossings of the Union Pacific Railroad and IH 35, pass near the end of Aquarena Springs with its bike lanes and sidewalks, and connect to the River Road bike lanes and sidewalks at a park trailhead.

Another multi-purpose path would be along Aquarena Springs to encourage more pedestrian and bicycling trips to the university and downtown. The development of these bicycle and pedestrian facilities would be coordinated with the pending reconstruction of Aquarena Springs Drive as part of development of the railroad overpass.

Several other connector trails are also included to access local and regional destinations. **Table 6-1** contains a summary of the recommended network of multipurpose paths. The priority for development is indicated as either Short Term (S), Intermediate Term (M), or Long Term (L).

Table 6-1
Recommended Network of Multipurpose Paths
San Marcos Transportation Master Plan
San Marcos, Texas

Location	Length	Priority
Along Aquarena Springs from IH 35 to University Drive	2.1	S
Along San Marcos River from Aquarena Springs to River Road, including an under crossing of IH 35	4.8	S
Along RM 12 from Franklin to Holland	0.1	S
Along the Blanco River from SH 80 to IH 35		S
Along Purgatory Creek, from CM Allen to the regional park west of the Wonder World Drive extension, with neighborhood connectors	5.2	M
Connector from the high school along Broadway to DeZavala to Crystal River and south to Cape Road	0.6	M
Connector from Mockingbird to Leah near the Medical Center	0.2	M
Along Blanco River from IH 35 to Dudley Johnson Park		M
Along Blanco River from Dudley Johnson Park to new park at US 80	7.9	L
Along San Marcos River east of Cape Road to the extension of SH 21 and then along the edge of the fish hatchery to Staples Road	4.2	L
Along Craddock Road from RM 12 to the regional park west of the Wonder World Drive extension	1.1	L
Convert Cape Road to one-way with two-way trail, River Road to SH 123	0.7	L

Note: Priority – S=Short Term, M=Intermediate Term, L=Long Term

On-Roadway Bicycle Facilities

On-road facilities follow pathways that have been established to accommodate existing travel demand. As such, an on-road bikeway network of appropriate bikeway types, utilizing to the greatest extent the existing system of local streets to connect neighborhood to adjacent destinations and other neighborhoods and crossing significant barriers, has the potential to serve large numbers of users economically.

A mixture of types of on-road bikeways has been included in the bikeway system network, occasionally utilizing off-road links to provide continuity along a corridor. Where it was possible to establish a bikeway along a corridor as a simple bike route using a series of neighborhood or secondary arterial streets, this was the preferred alignment. However, a large number of the proposed on-road bikeways consist of allowing additional space for bicyclists at the right edge of the roadway on arterial streets. This improvement can take the form of a wide curb lane, which is preferred by the more experienced cyclists under most conditions, or can consist of a dedicated lane adjacent to the right edge of the roadway, which is preferred by less experienced cyclists in order to allow them to ride confidently on busier roadways. According to

the manual, "Selecting Highway Design Treatments to Accommodate Bicycles", developed for FHWA in 1994, a bike lane or shoulder should generally be provided to accommodate the basic or less confident bicyclists on roadways with speed limits greater than 30 miles per hour or that experience traffic levels greater than 10,000 vehicles per day.

A summary of the recommended network of on-street bikeways is presented in **Table 6-2**. The priority for development is indicated as either Short Term (S), Intermediate Term (M), or Long Term (L).

Sidewalks and Pedestrian Districts

Sidewalks should be developed in conjunction with all future development in accordance with the established ordinances of the City of San Marcos. Many areas have been developed in the past without the provision of sidewalks. There are areas of residential and commercial concentration in San Marcos that could have the propensity for people to walk to nearby destinations. These areas are shown in Figure 6-2 as Pedestrian Districts.

A Pedestrian District identifies areas with predisposition for walking, based upon geographic, socioeconomic and development conditions. Specific criteria for identifying the Pedestrian District include:

- Presence of a public school within a residential area;
- Presence of Transit Station, such as rail station, bus transfer station or park & ride lot;
- Demographics – lower income persons tend to walk more than higher income; and,
- Type of Land Use – easy places to walk are within short walking distance, street grid facilitates walking, commercial and retail development near residential

The Pedestrian District would typically include an area within ½ mile of such facilities or areas possessing the desired attributes. A Pedestrian District will be a target area for funding of pedestrian facilities.

Projects include sidewalks and trails that focus on connectivity, convenience and function. Key focus areas for pedestrian facilities are indicated in **Table 6-3**. The priority for development is indicated as either Short Term (S), Intermediate Term (M), or Long Term (L).

Table 6-2
Recommended On-Street Bikeway Network
San Marcos Transportation Master Plan

Location	Status			Facility Type			Length (miles)	Priority
	E	C	P	R	L	S		
Hunter from ETJ to McCarty		x			x		4.0	S
Hunter from McCarty to Wonder World	x				x		1.0	-
Hunter/Hopkins from Wonder World to Dixon			x		x		0.6	M
McCarty from Paso del Robles to Hunter			x	x			2.0	S
McCarty from Hunter to SH 121 Extension			x			x	1.6	L
SH 121 Extension from McCarty to Harris Hill			x			x	6.5	L
SH 123 from ETJ to IH 35	x					x	5.9	-
Staples Road from County Line Rd to SH 123			x			x	2.4	L
Clovis Barker from Leah to SH 123			x	x			1.6	L
Cottonwood from Leah to SH 123			x	x			1.0	L
Wonder World Drive from RM 12 to Hunter		x				x	3.0	S
Wonder World Drive from Hunter to IH 35	x					x	0.9	-
Wonder World Drive from IH 35 to SH 123			x			x	1.2	M
Stagecoach from Craddock Ext'n to Purgatory trail			x	x			3.9	M
Gravel Road from Blanco to Stagecoach			x	x			1.0	M
Leah from Clovis Barker to Medical Drive			x		x		1.2	M
DeZavala from Mockingbird to Staples			x		x		0.5	M
Broadway from IH 35 to Staples			x	x	x		0.4	M
Guadalupe from Hopkins to IH 35			x		x		1.2	M
LBJ from Alabama to Hopkins			x		x		0.8	M
CM Allen from IH 35 to University			x	x			0.9	S
Cheatham from Guadalupe to Hopkins			x	x			1.2	S
Riverside from Hopkins to IH 35			x	x			0.6	S
River Road from IH 35 to SH 80 (3 Lane + BLs)			x		x		1.6	S
River Road from SH 80 to Uhland			x			x	1.2	M
Aquarena Springs from IH 35 to Uhland			x		x		1.0	S
Uhland from IH 35 to Harris Hill			x			x	1.8	M
River Ridge from Post Road to IH 35			x		x		1.5	M
Harris Hill from SH 21 to IH 35			x			x	1.6	M
Harris Hill/Yarrington from River Ridge to Post Rd			x	x			3.6	S
Old Stagecoach from ETJ to Post			x			x	2.0	L
Post from Old Stagecoach to Booth			x			x	2.7	M
Post from Booth to Aquarena Springs		x			x		1.3	S
Lime Kiln from Post to Outer Loop			x			x	3.2	L
Holland from LBJ to RM 12	x		x		x		0.8	S
RM 12 from Blanco/Lindsey to ETJ			x			x	4.0	M
Bishop from Craddock to Hopkins			x		x		2.1	M
Bishop from Hopkins to Purgatory Creek Trail			x	x			0.3	M
Franklin from Bishop to RM 12			x		x		1.0	M
San Antonio, MLK, Belvin			x	x			5.0	S
Patton, Armstrong, Blanco, Mitchell			x	x			3.0	S

E=existing, C=committed, P=proposed, R=bike route, L=bike lane, S=shoulder lane Note: Priority – S=Short Term, M=Intermediate Term, L=Long Term

Table 6-3
Key Areas for Sidewalk Development
San Marcos Transportation Master Plan
San Marcos, Texas

Location	Length	Priority
Along Guadalupe Street from Downtown, connecting to the Multimodal Transit Station, passing through the IH 35 interchange, and connecting to the existing sidewalks east of IH 35.	1.3	S
Along LBJ, McKie and CM Allen from Cheatham to Downtown.	2.1	S
Completion of the sidewalks along both sides of the street on San Antonio, Hopkins, and Belvin west of Downtown to Bishop.	5.0	S
Completion of the sidewalks along Cheatham from Guadalupe to Hopkins.	0.6	S
Completion of the sidewalks along Riverside from Hopkins to Cheatham	0.4	S
Along Hopkins northeast of Downtown, including proper ramps and clearances from LBJ to CM Allen, pedestrian crossing improvements at CM Allen, wide sidewalks from CM Allen to Riverside connecting to the existing walkways in front of the civic facilities, wide sidewalks continuing across the railroad tracks connecting to sidewalks near Thorpe and Cheatham and completing sidewalks through IH 35 onward to Riverside Drive.	0.9	S
Along both sides of Aquarena Springs from Bobcat Road to and though IH 35, continuing on to Uhland.	2.7	S
Improvements and completion of sidewalks on both sides of all streets between Downtown and the Texas State campus.	2.0	M
Safe routes to school for all schools according to an evaluation of each school service area.	10.0	S

Note: Priority – S=Short Term, M=Intermediate Term, L=Long Term

Bicycle and Pedestrian Network Development

The comprehensive network of bicycle and pedestrian facilities should be implemented in stages, simply due to fiscal, physical and other constraints. In order to achieve an orderly implementation of the plan, a prioritization of projects is needed. Levels and resources of funding will change during the implementation period and therefore, the prioritization plan must be flexible. The prioritization program allows sidewalks, bike routes, bike lanes and multi-use trails to be evaluated based on a set of criteria that is open to review and clearly understandable. A list of bicycle prioritization criteria is provided as a guide. A check list or ranking system,

with weighted values if necessary, may be applied to most effectively determine each project's priority.

The National Bicycling and Walking Study, developed by the Federal Highway Administration, recommended the following action plan for state and local governments to work towards creating a bicycling and walking compatible environments in their communities.

Action Item 1: Organize a bicyclist/pedestrian program
Action Item 2: Plan and construct needed facilities
Action Item 3: Promote bicycling and walking
Action Item 4: Educate bicyclists, pedestrians, and the public
Action Item 5: Enforce laws and regulations.

Following this basic framework, a plan for implementation of the San Marcos Bicycle/Pedestrian Plan in described in the following paragraphs. Draft policy statements are also presented as a model for possible future establishment of written public policy on bicycle and pedestrian accommodations.

Organize a Bicycle/Pedestrian Program

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. The committee should be formally established as a standing advisory committee by ordinance. The committee should meet regularly (e.g. quarterly) to follow-up on overseeing the implementation and further refinement of the Plan.

Bicycle/Pedestrian Program Coordination

CARTS (Capital Area Regional Transportation Study) and City staff are responsible for planning and implementing projects that impact walking and bicycling in the community. Within these departments, the role of bicycle/pedestrian program coordination should be assigned to one or more persons. The following responsibilities, as a minimum, should be addressed by designated persons with authority to take action on these matters:

- Review subdivision plats and street improvement plans for potential and required accommodations of bicyclists and pedestrians;
- Administration of bicycle parking equipment permits and requests;
- Oversee installation of bicycle sensitive traffic loop detectors and pedestrian push-button traffic signal actuators;
- Request funding from City, State, County, and Regional sources;
- Direct street and trail maintenance requests to proper department;
- Review Hike & Bike trail locations and designs;
- Record and analyze bicycle traffic counts;
- Record and analyze accidents involving pedestrians and bicyclists;

- Develop Public Service Announcements and distribute safety and promotional literature;
- Work with CARTS to provide appropriate bicycle and pedestrian connections from bike routes and trails to CARTS stations, and to examine the potential for bicycle-on-bus programs; and,
- Review design and location of extensive utility projects for potential of incorporating bike trail in design.

Educate Planners, Police Officers, Designers, and Local Representatives

An important element in the institutionalization of non-motorized transportation is a growing infrastructure of supportive professionals within government agencies, including the engineers and planners who conceive and implement much of the city's infrastructure. Coordination between transportation offices and a broad spectrum of public agencies will help to ensure that the needs of bicyclists and pedestrians are addressed, not only during project development, but in project improvements and maintenance as well.

Plan and Construct Needed Facilities

The San Marcos urbanized area, in compliance with Federal and State regulations, has a long range transportation plan that incorporates a bicycle and pedestrian element. This Bicycle and Pedestrian Plan is a further refinement of that element. Just as the city planning and engineering staff and local elected officials look to the long range plan for guidance on the development of the roadway network, so too should the Bicycle and Pedestrian Plan be referenced and assessed for needed facilities.

Obviously, not all of the proposed pedestrian and bicycle network can be developed immediately. Some of the on-street bicycle facilities will be developed in conjunction with the development of new facilities and the upgrading of existing facilities. Other bicycle and pedestrian facilities will have to be developed over time as funding becomes available. For the provision of bicycle and pedestrian facilities within existing roadway corridors and for paths on separate rights-of-way, needs must be prioritized and projects scheduled according to funding availability.

OTHER SUPPORTING BICYCLE FACILITIES AND PROGRAMS

Bicycle Parking

Bicycle parking racks should be provided, by ordinance, at all public buildings that are potential cyclist destinations. Specifically, bike parking racks should be provided at the library, the recreation center, city hall, the park & recreation department office on CM Allen at Hopkins, and at various strategic points on the Texas State campus.

Bicycle parking racks should be encouraged, potentially by ordinance, at privately owned facilities which are potential bicyclist destinations. These include shopping centers near densely populated areas and in the Downtown area on the square.

There are two basic types of bicycle parking equipment: bicycle racks, the basic form of bicycle parking provision, and bicycle lockers which provide a higher degree of bicycle protection often for rent or lease.

- Bicycle racks may be provided where parking needs are short term and some provisions are made for security or surveillance. The design of bicycle racks most useful for cyclists are such that the bicycle frame and wheels can be secured to the rack structure. Many types of bicycle racks are currently available, ranging from the basic wheel-engaging school yard type, to the more functional U-shapes or ribbon rails, to the "bike traps" with moveable segments to lock the bike in place. Prices of bike racks can range from $20 per space to over $200 per space.

- Bicycle lockers would be desirable for all-day parking if the location is remote from the destination or where the desired level of security is higher than provided by bike racks. Bicycle lockers are a physical enclosure for the bicycle, typically in individual compartments. They require a paved structure for mounting and require more physical space than a fully occupied bike rack of the same capacity. Costs of a locker installation can range from $200 to over $500 per space, depending on the quantities and type of facility.

Bicycles and Transit

The ability to link trips made by bicycle with bus trips provides significant expansion of the service area for bus routes and also increases the utility of bicycles as a travel mode. The Capital Area Regional Transportation System (CARTS) and the university's student bus service should improve their bus fleets and bus stop facilities to accommodate bicycles. Bike racks or lockers at bus stops and bike carriers on buses will enable cyclists to combine trips by bus and bicycle, increasing the range of service area and promoting the use of both modes independently and collectively. The purchase and installation of a bike rack on a bus costs less than $1,000 each.

Bicycle Education and Promotional Programs

Two important audiences must be addressed in public education campaigns – the bicyclists and the motorists. It is important that bicyclists are educated about how to use the facilities, what equipment they should have to operate safely, and how to interact with motorists and pedestrians. Likewise, the general public needs to be educated about how to share the roads with bicycles safely.

Land Use Patterns and Zoning

Local land use patterns are fundamental to the number of trips that can easily be made by walking or bicycling. Sprawling land use patterns produce lengthy trips and thus increased

dependence on motorized transportation. On the other hand, clustered patterns tend to promote shorter trip lengths that more readily enable waling and bicycling. Mixed land uses allow for the creation of self-sufficient neighborhood communities and shorter trip lengths to access needed goods and services.

City planning officials and staff should review the assumptions of land use plans and zoning ordinances and compare them to non-motorized travel needs identified in user surveys. Zoning requirements should be reviewed to ensure that they are bicycle and pedestrian-friendly. For example, a requirement for bicycle parking (in addition to requirements for off-street motor vehicle parking) may be added by ordinance. The City of Dallas has a representative bicycle parking ordinance that could be adapted for use in San Marcos.

Urban Development and Design

Street layout is important in the encouragement of safe bicycling and walking. Urban design guidelines can greatly improve the environment for safe and efficient bicycling and walking. In addition to State and national guidelines, many local agencies have adopted their own design standards. Most US cities are laid out in grids or modified grids. In comparison to less conventional designs, such as the radial system, a grid system maximizes direct access for bicycles. Street alignments shown in new subdivision plats should be reviewed to ensure they will accommodate cyclists and pedestrians as well as motor vehicles.

IMPLEMENTATION

The numerous projects that comprise the development of the bicycle facility network and the network of sidewalks in the pedestrian district consist of some immediate needs to satisfy either safety or high connectivity of demand, some joint development opportunities, some needed improvements, and some long range projects. The next essential step after completion of the overall plan of desired facilities and programs is the prioritization of the more immediate needs of bicyclists and pedestrians and the identification of sources of funding for implementation.

Prioritization

Annually, funding will need to be sought and budgeted towards the implementation of the prioritized set of bicycle and pedestrian projects. A process for determination of how projects receive funding each year should be established. Recommended criteria for determining implementation priorities include the following considerations:

- Connectivity of Demand - Provides a connection between significant bicycle activity center (e.g. neighborhoods, town centers, public facilities, transit facilities, parks, other trails, commercial developments).
- Public Support/Commitment - Includes general public and political support for the individual project.

- Cost Effectiveness - Can the project be accomplished in conjunction with another planned improvement project that is currently funded? Does the project improve overall road safety, etc. for the least cost?
- Funding Commitments - Has a commitment been made to fund the construction and ongoing maintenance for the facility?
- Right-of-Way - Is sufficient existing right-of-way available or unencumbered so that the project may proceed immediately?
- Network Development - Does this particular segment of bikeway connect other bikeways and provide an important linkage to facilitate regional bicycle travel?
- Cross Barriers - Does this particular project eliminate a potential barrier to bicycle travel or is there an existing barrier which would make completion of this bicycle facility difficult?
- Reduce Accidents - Is there data that indicates bicycle facility development along or within this corridor will improve bicyclist safety?

Identify/Coordinate Funding Sources

The City of San Marcos should work with CAMPO and the Texas Department of Transportation (TxDOT) to discuss funding opportunities. Bicycle facility projects and non-construction programs may be funded under a variety or multiple of funding sources, both at a Federal/State level and on the local level, as shown in **Tables 6-4** and **6-5**. (*Note: At publication time, the new federal transportation funding bill had not been authorized by Congress; In the interim, Congress has extended TEA-21 on a month by month basis).* Bicycle and pedestrian projects are eligible to compete with other highway/motorized projects under the state's Surface Transportation Program, if that is the current priority of the community. It is imperative that the eligibility, selection criteria, and timelines of each of these funding sources be fully understood in order to make advantageous use of their availability.

The City and CAMPO should work in coordination with TxDOT to achieve the implementation of planned bicycle and pedestrian facilities along State Highways, Farm-to-Market Roads, and other state maintained roadways.

The Bicycle/Pedestrian Program should be established with a dedicated local source of funding to be supplemented as needed to take advantage of matching fund opportunities. A baseline level of expenditures should be budgeted annually for needed improvement, and the expenditures guided by the BPAC.

Construct and Improve Facilities

Usable facilities must be in place in order for bicycling and walking to be promoted as a viable transportation option. On-road bicyclist facilities and sidewalks for pedestrians form the bulk of the circulation system for bicyclists and pedestrians.

Table 6-4
TEA-21 Funding Sources for Bicycle and Pedestrian Projects
San Marcos Transportation Master Plan
San Marcos, Texas

1. National Highway System (NHS) Funds may be used to construct bicycle transportation facilities and pedestrian walkways on land adjacent to any highway on the National Highway System (other than the Interstate System).

2. Surface Transportation Program (STP) Funds may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or nonconstruction projects (such as brochures, public service announcements, and route maps) related to safe bicycle use. Ten percent of STP funds are used for "Transportation Enhancements," which include the provision of facilities for bicyclists and pedestrians.

3. Congestion Mitigation and Air Quality Improvement (CMAQ) Programs Funds may be used for either the construction of bicycle transportation facilities and pedestrian walkways, or non-construction projects (such as brochures, public service announcements and route maps) related to safe bicycle use. CAMPO is preparing for administering CMAQ funds should the metropolitan area be designated as nonattainment for ozone.

4. Federal Lands Highway Funds may be used to construct pedestrian walkways and bicycle transportation facilities in conjunction with roads, highways, and parkways at the discretion of the department charged with the administration of such funds.

5. Scenic Byways Program Funds may be used to construct facilities along scenic highways for the use of pedestrians and bicyclists.

6. National Recreational Trails Fund monies may be used for a variety of recreational trails programs to benefit bicyclists, pedestrians, and other non-motorized and motorized users. Projects must be consistent with a Statewide Comprehensive Outdoor Recreation Plan required by the Land and Water Conservation Fund Act.

7. The Highway Safety Program is a source of funding for safety education and training and bicyclist safety remain priority areas for highway safety program funding. The priority status of safety programs for pedestrians and bicyclists expedites the approval process for these safety efforts.

8. Federal Transit Administration continues to allow transit funds to be used for bicycle and pedestrian access to transit facilities, to provide shelters and parking facilities for bicycles in or around transit facilities, or to install racks or other equipment for transporting bicycles on transit vehicles.

Table 6-5
Potential Sources of Local Funds for Bicycle and Pedestrian Facilities and Programs
San Marcos Transportation Master Plan
San Marcos, Texas

1. Capital Improvement Program - These are the predominant sources of local funds. The capital improvement program budget could be utilized as a source of matching funds for grants or there could be an annual itemized budget for bicycle facilities whether matched or not.

2. Bond Program – Bicycle and pedestrian facilities could be earmarked as part of a long term bond program. This is a common aspect of many bond programs in Texas, including Austin and Dallas.

3. Mitigation Measures - Developers may be charged to pay for mitigating negative project impacts. Communities within non-attainment areas, such as Arlington, Texas, have initiated Transportation Impact guidelines and fees. When projects do not meet guidelines and require fees, the funds may be used for such projects as bicycle facilities.

4. Developer Dedications - These measures require the developer within certain zones or districts to construct bicycling and walking facilities as a condition for enabling the project to proceed. For example, a restaurant owner in Eugene, Oregon, was required to make improvements to a river front trail before developing a new location.

5. Restorations - Some local agencies require that developers restore rights-of-way for non-motorized users.

6. Public agency land and funds – Flood control districts, irrigation districts, parklands and pubic utility fee strips and easements have been utilized to develop hike & bike paths and joint use maintenance drives.

7. Parks and Recreation Department Funds - In Houston, the Parks and Recreation Department is responsible for trail maintenance.

8. Donations (from the public and corporate sectors) - Special funds can be created to receive public and corporate donations for area bicycle and pedestrian programs.

9. Fund-raising rides and events – Local advocacy groups can conduct events, such as a Volksmarch or a Bicycle Tour, to raise funds for purposes they want to promote. Examples of uses of these funds include funding the position of Bicycle/Pedestrian Coordinator, bicycle or pedestrian network maps, city-wide safety and promotion programs, special studies, or even small projects.

As the initial phase of facility development, it would be most prudent to focus local resources on implementing the lower cost measures to accommodate bicyclists and pedestrians. Lower-cost measures for bicyclists include the signing of bike routes, designating shoulder lanes, and striping bike lanes, with specific attention to intersection treatments. Lower-cost pedestrian measures include sidewalk repairs, completing missing segments of sidewalks, and removal of sidewalk obstructions due to vegetation and street "furniture" (relocating newspaper stands, sign posts, etc). Matching funds should be sought to aid in the development of higher cost improvements, such as hike and bike trails, extensive sidewalk construction or reconstruction, and street modifications and traffic signals to accommodate bicyclists and pedestrians.

In addition to safety concerns, lack of adequate bicycle parking is often cited as a common reason why people do not bicycle. Any bicycle trip requires some sort of parking at its destination. Secure parking is particularly important for commuters leaving their bicycles for long periods of time and for those destinations which lie in high-crime areas. An increasing number of cities now require bicycle parking facilities in new developments. Apartment complexes, college dormitories and activity centers, or other high density settings need to address the issue of where to store bicycles while at home.

The City of San Marcos should take the lead to provide adequate bicycle parking at all public-access facilities. The university should follow suit with provision of bike racks at strategic locations on campus. Bicycle parking provisions should be encouraged, but not required initially, at work places and commercial development in the urbanized area.

Promote Bicycle/Transit Joint Use

The San Marcos Urban System should undertake studies and planning to implement service and facility improvements for intermodal trips using bicycles and transit. Bike racks at selected transit stops and transfer terminals will provide secure parking for cyclists who ride their bikes to and from bus routes. Bike racks on buses will enable cyclists to use bicycles at both ends of their transit trips.

Promote Bicycling and Walking

A coordinated approach of public information and awareness programs to promote bicycling and walking yields the best results. Such an approach may include events like bicycle-or walk-to-work days to encourage bicycling or walking trips to work and lead to more frequent use of these modes.

Magazines and other publications, advertisements and the news media, the involvement of trade organizations and other clubs, employer incentives offered to their employees to bike to and from work (reimbursement, parking, "flextime"), and the publication of maps are other promotional methods. Holding conferences, bicycle rallies, and "bike to work" days are a good way to bring together many elements of the bicycling and pedestrian community, give information, and strengthen group identity and a common mode of operation.

Prepare and Disseminate Public Information on Bicycle/Pedestrian Routes and Programs

As implementation of the hike and bike route network proceeds, prepare a San Marcos Bicycle and Pedestrian Guide showing bike routes and facilities. Widely distribute copies of the guide to residents and visitors.

Educate Bicyclists, Pedestrians, and the Public

Closely tied to promoting bicycling and walking, education for all road users helps ensure safe travel habits. Bicyclist/pedestrian programs typically maintain a variety of pamphlets, videos, brochures, and other resources pertaining to safe practices for individuals or groups. Dissemination of safety and educational materials may take many forms, drawing upon available resources:

- TxDOT maintains the full-time position of Bicycle and Pedestrian Coordinator, with similar part-time positions in each of its Districts. Information, materials, and technical assistance is available through TxDOT, including a motorist/bicyclist information pamphlet, "Don't Be a Bubbasaurus/Beastasaurus;"
- Working through the City Parks and Recreation Department's Summer Education Program, bike rodeos may be conducted and educational materials distributed to area youths. Other resources for these events include the City Police Department and local businesses such as Wal-Mart, who have conducted these activities in the past;
- Parent-Teacher Associations may serve as avenues for disseminating information on safety for pedestrian and bicycle activities to parents of school-age children.
- Working with the San Marcos Consolidated Independent School District and State Department of Education, the program may identify materials for distribution through the San Marcos schools to ensure that children receive age-appropriate instruction in bicyclist and pedestrian safety education. One excellent program is being developed by the Texas Bicycle Coalition.
- The State Division of Motor Vehicles can institute education programs for motorists on safely interacting with bicyclists and pedestrians.

Enforce Laws and Regulations

Effective enforcement entails the citing of pedestrian and bicyclist violations, as well as infractions of motor vehicle operators. Enhancing the safety of bicycling and walking will have the most success if enforcement, engineering, education, and encouragement efforts are coordinated.

States can take steps to encourage bicyclist and pedestrian enforcement at the local level, as well as examine vehicle codes which may include regulations or provisions that actually discourage bicycling and walking, such as not providing sidewalks for pedestrians. However, much of what can be done with regard to enforcement and regulation of bicyclist and pedestrian actions occurs

at the local level. Areas with a high likelihood of infractions and motor vehicle crashes involving bicyclists and pedestrians, such as central business districts and schools, should be targeted for high enforcement, perhaps by using police patrol on bicycles. In many cases, revisions of local traffic rules or consideration of new laws is needed to promote and encourage safer bicycling and walking. Proper education of law enforcement officers is necessary to assure that safe riding and walking practices are enforced in a consistent manner.

Policy Statements

To formalize the establishment of a bicycle and pedestrian program for the City of San Marcos, it may be desirable to have public comment and City Commission adoption of certain policies that will guide the city development of bicycle and pedestrian facilities and programs.

Sidewalks - In the urbanized area of San Marcos, pedestrian travel is and should be further encouraged as an integral part of the transportation system. It can be said that the presence of pedestrians along the streets is a life sign of the community. The quality and continuity of sidewalks play a significant role in encouraging pedestrian activity. Sidewalks have been ignored or even discarded over the years in the interest of reducing developer costs, and as school busing of pupils gradually replaces walking as a means of travel to neighborhood schools.

The following proposed policy statements and potential programs represent actions toward promoting a pedestrian-friendly atmosphere in San Marcos.

Policy Statement #1: Sidewalks

Sidewalks represent the most basic transportation facilities and should, in effect, be present along all urban streets, with the exception of very low volume residential streets where people can be expected to walk in the street and in rural areas where walking distances are too far to be practical.

Needed Action Items:

1. Inventory existing sidewalks along all arterial and collector streets, noting widths and condition. Identify high accident locations.
2. Develop an annual budgeted program of sidewalk construction and repair. Establish criteria to prioritize improvements such as level of existing and potential usage, connectivity, and safety concerns.
3. Update sidewalk design standards for San Marcos. The recommended urban sidewalk should be 5 feet in continuous width with a minimum of 3 feet of buffer between the edge of the sidewalk and the face of the roadway curb. ADA requirements state that pedestrian ways should experience grades of less than 1:12 and cross slopes of less than 1:50. Sight distances should be given due consideration. Surfaces should be firm, stable and slip resistant. Parallel surface irregularities should be no greater than 1/2 inch wide. At least 3 feet of the

walkway should be clear of obstructions. Street furniture and pole locations should be placed so that pedestrian movement is not impeded or complicated. At intersections, the maximum distance for crossing a street should be no more than 48 feet. For longer crossing distances, separated turn lanes, refuge islands, and medians should be used to reduce street crossing distance, especially at complex intersections. Sight distances for oncoming and turning traffic should provide an adequate view for motorists, bicyclists and pedestrians alike. Auxiliary left turn lanes should be minimized in heavily congested areas where a high volume of pedestrian traffic exists. Use of free right turns should be minimized where significant pedestrian activity is anticipated.

4. Pedestrian facilities should be maintained to ensure the safety and functionality of pedestrian flow. Periodic refurbishing and debris removal will help keep original design concepts intact. The degree of maintenance provided has a direct impact facility service life, effectiveness, level of use, liability and community image. Poor facility maintenance coveys a feeling of lack of security and fear for personal safety, often resulting in decreased facility usage with a possible increase in pedestrian accidents elsewhere due to the use of alternative, less safe routes.

5. In the interest of providing safe and alternative modes of transportation for bicyclists and pedestrians, and to encourage the construction of continuous sidewalk throughout the City, the following subsection is proposed to be added to the San Marcos City Code.

   Section 110.084 (c) Sidewalks required to be continuous.

   (1) Where an undeveloped lot of not more than <u>500</u> feet of street frontage is located between two developed lots, and where the sidewalk on either side of the undeveloped lot has a length longer than <u>200</u> feet, and where the continuity of the sidewalk is desired by the City for connecting pedestrians to activity centers, then City may notify the property owner identified on the current tax roll that the owner shall be responsible for construction of the sidewalk within the ensuing two (2) years, or in lieu of the construction of the sidewalk, the property owner shall place into an interest bearing escrow account within a period of two years the amount equal to the cost of constructing said sidewalk. The City shall then use such funds to construct the sidewalk within a period of 5 years. If the sidewalk is not constructed within 5 years, the funds shall be returned to the property owner of record with interest.

Bicycle Facilities - The following proposed policy statements and potential programs represent actions toward promoting a pedestrian-friendly atmosphere in San Marcos.

Policy Statement #2: Bicycle Facilities

The bicycle, as a low-cost and non-polluting form of personal transportation, shall be encouraged as an acceptable mode for utilization and recreational trip purposes.

Needed Action Items:

1. Bicycles are recognized as vehicles and should be accommodated on all roadways:
   a. All roadway improvement projects shall be reviewed for the ability to accommodate average bicyclists; non accommodation should be by exception.
   b. Develop an annual budgeted program of spot improvements for bicyclist safety on existing roadways.
   c. Develop an annual budgeted program of designated bikeway network expansion.
   d. Review the City's street cleaning and maintenance program, and modify as necessary to better accommodate bicyclists.
2. Hike and bike trails may serve both functional and recreational purposes:
   a. Be opportunistic in securing rights-of-way for corridors to develop trails that access desirable destinations or which make needed connections to other bikeways or across barriers.
   b. Develop a planned sequence of development of the trail system as opportunities arise. As much as possible, leverage the budgeted bikeway funding with outside funding sources for trail development.
3. Bicycle storage is essential to encourage and give order to the increased use of the bicycle to make trips:
   a. Bicycle parking racks should be conveniently provided at all public buildings.
   b. Investigate ways to integrate bicycling and transit (e.g. allow bikes in bus, bike racks on front of bus, bike racks at bus stations, etc.).
   c. Private developments should be encouraged to provide bicycle parking (e.g. reduced auto parking space requirements).
4. A bicycle safety education program should be initiated and should be closely coordinated with a follow-up enforcement program.
5. Bicycling encouragement programs should be initiated.
   a. These may consist of bike-to-work days, local recognition of National Bicycle Week in May each year, and special bicycling events (tours, races, rodeos).
   b. Employers should be encouraged to accommodate the bicyclist-employee trips to and from work. Accommodations may include: modified work schedules, bike storage at work, lockers and even showers at work.
   c. A map of bicycle routes in the city should be developed and distributed to inform bicyclists of desirable or improved facilities that form a network to accommodate trips throughout the city.

Chapter 7
Roadway Transit, and Rail Element

In this chapter, the roadway projects that were selected for the Recommended Transportation Master Plan (see Chapter 8) are evaluated, and the results from the related TransCAD model runs are presented. This chapter also presents recommendations about transit service, commuter rail service, and addresses other elements, such as transportation systems management, corridor preservation and access management.

EVALUATION OF TRANSPORTATION MASTER PLAN RECOMMENDED PROJECTS

A Project Evaluation Matrix (contained in **Appendix D)** for projects that are recommended was developed to help further refine and program the recommended projects. The matrix displays the summary results of project analysis in the following criteria – traffic, environmental, socioeconomic and engineering considerations. These criteria were applied to the list of all considered alternatives that were developed during the public participation process for this project, and in more detail for the projects that have been determined feasible to include in the recommended Transportation Master Plan in Chapter 8. In addition to these criteria, the recommended projects were tested using the TransCAD travel demand model. The results of this traffic analysis are contained in the following section of the TMP.

SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACTS

This section discusses the social, economic and environmental considerations associated with the implementation of the recommended Transportation Master Plan, along with pertinent background information.

Social and Economic

To ensure that the social and economic interests of all geographic and population sectors of the community were reflected in the final plan document, an extensive civic engagement process was conducted in the preparation of this Plan. Input from San Marcos citizens was solicited extensively through numerous meetings of the Transportation Advisory Board, a broadly represented stakeholders group, and a technical committee. In addition, the City literally took the planning process to the community's inner-city and low-income neighborhoods where citizens were afforded the opportunity to provide their ideas and concerns about the local, as well as the regional transportation system.

In the end, the plan was presented, discussed, and approved by the San Marcos City Council in a public meeting. The entire San Marcos community has had ample opportunities to suggest proposed improvements most beneficial to all citizens and comment on the entire universe of potential improvements.

The impact on the San Marcos community by the proposed improvements, because they were proposed by the community itself, will be a positive one. Pedestrian, bicycle, public transit, and private motor vehicle mobility and safety will be enhanced. To help reduce traffic in the downtown and University area, pedestrian and bicycle improvements are recommended to foster

increased use of walking and bicycle transportation modes to and from these major destinations. Enhanced pedestrian and hike-and-bike trails are proposed to increase the number of school children walking and riding bicycles to and from school. Commuter pedestrian and bicycle traffic will be enhanced by completing the missing segments of the current systems. With respect to the historic neighborhoods such as the Belvin and San Antonio Streets historic areas, additional vehicular traffic through these areas from new developments to the south will only exacerbate the existing traffic congestion and air pollution regardless how many alternative routes are opened to reach downtown and the University. The same can be said of downtown where increased mobility can be ensured through an enhancement of public transit services to and from downtown and the University.

Improved vehicular flow in the inner-city and improved suburban area roadways will increase the opportunity for enhanced public transit system routes throughout the community. The Plan recommends an improved coordination, if not consolidation, of the University's bus system with that of CARTS to expand the service area of the combined systems and increase the ridership opportunities of University students and non-students alike. This will increase the opportunity for all citizens, but in particular, low-income citizens, University and public school students, to travel to and from places of employment, essential medical and public services and recreation. Teenagers in the public housing neighborhood along River Road are already enjoying enhanced summer-time employment opportunities because CARTS recently extended its service to these neighborhoods.

San Marcos has the opportunity to coordinate its transportation system and land use planning processes to ensure that the community grows in a manner that will enable the municipality to serve all geographic sectors and population groups in the community equally with enhanced transportation services— especially transit service. This Transportation Master Plan is the first and very important step in this public process.

Environmental

In 1996 the San Marcos Comprehensive Plan's Citizen Advisory Committee envisioned San Marcos as "a community that offers a wide range of transportation options and has a safe and efficient street system." The Transportation Master Plan strives to achieve this vision by ensuring that the community's quality of life will be improved through improved mobility that will enhance its economic development potential while protecting the environment. The Transportation Master Plan conforms to the guiding principles set forth in the Comprehensive Plan and the goals and objectives developed for the TMP.

The TMP ensures the protection of existing neighborhoods, parks and the overall environment while developing transportation alternatives that will provide improved mobility and safety. The TMP proposes increased accessibility to both bicyclists and pedestrians by integrating non-vehicular facilities with multi-modal transportation improvements throughout the community. The downtown's environment will be improved by reducing congestion while promoting

pedestrian, bicycle and public transit mobility. The TMP will enable the City of San Marcos to serve new developments with appropriate transportation system improvements, thereby promoting economic vitality and neighborhood livability. These planning efforts have been ensured by engaging the overall community in the various public planning processes.

Potential impacts on the environment as a result of transportation system improvements result from roadways traversing flood plains of rivers and creeks, primarily in the central and eastern portions of the study area, as well as possible encroachment on geological features such as caves, springs, and sinkholes— karst features— primarily in the western portion of the study area.

The Plan includes transportation system recommendations throughout the urban and suburban areas of the community. In some instances, the proposed improvements are entirely within the urban area, and may be limited to widening of a roadway. In such cases, there could be a very limited impact on the natural environment, but would impact the man-made environment to varying degrees— depending on the existing land uses along that proposed roadway widening. The TMP's scope is one that recommends transportation system improvements at a macro level vs. a micro level that would specifically layout an improvement. Therefore, at this level of analysis it is not possible to state the exact impact on properties adjoining proposed improvements. That impact will be determined in the improvement design phase. It is not uncommon in urban areas where roadway improvements are imperative for there to be some impact on adjoining properties such as reduction of parking spaces or even displacement of existing land uses.

In other cases, the proposed improvements are in undeveloped rural land where there may be some impact on the natural environment while little to none on the man-made environment. In all cases, the community will consider the trade-offs of the proposed improvements on both the natural and the man-made environments as there can never be absolutely no impact whatsoever.
All of the proposed improvements in this Transportation Master Plan have been thoroughly considered by the Transportation Advisory Board, technical and stakeholder committees, staff, and consultant team as to their benefit to the community's mobility and impact on the environment. The matrix "***Evaluation Criteria of the San Marcos Transportation Master Plan, Proposed Roadway Improvements***" rates these thirty-eight improvements by potential impact on the environment (see Appendix D). It should be noted that only three of the thirty-eight projects has a potential "unfavorable" impact on the environment, while all three would improve mobility. Furthermore, all three are located in areas that are relatively undeveloped giving the community ample opportunity to mitigate that impact in its design of such improvements.

TRANSPORTATION SYSTEM MANAGEMENT

In addition to the major recommended roadway improvements, it is recommended that traditional traffic operational practices and Transportation System Management (TSM) techniques be employed at critical locations to alleviate deficiencies that may continue with the Transportation Master Plan improvements. These types of improvements are typically cost effective methods that improve traffic flow by making better use of the existing transportation system. Examples of these improvements include provisions of intersection turn lanes and other geometric improvements, coordinated signal systems that efficiently accommodate travel demands, effective utilization of traffic control devices, lane channelization, on-street parking prohibitions, and turn restrictions. Operational improvements are also important considerations in the interim when partial implementation of some thoroughfare improvements may cause capacity overloads on other system facilities.

The following is a list of intersections that were examined for the implementation of potential TSM improvements. A complete listing of the recommendations for these corridors is contained in Chapter 8 – Recommended Transportation Plan.

- Aquarena Springs Drive (Loop 82) and Sessom Drive
- Ed J. L Green and Sessom Drive
- Peques Drive and Sessom Drive
- N LBJ Drive and Sessom Drive
- Comanche Street and Hopkins Street (RM 12)
- IH 35 Frontage Roads and Hopkins Street
- Thorpe Lane and Hopkins Street
- Charles Austin Drive/City Hall Drive and Hopkins Street
- Thorpe Lane and Robbie Lane
- Thorpe Lane and Springtown Way
- Thorpe Lane and Aquarena Springs Drive
- IH 35 Frontage Roads and SH 123
- Staples Road/Hays Street and SH 123
- Broadway and SH 123
- De Zavala Drive/Leah Street and SH 123

TRAFFIC SIGNAL UPGRADES

A common theme discussed at all of the public meetings and stakeholders meetings during the development of the Transportation Master Plan was the need for improvements in traffic signal timing and synchronization. The City of San Marcos and the Texas Department of Transportation have begun a project to evaluate and improve nearly all traffic signal locations throughout the City. The project includes hardware and software upgrades at signal locations and implementation of improved traffic signal timings. The City of San Marcos and the Texas

Department of Transportation should ensure that the program underway is successfully completed to reduce delay and improve travel on local streets throughout San Marcos.

TRANSIT SYSTEM IMPROVEMENTS

As discussed in Chapter 2 – Existing Transportation Conditions, two transit operators provide service within the area – the Capital Area Rural Transportation System and the TxTRAM system operated by Texas State University-San Marcos. Recommendations in this section are general in nature, and further focused studies may be necessary in order to explore the feasibility of these recommendations and to plan for their implementation.

Comments at the public meetings identified the need for increased marketing about existing CARTS transit services. These comments generally reflected three ideas:

1. A lack of knowledge that transit service was available in the community;
2. The lack of knowledge that the service is available to everyone within the community, and not just certain special needs groups ; and,
3. The need for education about how the public would go about accessing and using the transit service.

In theory, it would be ideal if the two operators could work together to ensure maximum coverage within the community without duplicating efforts. This idea has been explored by CARTS. Any obstacles to this should be explored (i.e. funding sources may not allow certain services to be combined). Also, the San Marcos Station multimodal transit center is an important asset to the community, and opportunities to increase the usage of the center should be explored.

During the public meetings, the idea also emerged that “park and ride” service for Texas State University-San Marcos should be explored. The idea is that remote parking lots would be located adjacent to IH 35, and then students and employees would ride a shuttle to the main campus. This type of system has the potential to reduce traffic congestion on streets around the campus and on the primary arterials leading to the University. Other ideas to emerge during the TMP development process include the following potential changes or enhancements:

- Constructing a connector at Donaldson Street to help buses move through area more efficiently;
- Consider using smaller buses;
- Look at providing weekend service and operating longer hours;
- Provide covered shelters;
- Look at CARTS routes to ensure good access to City facilities is provided;
- Ensure that service is provided to major events in City;
- Look for opportunities to fill in San Marcos CISD service gaps;
- Develop proactive system to distribute service schedules (i.e. work with Texas State marketing classes); and,

- Providing transportation to local parks during the summer season.

COMMUTER RAIL SERVICE

The potential for commuter rail service has been explored along the Austin to San Antonio corridor during the past few years. The City of San Marcos is included in the discussions and should continue to pursue the possibility of a commuter rail station within the City, with direct service to both the Austin and San Antonio metropolitan areas. As part of development efforts, the City has developed the following vision and goals related to commuter rail.

Commuter Rail Vision - The San Marcos Commuter Rail Station will be a multimodal transportation hub of regional significance and a prominent and distinctive gateway for San Marcos and the region. The station will bring critical elements of the public and private local and regional transportation systems, both existing and future, together with private development and inspiring civic features.

San Marcos Station will create an exciting setting that will improve the connections between all transportation modes, respect the character and historical significance of the station and its adjacent neighborhoods and provide a stimulating environment for public activity and economic vitality.

Goals - The San Marcos Commuter Rail Station will be a public/private partnership that will identify and evaluate potential transportation, development and civic components, along with design character, and financing, ownership and governance structures for the San Marcos Station site. The public/private partnership shall establish a final integrated plan that provides the best possible solution for development of the site in light of the project's vision, recognizing that transportation and its connectivity is the primary focus.

I. Transportation/Multimodal Center

A. Develop a public transportation facility that will:

- Be the hub of the regional transportation system;
- Ensure that all modes function together to optimize the efficiency of each mode for system-wide efficiency;
- Provide connections for all transportation modes into and throughout the San Marcos region;
- Increase transit ridership and use of other forms of public and private transit and alternative transportation modes;
- Provide increased ground transportation options to the traveling public;
- Accommodate all ground passenger modes, both public and private, to the greatest extent feasible on the site;
- Create a system of mode transfer and way-finding orientation which allows for simple and efficient movements and connections for travelers;

B. San Marcos Station should support major activity centers and destinations in the region by providing easy access and seamless connections.

C. Provide transit options and uses at San Marcos Station that are consistent with the Horizon Master Plan.

D. Provide the opportunity for connections to and between local, regional, statewide, and national transportation systems and networks.

II. Urban Design and Neighborhood Integration

A. Develop a plan that will provide pedestrian friendly urban design elements that:

- Ensure that the mass, scale, orientation, and architecture of the San Marcos Station site and its private development are harmonious with the station and the surrounding neighborhoods;
- Encourage a mix of land uses on the site that creates appropriate densities of development that are compatible with neighborhood plans and concepts;

B. Serve as a transfer hub for Downtown, Texas State University, the Outlet Malls, and the neighborhoods, emphasizing pedestrian and bicycle connections to and through the development, easy access to transit, and an active, attractive environment.

C. The San Marcos Station multimodal transportation center and related on-site development should create a positive user experience.

D. Provide for the creation of public spaces

III. Development Feasibility

A. Develop a plan for the facility that maximizes the opportunity for public/private development that supports transit ridership, serves neighborhood needs, functions as a regional and statewide amenity, generates project revenues to help offset costs, and enhances Downtown's environment.

B. Develop a financing package that optimizes the use of funding from Federal, State, Local and private sources.

C. Integrate transportation and development in an economically sustainable phasing and build out strategy that takes advantage of available funding and public/private partnerships.

IV. Implementation and Governance

A. Develop a plan that provides governance of the San Marcos Station site that is appropriate for a public/private facility, that does not put undue risk and burden on the taxpayers and that provides opportunities for private partners and users.

B. Ensure that the long-term ownership and governance structure for the San Marcos Station site incorporates strict and demanding standards of quality

and cost-effectiveness for facility design and quality of workmanship, as well as for on-going operations and maintenance.

TRAFFIC IMPACTS OF ROADWAY PROJECTS

With complete implementation of the Recommended Transportation Master Plan by the Year 2025, the majority of roadways in the San Marcos area are projected to operate at an acceptable level of service, LOS D or better. Although the population within the study area (ETJ) is forecasted to more than double during the next 25 years, the TMP projects will help accommodate this growth.

The next section presents the traffic impact analysis results for projects that will be presented in more detail in Chapter 8. In Chapter 8, the projects will be presented with specific descriptions, preliminary costs, and implementing agencies.

The master list of roadway projects that were evaluated in the travel demand model for the Recommended Transportation Master Plan is contained in **Table 7-1**.

PROJECTED TRAFFIC VOLUMES AND LEVELS OF SERVICE

Based on the traffic analysis performed by the TransCAD travel demand model, projected traffic volumes and roadway levels of service were projected for the years 2007, 2010 and 2025. The results of these model runs are contained in **Figures 7-1**, **7-2** and **7-3**. The maps in these figures show roadway levels of service for each road contained in the San Marcos travel model, and feature representative projected traffic volumes for each of the model horizon years.

Most local roadways are projected to operate at acceptable LOS conditions in years 2007, 2012, and 2025 with implementation of the recommended transportation plan. A few roadways will continue to operate at unacceptable, or near unacceptable levels. For example, Hopkins Street, north of San Antonio Street is projected to initially deteriorate to unacceptable LOS E and F conditions by year 2012, but by year 2025 it is projected to improve to LOS D conditions with implementation of important projects. The Transportation Advisory Board is hopeful that the Wonder World Drive extension and the Craddock Street improvements will help alleviate the Hopkins Street situation, but alternative roadway improvements may be necessary. A number of alternatives were considered, but because of the impact on existing neighborhoods they are not recommended at this time.

In addition, RM 12 and Aquarena Springs Drive are projected to operate at or near capacity by year 2025, even after proposed widening projects are implemented. By year 2025, the proposed east and west outer loop freeway facilities are projected to carry high traffic volumes (30,000 to 50,000 vpd in many sections), which provides relief for many local roadways.

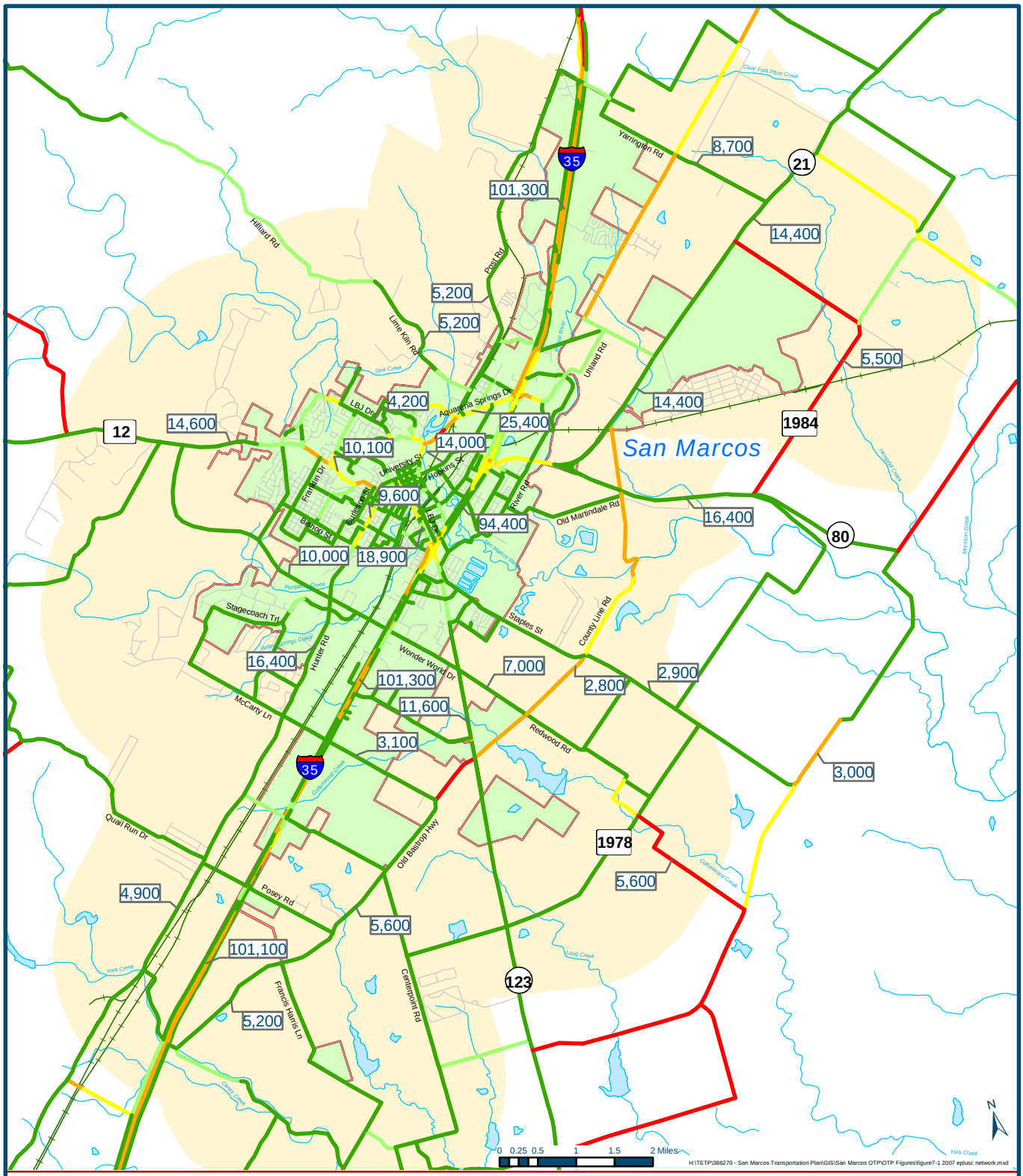
Table 7-1
Modeled Transportation Master Plan Projects
San Marcos Transportation Master Plan
San Marcos, Texas

Improvement	From	To	Program
Wonder World Drive - Construct 4 lane bridge and 1 lane frontage roads at railroad tracks - Construct extension from Hunter Road to RM 12	IH 35 FM 2439	FM 2439 RM 12	S
Craddock Street - Widen to 4 lane divided	RM 12	Bishop	S
RM 12 -Widen to 4-lane undivided section with turn lanes at Craddock Street	Wonder World Drive extension	RM 32	S
Aquarena Springs Drive - Railroad Grade Separation (future traffic forecasts should have 6 lane bridge structure) - Realignment of Post Road intersection - Intersection improvements at Sessom (Dedicated right turn lane on Aquarena Springs and 2 left turn lanes on Sessom; 5 ft. sidewalks and pedestrian crossings) and bike lanes/trail	IH 35	Sessom Drive	S
Widen Hunter Road to 3 lanes from Bishop Street to Dixon Street, 4 lanes from Dixon Street to Purgatory Creek, and 5 lanes from Purgatory Creek to Wonder World Drive	Bishop Street	Wonder World Drive	S
Widen Hunter Road to 5 lanes	Wonder World Drive	Comal County Line	S
Widen Post Road to 3 lanes with bike lanes and sidewalks	300' west of Bert Brown Road	North City Limit	S
Construct River Road RR Overpass	At RR Tracks		S
Add U-Turn Lane to Improve Transit Center Access	At Donaldson Street		S
Add Signage on SH 21 at Yarrington Road Directing Traffic to IH 35 via Yarrington Road			S
River Rd -Extend existing River Road from SH 80 to Aquarena Springs) -Restripe/Strip all sections of River Road to 3 lanes with bike lanes	IH 35	Aquarena Springs Drive	S
Extend Craddock Street south as 4 lane divided section	Bishop Street	Wonder World Drive	S
Widen Hopkins to 6 lanes	CM Allen	IH 35	M

Improvement	From	To	Program
Extend Craddock with 4 lanes	End Craddock	Lime Kiln Rd	M
Realign Holland and Academy to provide Sessom connection to RM 12	Sessom	RM 12	M
Widen Post Road to 4 lanes (6 lanes needed w/o Loop)	Aquarena Springs	Northern Study Area limit	M
Widen Aquarena to 6 lanes	Sessom	IH 35	M
Construct 4-lane freeway as E. Outer Loop	IH 35 North	IH 35 South	M
Construct 4-lane freeway as W. Outer Loop	IH 35 North	IH 35 South	M
Lime Kiln Widening from Hilliard east and extend new roadway to join Uhland as 4 lane divided section	Hilliard	Uhland	M
Extend River Ridge Parkway west as 2 lane section	IH 35	Post Road	M
Extend River Ridge Pkwy. (2 lanes)		Harris Hill	M
Widen RM 12 to 6 lanes	Wonder World Drive	RM 32	M
Widen Comanche Street to 4 lanes (Sessom to Hopkins); improve 2-lane section (Hopkins to MLK)	Sessom	MLK	M
Complete missing sections of University Drive (4 lane section) from Guadalupe to Comanche; long range complete section from Comanche to RM 12	Guadalupe	RM 12	M
Widen SH 80 to 6 lanes (including underpass at IH 35)	IH 35	SH 21	M
Widen Thorpe Lane to 5 lanes	Aquarena Springs Dr	Hopkins St	M
Widen Hutchison to 3 lanes	CM Allen	Moore St	M
Widen IH 35 underpasses to 6 lanes at SH 123, Loop 82, Wonder World Drive, Centerpoint Drive, River Ridge Parkway and McCarty Lane	IH 35	At Underpasses	M
Extend River Ridge Parkway (2 lanes)	Post Road	Lime Kiln Road	M
SH 21 extension - Construct 5 lane north-south arterial	Posey Rd.	SH 80/SH 21	M
Widen Charles Austin to 4 lane undivided			M
Widen FM 621 to 3 lanes	SH 123	Old Bastrop Hwy.	M
Realign and straighten Cape Road, including new bridge			M
Construct Cottonwood Creek Parkway (5 lanes)	IH 35	Leah Dr	M
Extend Lime Kiln Rd. (4 lane divided)	Current Terminus	W. Outer Loop	L
Upgrade Old Bastrop Hwy (4 lane divided) with interchange at Loop	South of E. Outer Loop	IH 35 South	L
Construct 4-Lane divided arterial	Southwest corner of W. Outer Loop	Old Bastrop Hwy. (Project R-19) at IH 35 South	L

Improvement	From	To	Program
Widen SH 21 to 6 lanes	SH 80	Northern ETJ	L
Widen IH 35 to 8 mainlanes/3-lane feeder roads	Northern ETJ	Southern ETJ	L
Construct Posey Road Overpass (6 lanes)	IH 35	At Posey Road	L
Widen SH 123 to 5 lanes	IH 35	County Line Rd	L
Intersection Improvements at SH 123 and FM 621	FM 621	SH 123	L
Construct Purgatory Greenway Trail	ETJ	San Marcos River Trail	L
Construct trail connection across RM 12 to connect to Franklin	Sessom	Franklin	L

Program – S=Short Term 2005-2010; M=Intermediate Term 2010-2015; L=Long Term 2015-2025



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

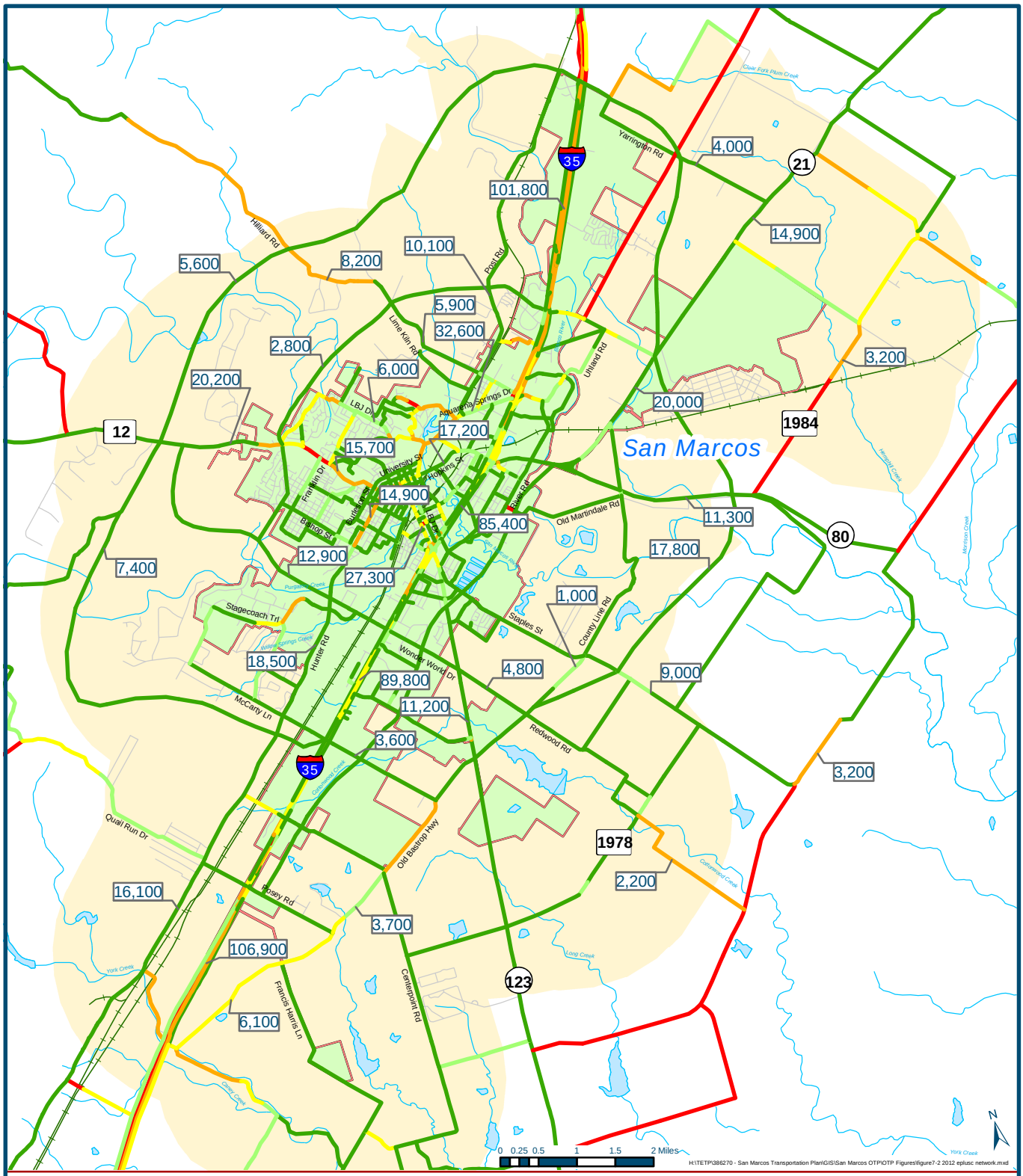
Local Roads
Railroads
San Marcos City Limits
San Marcos ETJ
1234 Volumes

Map Date: July 30, 2004

LOS
A
B
C
D
E
F

Figure 7-1
Year 2007 Projected Daily Traffic Volumes and Levels of Service on the Existing Plus Committed Network

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

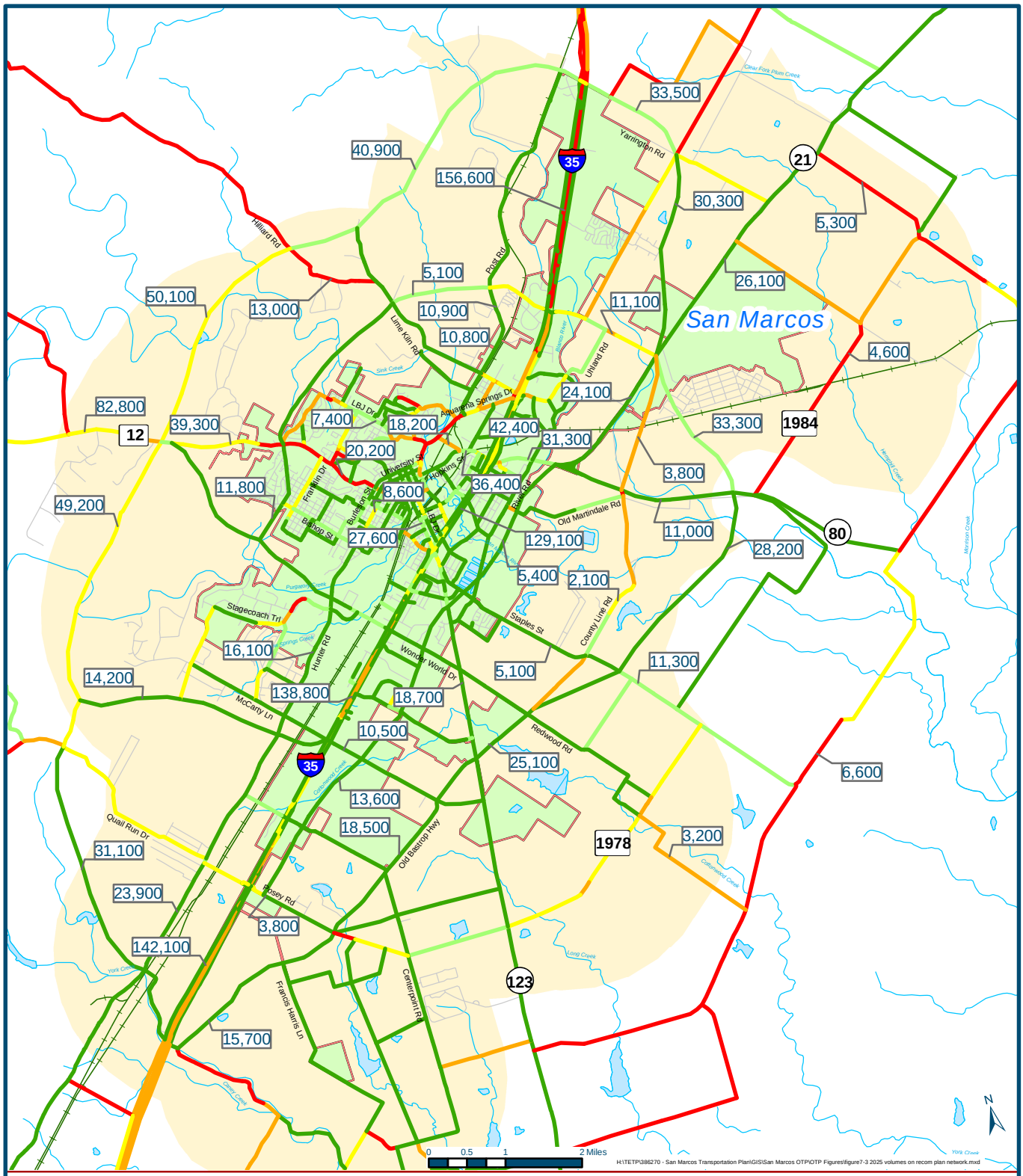
Local Roads
Railroads
San Marcos City Limits
San Marcos ETJ
1234 Volumes

LOS
A
B
C
D
E
F

Map Date: July 30, 2004

Figure 7-2
Year 2012 Projected Daily Traffic Volumes and Levels of Service on the Existing Plus Committed Network

San Marcos Transportation Master Plan
San Marcos, TX



San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Roads
- Railroads
- San Marcos City Limits
- San Marcos ETJ
- 1234 Volumes

Map Date: July 30, 2004

LOS

- A
- B
- C
- D
- E
- F

Figure 7-3
Year 2025 Projected Daily Traffic Volumes And Levels of Service for the Recommended Transportation Improvement Program

San Marcos Transportation Master Plan
San Marcos, TX

OTHER RECOMMENDATIONS

Corridor Management

The recommended Transportation Master Plan described in this report was developed based on traditional thoroughfare planning principles, community values, public involvement, and input by the Transportation Advisory Board, TAC, Stakeholders, the general public and City Staff. TMP development was completed giving consideration to the existing transportation system, network continuity, functional classification system relationships, land access, growth potential throughout the City of San Marcos and its Extraterritorial Jurisdiction (ETJ), and recognition of environment, engineering, and land use constraints.

In addition to proposed roadway improvements and roadway cross section standards, the Transportation Plan includes other transportation-related recommendations. These recommendations include modifications to transportation-related regulations, policies, and guidelines; corridor preservation measures; and, access management guidelines. These recommendations are intended to provide consistency between the Transportation Plan and related regulations and to facilitate plan implementation.

Collectively, these recommendations are referred to as corridor management. Corridor management includes preserving needed right-of-way in advance, minimizing development within the proposed right-of-way of a planned transportation facility, and preserving the safety and efficiency of the existing facilities through access management. Corridor management promotes the orderly development of a transportation network and helps to assure that transportation facilities will be adequate to serve existing and planned development.

Traffic Calming

Traffic calming measures are generally implemented to reduce the travel speeds of vehicles in residential areas, and to discourage traffic from cutting through neighborhoods unnecessarily. A list of 11 potential traffic calming policies has been developed in conjunction with the San Marcos Transportation Master Plan, which is contained in this section. Each policy is accompanied by a discussion and guidance. Traffic calming measures must be derived on a case-by-case basis – there is no "one size fits all" approach to traffic calming. In addition, the measures selected, if any, must also be developed in an active process in which the public and City Staff work collaboratively to ensure that the best possible outcome occurs.

1. **Deflection devices, such as speed humps or serpentines, should be limited to two lane, local and collector roadways.**
   By definition, traffic calming measures are designed to slow or impede traffic and introduce inconvenience to the motorist in order to raise awareness or adjust behavior. Local and collector roadway corridors serve a variety of functions, many of which are generally conducive to physical barriers. They provide access to destinations, including neighborhoods;

interact with pedestrian and bicycle paths such as sidewalks, crosswalks, trails, and bike lanes; connect with other roadways; and provide adjacent parking. A wide variety of traffic calming techniques allow local and collector roadways to meet these functions, in addition to their role in moving vehicles. Arterials and collectors with greater than two lanes, on the other hand, are designed to handle high volume and/or high speed traffic flow with limited access or interruption. Deflection devices not only impede the intent of these roadways, but also may enhance the possibility of collisions.

2. **Traffic calming should be conducted on an area-wide basis when possible.**
   Traffic calming changes made to a single street segment may achieve a reduction in speed, but will also likely encourage motorists to take alternative routes. When possible, traffic calming should occur in a planned manner and cover a larger area, such as a neighborhood. This permits the opportunity to carefully analyze the character of the area and determine if other roadways within the community face similar circumstances. It also allows observation of area-wide impacts of traffic calming applications.

3. **Implement subdivision and roadway design that reduces volume, speed, collision and cut-through traffic issues prior to the need for traffic calming.**
   Good, proactive design is recognized as a viable means of addressing speed and safety issues before they occur. For example, narrow travel lanes (ranging according to appropriate design from 10 to 11 feet) make a motorist less comfortable, increase awareness and reduce speeds. Addition of street trees enhances the sense of enclosure and provides a naturally calming effect on traffic. Limited street length between interruptions such as intersections increase connectivity, reduce speed and disperse traffic. Analysis of subdivision and roadway design can be used to anticipate and address the possibility of speed or safety issues. Design of narrow lanes may require a waiver from standard design practices.

4. **Install traffic calming measures in accordance with a traffic calming plan developed through a public participation process.**
   Traffic calming solutions are often ill-planned with little regard for consequences, including complaints and animosity among residents upon which traffic calming measures have been "forced." Traffic calming is more successful when implemented through a formal planning process developed in coordination with those individuals that must live with changes to the roadway. Community participation can include a public process for complaints, citizen committees that propose measures, public meetings, and follow-up surveys for acceptance.

5. **Consider constraints in development of any traffic calming plan.**
   Constraints represent certain conditions that must be met or that otherwise must be taken into consideration prior to development of a plan. Constraints may include such items as specified emergency routes, parking that needs to be kept, limited right-of-way, and location of major destinations along a roadway.

6. **Determine traffic calming warrants based upon severity of problems caused by speed, volume, collisions (particularly pedestrian related collisions), or cut-through traffic.**
   While a number of conditions exist that are important to efficient and safe operation of a roadway, traffic calming ultimately is utilized to address one or more of four issues: speed, volume, collisions, or cut-through traffic. The severity of these variables should establish the need for traffic calming and may also be used to establish priority among roadways or neighborhoods that are seeking treatment.

7. **A traffic calming toolbox should include sufficient measures to permit a choice that is most appropriate to the circumstances.**
   Too many communities limit traffic calming solutions to speed humps. Numerous devices may be utilized for specific circumstances. Each has benefits and limitations to be considered prior to implementation. A toolkit allows for comparison of measures to determine those most appropriate, including the possible combination of treatments. Examples of devices include traffic circles, speed humps, raised intersections, chicanes, lane narrowing, increased enforcement and education.

8. **When appropriate, attempt nonintrusive traffic calming measures prior to implementation of physical measures.**
   Physical traffic calming treatments can be expensive and intrusive. A tiered treatment system may be used to first attempt less intrusive measures such as increased enforcement, signage and education prior to installation of physical devices. The impact of nonintrusive measures may "wear off" once motorists become accustomed to their presence. Results should be measured occasionally over a long term - such as 18 months – to determine effectiveness.

9. **Selection of an appropriate traffic calming device should include obvious criteria such as impact on speed or pedestrian safety, but also on secondary measures such as impacts on noise, pollution, maintenance, and parking.**
   Consideration should be given to the character of the area and corridor in which devices are proposed. Characteristics often compared include safety improvement, pedestrian safety, speed reduction, volume reduction, conflict reduction, environment, access restrictions, emergency response, enforcement, multi-modal impacts, maintenance issues, relative cost.

10. **Utilize appropriate before and after studies to determine the effectiveness of traffic calming measures.**
    Specific studies aid in confirming problems and also provide performance measures in determining the effectiveness of a traffic calming plan. The primary purpose of before and after studies is to first confirm and measure the extent of proposed problems and second, to measure the effectiveness of a traffic calming plan. Depending upon the problem that is faced, studies may include Average Daily Traffic, pedestrian counts, spot speed surveys, collision analysis, origin-destination studies, or other relevant observations.

11. **Promote development activities and land use policies that encourage pedestrian amenities and activities.**
    Enhancement is a fourth means of achieving traffic calming and its impact may be either direct or indirect. Enhancements that improve the pedestrian environment serve to both entice individuals to walk and potentially reduce the number of automobiles utilizing the street. These enhancements may include incorporation of landscaping into the streetscape, strategic location of commercial and recreational activity within walking distance of most residents, required sidewalks, and other features such as street furniture. As pedestrians become more frequent, motorists become more attentive and seek to avoid potential conflicts. In addition, increased availability of on-street and formalized off-street parking at points of destination will reduce traffic searching for parking in residential areas and further reduce potential conflicts.

Corridor Preservation

Corridor preservation is the first action in the corridor management process. Corridor preservation techniques are important tools for local, state, and federal agencies to protect needed future right-of-way for proposed transportation facilities. AASHTO defines corridor preservation as a "concept utilizing the coordinated application of various measures to obtain control of or otherwise protect right-of-way for a planned transportation facility. Corridor preservation techniques should be applied as early as possible after the transportation corridor is identified either along a new alignment, or along an existing facility to:

- Prevent inconsistent development;
- Minimize or avoid environmental, social, and economic impacts;
- Reduce displacement;
- Prevent the foreclosure of desirable location options;
- Permit orderly project development; and,
- Reduce costs."

A prerequisite for selecting corridors for preservation is the presence of a transportation plan, such as the City of San Marcos' Transportation Master Plan. These types of plans typically identify future transportation corridors based on analysis of transportation deficiencies, a needs study, a statewide planning process, and urban development plans. Potential transportation corridors not identified in a city transportation plan would require too much study, planning, and public participation to warrant early preservation action. Corridor preservation candidates can be prioritized using the following five criteria:

- Importance of the Corridor;
- Immediacy of Development;
- Risk of Foreclosing Options;
- Opportunity to Prevent Loss of the Corridor; and,
- Strength of Local Government Support.

Successful corridor preservation actions require cooperation and a working relationship between numerous public agencies, private developers, and public interest groups. Agencies and groups that should be included in corridor preservation activities include the following:

- **Federal:** Federal Highway Administration (FHWA) and Resource Agencies (EPA, Corps of Engineers, etc.);
- **State:** TxDOT, State Legislature, and Resource Agencies;
- **Local:** City Council, Mayors and Executives, Planning Commissions, City Planning and Public Works Departments;
- **Private:** Land Owners, Developers, Chamber of Commerce, and Bankers; and,
- **Citizens:** Corridor Neighborhood and Civic Groups, Umbrella Public Interest Groups, and Environmental Activists.

Establishing means of corridor preservation for the implementation of the San Marcos Transportation Master Plan is important. Before a new facility is constructed, all sections throughout the route should have protected right-of-way to assure ultimate development of the entire facility. Means that can be employed to assist in the successful planning and implementation of roadway improvements are identified in **Table 7-3**. These techniques are divided into two basic categories, including interim protection techniques and preservation techniques. Interim protection techniques, such as official maps of reservation, and options to purchase at a later date, strive to hold land out of development until right-of-way purchases can be made or land titles transferred. Interim protection techniques provide temporary assurances that right-of-way will be available in the future, but they cannot guarantee right-of-way protection. Preservation techniques on the other hand definitely ensure that right-of-way is, or will be, available for a transportation facility when needed. Preservation techniques include such measures as fee simple acquisition, landowner donations, and development easement acquisitions.

Access Management and Driveway Access Control

Access Management is another important component of the corridor management process. Access management is defined as the protecting of the capacity of existing transportation routes and systems by controlling access rights from adjacent properties. Access management techniques serve to limit and separate vehicle (and pedestrian) conflict points, reduce locations requiring vehicle deceleration, remove vehicle turning movements from through lanes, create intersection spacings that facilitate signal progression, and provide adequate on-site capacity to accommodate ingress and egress traffic movements. Limiting access of new developments will not require additional cost from the City. However, elimination of access rights will require compensation by the City.

Access management techniques are extremely important for managing congestion on existing transportation facilities. The implementation of applicable techniques, or a combination of techniques, can eliminate the need for expensive roadway widenings or potential right-of-way acquisitions. The widening of Hopkins Street through San Marcos is an improvement that is

needed strictly from a transportation point of view but was not recommended in this plan due to the unavailability of right-of-way. Studies have shown that increasing the signalized intersection spacing to uniform intervals of one-half mile and the use of a non-traversable median to restrict left-turns will increase the capacity of a four-lane urban arterial by about 50 percent as compared to quarter-mile signal spacing and unrestricted left-turns. This is the same increase in capacity that can be obtained by widening a four-lane divided arterial to six lanes. Also, safety will be increased and congestion reduced to a greater extent than by the roadway widening. Research has consistently shown that access management helps to reduce the rate and severity of traffic accidents and improves pedestrian and bicycle safety.

Table 7-3
Corridor Preservation Techniques
San Marcos Transportation Master Plan
San Marcos, Texas

Corridor Preservation Technique	Interim Protection	Preservation
Subdivision Regulations	✓	✓
Building Permits	✓	
Building Setbacks	✓	
Access Management and Control	✓	✓
Fee Simple Acquisition		✓
Development Easement Acquisition		✓
Landowner Donations		✓
Public/Private Partnerships (toll facilities)		✓
Options to Purchase at a Later Date	✓	
Official Maps of Reservation	✓	
General Plan Corridor Designations	✓	
Transfer Development Rights to Other Properties or Land Swaps		✓
Density Transfer within a Single Property	✓	
Interim Uses on Right-of-Way	✓	
Irrevocable Offers to Dedicate	✓	
Highway Right-of-Way Platting	✓	
Developer Agreements	✓	
Tax Abatement	✓	
Voluntary Developer Reservations	✓	
Special Assessment Districts Involving Right-of-Way Dedications		✓

SOURCE: Corridor Preservation: Case Studies and Analysis Factors in Decision-Making, Volume I, U.S. Department of Transportation, Federal Highway Administration, FHWA-PD-96-044, 1995.

From a land development perspective, access management assists in the orderly layout and use of land and helps to discourage poor subdivision and site design. Poorly designed entrances and exits to major developments not only present a traffic hazard, but also cause increased congestion, which can create a negative image of the development. In addition, access management techniques, such as reducing the number and frequency of driveways and median openings, improve the appearance of major corridors. Scenic and environmental features can be increased, which improves the image of streetscapes and can attract additional economic development.

Access management relies on a variety of access control techniques to promote efficient vehicular movements. These include the following:

- Limit number of conflict points;
- Separate conflict points;
- Limit deceleration;
- Remove turning vehicles from through lanes;
- Space major intersections to facilitate progressive travel speeds along arterials; and,
- Provide adequate on-site storage to accommodate both ingress and egress traffic.

Several access management strategies implement more than one of the above techniques in a single measure. The access management techniques most applicable for San Marcos can be separated into three major categories: signalized intersection spacing and coordination, medial access treatments, and marginal access treatments. Other access management recommendations relating to driveways and driveway spacings will be discussed in a later section of this chapter.

Recommended strategies and their potential application areas are identified in **Table 7-4**. Traffic signal coordination and actuated signal control are strategies recommended to improve progression and reduce delay on existing arterial streets. Traffic Light Synchronization (TLS) programs have been implemented throughout the State of Texas and have been shown to reduce delay, improve progression, reduce fuel consumption, and improve air quality. For new traffic signal installation and implementation of recommended new thoroughfares, traffic signals should be consistently spaced at one-half mile intervals on major arterials and one-quarter or one-third mile spacings on minor arterials. Consistent traffic signal spacing is an effective access management technique that has been shown to improve progression, reduce delay, and reduce travel time.

For medial access techniques, Table 7-4 identifies recommendations for the City of San Marcos for median type, median width, median channelization, and median opening spacings. Raised medians should be utilized on all major arterial facilities to provide for efficient traffic flow, improved safety, and reduced congestion. A before and after study recently conducted in Atlanta identified a 37 percent reduction in total accidents and a 48 percent reduction in injury accidents after replacing an existing continuous two-way left-turn lane (CTWLTL) on a six-lane divided arterial with a raised median. Furthermore, a Georgia Tech study analyzed accident data at 32 raised median sections and 50 CTWLTL sections before concluding that raised medians resulted

in safer operation than CTWLTLs when the ADT exceeded 24,000 vehicles per day. As the ADT increases, gaps in the opposing traffic stream become shorter and more infrequent. This makes it increasingly difficult for vehicles to execute multiple left-turn maneuvers from CTWLTLs. A Florida study also reported lower accident rates for arterials with raised medians than for arterials with CTWLTLs. Accident rates on both four-lane and six-lane arterials were approximately 25 percent lower on facilities with raised medians when compared to facilities with CTWLTLs.

For the City of San Marcos, raised medians are recommended for all urban major arterials and or all urban minor arterials with projected future volumes greater than 20,000 vehicles per day. This would include roadways such as Hopkins Street, Aquarena Springs Drive and SH 80 East. Major arterials should only be constructed with raised medians in order to ensure they serve their primary function of traffic movement. Minor arterials that are not expected to have traffic volumes exceed 20,000 vehicles per day (vpd) during the planning horizon (greater than 20 years) may be constructed with a CTWLTL provided the opportunity for converting the CTWLTL to a raised median in the future exists. Should a minor arterial exceed its projected future volume and exceed 20,000 vpd, the CTWLTL should be converted to a raised median to improve traffic flow and safety.

Other medial recommendations include standard median widths (22 feet for major arterials and 16 feet for minor arterials), median channelization (left-turn lanes provided at major cross streets and mid-block locations), and median opening spacings (600 ft. for major arterials and 450 ft. for minor arterials). A 22 ft. median width for major arterials permits the inclusion of left-turn lanes at major intersections and mid-block locations. The wider median width also permits turning vehicles to be removed from through traffic at median openings. A 16 ft. median on minor arterials will permit a CTWLTL for low volume minor arterials and provides sufficient space to convert to a raised median should volumes exceed design requirements.

Marginal access techniques require a minimum unsignalized intersection spacing of 350 feet, or 12 to 15 unsignalized intersections per mile on arterials. This spacing of unsignalized intersections reduces the speed differential between through and turning vehicles and improves safety by reducing the accident rate. In addition, right-turn bays are recommended to be provided at major intersections and major mid-block developments with high turning volumes (generally considered to be greater than 100 vehicles per hour during the peak hour). Right-turn bays help to improve traffic operations and reduce delay at signalized and unsignalized intersections by removing the turning movements from the through traffic stream. In addition, right-turn bays should also be provided on the stem of T-intersections with relatively high turning volumes to reduce delay to turning vehicles.

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.

Driveway Access Control

Driveway access control should be considered by the City of San Marcos, including appropriate recommendations regarding the location, spacing, width, radius, and other design considerations for driveways on arterials, collectors, and local streets. The development of this type of policy or ordinance should include input from local officials, local residential developers, and local commercial developers and should be compatible with the Transportation Master Plan.

Chapter 8
Recommended Transportation Master Plan

The recommended transportation plan for the City of San Marcos was developed based upon future traffic volume forecasts, transportation network continuity, projected future development, environmental considerations/constraints, and other factors. This chapter identifies the Recommended Transportation Master Plan and the financial implementation program. The financial implementation program presents actions, costs and timelines for the successful deployment of elements outlined within the Transportation Master Plan. The financial implementation program is divided into three program periods, which are designed to be consistent with the City of San Marcos' Capital Improvement Program schedule:

- Short Term – Fiscal Years 2005-2010;
- Intermediate Term – Fiscal Years 2010-2015; and,
- Long Term – Fiscal Years 2015-2025.

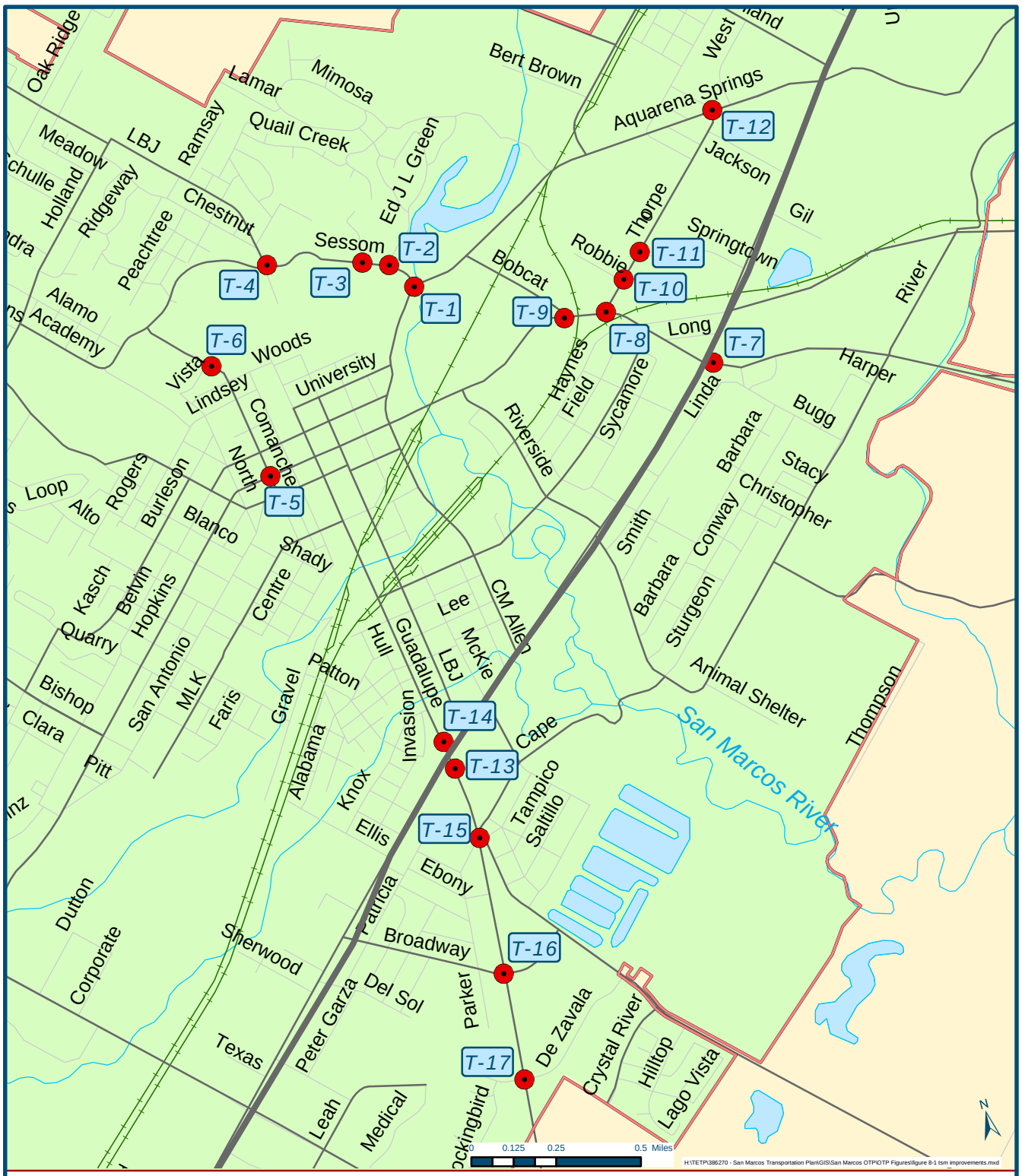
RECOMMENDED TRANSPORTATION MASTER PLAN

The recommended Transportation Master Plan for the City of San Marcos includes the implementation of new major and minor arterials and collector streets to guide the orderly development of the region's transportation system. The plan includes four primary types of improvements: roadway widenings, new roadway facilities, transit improvements, and bicycle/pedestrian improvements.

Roadway widenings provide for additional travel lanes to relieve congested roadway conditions and were recommended in locations where future projected traffic volumes exceeded roadway capacities. Roadway widenings provided for more efficient travel and in most cases were recommended in locations where additional right-of-way could be acquired with minimal impact to adjacent land uses.

New roadway facilities included both new roadway alignments as well as extensions of existing facilities. The alignments were developed by balancing the need to minimize negative impacts to adjacent land uses with the benefits of improved local travel conditions. They generally provide for additional local area traffic circulation as well as important new connections to improve the overall transportation system continuity.

The Recommended Transportation Master Plan was developed based upon the detailed analysis of alternative transportation projects, extensive public involvement efforts, consideration of social and environmental impacts, and evaluation of projected project costs. The Recommended Transportation Master Plan is illustrated in **Figure 8-1** and **Figure 8-2** and also identified in **Table 8-1**, **8-2**, and **8-3** on the following pages.



San Marcos Transportation Master Plan

Wilbur Smith Associates

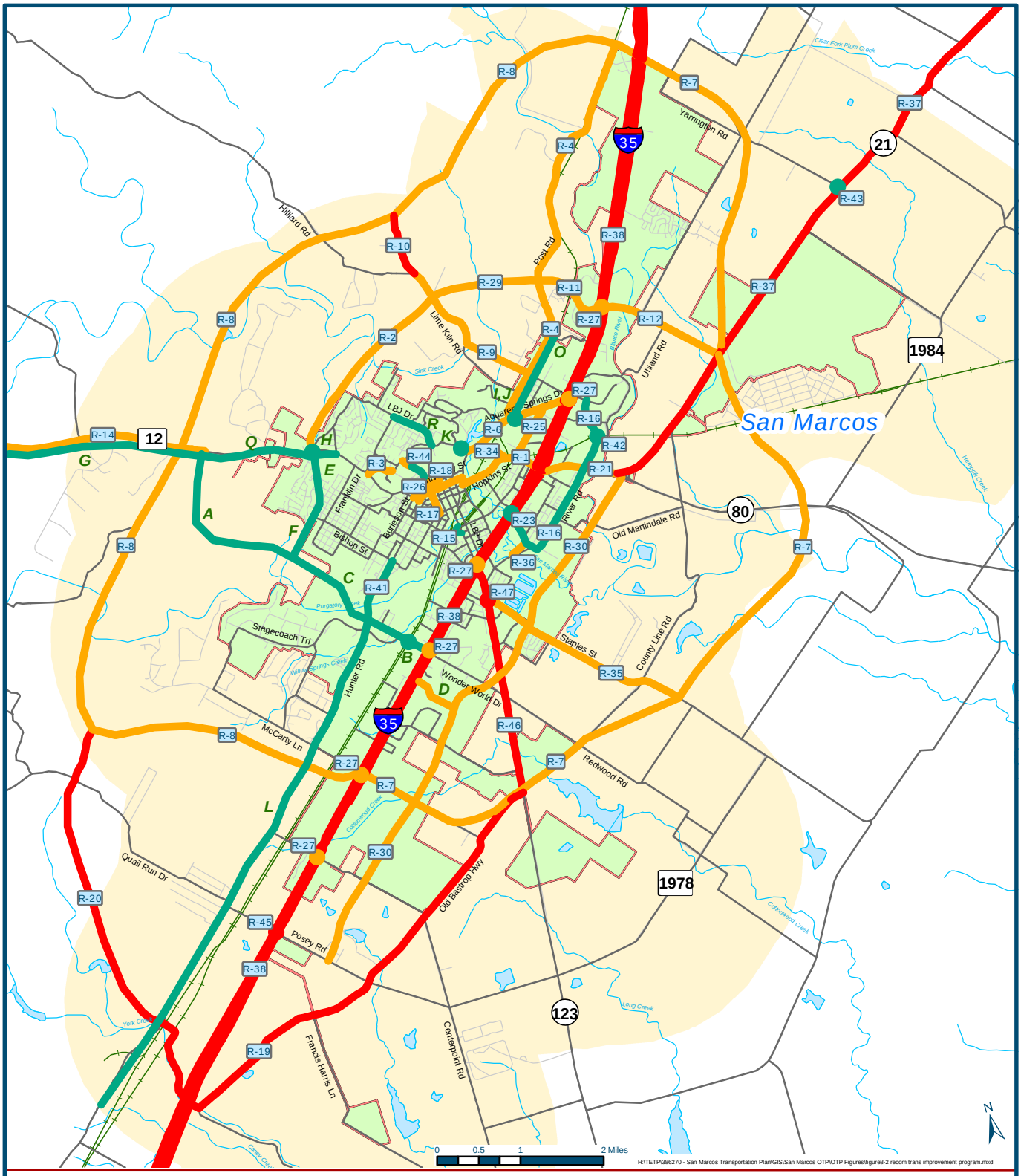
Map Key

- TSM Projects
- Local Roads
- Railroads
- San Marcos City Limits
- San Marcos ETJ

Map Date: March 4, 2004

Figure 8-1
Transportation System Management (TSM) Improvements

San Marcos Transportation Master Plan
San Marcos, TX



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San Marcos Transportation Master Plan

Wilbur Smith Associates

Map Key

- Local Roads
- Railroads
- San Marcos City Limits
- San Marcos ETJ
- R-99 Project Number

Map Date: May 11, 2004

Roadway Projects by Year

- Short-Term
- Intermediate-Term
- Long-Term

Figure 8-2
Recommended Transportation Improvement Program (2005 - 2025)

San Marcos Transportation Master Plan
San Marcos, TX

Table 8-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Roadway Projects					
A,B,C	Wonder World Drive - Construct 4 lane bridge and 1 lane frontage roads at railroad tracks - Construct extension from Hunter Road to RM 12	IH 35	RM 12	$ 5,241,000[1]	City of San Marcos and TxDOT
E	Craddock Street - Widen to 4 lane divided	RM 12	Bishop	$ 1,600,000[2]	City of San Marcos
G, H	RM 12 -Widen to 4-lane undivided section with turn lanes on RM 12 at Craddock Street	Wonder World Drive extension	RM 32	$ 2,975,000*	TxDOT
I,J,K	Aquarena Springs Drive - Railroad Grade Separation (future traffic forecasts should have 6 ln bridge structure) - Realignment of Post Road intersection - Intersection improvements at Sessom (Dedicated right turn lane on Aquarena Springs and 2 left turn lanes on Sessom; 5 ft. sidewalks and pedestrian crossings) and bike lanes/trail	IH 35	Sessom Drive	$ 800,000[1]	City of San Marcos and TxDOT
L	Widen Hunter Road to 5 lanes	Wonder World Drive	Comal County Line	$ 2,150,000[1]	City of San Marcos and TxDOT
R-41	Hunter Road - construct 5 lanes from Wonder World Drive to north of Purgatory Creek channel - transition from 5 to 4 lanes and continue 4 lanes to Dixon Street - transition from 4 to 3 lanes and continue 3 lanes to Bishop Street	Wonder World Drive	San Antonio Street	$700,000	TxDOT and City of San Marcos
O	Widen Post Road to 3 lanes with bike lanes and sidewalks	300' west of Bert Brown Rd	North City Limit	$ 2,445,000	City of San Marcos
R-42	Construct River Road RR Overpass	At RR Tracks		$1,800,000	City of San Marcos
R-15	Add U-Turn Lane to Improve Transit Center Access	At Donaldson Street		$ 200,000	CARTS
R-43	Add Signage on SH 21 at Yarrington Road Directing Traffic to IH 35 via Yarrington	SH 21	At Yarrington Road	$5,000	City of San Marcos and TxDOT

Table 8-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
R-16	River Rd -Extend existing River Road from SH 80 to Aquarena Springs) 4 Lane Section -Restripe/Stripe all sections of River Road to 3 lanes with bike lanes (South of SH 80)	IH 35	Aquarena Springs Drive	$ 5,535,000	City of San Marcos
P	Citywide Traffic Signal Upgrades	Various Locations throughout City			TxDOT
Q	Widen RM 12 to 3 lanes	Wonder World Drive	Hughson Street	$850,000	TxDOT
R	Resurface and restripe North LBJ Street to 2 lane section with bike lanes	Sessom Drive	Holland Street	$ 76,000	City of San Marcos
R-44	Widen Comanche Street to 5 lanes	Student Center	Woods	$250,000	City of San Marcos
F	Extend Craddock Street South as 4 lane divided section	Bishop Street	Wonder World Drive	$ 1,713,000	City of San Marcos
Transportation Systems Management Projects					
T-1	Aquarena Springs Drive - Construct an eastbound right turn lane and restripe the eastbound approach to provide three outbound lanes and two inbound lanes consisting of two left turn lanes and one right turn lane. - Restripe the southbound approach to provide two through lanes and one free flowing right turn lane.	Aquarena Springs Drive	At Sessom Drive	$166,000	City of San Marcos
T-2	Ed J. L. Green - Restripe the southbound approach to provide a double yellow centerline.	Ed J. L. Green	At Sessom Drive	$1,000	City of San Marcos
T-3	Peques Drive - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one right turn lane. - Install traffic signal equipment to control the northbound approach of the State Street and Sessom Drive intersection. This intersection approach will be operated as part of the Peques Dr. and Sessom Drive intersection. - Optimize signal timing and phasing to provide a dummy signal phase, which will allow gaps for southbound left turning vehicles exiting the Ed J. L. Green and Sessom Drive intersection.	Peques Drive	At Sessom Drive	$102,000	City of San Marcos

Table 8-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
T-4	N. LBJ Drive - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one left/through/right shared lane. - Construct a westbound right turn lane.	N. LBJ Drive	At Sessom Drive	$14,000	City of San Marcos
T-5	Comanche Street - Restripe the westbound approach to provide three outbound lanes and one inbound lane consisting of one left turn bay, one through lane, and one through/right shared lane.	Comanche Street	At Hopkins Street (RM 12)	$2,000	City of San Marcos
T-6	Comanche Street - Restripe the northbound and southbound approaches to provide for four-foot bike lanes on both sides. - Restripe the northbound and southbound approaches to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane.	Comanche Street	At Student Center Drive	$5,000	City of San Marcos
T-7	IH 35 East Frontage Rd. - Construct a northbound right turn lane. The right turn lane should extend to Bugg Lane. - Construct a westbound right turn lane. - Extend the existing east-west sidewalks beyond the east side of the intersection.	IH 35 East Frontage Rd.	At Hopkins Street	$114,000	City of San Marcos
T-8	Thorpe Lane - Construct a southbound right turn lane and determine the most appropriate lane use for the southbound approach. - Construct an eastbound through lane and restripe the eastbound approach to provide dual left turn lanes and two through lanes. The outer lane in the eastbound direction should merge east of Thorpe Lane. - Construct a westbound right turn lane.	Thorpe Lane	At Hopkins Street	$167,000	City of San Marcos
T-9	Hopkins Street at Charles Austin Drive - Convert the existing westbound shoulder into a right turn lane. Traffic currently utilizes this shoulder as a right turn lane.	Charles Austin Drive/ City Hall Drive	At Hopkins Street	$15,000	City of San Marcos

Table 8-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
T-10	Thorpe Lane - Relocate existing traffic signal at this intersection to the intersection of Thorpe Lane and Springtown Way. - Restripe the westbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane. - Restripe the eastbound approach to provide two outbound lanes and two inbound lanes consisting of one left turn lane and one through/right shared lane.	Thorpe Lane	At Robbie Lane	$102,000	City of San Marcos
T-11	Thorpe Lane - Relocate existing traffic signal at the intersection of Thorpe Lane and Robbie Lane to this intersection. - Restripe the westbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane.	Thorpe Lane	At Springtown Way	Included in T-10	City of San Marcos
T-12	Thorpe Lane - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane. - Provide a curbed median island for the westbound approach to physically prohibit left turn access into the first driveway, north of Aquarena Springs Drive and east of the intersection.	Thorpe Lane	Aquarena Springs Drive	$5,000	City of San Marcos
T-13	IH 35 EFR - Construct a westbound right turn bay.	IH 35 East Frontage Rd.	At SH 123	$37,000	TxDOT
T-14	IH 35 WFR - Construct an eastbound right turn bay.	IH 35 West Frontage Rd.	At SH 123	$37,000	TxDOT
T-15	Staples Road/Hays Street - Restripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left/ through /right shared lane and one right turn lane.	Staples Road/ Hays Street	At SH 123	$1,000	City of San Marcos
T-16	Broadway - Lengthen the existing southbound left turn bay.	Broadway	SH 123	$11,000	City of San Marcos

Table 8-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
T-17	De Zavala Drive/Leah Street - Stripe the southbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one though/right shared lane. - Stripe the northbound approach to provide two outbound lanes and one inbound lane consisting of one left turn lane and one through/right shared lane.	De Zavala Drive/ Leah Street	At SH 123	$2,000	City of San Marcos
Bicycle and Pedestrian Projects					
BP-1	Wonder World Drive - Sign & stripe Shoulder Bike Lanes* - Improve at-grade crossings at RR tracks for bicycles	IH 35	RM 12	$ 100,000	City of San Marcos and TxDOT
BP-2	Cottonwood Creek Parkway - Sign & Stripe bike lanes as part of roadway	IH 35	Leah Drive	$ 144,000	City of San Marcos
BP-3	Craddock Street - Designate bike lanes as part of roadway development	RM 12	Wonder World Drive extension	$ 99,000	City of San Marcos
BP-4	RM 12 - Sign & stripe Shoulder Bike Lanes	Wonder World Dr.	RM 32 (Wimberley)	$ 500,000	TxDOT
BP-5	Aquarena Springs Drive - 5 ft. sidewalks and pedestrian crossings at Sessom* - 10-foot wide trail	IH 35	Sessom Drive	$ 500,000	City of San Marcos and TxDOT
BP-6	Hunter Road - Sign & stripe Shoulder Bike Lanes	Wonder World Drive	Comal County line	$ 50,000	City of San Marcos and TxDOT
BP-7	Post Road - 5' bike lanes and sidewalks	Bert Brown Rd.	North City Limit	$ 610,000	City of San Marcos
BP-8	Bike/Pedestrian crossings of San Marcos River on Hopkins and Aquarena Springs	On Hopkins	On Aquarena Springs	$ 64,000	City of San Marcos
BP-32	Construct Sidewalk via IH 35 underpass to River Road for Bike/Pedestrian access to underpass connection with IH 35/Cheatham improvements (2 lane underpass); bike lanes	River Road	Riverside	$ 39,000	City of San Marcos
BP-9	Designate and Sign the following Bike Routes: • Belvin Street • Dixon Street	 Dixon Belvin	 CM Allen Hunter/Hopkins	 $ 1,300 $ 500	City of San Marcos

Table 8-1
Short Term Improvement Program (2005 to 2010)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
	• San Antonio Street	Dixon	CM Allen	$ 1,300	
	• ML King Street	Mitchell	San Antonio	$ 500	
	• Mitchell Street	Gravel	Quarry	$ 500	
	• Quarry Street	Mitchell	Prospect	$ 500	
	• Prospect Street	Quarry	Columbia	$ 500	
	• Columbia Street	Prospect	Franklin	$ 500	
	• Clara Street	Prospect	Belvin	$ 500	
	• Bishop Street	Hopkins	San Antonio	$ 500	
	• Bishop Street with Bike Lanes	Lisa	Hopkins	$ 1,000	
	• Hilyer Street	Columbia	Perkins	$ 500	
	• Perkins Street	Hilyer	Franklin	$ 500	
	• Blanco Street	RM 12	Gravel	$ 750	
	• Gravel Street	Mitchell	Blanco	$ 500	
	• Patton Street	Gravel	Armstrong	$ 500	
	• Armstrong Street	Patton	LBJ	$ 500	
	• Lee Street	LBJ	CM Allen	$ 500	
	• McKee Street	Lee	Cheatham	$ 500	
			Total Estimated Cost	**$29,238,850**	

Source: City of San Marcos 1. City of San Marcos Funding; does not include TxDOT portion 2. Includes cost for widening and extending to Wonder World Drive, which is contained in the Year 2010 Project List
* Only portion within City Limits, not entire length.

Table 8-2
Intermediate Term Improvement Program (2010 to 2015)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Roadway Projects					
R-1	Widen Hopkins to 6 lanes	CM Allen	IH 35	$ 3,522,000	TxDOT
R-2	Extend Craddock with 4 lanes	End Craddock	Lime Kiln Rd	$ 15,096,000	City of San Marcos
R-3	Realign Holland and Academy to provide Sessom connection to RM 12	Sessom	RM 12	$ 2,562,000	Texas State University
R-4	Widen Post Road to 4 lanes (6 lanes needed w/o Loop)	Aquarena Springs	Northern Study Area limit	$ 18,063,000	City of San Marcos
R-6	Widen Aquarena to 6 lanes	Sessom	IH 35	$ 7,519,000	TxDOT
R-7	Construct 4-lane freeway as E. Outer Loop	IH 35 North	IH 35 South	$ 122,940,000	TxDOT and Hays County
R-8	Construct 4-lane freeway as W. Outer Loop	IH 35 North	IH 35 South	$ 141,179,000	TxDOT and Hays County
R-9	Lime Kiln Widening from Hilliard east and realign to join Uhland as 4 lane divided section	Hilliard	Uhland	$ 8,718,000	City of San Marcos
R-11	Extend River Ridge Parkway west as 2 lane section	IH 35	Post Road	$ 2,743,000	City of San Marcos
R-12	Extend River Ridge Pkwy. (2 lanes)	IH 35	SH 21	$ 7,202,000	City of San Marcos
R-14	Widen RM 12 to 6 lanes	Wonder World Drive	RM 32	$ 42,144,000	TxDOT
R-17	Widen Comanche Street to 4 lanes (Sessom to Hopkins); improve 2-lane section (Hopkins to MLK)	Sessom	MLK	$ 1,642,000	City of San Marcos
R-18	Complete missing sections of University Drive (4 lane section) from Guadalupe to Comanche; long range complete section from Comanche to RM 12	Guadalupe	RM 12	$ 212,000	City of San Marcos
R-21	Widen SH 80 to 6 lanes (including underpass at IH 35)	IH 35	SH 21	$ 8,675,000	TxDOT
R-25	Widen Thorpe Lane to 5 lanes	Aquarena Springs Dr	Hopkins St	$ 1,617,000	City of San Marcos
R-26	Widen Hutchison to 3 lanes	CM Allen	Moore St	$ 718,000	City of San Marcos
R-27	Widen IH 35 underpasses to 6 lanes at SH 123, Aquarena Springs Drive, Wonder World Drive, Centerpoint Drive, River Ridge Parkway and McCarty Lane	IH 35	At SH 123 At Aquarena Spg At Wonder World At Centerpoint Dr At River Ridge At McCarty Ln	$7,000,000	TxDOT

Table 8-2
Intermediate Term Improvement Program (2010 to 2015)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
R-29	Extend River Ridge Parkway (2 lanes)	Post Road	Lime Kiln Road	$ 4,615,000	City of San Marcos
R-30	SH 21 extension - Construct 5 lane north-south arterial	Posey Rd.	SH 80/SH 21	$34,849,000	TxDOT and City of San Marcos
R-34	Widen Charles Austin to 4 lane undivided	Hopkins	Aquarena Springs	$ 897,000	City of San Marcos
R-35	Widen FM 621 to 3 lanes	SH 123	Old Bastrop Hwy.	$ 2,656,000	TxDOT
R-36	Realign and straighten Cape Road, including new bridge	SH 123	River Road	$ 1,285,000	City of San Marcos
D	Construct Cottonwood Creek Parkway (5 lanes)	IH 35	Leah Dr	$ 750,000	City of San Marcos
Bicycle and Pedestrian Projects					
BP-10	San Marcos River Hike & Bike Trail Extension	Hopkins	Linda	$1,100,000	City of San Marcos
BP-11	Complete the trail and sidewalk network along Hopkins	CM Allen Pkwy.	IH 35	$ 125,000	City of San Marcos and TxDOT
BP-12	Craddock North Extension - Sign and Stripe bike lanes/shoulders	Current Craddock Terminus	Lime Kiln Road	$ 303,000	City of San Marcos
BP-13	Post Road - Sign and stripe shoulder bike lanes	Aquarena Springs	ETJ	$ 610,000	City of San Marcos
BP-14	River Ridge Parkway - Sign and stripe shoulder bike lanes		Harris Hill	$ 186,000*	City of San Marcos
BP-15	RM 12 - Sign and stripe shoulder bike lanes	W. Outer Loop	RM 32	$ 1,380,000*	City of San Marcos and TxDOT
BP-16	Add sidewalks on Guadalupe	San Antonio	IH 35	$200,000	City of San Marcos
BP-17	River Rd. - Sign and stripe shoulder bike lanes	SH 80	Aquarena Springs	$ 71,000*	City of San Marcos
BP-18	SH 80 (including underpass at IH 35) - Complete sidewalks from IH 35 to River Road	IH 35	SH 21	$141,000	City of San Marcos and TxDOT
BP-19	Hutchison - Sign and stripe bike lanes - Repair and complete sidewalks both sides	CM Allen Pkwy	Moore St	$ 76,000	City of San Marcos
BP-20	FM 621 - Sign and stripe shoulder bike lanes	SH 123	Old Bastrop Hwy.)	$ 309,000*	City of San Marcos and TxDOT
			Total Estimated Cost	**$441,105,000**	

* This includes only construction costs; other elements, such as contingency costs, are included with the roadway cost estimates in Table 8-2.

Table 8-3
Long Term Improvement Program (2015 to 2025)
San Marcos Transportation Master Plan

Project Reference Number/Letter	Improvement	From	To	Order-of-Magnitude Construction Cost	Responsible Agency
Roadway Projects					
R-10	Extend Lime Kiln Rd. (4 lane divided)	Hilliard Road	W. Outer Loop	$ 5,540,000	City of San Marcos
R-19	Upgrade Old Bastrop Hwy (4 lane divided) with interchange at Loop	South of E. Outer Loop	IH 35 South	$ 18,038,000	City of SM, Hays County, TxDOT
R-20	Construct 4-Lane divided arterial	Southwest corner of W. Outer Loop	Old Bastrop Hwy. (Proj R-19) at IH 35 S	$ 28,025,000	City of SM, Hays County, TxDOT
R-23	Reconstruct IH 35 underpass to provide connection between River Rd and Riverside across IH 35 (4 lanes)	River Road	Riverside	$ 1,704,000	City of SM, TxDOT and CAMPO
R-37	Widen SH 21 to 6 lanes	SH 80	Northern ETJ	$ 15,993,000	TxDOT
R-38	Widen IH 35 to 8 mainlanes/3-lane feeder roads	Northern ETJ	Southern ETJ	$ 135,932,000	TxDOT
R-45	Construct Posey Rd Overpass (6 lns)	IH 35	At Posey Road	$ 1,800,000	TxDOT
R-46	Widen SH 123 to 5 lanes	IH 35	County Line Rd	$ 1,200,000	TxDOT
R-47	Intersection Improvements at SH 123 and FM 621	FM 621	SH 123	$ 100,000	TxDOT
Bicycle and Pedestrian Projects					
BP-21	Construct Purgatory Greenway Trail	ETJ	SM River Trail	$ 5,000,000	City of SM
BP-22	Construct trail connection across RM 12 to connect to Franklin	Sessom	Franklin	$ 250,000	City of San Marcos
BP-23	Lime Kiln Road - Sign and stripe bike lanes	Post Road	Hilliard Road	$ 200,000*	City of San Marcos
BP-24	Lime Kiln Rd. - Sign and stripe bike lanes	Hilliard Road	W. Outer Loop	$ 144,000*	City of San Marcos
BP-25	River Ridge Parkway - Sign and stripe shoulder bike lanes	IH 35	Post Road	$ 103,000*	City of San Marcos
BP-26	Comanche Street - Sign and stripe bike lanes	Sessom	MLK	$ 101,000*	City of San Marcos
BP-27	Old Bastrop Hwy - Sign and stripe shoulder bike lanes	E. Outer Loop	IH 35 South	$ 696,000*	City of San Marcos
BP-28	New 4-Lane divided arterial - Sign and stripe shoulder bike lanes	W. Outer Loop	Old Bastrop Hwy. at IH 35 S	$ 624,000*	City of San Marcos
BP-29	Craddock South - Sign and stripe shoulder bike lanes	Craddock Southern Term.	Wonder World Drive	$ 99,000*	City of San Marcos
BP-30	Stagecoach Trail - Sign and stripe bike lanes	Craddock	W. Outer Loop	$ 200,000*	City of San Marcos
BP-31	Cape Road - Sign and stripe bike lanes, add shoulders as needed			$ 100,000	City of San Marcos
			Total Estimated Cost	**$215,849,000**	

* This includes only construction costs; other elements, such as contingency costs, are included with the roadway cost estimates in Table 8-3.

PRELIMINARY CONSTRUCTION COST ESTIMATES

Order-of-magnitude project cost estimates were developed for the recommended TMP projects and included construction cost estimates, estimated right-of-way acquisition costs and estimated professional services (engineering and surveying) fees. All estimated costs are in terms of end of Year 2003 cost values, and do not include an inflation factor. The estimated project costs should be used only for the purposes of comparing the relative cost of a project against other projects. Preliminary project cost estimates are identified in Tables 8-1, 8-2, and 8-3. Appendix D contains more detail about the cost assumptions related to each recommended project. More detailed cost estimates will need to be developed in the future for the selection of a particular project, which would account for the final roadway alignment and the needed design survey.

Preliminary opinions of probable construction costs included six improvement items:

1) Paving;
2) Drainage;
3) Bicycle/Pedestrian Lanes;
4) Bridges and Major Culverts;
5) Railroad Crossings; and,
6) Intersection Signalization.

A 10 percent construction contingency factor was utilized in the preliminary cost estimation of the roadway projects. Preliminary drainage construction costs were specifically segregated from the other construction-related costs since they may be eligible for funding through the City's current Drainage Impact Fee. Water and wastewater utility construction costs were not included.

Roadway paving construction cost estimates were based on actual Year 2003 unit prices from bids in the City of San Marcos. The roadway paving construction includes hot mix asphaltic concrete pavement, crushed limestone flexible base, excavation and embankment (fill), subgrade preparation, curb and gutter, lane dividing striping, sidewalks, temporary erosion controls and revegetation. Bicycle/pedestrian lane construction costs are included in the cost estimates provided for on-road bike lanes or sidewalks. Additional bicycle/pedestrian facility costs not included in a roadway project are shown separately, and the construction cost estimate is based on a per foot and per side of roadway basis.

Drainage calculation costs were estimated as a percentage of the paving costs for that particular project type. The percentages and per foot cost estimates were based on actual Year 2003 unit price bids on similar projects.

Bridge and major culvert costs were estimated by preliminarily evaluating the number of river or creek crossings for a particular roadway project. Bridge lengths were averaged at a typical 500-foot length, except for the Blanco River crossings. For the Blanco River, bridge lengths were estimated at 700 feet. Bridge widths were evaluated using the anticipated right-of-way width, or

additional right-of-way for a widening project, for a particular roadway. Major culvert construction costs were based on the roadway's right-of-way width.
Some of the recommended roadway projects will include railroad crossings, either at grade or grade separated crossings. At grade crossing costs considered only the new installation costs for crossing arms and signalization. Grade separation crossings included a bridge of 400-foot average length by the roadway right-of-way width.

Intersection signalization cost estimates were also considered in the construction costs. At the proposed intersection of two recommended projects, signalization costs were split in half for each. Right-of-way (ROW) acquisition costs were estimated for a particular project considering the project location and adjacent land use. Three land uses were evaluated:

(1) commercial;
(2) urban residential; and,
(3) rural ranchland.

Costs for each ROW type were provided by the City of San Marcos Engineering Department.

Professional engineering and surveying services fees are based on an estimated 18 percent of the total construction cost. Of this total fee factor, 13 percent is allocated for typical provided design surveys, engineering design and construction drawing preparation, geotechnical investigations, environmental assessments, permitting, and bidding. Typical construction administration services are estimated at 5 percent.

TYPICAL BICYCLE AND PEDESTRIAN FACILITY DEVELOPMENT COSTS

The following costs are provided for use in preparing an order of magnitude estimate of the construction cost for bicycle and pedestrian facility improvements. This data will help to facilitate initial planning decisions. A cost range is provided on a per mile basis, recognizing that there are many variables that affect final cost (i.e. site conditions, utilities, availability of right-of-way, fluctuations in construction market). For this reason, the costs presented here reflect only those costs related to materials and labor for construction based on minimum facility widths. Costs for facility improvements associated with larger roadway projects will usually attain lower unit construction prices than separate improvement projects.

Each facility project will typically require an engineering study to determine all of the design issues and estimated cost. Factors such as right-of-way acquisition, bridges and other grade separated crossings, utility relocation, clearing and grubbing of existing conditions, landscape plantings, lighting, benches, retaining walls, property fencing and other amenities need to be included in each project's individual cost estimate.

Engineering design fees can be expected to be 8 to 15 percent of the total project cost for these facility types. Each construction project should also include a minimum 10 percent contingency

fund. The following cost estimates for bicycle facilities were developed using average unit costs for specific improvement types. This list in **Table 8-4** represents basic cost units for various facility types.

Table 8-4
Typical Unit Costs of Construction for Bicycle and Pedestrian Facilities
San Marcos Transportation Master Plan
San Marcos, Texas

Improvements	Typical Unit Costs
Roadway re-striping (wide curb lanes or designated bike lanes)	$15,000 to $20,000 per mile
6' wide paving of existing gravel shoulder along roadway in both directions	$150,000 to $200,000 per mile
10' wide paving of separated trail facility	$90,000 to $150,000 per mile
10' wide trail on existing roadway alignment (4" depth limestone screenings)	$25,000 to $30,000 per mile
5' wide sidewalk	$50,000 to $80,000 per mile
Signing of bicycle facilities (5 signs per mile each way)	$3,000 to $5,000 per mile
Traffic Signal installation	$80,000 to $100,000 per location

Table 8-5 provides a summary of the TMP implementation costs by program year, and the overall estimated total. With high population and employment growth forecasted, the TMP provides for more aggressive development of roadway capacity to handle this growth. Correspondingly, the estimated costs for program years 2015 and 2025 reflect a significantly higher level of investment than in the past. Through the build-out of the recommended TMP, the estimated implementation cost is approximately $686 million.

Table 8-5
Total Estimated Implementation Cost
San Marcos Transportation Master Plan
San Marcos, Texas

Program Year	Estimated Total Cost
Year 2010	$ 29,238,850
Year 2015	$ 441,105,000
Year 2025	$ 215,849,000
Total Estimated TMP Cost	**$ 686,192,850**

COORDINATING TRANSPORTATION PLANNING ACTIVITIES

Improved coordination and cooperative efforts of local and state officials must be continued to fully realize the benefits of the San Marcos Transportation Master Plan. The interaction between urban growth and traffic movement will require highway and planning agencies to have both direct and related roles in transportation. The extent to which future land uses follow the year 2025 development projections will determine, to a large degree, the actual implementation schedule of the Transportation Plan. Conversely, the extent to which major components of the future land use projections are realized will be dependent upon the adequacy of the transportation system.

Successful implementation of the San Marcos Transportation Master Plan will also depend on the understanding and support of the plan by the citizens of the City of San Marcos. It is difficult for the governing officials to implement any plan unless the community is made aware of its advantages, and supports the plan. The local governments must have support of the citizens to make the plan a reality.

CONCLUSIONS

The recommended San Marcos Transportation Master Plan provides a framework for rational development of an efficient transportation system as the City of San Marcos continues to grow and develop in future years. Implementation of the Transportation Master Plan will require the continued cooperation and coordination of local, state, and federal officials in making judicious decisions concerning the availability and use of roadway improvement funds. Implementation of the San Marcos Transportation Master Plan is an important element in improving and fulfilling the future mobility needs of the City of San Marcos and its environs.

Appendix A
Traffic Analysis Zones
2000 Demographic Data

Appendix A
Traffic Analysis Zones
2000 Demographic Data

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
401	0	0	0	0	0	0	0	0
402	0	0	0	0	0	0	1	3
403	0	0	0	0	0	0	8	12
404	0	0	0	0	0	0	1	3
405	0	0	0	0	0	0	2	7
406	1	1	1	0	0	0	5	16
407	3	3	4	0	0	0	1	2
408	1	0	0	0	0	0	1	2
409	0	0	0	0	0	0	2	8
410	1	0	0	0	0	0	2	5
411	0	0	0	0	0	0	1	3
412	0	0	0	0	0	0	14	40
413	0	0	0	0	0	0	0	1
414	0	0	0	0	0	0	0	0
415	0	0	0	0	0	0	0	0
416	0	0	0	0	0	0	3	11
417	0	0	0	0	0	0	14	47
418	0	0	0	0	0	0	0	1
419	0	0	0	0	0	0	4	11
420	0	0	0	0	0	0	1	2
421	0	0	0	0	0	0	1	2
422	0	0	0	0	0	0	1	1
423	0	0	0	0	0	0	9	15
38001	1	0	1	0	2	0	6	17
38002	5	1	5	0	11	0	85	255
38003	3	1	4	0	7	0	80	221
38004	5	1	5	0	11	0	91	266
38005	2	0	3	0	5	0	10	33
38006	1	1	0	0	7	0	42	130
38007	72	52	152	0	0	0	50	153
38008	0	0	0	0	6	0	13	43
38009	25	2	0	0	0	0	28	88
38010	3	1	3	0	6	0	67	170
38011	8	1	34	0	43	0	0	1
38012	0	0	0	0	1	0	3	9
38013	1	1	0	0	20	0	192	947
38014	17	1	0	0	2	0	46	115

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38015	2	0	2	0	4	0	11	32
38016	5	0	21	0	27	0	170	443
38017	36	3	0	0	20	0	73	206
38018	0	0	0	0	16	0	5	13
38019	12	6	29	0	60	0	255	663
38020	14	10	19	0	107	0	226	603
38021	0	0	0	0	89	0	72	173
38022	0	0	1	0	53	0	32	82
38023	5	1	5	0	5	0	29	73
38024	0	0	0	0	0	0	0	0
38025	36	6	40	0	3	0	242	597
38026	1	2	5	0	10	0	126	339
38027	14	4	1	0	6	0	219	504
38028	28	32	29	0	3	0	220	508
38029	1	0	0	0	3	0	176	325
38030	50	25	48	0	3	0	62	161
38031	4	4	0	0	27	0	116	351
38032	3	5	14	0	20	0	457	1,202
38033	0	0	0	0	75	0	98	345
38034	2	2	5	0	205	0	284	1,028
38035	3	3	7	0	39	0	118	289
38036	3	3	7	0	42	0	31	82
38037	0	0	1	0	3	0	42	110
38038	0	0	0	0	0	0	6	17
38039	30	16	74	0	60	0	6	16
38040	23	13	56	0	36	0	234	478
38041	9	6	25	0	15	0	50	109
38042	7	5	9	0	54	0	104	278
38043	3	1	26	0	19	0	6	19
38044	1	0	6	0	5	0	127	386
38045	0	0	3	0	9	0	0	0
38046	0	13	9	0	21	0	44	138
38047	4	1	30	0	22	0	0	0
38048	2	7	7	0	8	0	18	59
38049	1	20	14	0	13	0	105	326
38050	2	1	19	0	2	0	1	3
38051	0	34	22	0	69	0	3	5
38052	4	1	36	0	53	0	3	11
38053	25	6	25	0	5	0	17	47
38054	29	7	30	0	4	0	0	0

Traffic Analysis Zones
2000 Demographic Data

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38055	37	10	39	0	3	0	4	10
38056	3	2	10	0	6	0	50	141
38057	4	3	12	0	4	0	46	100
38058	17	19	47	0	123	0	103	238
38059	17	9	42	0	27	0	155	333
38060	28	15	68	0	44	0	242	628
38061	11	6	29	0	18	0	91	197
38062	9	5	22	0	14	0	89	207
38063	92	24	105	0	43	0	48	114
38064	2	0	2	0	4	0	66	194
38065	6	0	25	0	31	0	51	151
38066	1	0	1	0	2	0	50	150
38067	4	3	6	0	43	0	67	198
38068	15	17	56	0	24	0	17	51
38069	51	33	68	0	841	0	648	1,284
38070	17	19	64	0	9	0	18	51
38071	11	13	43	0	14	0	117	382
38072	12	13	43	0	80	0	64	214
38073	0	0	1	0	0	0	2	6
38074	7	4	1	0	179	0	37	122
38075	4	3	1	0	95	0	51	165
38076	5	3	0	0	159	0	167	387
38077	0	0	4	0	71	0	0	0
38078	36	103	118	0	29	0	100	242
38079	20	31	75	0	18	0	30	81
38080	6	13	23	0	7	0	62	173
38081	17	39	60	0	18	0	31	92
38082	23	25	83	0	75	0	0	0
38083	13	14	46	0	16	0	0	0
38084	21	25	79	0	6	0	108	253
38085	27	29	97	0	34	0	0	0
38086	17	16	48	0	44	0	117	299
38087	31	89	102	0	44	0	102	191
38088	24	70	79	0	12	0	56	113
38089	34	96	108	0	18	0	51	111
38090	7	9	18	3	55	0	90	189
38091	0	0	0	0	0	0	0	0
38092	16	9	39	0	27	0	62	153
38093	19	20	117	11	3	0	3	3

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38094	29	30	179	21	6	2,000	8	15
38095	7	7	40	0	12	0	21	53
38096	8	8	47	0	14	0	14	35
38097	25	26	155	1	47	0	43	84
38098	16	16	97	0	29	0	19	38
38099	21	23	130	197	10	100	0	1
38100	15	15	92	0	28	0	33	77
38101	14	15	87	139	8	250	113	219
38102	7	17	26	3	92	0	59	117
38103	5	15	19	2	78	0	20	66
38104	12	14	23	0	108	0	157	358
38105	4	3	5	0	28	0	89	229
38106	6	5	9	0	48	0	134	354
38107	2	2	3	0	17	0	50	132
38108	11	8	16	0	83	0	123	342
38109	3	8	11	0	43	0	15	29
38110	11	31	25	0	107	0	34	64
38111	24	26	144	242	5	0	19	39
38112	7	19	16	0	64	0	1	3
38113	6	17	21	0	89	0	24	49
38114	5	14	17	0	69	0	33	65
38115	3	9	13	0	14	0	7	14
38116	4	11	15	0	41	0	1	1
38117	7	7	40	0	43	0	16	26
38118	4	4	42	19	44	0	0	0
38119	2	3	229	287	147	0	0	0
38120	4	5	389	502	257	0	0	0
38121	2	3	215	209	111	0	0	0
38122	4	4	44	24	46	0	0	0
38123	25	26	173	222	94	0	16	98
38124	56	71	2,116	1	98	0	3	4,046
38125	3	3	225	232	120	0	0	0
38126	2	2	13	0	13	0	5	11
38127	7	8	46	89	10	0	0	0
38128	11	11	66	129	15	0	2	21
38129	56	13	58	0	474	600	290	510
38130	90	26	101	21	155	0	199	336
38131	3	9	25	7	65	0	2	2
38132	3	10	11	0	63	0	6	6
38133	3	10	12	0	142	0	0	0

Traffic Analysis Zones
2000 Demographic Data

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38134	3	7	8	0	34	0	4	5
38135	4	12	13	0	41	0	2	4
38136	4	10	15	1	144	0	0	0
38137	6	18	20	0	81	0	5	7
38138	3	8	9	0	48	0	1	1
38139	4	11	13	0	15	0	0	0
38140	3	7	9	0	46	0	0	0
38141	5	15	18	0	77	0	14	40
38142	4	11	13	0	112	0	2	13
38143	12	36	41	0	370	0	121	248
38144	14	40	46	0	411	0	83	151
38145	7	45	8	0	174	0	5	16
38146	3	19	4	0	74	0	48	129
38147	1	6	1	0	24	0	0	0
38148	3	12	26	0	75	0	0	0
38149	5	23	49	0	140	0	0	0
38150	3	3	9	0	107	0	0	0
38151	2	9	2	0	35	0	17	60
38152	14	14	38	0	284	0	458	950
38153	3	10	11	0	64	0	2	3
38154	5	16	18	0	102	0	0	0
38155	18	68	96	0	154	230	0	0
38156	1	6	13	0	58	5,000	0	0
38157	17	3	11	0	221	0	67	129
38158	14	3	11	0	238	0	32	63
38159	288	57	132	0	632	0	633	1,249
38160	3	14	30	0	101	6,000	0	0
38161	18	18	107	203	24	0	7	9
38162	35	34	162	0	210	0	138	273
38163	10	2	6	0	30	0	100	176
38164	0	0	0	0	0	0	13	32
38165	14	4	15	2	126	0	278	578
38166	1	5	10	0	48	0	0	0
38167	2	9	19	0	85	0	0	0
38168	7	2	7	0	29	0	285	685
38169	29	8	31	5	265	0	432	810
38170	6	28	60	0	150	0	309	587
38171	12	3	13	2	109	0	539	1,029
38172	9	6	18	0	22	0	271	566

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38173	12	55	119	0	243	0	606	970
38174	48	34	103	0	625	0	61	211
38175	17	12	36	0	139	0	55	183
38176	5	4	11	0	178	0	52	159
38177	16	4	17	2	143	0	154	298
38178	19	13	39	0	170	0	68	457
38179	8	6	17	0	13	0	249	517
38180	4	3	8	0	80	0	2	6
38181	10	7	21	0	4	0	6	18
38182	2	1	4	0	39	0	1	2
38183	1	0	4	0	6	0	0	0
38184	14	10	31	0	3	0	47	1,519
38185	4	4	22	0	22	0	49	104
38186	34	33	155	0	202	0	150	300
38187	47	9	27	0	76	0	0	0
38188	0	0	1	0	5	0	27	64
38189	4	22	38	0	39	0	0	0
38190	19	52	61	0	20	0	52	128
38191	2	2	8	0	2	0	8	26
38192	2	2	7	0	2	0	16	40
38193	3	4	10	0	16	0	0	0
38194	9	10	34	0	43	0	24	68
38195	5	10	16	0	70	0	35	88
38196	1	1	3	0	1	0	2	4
38197	7	20	23	0	121	0	3	6
38198	6	19	22	0	119	0	15	25
38199	4	26	5	0	11	0	42	113
38200	9	24	30	0	22	0	0	0
38201	4	14	15	0	11	0	0	0
38202	2	1	6	0	9	0	15	42
38203	4	0	16	0	20	0	79	181
38204	4	1	13	0	19	0	113	227
38205	10	2	7	0	19	0	116	276
38206	13	14	26	0	14	0	6	16
38207	89	24	93	0	6	0	9	27
38208	17	2	17	0	146	0	133	440
38209	2	1	5	0	11	0	66	175
38210	22	15	46	0	178	0	70	194
38211	26	19	55	0	1	0	14	44
38212	14	10	29	0	0	0	10	30

Traffic Analysis Zones
2000 Demographic Data

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38213	6	4	12	0	0	0	2	6
38214	21	15	44	0	0	0	4	12
38215	3	0	13	0	17	0	4	11
38216	1	0	1	0	0	0	19	54
38217	53	37	62	0	162	0	40	114
38218	165	84	157	0	3	0	496	1,440
38219	15	5	11	0	31	0	23	44
38220	15	5	11	0	3	0	38	88
38221	6	2	0	0	24	0	355	629
38222	1	0	3	0	20	0	49	140
38223	51	36	60	0	3	0	57	150
38224	9	1	7	0	7	0	95	272
38225	3	0	3	0	13	0	24	65
38226	6	1	9	0	39	0	32	81
38227	8	6	11	0	65	0	24	54
38228	5	3	13	0	15	0	76	202
38229	4	0	1	0	23	0	18	52
38230	2	0	2	0	7	0	142	415
38231	2	0	2	0	5	0	40	118
38232	2	0	0	0	8	0	103	284
38233	3	0	2	0	3	0	27	75
38234	0	0	0	0	0	0	5	15
38235	69	8	2	0	83	0	42	115
38236	3	0	1	0	10	0	84	220
38237	0	0	0	0	0	0	5	16
38238	46	34	55	0	251	0	48	128
38239	10	155	13	0	50	0	28	48
38240	20	41	23	0	46	0	71	225
38241	13	205	12	0	33	0	41	113
38242	9	13	7	0	30	0	27	67
38243	3	326	3	0	45	0	54	103
38244	6	151	7	0	44	0	91	264
38245	12	29	9	0	54	0	255	804
38246	148	18	4	0	15	0	24	57
38247	20	2	1	0	4	0	0	0
38248	146	17	4	0	17	0	0	0
38249	112	13	3	0	11	0	0	0
38250	132	16	3	0	11	0	3	4
38251	10	1	7	0	24	0	210	602

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38252	113	14	3	0	174	0	2	5
38253	79	9	2	0	88	0	51	141
38254	130	16	3	0	11	0	0	1
38255	540	69	22	0	713	0	60	162
38256	41	20	39	0	151	0	225	632
38257	9	1	1	0	78	0	115	342
38258	0	13	0	0	376	0	0	0
38259	142	17	4	0	12	0	1	2
38260	7	85	7	0	25	0	13	32
38261	20	14	23	0	143	0	5	10
38262	6	1	4	0	11	0	523	2,132
38263	22	6	107	0	166	0	95	326
38264	24	5	15	0	44	0	80	242
38265	6	2	4	0	12	0	146	494
38266	26	6	17	0	49	0	133	426
38267	6	1	4	0	11	0	132	447
38268	15	3	9	0	27	0	30	65
38269	3	1	21	0	15	0	3	9
38270	1	0	1	0	2	0	82	223
38271	1	0	0	0	1	0	50	184
38272	1	114	1	0	7	0	2	8
38273	4	194	3	0	25	0	3	7
38274	4	377	5	0	35	0	8	28
38275	0	39	0	0	827	0	0	0
38276	104	67	129	0	41	0	9	26
38277	12	13	44	0	122	0	0	0
38278	115	14	5	0	235	0	1	2
38279	4	2	5	0	2	0	0	0
38280	2	1	2	0	1	0	0	0
38281	87	11	2	0	97	0	20	79
38282	3	1	31	0	3	0	1	2
38283	9	6	11	0	5	0	0	0
38284	35	23	43	0	13	0	4	12
38285	3	2	7	0	0	0	2	7
38286	43	31	90	0	0	0	71	237
38287	52	37	109	0	2	0	2	3
38288	53	38	113	0	2	0	3	5
38289	1	1	1	0	0	0	0	0
38290	31	20	40	0	15	0	1	1
38291	15	10	19	0	33	0	6	18

Traffic Analysis Zones
2000 Demographic Data

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38292	9	6	11	0	39	0	2	8
38293	8	5	10	0	36	0	0	0
38294	17	11	20	0	76	0	0	0
38295	13	8	16	0	59	0	1	2
38296	19	13	24	0	83	0	8	26
38297	14	9	17	0	62	0	3	5
38298	2	3	9	0	5	0	18	55
38299	4	4	10	0	34	0	11	23
38300	3	8	8	0	47	0	11	31
38301	0	0	0	0	309	0	8	22
38302	74	9	2	0	150	0	5	12
38303	7	8	26	0	14	0	55	188
38304	4	4	9	0	30	0	41	101
38305	5	5	11	0	38	0	32	73
38306	0	1	1	0	3	0	145	474
38307	77	10	5	0	157	0	3	8
38308	1	1	4	0	3	0	3	5
38309	78	9	2	0	158	0	4	9
38310	15	17	27	0	134	0	303	703
38311	11	31	35	0	4	0	29	54
38312	4	11	9	0	41	0	35	56
38313	5	13	10	0	44	0	9	29
38314	6	17	14	0	68	0	33	69
38315	3	9	11	0	48	0	1	4
38316	10	30	27	0	29	0	0	0
38317	6	11	18	0	2	0	0	0
38318	2	11	2	0	3	0	9	20
38319	5	30	5	0	115	0	39	99
38320	6	17	10	0	124	0	521	1,258
38321	4	24	4	0	90	0	67	160
38322	4	21	4	0	82	0	35	86
38323	3	17	3	0	65	0	16	60
38324	2	2	4	0	43	0	589	1,755
38325	3	4	7	0	74	0	309	866
38326	3	19	3	0	72	0	59	166
38327	1	2	4	0	47	0	189	395
38328	17	18	34	0	61	0	59	185
38329	24	26	47	0	13	0	12	26
38330	3	4	9	0	93	0	8	20

TAZ ID	Basic Employment	Retail Employment	Service Employment	University Employment	Total Employment	University Employment	Households	Population
38331	6	7	12	0	53	0	51	116
38332	3	4	14	0	73	0	0	0
38333	7	18	18	0	99	0	1	1
38334	7	18	19	0	104	0	7	13
38335	3	4	9	0	96	0	1	4
38336	9	27	26	0	140	0	0	0
38337	2	3	6	0	55	0	0	0
38338	3	10	9	0	51	0	3	4
38339	3	9	9	0	48	0	0	0
38340	0	1	1	0	13	0	0	0
38341	3	8	7	0	39	0	0	0
38342	4	0	0	0	0	0	29	83
38343	13	1	0	0	0	0	81	291
38344	18	1	0	0	1	0	183	665
38345	1	2	2	0	20	0	0	0
38346	22	6	23	0	1	0	4	10
38347	171	21	174	0	18	0	256	823
38348	71	9	73	0	5	0	4	17
38349	10	0	0	0	315	0	487	1,410
38350	18	1	0	0	50	0	72	257
38351	11	10	27	0	7	0	63	183
38352	0	0	0	0	1	0	6	15
38353	0	0	0	0	0	0	2	4
38354	1	0	4	0	2	0	127	400
38355	12	3	12	0	2	0	46	117
38356	32	8	32	0	4	0	102	254
38357	37	10	38	0	5	0	15	40
38358	5	5	27	5	11	0	4	13
38359	6	6	35	51	3	0	0	0
38360	3	1	3	0	6	0	95	276
38361	1	0	1	0	2	0	7	21
38362	45	11	45	0	6	0	15	40
38363	3	1	5	0	19	0	15	51
38364	1	0	4	0	6	0	0	0
38365	6	6	0	0	3	0	490	1,060
38366	1	0	5	0	20	0	65	189

Appendix B
Texas State University – San Marcos
Travel Survey Data

Appendix B
Texas State University-San Marcos
Travel Survey Data

Southwest Texas State University Student Survey
Transportation Master Plan Survey
for the City of San Marcos

This survey is part of a study being performed for the City of San Marcos to develop a Transportation Master Plan for the area. The purpose of the study is to determine how SWTSU students and staff travel to the University each day. The survey is intended to be anonymous.

1. What is today's date? _____

2. Are you a SWT student or SWT staff? (if visitor, then do not continue) _____

3. What city do you live in right now? _____

4. Please look at the zone map for the city that you live in. Which zone do you live in?
   Map No.__Zone No.__

5. If you live in San Marcos, do you live on-campus? _____

6. How did you get to campus today? (Please circle only one answer.)
   a. By walking
   b. By biking
   c. By bus
   d. By car
   e. I got a ride
   f. A combination of those listed above. Please list all of the modes of transportation in the order that they were used from your home to campus. _____
   _____

7. If you arrived to campus by car, was the car parked in a University-owned lot (includes Bobcat stadium)?
   _____

8. If you arrived to campus by car, how many occupants were present in the car (including the driver)? __

9. If you typically arrive to campus by car, do you park in the same lot each time you drive to campus?__
10. How many days a week, Monday thru Friday, do you come to campus? _____

11. How many times today will you come to campus? _____

12. If you will make more than one trip to campus today, will you use a car for more than one? _____

13. What time did you arrive on-campus today? _____

14. What time will you leave campus today? _____

CONTINUED ON NEXT PAGE. PLEASE TURN OVER TO COMPLETE SURVEY.

15. Where was the last place you were at, before you came to school? (Example: home, off-campus job, shopping, restaurant, etc.) _____

16. Please look at the zone maps. What zone was the last place you were at, before you came to school?
    Map No.__Zone No._____

17. Where will you go after you leave campus today? (Example: home, off-campus job, shopping, to eat, etc.)_____
    _____

18. Please look at the zone maps. Which zone will you go to after you leave campus today?
    Map No.____Zone No._____

19. If a light commuter rail system were built in the future, would you use it?_____

20. If more sidewalks were built in the future, would you use them more than you do now?_____

21. If more bike lanes were built in the future, would you use them more than you do now?_____

Thank you for participating in this survey. Your answers

will help to plan for a more efficient transportation system for SWTSU and the City of San Marcos.

Table 1.

Question # 4, Number of Respondents Living in Each Map and Zone Number

Zone 1		Zone 2A		Zone 2B	
Area	Number of Respondents	Area	Number of Respondents	Area	Number of Respondents
1	31	1	1	1	0
2	1	2	0	2	0
3	12	3	0	3	3
4	4	4	0	4	1
5	18	5	0	5	0
6	7	6	0	6	0
7	0	7	0	7	0
8	1	8	0	8	0
9	0	9	0	9	0
10	0	10	0	10	19
11	0	11	0	11	30
12	0	12	2	12	5
13	0	13	1	13	11
14	0	14	0	14	11
15	1	15	0	15	2
16	1	16	0	16	3
17	0	17	0	17	38
18	0	18	1	18	5
19	7	19	0	19	30
20	2	20	0	20	11
21	0	21	0	21	9
22	0	22	0	22	4
23	2	23	0	23	1
24	5	24	0	24	0
25	1	25	1	25	11
26	2	26	0	26	2
27	12	27	0	27	0
28	2	28	0	28	1
29	1	29	0	29	21
30	3	30	0	30	2
31	2	31	0	31	4
32	3	32	0	32	79
33	3	33	0	33	27
34	9	34	0	34	6
35	1	35	0	35	3
36	2	36	0	36	16
37	3	37	1	37	16
38	0				
39	2				
40	0				
41	0				
42	0				
43	1				
44	3				
45	1				
46	0				
47	6				
48	0				
49	0				
50	0				
51	1				
52	0				
53	0				
99	2				

Summary of Survey Responses

568	Surveys collected		
377	3/20/2003	66%	
161	3/19/2003	28%	
7	3/18/2003	1%	
23	No responses	4%	
534	Students responded to the survey		94%
20	Faculty/Staff responded to the survey		4%
10	Staff/Student responded to the survey		2%
4	Visitors responded to the survey		1%
409	Respondents live in San Marcos		72%
13	Respondents live in San Antonio		2%
80	Respondents live in Austin		14%
15	Respondents live in New Braunfels		3%
51	Respondents live in other cities		9%
152	Lived in Location Map 1		27%
7	Lived in Location Map 2a		1%
370	Lived in Location Map 2b		65%
39	No response		7%
124	Lived on Campus		22%
288	Lived out of Campus		51%
156	No response		27%
126	Respondents walked to campus		22%
16	Respondents biked to campus		3%
118	Respondents bused to campus		21%
141	Respondents drove to campus		25%
13	Respondents got a ride to campus		2%
150	Used several of the above modes to get to campus		26%
4	No Responses		1%
221	Parked in Univ Lot		39%
73	Not parked in Univ Lot		13%
228	Just 1 person in the car		40%
44	2 people in car		8%
5	3 people in car		1%
5	4 people in car		1%
224	Parked in the same lot each time		39%
70	Parked in the different lots		12%

4.3	is the average number of times a week that respondents come to campus	
1.6	is the average number of times a day that respondents come to campus	
142	Use car for more than one campus trips	25%
174	Use car for just one campus trips	31%
475	Coming from home	84%
32	Coming from dorm	6%
61	Others and no responses	11%
142	from location 1	25%
7	from location 2a	1%
351	from location 2b	62%
68.0	No response	12%
436	Going to home	77%
25	Going to dorm	4%
107	Others and no responses	19%
144	to location 1	25%
10	to location 2a	2%
343	to location 2b	60%
71	No response	13%
	If a light commuter rail system were built in future, would you use it ?	
479	Yes	84%
57	No	10%
6	Maybe	1%
26	No Response	5%
	If more sidewalks were built in the future, would you use it?	
399	Yes	70%
139	No	24%
3	Maybe	1%
27	No Response	5%
	If more bikes lanes were build in the future, would you use them more than you do now?	
255	Yes	45%
278	No	49%
0	Maybe	0%
35	No Response	6%

Appendix C
Bicycle and Pedestrian Facility Inventories

Table C-1
Existing and Proposed Bicycle Facilities

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
	Mill	St		Potential Bike Route	Sector 7 Plan	Local	Yes	112	2	G
W	San Antonio	St		Potential Bike Route		Regional	Yes	151	2	G
	Riverside	Dr		Potential Bike Route		Local	No	298	0	
N	Mitchell	St		Potential Bike Route		Local	No	133	0	
	Uhland	Rd		Potential Bike Route	Sector 7 Plan	Local	Yes	447	2	G
	Cheatham	St		Potential Bike Route		Local	Yes	77	4	G
	Belvin	St		Potential Bike Route		Regional	No	62	0	
W	MLK	Dr		Potential Bike Route		Local	No	186	0	
	Cheatham	St		Potential Bike Route		Local	Yes	175	4	G
	Craddock	Ave		Potential Bike Route		Local	No	235	0	
	Cheatham	St		Potential Bike Route		Local	Yes	123	4	G
S	LBJ	Dr		Potential Bike Lanes		TxDOT	No	301	0	
	Mill	St		Potential Bike Route	Sector 7 Plan	Local	Yes	113	2	G
E	Holland	St		Bike Lanes	Existing	Local	No	45	0	
	Prospect	St		Potential Bike Route	Sector 2 Plan	Local	No	140	0	
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	185	2	F
	Cheatham	St		Potential Bike Route		Local	No	124	0	
S	Guadalupe	St		Potential Bike Lanes		TxDOT	No	186	0	
	Clovis Barker	Rd		Potential Bike Route	Sector 5 Plan	Local	No	1966	0	
W	MLK	Dr		Potential Bike Route		Local	No	85	0	
	CM Allen	Pkwy		Potential Bike Route		Regional	Yes	98	4	G
	Craddock	Ave	Ext	Planned Bike Path	CIP	Local	No	653	0	
	Wonder World	Dr	Ext	Planned Shoulders	Engr	TxDOT	No	2813	0	
	Wonder World	Dr	Ext	Planned Shoulders	Engr	TxDOT	No	1934	0	
N	LBJ	Dr		Potential Bike Trail		Local	No	134	0	
W	San Antonio	St		Potential Bike Route		Regional	Yes	125	2	G
N	Mitchell	St		Potential Bike Route		Local	No	169	0	
W	Grove	St		Potential Bike Lanes		TxDOT	Yes	122	3	G
	McKie	St		Potential Bike Route		Local	No	98	0	
	Prospect	St		Potential Bike Route	Sector 2 Plan	Local	No	89	0	
	Mill	St		Potential Bike Route	Sector 7 Plan	Local	Yes	112	2	G
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	247	2	G
	Belvin	St		Potential Bike Route		Regional	No	109	0	
	Craddock	Ave		Planned Bike Path	CIP	Local	No	282	0	
	McKie	St		Potential Bike Route		Local	No	65	0	
N	LBJ	Dr		Potential Bike Trail		Local	No	92	0	
S	LBJ	Dr		Potential Bike Lanes		TxDOT	No	119	0	
S	Guadalupe	St		Potential Bike Lanes		TxDOT	Yes	116	2	F
	Prospect	St		Potential Bike Route	Sector 2 Plan	Local	No	111	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	256	2	G
W	San Antonio	St		Potential Bike Route		Regional	Yes	124	2	G
	Mill	St		Potential Bike Route	Sector 7 Plan	Local	Yes	107	2	G
W	Holland	St		Bike Lanes	Existing	Local	No	203	0	
	Prospect	St		Potential Bike Route	Sector 2 Plan	Local	No	73	0	

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
W	MLK	Dr		Potential Bike Route		Local	No	196	0	
S	Mitchell	St		Potential Bike Route		Local	No	149	0	
	CM Allen	Pkwy		Potential Bike Route		Regional	Yes	137	4	G
	Lee	St		Potential Bike Route		Local	No	77	0	G
	Lee	St		Potential Bike Route		Local	No	170	0	
	McKie	St		Potential Bike Route		Local	No	74	0	
	Belvin	St		Potential Bike Route		Regional	No	205	0	
	Lee	St		Potential Bike Route		Local	No	129	0	
S	Mitchell	St		Potential Bike Route		Local	No	93	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	118	2	G
W	Holland	St		Bike Lanes	Existing	Local	No	86	0	
	Academy	St		Potential Bike Route		Regional	No	96	0	
	Academy	St		Potential Bike Route		Regional	No	111	0	
N	LBJ	Dr		Potential Bike Trail		Local	No	134	0	
	Academy	St		Potential Bike Route		Regional	No	113	0	
	Academy	St		Potential Bike Route		Regional	No	132	0	
S	Guadalupe	St		Potential Bike Lanes		TxDOT	Yes	121	2	F
	Prospect	St		Potential Bike Route	Sector 2 Plan	Local	No	129	0	
	Aquarena Springs	Dr		Potential Trail	Sector 7 Plan	TxDOT	Yes	99	5	G
W	San Antonio	St		Potential Bike Route		Regional	Yes	154	2	G
	CM Allen	Pkwy		Potential Bike Route		Regional	Yes	94	4	G
	Craddock	Ave		Planned Bike Path	CIP	Local	No	216	0	
	Craddock	Ave		Planned Bike Path	CIP	Local	No	175	0	
	Blanco	St		Potential Bike Route		Regional	No	89	0	
	Burleson	St		Potential Bike Route		Local	No	114	0	
	Burleson	St		Potential Bike Route		Local	No	176	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	888	2	G
S	Mitchell	St		Potential Bike Route		Local	No	92	0	
N	Bishop	St		Potential Bike Lanes		Local	Yes	113	2	F
S	LBJ	Dr		Potential Bike Route		Local	No	117	0	
	Belvin	St		Potential Bike Route		Regional	No	165	0	
S	Mitchell	St		Potential Bike Route		Local	No	88	0	
S	Guadalupe	St		Potential Bike Lanes		TxDOT	Yes	118	2	F
	Roosevelt	St		Potential Bike Route		Local	No	71	2	F
	Aquarena Springs	Dr		Potential Trail	Sector 7 Plan	TxDOT	Yes	454	5	G
	Hunter	Rd		Existing Shoulders	Existing	TxDOT	Yes	195	5	E
	Aquarena Springs	Dr		Potential Trail	Sector 7 Plan	TxDOT	Yes	92	5	G
	CM Allen	Pkwy		Potential Bike Route		Regional	Yes	171	4	G
	Eastwood	St		Potential Bike Route	Sector 7 Plan	Local	No	230	0	
	Hunter	Rd		Existing Shoulders	Existing	TxDOT	Yes	504	5	E
	Aquarena Springs	Dr		Planned Bike Lanes		Regional	No	972	0	
	Aquarena Springs	Dr		Potential Trail	Sector 7 Plan	TxDOT	Yes	119	5	G
W	Holland	St		Bike Lanes	Existing	Local	No	126	0	
	Aquarena	Dr		Potential Trail	Sector 7 Plan	TxDOT	Yes	107	5	G

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
	Springs									
	Roosevelt	St		Potential Bike Route		Local	No	125	2	F
S	Guadalupe	St		Potential Bike Lanes		TxDOT	Yes	241	2	F
W	San Antonio	St		Potential Bike Route		Regional	Yes	220	2	G
	Aquarena Springs	Dr		Potential Trail	Sector 7 Plan	TxDOT	No	303	0	
S	Guadalupe	St		Potential Bike Lanes		TxDOT	Yes	57	2	F
N	LBJ	Dr		Potential Bike Trail		Local	No	144	0	
N	LBJ	Dr		Potential Bike Route		Local	No	94	0	
W	San Antonio	St		Potential Bike Route		Regional	Yes	39	2	
	Roosevelt	St		Potential Bike Route		Local	No	124	2	F
	Thorpe	Ln		Potential Bike Lanes	Sector 7 Plan	Local	No	105	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	406	2	G
	Gravel	St		Potential Bike Route		Local	No	235	0	
S	Mitchell	St		Potential Bike Route		Local	No	156	0	
	Belvin	St		Potential Bike Route		Regional	No	266	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	274	2	G
W	Holland	St		Bike Lanes	Existing	Local	No	139	0	
W	San Antonio	St		Potential Bike Route		Regional	Yes	64	2	G
	Ranch Road 12			Potential Shoulders	Wonder World Drive Land Use Plan	Regional	No	1307	0	
	Ranch Road 12			Potential Shoulders	Sector 2 Plan	Regional	Yes	319	2	G
S	Guadalupe	St		Potential Bike Lanes		TxDOT	Yes	166	2	F
	Ranch Road 12			Potential Shoulders	Sector 2 Plan	Regional	Yes	474	2	G
N	LBJ	Dr		Potential Bike Trail		Local	No	111	0	
	Ranch Road 12			Potential Shoulders	Sector 2 Plan	Regional	Yes	169	2	G
	Ranch Road 12			Potential Shoulders	Sector 2 Plan	Regional	No	422	0	
	Ranch Road 12			Potential Shoulders	Sector 2 Plan	Regional	No	453	0	
	Ranch Road 12			Potential Trail	Sector 2 Plan	Regional	No	138	0	
	Ranch Road 12			Potential Trail	Sector 2 Plan	Regional	No	101	0	
	Ranch Road 12			Potential Shoulders or Lanes	Sector 2 Plan	Regional	Yes	69	2	G
W	San Antonio	St		Potential Bike Route		Regional	No	115	0	
	Ranch Road 12			Potential Shoulders or Lanes	Sector 2 Plan	Regional	Yes	193	2	G
	Ranch Road 12			Potential Shoulders or Lanes	Sector 2 Plan	Regional	Yes	433	2	G
	Thorpe	Ln		Potential Bike Lanes	Sector 7 Plan	Local	Yes	153	4	G
N	Bishop	St		Potential Bike Lanes		Local	No	158	0	
	Leah	St		Potential Bike Trail	Sector 5 Plan	Local	No	289	0	
	Craddock	Ave		Planned Bike Path	CIP	Local	No	113	0	
N	Mitchell	St		Potential Bike Route		Local	No	102	0	
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	No	109	0	
	Love	St		Potential Bike Route		Local	No	120	0	
W	San Antonio	St		Potential Bike Route		Regional	No	228	0	
	Hunter	Rd		Potential Bike Lanes		TxDOT	Yes	280	2	G
	Dixon	St		Potential Bike Route		Regional	No	111	0	

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
	River	Rd		Potential Bike Lanes or Route		Regional	No	1095	0	
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	109	2	F
W	Holland	St		Potential Bike Lanes		Regional	Yes	270	2	G
	Perkins	St		Potential Bike Route		Local	No	345	0	
	Post	Rd		Planned Bike Lanes	CIP	Regional	No	758	0	
	Post	Rd		Planned Bike Lanes	CIP	Regional	Yes	478	2	F
	Post	Rd		Planned Bike Lanes	CIP	Regional	No	284	0	
	Post	Rd		Planned Bike Lanes	CIP	Regional	No	300	0	
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	No	294	0	
	Patton	St		Potential Bike Route		Local	No	105	0	
	Patton	St		Potential Bike Route		Local	No	151	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	117	2	G
	Craddock	Ave		Planned Bike Path	CIP	Local	No	126	0	
	De Zavala	Dr		Potential Bike Route		Local	Yes	349	0	
	Stagecoach	Trl		Potential Bike Route		Local	Yes	771	4	E
S	Stagecoach	Trl		Potential Bike Route		Local	No	669	0	
	University	Dr		Potential Bike Route		TxDOT	Yes	96	5	G
	Wonder World	Dr		Existing Shoulders	Existing & Planned	TxDOT	No	373	0	
	Wonder World	Dr		Existing Shoulders	Existing & Planned	TxDOT	No	430	0	
	Wonder World	Dr		Potential Bike Lanes	Sector 5 Plan	TxDOT	Yes	411	5	G
	Wonder World	Dr		Potential Bike Lanes	Sector 5 Plan	TxDOT	Yes	234	5	G
	Wonder World	Dr		Potential Bike Lanes	Sector 5 Plan	TxDOT	Yes	242	5	G
	Sadler	Dr		Planned Bike Path	Developer	Local	No	94	0	
	Wonder World	Dr		Potential Bike Lanes	Sector 5 Plan	TxDOT	Yes	826	5	G
	Thorpe	Ln		Potential Bike Lanes	Sector 7 Plan	Local	Yes	500	4	G
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	No	280	0	
	Hunter	Rd		Potential Bike Lanes		TxDOT	Yes	186	2	G
	Craddock	Ave		Planned Bike Path	CIP	Local	No	128	0	
	Lime Kiln	Rd		Potential Bike Lanes	Sector 7 Plan	Local	No	988	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	272	4	G
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	No	94	0	
	Perkins	St		Potential Bike Route		Local	No	121	0	
	Thorpe	Ln		Potential Bike Lanes	Sector 7 Plan	Local	Yes	337	4	G
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	No	104	0	
	Hunter	Rd		Planned Shoulders		TxDOT	No	74	0	
	Hunter	Rd		Planned Shoulders		TxDOT	No	176	0	
	Hunter	Rd		Planned Shoulders		TxDOT	No	190	0	
	Hunter	Rd		Planned Shoulders		TxDOT	No	329	0	
	Hunter	Rd		Planned Shoulders		TxDOT	No	1356	0	
E	Hopkins	St		Potential Trail		TxDOT	Yes	214	4	G
	Hunter	Rd		Planned Shoulders		TxDOT	No	1861	0	
E	Hopkins	St		Potential Trail		TxDOT	Yes	600	4	G
	Hunter	Rd		Planned Shoulders		TxDOT	Yes	511	5	E

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
	Craddock	Ave		Planned Bike Path	CIP	Local	No	153	0	
	Hunter	Rd		Potential Bike Lanes		TxDOT	Yes	373	2	G
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	781	4	G
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	Yes	105	2	G
	Stagecoach	Trl		Potential Bike Route		Local	Yes	96	4	E
E	Hopkins	St		Potential Trail		TxDOT	Yes	219	4	G
	Stagecoach	Trl		Potential Bike Route		Local	Yes	150	4	E
N	CM Allen	Pkwy		Potential Bike Route		TxDOT	Yes	148	4	G
E	Hutchison	St		Potential Bike Route		TxDOT	No	174	0	
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	No	112	0	
E	Hutchison	St		Potential Bike Route		TxDOT	No	128	0	
E	Hutchison	St		Potential Bike Route		TxDOT	No	129	0	
	Perkins	St		Potential Bike Route		Local	No	115	0	
W	Hutchison	St		Potential Bike Route		Regional	No	120	0	
	Cheatham	St		Potential Bike Route		Local	Yes	99	2	G
W	Hutchison	St		Potential Bike Route		Regional	No	109	0	
	Blanco	St		Potential Bike Route		Regional	No	113	0	
	Franklin	St		Potential Bike Lanes or Route	Sector 2 Plan	Local	No	128	0	
W	Hutchison	St		Potential Bike Route		Regional	No	168	0	
E	Hopkins	St		Potential Trail		TxDOT	Yes	382	4	G
	Post	Rd		Potential Bike Lanes		Regional	No	3294	0	
N	CM Allen	Pkwy		Potential Bike Route		Regional	Yes	140	4	G
	Hunter	Rd		Existing Shoulders	Existing	TxDOT	Yes	231	5	E
	Yarrington	Rd		Potential Bike Route		Regional	No	3382	0	
	Harris Hill	Rd		Potential Bike Route		Regional	No	4443	0	
	Riverside	Dr		Potential Bike Route		Local	No	130	0	
N	LBJ	Dr		Potential Bike Lanes		TxDOT	Yes	129	3	G
	Prospect	St		Potential Bike Route	Sector 2 Plan	Local	No	111	0	
N	Guadalupe	St		Potential Bike Lanes		TxDOT	No	126	0	
	Blanco	St		Potential Bike Route		Regional	No	68	0	
	Uhland	Rd		Potential Bike Lanes		Regional	No	1436	0	
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	121	2	F
	Hazelton	St		Potential Bike Route	Sector 2 Plan	Local	No	197	0	
W	Hutchison	St		Potential Bike Route		Regional	No	139	0	
	Hunter	Rd		Existing Shoulders	Existing	TxDOT	Yes	238	5	E
	Broadway	St		Potential Bike Lanes or Route	Sector 5 Plan	Local	No	120	0	
	Cheatham	St		Potential Bike Route		Local	Yes	205	2	G
N	LBJ	Dr		Potential Bike Lanes		TxDOT	Yes	127	3	G
E	San Antonio	St		Potential Bike Route		Regional	No	128	0	
	Broadway	St		Potential Bike Lanes or Route	Sector 5 Plan	Local	Yes	97	0	
	Hazelton	St		Potential Bike Route	Sector 2 Plan	Local	No	103	0	
	Blanco	St		Potential Bike Route		Regional	No	116	0	
	Broadway	St		Potential Bike Lanes or Route	Sector 5 Plan	Local	Yes	106	4	G

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
E	San Antonio	St		Potential Bike Route		Regional	Yes	126	2	G
N	Guadalupe	St		Potential Bike Lanes		TxDOT	No	101	0	
	Hunter	Rd		Existing Shoulders	Existing	TxDOT	Yes	301	5	E
E	San Antonio	St		Potential Bike Route		Regional	Yes	130	2	G
	Broadway	St		Potential Bike Lanes or Route	Sector 5 Plan	Local	Yes	99	4	G
W	San Antonio	St		Potential Bike Route		Regional	Yes	120	2	G
W	San Antonio	St		Potential Bike Route		Regional	Yes	83	2	G
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	109	2	F
	Hazelton	St		Potential Bike Route	Sector 2 Plan	Local	No	106	0	
W	Hutchison	St		Potential Bike Route		Regional	No	206	0	
	Blanco	St		Potential Bike Route		Regional	No	118	0	
	Riverside	Dr		Potential Bike Route		Local	No	231	0	
	Broadway	St		Potential Bike Lanes or Route	Sector 5 Plan	Local	Yes	236	4	G
S	Edward Gary	St		Potential Bike Route		Local	No	284	0	
	Broadway	St		Potential Bike Lanes or Route	Sector 5 Plan	Local	Yes	130	4	G
N	CM Allen	Pkwy		Potential Bike Route		Regional	Yes	128	4	G
	Riverside	Dr		Potential Bike Route		Local	No	158	0	
	Cheatham	St		Potential Bike Route		Local	Yes	259	2	G
	Hazelton	St		Potential Bike Route	Sector 2 Plan	Local	No	107	0	
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	128	2	F
W	San Antonio	St		Potential Bike Route		Regional	Yes	149	2	G
	CM Allen	Pkwy		Potential Bike Route		Regional	No	203	0	
W	Hutchison	St		Potential Bike Route		Regional	No	131	0	
	Leah	Ave		Potential Bike Lanes	Sector 5 Plan	Local	No	131	0	
	Hazelton	St		Potential Bike Route	Sector 2 Plan	Local	No	130	0	
	Leah	Ave		Potential Bike Lanes	Sector 5 Plan	Local	No	64	0	
	Leah	Ave		Potential Bike Lanes		Local	Yes	382	2	G
	Wonder World	Dr		Existing Shoulders	Existing & Planned	TxDOT	No	243	0	
S	LBJ	Dr		Potential Bike Lanes		TxDOT	Yes	203	3	G
	Leah	Ave		Potential Bike Lanes		Local	Yes	268	2	G
	De Zavala	Dr		Potential Bike Lanes	Sector 5 Plan	Local	No	715	0	
W	San Antonio	St		Potential Bike Route		Regional	Yes	135	2	G
	Wonder World	Dr		Existing Shoulders	Existing & Planned	TxDOT	No	210	0	
E	MLK	Dr		Potential Bike Route		Local	No	127	0	
S	Guadalupe	St		Potential Bike Lanes		TxDOT	No	230	0	
	Leah	Ave		Potential Bike Lanes		Local	Yes	209	3	E
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	110	2	F
N	LBJ	Dr		Potential Bike Route		Local	No	181	0	
N	LBJ	Dr		Potential Bike Route		Local	No	99	0	
	Wonder World	Dr		Existing Shoulders	Existing & Planned	TxDOT	No	107	0	
W	MLK	Dr		Potential Bike Route		Local	No	120	0	
	River	Rd		Potential Bike Lanes or Route		Regional	Yes	458	2	G
W	MLK	Dr		Potential Bike Route		Local	No	109	0	

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
	Belvin	St		Potential Bike Route		Regional	No	152	0	
	Craddock	Ave		Potential Bike Route		Local	No	345	0	
N	LBJ	Dr		Potential Bike Route		Local	No	274	0	
W	MLK	Dr		Potential Bike Route		Local	No	102	0	
N	LBJ	Dr		Potential Bike Route		Local	No	130	0	
	CM Allen	Pkwy		Potential Bike Route		Regional	No	418	0	
	Cheatham	St		Potential Bike Route		Local	Yes	257	2	G
S	LBJ	Dr		Potential Bike Lanes		TxDOT	Yes	100	3	G
W	MLK	Dr		Potential Bike Route		Local	No	103	0	
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	111	2	F
	Craddock	Ave		Potential Bike Route		Local	No	391	0	
	Hazelton	St		Potential Bike Route	Sector 2 Plan	Local	No	116	0	
	Uhland	Rd		Potential Bike Route	Sector 7 Plan	Local	Yes	99	2	G
	Cheatham	St		Potential Bike Route		Local	Yes	109	2	G
	Craddock	Ave		Potential Bike Route		Local	No	380	0	
	Riverside	Dr		Potential Bike Route		Local	No	141	0	
W	San Antonio	St		Potential Bike Route		Regional	Yes	133	2	G
N	LBJ	Dr		Potential Bike Route		Local	No	123	0	
	Belvin	St		Potential Bike Route		Regional	No	154	0	
	Hazelton	St		Potential Bike Route	Sector 2 Plan	Local	No	104	0	
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	112	2	F
	Uhland	Rd		Potential Bike Route	Sector 7 Plan	Local	Yes	110	2	G
E	Holland	St		Bike Lanes	Existing	Local	No	80	0	
S	Guadalupe	St		Potential Bike Lanes		TxDOT	No	215	0	
W	MLK	Dr		Potential Bike Route		Local	No	107	0	
	Belvin	St		Potential Bike Route		Regional	No	123	0	
	Uhland	Rd		Potential Bike Route	Sector 7 Plan	Local	Yes	111	2	G
W	San Antonio	St		Potential Bike Route		Regional	Yes	149	2	G
	Cheatham	St		Potential Bike Route		Local	Yes	449	4	G
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	112	2	F
N	LBJ	Dr		Potential Bike Trail		Local	No	374	0	
	Clovis Barker	Rd		Potential Bike Route	Sector 5 Plan	Local	No	382	0	
E	Holland	St		Bike Lanes	Existing	Local	No	188	0	
	Prospect	St		Potential Bike Route	Sector 2 Plan	Local	No	124	0	
	Uhland	Rd		Potential Bike Route	Sector 7 Plan	Local	Yes	160	2	G
	Hunter	Rd		Planned Shoulders		TxDOT	Yes	725	5	E
S	LBJ	Dr		Potential Bike Route		Local	No	119	0	
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	98	2	F
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	247	2	G
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	149	2	G
N	Bishop	St		Potential Bike Lanes	Sector 2 Plan	Local	Yes	22	2	G
	Craddock	Ave		Planned Bike Path	CIP	Local	No	133	0	
	Belvin	St		Potential Bike Route		Regional	No	128	0	
W	San Antonio	St		Potential Bike Route		Regional	Yes	110	2	G
E	Holland	St		Bike Lanes	Existing	Local	No	99	0	
	Leah	Ave		Potential Bike Lanes		Local	Yes	561	3	E
				Potential Bike Lanes		Local	No	386	0	

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
				Potential Trail		Local	No	1775	0	
	Cottonwood	Pkwy		Potential Bike Path or Lanes	Sector 5 Plan	Local	No	347	0	
	Cottonwood	Pkwy		Potential Bike Path or Lanes	Sector 5 Plan	Local	No	230	0	
	Cottonwood	Pkwy		Potential Bike Path or Lanes	Sector 5 Plan	Local	No	409	0	
	Cottonwood	Pkwy		Potential Bike Path or Lanes	Sector 5 Plan	Local	No	611	0	
	Sadler	Dr		Planned Bike Path	Developer	Local	No	622	0	
	Aquarena Springs	Dr		Planned Bike Lanes		Regional	No	359	0	
	Civic Center	Lp		Potential Bike Lanes		Local	No	337	0	
	River Ridge	Pkwy	Ext	Potential Bike Lanes		Regional	No	2575	0	
	Ranch Road 12			Potential Shoulders	TxDOT	TxDOT	No	2306	0	
	Old Stagecoach	Rd		Potential Bike Lanes		Regional	No	3745	0	
	Hunter	Rd		Planned Shoulders		TxDOT	No	1227	0	
	Rogers	St		Potential Bike Route		Regional	No	61	0	
	Scott	St		Potential Bike Route		Regional	No	28	0	
	Post	Rd		Planned Bike Lanes		Regional	No	281	0	
W	Hopkins	St						123	2	G
	Elm Hill	Ct						162	2	G
	Barbara	Dr						174	2	G
	Patton	St						72	2	G
W	Hopkins	St						122	2	G
N	Bishop	St		Potential Bike Lanes				104	2	F
	Barbara	Dr						162	2	G
	Barbara	Dr						71	2	G
N	Bishop	St		Potential Bike Lanes				209	2	F
	Barbara	Dr						105	2	G
	Clearview	Cir						188	2	G
W	Hopkins	St						375	2	G
	Barbara	Dr						202	2	G
	West	Ave						438	2	G
	Foxtail	Run						270	4	E
	Hwy 123			Existing Shoulders				430	4	G
	Hwy 123			Existing Shoulders				255	4	G
	Hwy 123			Existing Shoulders				386	4	G
	Hwy 123			Existing Shoulders				503	4	G
	Hwy 123			Existing Shoulders				237	4	G
	IH35							197	3	G
	IH35							199	3	G
	IH35							298	3	G
	IH35							321	3	G
	IH35							114	3	G
	IH35							121	3	G
	IH35							296	3	G
	IH35							138	3	G
	IH35							188	3	G

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
	IH35							53	3	G
	IH35							59	3	G
	Alamo	St						156	2	G
	IH35							359	3	G
	IH35							98	3	G
	IH35							179	3	G
	IH35							405	2	F
	IH35							204	2	F
	IH35							606	2	F
	IH35							289	2	F
	IH35							1143	2	F
	IH35							1640	2	F
	Barbara	Dr						215	2	G
	Alamo	St						112	2	G
	Lago Vista	Dr						255	2	E
	Lockwood	Dr						116	2	G
	Alamo	St						113	2	G
	Benning	St						76	2	E
	Benning	St						80	2	E
	Stagecoach	Trl						306	4	E
	Stagecoach	Trl						193	4	E
	Alamo	St						117	2	G
	Stagecoach	Trl						429	4	E
	Patton	St						78	2	G
	Patton	St						156	2	G
	Foxtail	Run						82	4	E
	Stagecoach	Trl						255	4	E
	Missum	Pt						127	2	E
	Deer Stand	Lp						553	2	E
	University	Dr						124	4	G
	University	Dr						119	4	G
	University	Dr						132	4	E
	University	Dr						130	4	E
	Stagecoach	Trl						272	4	E
	Stagecoach	Trl						360	4	E
	Stagecoach	Trl		Potential Bike Route				253	4	E
E	Hopkins	St		Potential Trail				93	4	G
E	Hopkins	St		Potential Trail				210	4	G
E	Hopkins	St						130	4	G
E	Hopkins	St						127	4	G
E	Hopkins	St						128	4	G
W	Hopkins	St						120	4	G
W	Hopkins	St						110	4	G
W	Hopkins	St						167	4	G
	Lockwood	Dr						144	2	G
	Candlelight	Ln						297	2	G
W	Hopkins	St						61	4	G

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
	Candlelight	Ln						243	2	G
	Lockwood	Dr						271	2	G
	Peter Garza	St						467	2	G
W	Hopkins	St						209	2	G
	San Marcos	Pkwy						236	2	G
	Oak Ridge	Dr						487	2	G
	Ashley	Ct						66	2	E
W	Hopkins	St						131	2	G
	Clearview	Cir						191	2	G
	Hilltop	Dr						252	2	E
	Oak Ridge	Dr						521	2	G
	Overlook	Way						247	2	E
	Hilltop	Dr						88	2	E
	Lago Vista	Dr						177	2	E
	Elm Hill	Ct						243	2	G
	Mira Loma	Ln						267	2	E
	Lago Vista	Dr						128	2	E
	Barbara	Dr						142	2	G
	Hilltop	Dr						110	2	E
	Crystal	Cv						61	2	E
	Lago Vista	Dr						73	2	E
	Hilltop	Dr						221	2	E
W	Hopkins	St						151	2	G
	LBJ	Cv						31	0	
W	Hopkins	St						152	2	G
	Barbara	Dr						205	2	G
	Third	St						71	2	F
	Third	St						110	2	F
	Third	St						109	2	F
	Forest	Dr						228	2	G
	Moore	St		Potential Bike Route				183	2	G
	Moore	St		Potential Bike Route				70	2	G
	Moore	St		Potential Bike Route				70	2	G
	Moore	St						114	2	G
	Moore	St						117	2	G
	Stagecoach	Trl						8	0	E
	Lime Kiln	Rd		Potential Bike Lanes		Local	No	2325	0	
	Lime Kiln	Rd		Potential Shoulders or Lanes		Local	No	1446	0	
	Hilliard	Rd						2552	0	
	Moore	St						103	0	
	Moore	St						82	0	
				Potential Bike Route				115	0	
				Potential Bike Route				122	0	
				Potential Bike Route				183	0	
				Potential Bike Route				70	0	
				Potential Bike Route				142	0	

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
				Potential Bike Route				70	0	
	Linda	St		Potential Bike Route				194	0	
	Linda	St		Potential Bike Route				238	0	
	Bugg			Potential Bike Route				115	0	
	Bugg			Potential Bike Route				104	0	
	Bugg			Potential Bike Route				135	0	
	Bugg			Potential Bike Route				147	0	
	Bugg			Potential Bike Route				138	0	
	Linda	St		Potential Bike Route				537	0	
				Potential Trail				1635	0	
				Trail				1354	0	
				Potential Bike Route				101	0	
				Potential Bike Route				119	0	
				Potential Bike Route				123	0	
				Potential Bike Route				184	0	
				Potential Bike Route				507	0	
				Potential Bike Route				93	0	
				Potential Bike Route				104	0	
				Potential Bike Route				113	0	
				Potential Bike Route				201	0	
				Potential Bike Route				214	0	
				Potential Bike Route				36	0	
				Potential Bike Route				119	0	
				Potential Bike Route				119	0	
				Potential Bike Route				150	0	
				Potential Bike Route				302	0	
				Potential Bike Route				143	0	
				Potential Bike Lanes				104	0	
				Potential Bike Route				96	0	
				Potential Bike Lanes				209	0	
				Potential Bike Route				210	0	
	Hwy 123			Existing Shoulders				6255	0	
				Potential Trail				471	0	
	River Ridge	Pkwy		Potential Bike Route				746	0	
	Daisy	St		Potential Bike Route				396	0	
	Paintbrush			Potential Bike Route				365	0	
				Potential Trail				114	0	
	Blanco	St		Potential Bike Route				104	0	
	Blanco	St		Potential Bike Route				76	0	
	Blanco	St		Potential Bike Route				104	0	
E	McCarty	Ln		Potential Bike Lanes				540	0	
W	McCarty	Ln		Potential Bike Route				242	0	
W	McCarty	Ln		Potential Bike Route				107	0	
W	McCarty	Ln		Potential Bike Route				2970	0	
E	McCarty	Ln		Potential Bike Lanes				518	0	
W	McCarty	Ln		Potential Bike Route				398	0	
E	McCarty	Ln		Potential Bike Lanes				1503	0	

PRE FIX	NAME	SUFFIX	SUFFIX	FACILITY_TYPE	SOURCE	ROLE	SIDE WALK	LENGTH	LNS	PV
				Potential Trail				0	0	
				Trail				0	0	
				Potential Bike Lanes				0	0	
	Post	Rd		Potential Bike Lanes		Regional	No	958	0	
	Post	Rd		Potential Bike Route		Regional	No	1943	0	
				Potential Trail				0	0	
				Potential Trail				0	0	
	Highway 21	Hwy		Potential Shoulders				0	0	
				Potential Trail				0	0	
				Potential Trail				0	0	
				Potential Trail				0	0	
				Potential Bike Lanes				0	0	
	Bishop			Potential Trail		Local	No	734	0	
	Bishop			Potential Bike Path or Lanes		Local	No	855	0	
	Quail	Run		Potential Bike Route				0	0	
	Staples	Rd		Potential Bike Lanes				0	0	
				Potential Shoulders or Lanes				0	0	

LNS = Lanes
PV = Pavement Conditions

Table C-2
Existing and Proposed Pedestrian Facilities

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
	Third	St	Existing Sidewalk	105	2	2	F	
	Third	St	Existing Sidewalk	110	2	2	F	
	Third	St	Existing Sidewalk	109	2	2	F	
	Alamo	St	Existing Sidewalk	156	2	2	G	
	Alamo	St	Existing Sidewalk	112	2	2	G	
	Alamo	St	Existing Sidewalk	113	2	2	G	
	Alamo	St	Existing Sidewalk	117	2	2	G	
	Aquarena Springs	Dr	Existing Sidewalk	99	2	5	G	
	Aquarena Springs	Dr	Existing Sidewalk	454	2	5	G	
	Aquarena Springs	Dr	Existing Sidewalk	92	2	5	G	
	Aquarena Springs	Dr	Existing Sidewalk	119	2	5	G	
	Aquarena Springs	Dr	Existing Sidewalk	107	2	5	G	
	Aquarena Springs	Dr	Existing Sidewalk	288	2	5	G	
	Ashley	Ct	Existing Sidewalk	66	2	2	E	New Residential Development
	Barbara	Dr	Existing Sidewalk	174	2	2	G	
	Barbara	Dr	Existing Sidewalk	162	2	2	G	
	Barbara	Dr	Existing Sidewalk	71	2	2	G	
	Barbara	Dr	Existing Sidewalk	105	2	2	G	
	Barbara	Dr	Existing Sidewalk	202	2	2	G	
	Barbara	Dr	Existing Sidewalk	215	2	2	G	
	Barbara	Dr	Existing Sidewalk	142	2	2	G	
	Barbara	Dr	Existing Sidewalk	205	2	2	G	
	Benning	Dr	Existing Sidewalk	76	2	2	E	New Residential Development
	Benning	Dr	Existing Sidewalk	80	2	2	E	New Residential Development
	Bishop	St	Proposed Sidewalk	185	2	2	F	Intermittent sidewalks
	Bishop	St	Proposed Sidewalk	104	2	2	F	Intermittent sidewalks
	Bishop	St	Proposed Sidewalk	209	2	2	F	Intermittent sidewalks
	Bishop	St	Existing Sidewalk	113	2	2	F	
	Bishop	St	Existing Sidewalk	109	2	2	F	
	Bishop	St	Existing Sidewalk	121	2	2	F	
	Bishop	St	Existing Sidewalk	109	2	2	F	
	Bishop	St	Existing Sidewalk	128	2	2	F	
	Bishop	St	Existing Sidewalk	110	2	2	F	
	Bishop	St	Existing Sidewalk	111	2	2	F	
	Bishop	St	Existing Sidewalk	112	2	2	F	
	Bishop	St	Proposed Sidewalk	112	2	2	F	Intermittent sidewalks
	Bishop	St	Existing Sidewalk	98	2	2	F	
	Bishop	St	Existing Sidewalk	247	2	2	G	New Subdivision
	Bishop	St	Existing Sidewalk	149	2	2	G	New Subdivision
	Bishop	St	Existing Sidewalk	22	2	2	G	New Subdivision
	Broadway		Existing Sidewalk	106	2	4	G	

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
	Broadway		Existing Sidewalk	99	2	4	G	
	Broadway		Existing Sidewalk	236	2	4	G	
	Broadway		Existing Sidewalk	130	2	4	G	
	C.M. Allen	Pkwy	Proposed Sidewalk	98	2	4	G	
	C.M. Allen	Pkwy	Proposed Sidewalk	137	2	4	G	
	C.M. Allen	Pkwy	Proposed Sidewalk	94	2	4	G	
	C.M. Allen	Pkwy	Proposed Sidewalk	171	2	4	G	
	C.M. Allen	Pkwy	Proposed Sidewalk	148	2	4	G	
	C.M. Allen	Pkwy	Proposed Sidewalk	140	2	4	G	
	C.M. Allen	Pkwy	Proposed Sidewalk	128	2	4	G	
	Candlelight	Ln	Existing Sidewalk	297	2	2	G	
	Candlelight	Ln	Existing Sidewalk	243	2	2	G	
	Cheatham	St	Existing Sidewalk	77	2	4	G	
	Cheatham	St	Existing Sidewalk	175	2	4	G	
	Cheatham	St	Existing Sidewalk	123	2	4	G	
	Cheatham	St	Existing Sidewalk	99	2	2	G	
	Cheatham	St	Existing Sidewalk	205	2	2	G	
	Cheatham	St	Existing Sidewalk	259	2	2	G	
	Cheatham	St	Existing Sidewalk	257	2	2	G	
	Cheatham	St	Existing Sidewalk	109	2	2	G	
	Cheatham	St	Existing Sidewalk	449	2	4	G	
	Clearview	Cir	Existing Sidewalk	188	2	2	G	
	Clearview	Cir	Existing Sidewalk	191	2	2	G	
	Crystal River	Pkwy	Existing Sidewalk	132	2	2	E	
	Crystal River	Pkwy	Existing Sidewalk	189	2	2	E	
	Crystal River	Pkwy	Existing Sidewalk	78	2	2	E	
	Crystal River	Pkwy	Existing Sidewalk	126	2	2	E	
	Crystal	Cv	Existing Sidewalk	61	2	2	E	
	Deer Stand	Loop	Existing Sidewalk	553	2	2	E	New Residential Development
	Elm Hill	Ct	Existing Sidewalk	162	2	2	G	New Residential Development
	Elm Hill	Ct	Existing Sidewalk	243	2	2	G	New Residential Development
	Forest	Ln	Existing Sidewalk	154	2	2	G	
	Foxtail	Run	Existing Sidewalk	270	2	4	E	
	Franklin	Dr	Existing Sidewalk	105	2	2	G	
	Grove	St	Existing Sidewalk	122	1	3	G	
	Guadalupe	St	Existing Sidewalk	116	2	2	F	
	Guadalupe	St	Existing Sidewalk	121	2	2	F	
	Guadalupe	St	Proposed Sidewalk	118	2	2	F	Intermittent sidewalks
	Guadalupe	St	Proposed Sidewalk	241	2	2	F	Intermittent sidewalks
	Guadalupe	St	Proposed Sidewalk	57	2	2	F	Intermittent sidewalks
	Guadalupe	St	Proposed Sidewalk	166	2	2	F	Intermittent sidewalks
	Hilltop	Cv	Existing Sidewalk	252	2	2	E	New residential development
	Hilltop	Cv	Existing Sidewalk	88	2	2	E	New residential development

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
	Hilltop	Cv	Existing Sidewalk	110	2	2	E	New residential development
	Hilltop	Cv	Existing Sidewalk	221	2	2	E	New residential development
	Holland	St	Existing Sidewalk	270	2	2	G	bike lane on both sides of street
	Hopkins	St	Existing Sidewalk	123	2	2	G	
	Hopkins	St	Existing Sidewalk	122	2	2	G	
	Hopkins	St	Existing Sidewalk	375	2	2	G	
	Hopkins	St	Proposed Sidewalk	214	2	4	G	
	Hopkins	St	Existing Sidewalk	600	2	4	G	
	Hopkins	St	Proposed Sidewalk	219	2	4	G	
	Hopkins	St	Existing Sidewalk	93	2	4	G	
	Hopkins	St	Existing Sidewalk	210	2	4	G	
	Hopkins	St	Existing Sidewalk	317	2	4	G	
	Hopkins	St	Existing Sidewalk	127	2	4	G	
	Hopkins	St	Existing Sidewalk	128	2	4	G	
	Hopkins	St	Existing Sidewalk	120	2	4	G	
	Hopkins	St	Existing Sidewalk	110	2	4	G	
	Hopkins	St	Existing Sidewalk	167	2	4	G	
	Hopkins	St	Existing Sidewalk	61	2	4	G	
	Hopkins	St	Existing Sidewalk	209	2	2	G	On street parking
	Hopkins	St	Existing Sidewalk	131	2	2	G	
	Hopkins	St	Existing Sidewalk	151	2	2	G	
	Hopkins	St	Existing Sidewalk	152	2	2	G	
	Hunter	Rd	Existing Sidewalk	195	2	5	E	
	Hunter	Rd	Existing Sidewalk	504	2	5	E	
	Hunter	Rd	Existing Sidewalk	280	2	2	G	
	Hunter	Rd	Existing Sidewalk	186	2	2	G	
	Hunter	Rd	Existing Sidewalk	373	2	2	G	
	Hunter	Rd	Existing Sidewalk	231	2	5	E	
	Hunter	Rd	Existing Sidewalk	238	2	5	E	
	Hunter	Rd	Existing Sidewalk	301	2	5	E	
	Hunter	Rd	Existing Sidewalk	725	2	5	E	
			Existing Sidewalk	134		0		
			Existing Sidewalk	144		0		
			Existing Sidewalk	111		0		
	LBJ	Dr	Existing Sidewalk	123	1	3	G	
	LBJ	Dr	Existing Sidewalk	129	1	3	G	
	LBJ	Dr	Existing Sidewalk	127	1	3	G	
	LBJ	Dr	Existing Sidewalk	203	1	3	G	
	LBJ	Dr	Existing Sidewalk	100	1	3	G	
			Existing Sidewalk	31		0		
	Lago Vista		Existing Sidewalk	255	2	2	E	New residential development
	Lago Vista		Existing Sidewalk	177	2	2	E	New residential development
	Lago Vista		Existing Sidewalk	128	2	2	E	New residential

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
								development
	Lago Vista		Existing Sidewalk	73	2	2	E	New residential development
	Leah	Ave	Existing Sidewalk	382	2	2	G	Marked bike route (no bike lane noted on pavement)
	Leah	Ave	Existing Sidewalk	268	2	2	G	Marked bike route (no bike lane noted on pavement)
	Leah	Ave	Existing Sidewalk	209	2	3	E	Bike lane on one side of street next to apartments
	Leah	Ave	Existing Sidewalk	135	2	3	E	Bike lane on one side of street next to apartments
	Leah	Ave	Existing Sidewalk	118	2	3	E	Bike lane on one side of street next to apartments
	Lockwood	Dr	Existing Sidewalk	116	2	2	G	Possible elementary school route
	Lockwood	Dr	Existing Sidewalk	144	2	2	G	Possible elementary school route
	Lockwood	Dr	Existing Sidewalk	271	2	2	G	Possible elementary school route
	Mill	St	Existing Sidewalk	112	2	2	G	Speed humps
	Mill	St	Existing Sidewalk	113	2	2	G	Speed humps
	Mill	St	Existing Sidewalk	112	2	2	G	Speed humps
	Mill	St	Existing Sidewalk	107	2	2	G	Speed humps
	Mill	St	Existing Sidewalk	98	2	2	G	Speed humps
	Mill	St	Existing Sidewalk	157	2	2	G	Speed humps
	Mira Loma	Ln	Existing Sidewalk	267	2	2	E	New residential development
	Foxtail	Run	Existing Sidewalk	82	2	4	E	
	Missum	Pt	Existing Sidewalk	127	2	2	E	New residential development
	Oak Ridge		Existing Sidewalk	487	2	2	G	New residential development
	Oak Ridge		Existing Sidewalk	521	2	2	G	New residential development
	Overlook	Way	Existing Sidewalk	247	2	2	E	New Residential Development
	Patton	Dr	Existing Sidewalk	72	2	2	G	
	Patton	Dr	Existing Sidewalk	78	2	2	G	
	Patton	Dr	Existing Sidewalk	156	2	2	G	
	Peter Garza	St	Existing Sidewalk	467	2	2	G	Adjacent to elementary school
	Post	Rd	Existing Sidewalk	403	2	2	F	
	River	Rd	Proposed Sidewalk	247	2	2	G	
	River	Rd	Existing Sidewalk	256	2	2	G	
	River	Rd	Existing Sidewalk	118	2	2	G	
	River	Rd	Existing Sidewalk	891	2	2	G	
	River	Rd	Existing Sidewalk	406	2	2	G	
	River	Rd	Proposed Sidewalk	274	2	2	G	
	River	Rd	Existing Sidewalk	118	2	2	G	
	River	Rd	Existing Sidewalk	174	2	4	G	

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
	River	Rd	Existing Sidewalk	460	2	2	G	
	Roosevelt	St	Existing Sidewalk	71	2	2	F	
	Roosevelt	St	Existing Sidewalk	125	2	2	F	Close to Dunbar Park
	Roosevelt	St	Existing Sidewalk	124	2	2	F	
	San Antonio	St	Existing Sidewalk	151	2	2	G	
	San Antonio	St	Existing Sidewalk	125	2	2	G	
	San Antonio	St	Existing Sidewalk	110	2	2	G	
	San Antonio	St	Existing Sidewalk	124	2	2	G	
	San Antonio	St	Existing Sidewalk	154	2	2	G	
	San Antonio	St	Existing Sidewalk	220	2	2	G	
	San Antonio	St	Existing Sidewalk	39	2	2	G	
	San Antonio	St	Existing Sidewalk	64	2	2	G	
	San Antonio	St	Existing Sidewalk	126	2	2	G	
	San Antonio	St	Existing Sidewalk	130	2	2	G	
	San Antonio	St	Existing Sidewalk	120	2	2	G	
	San Antonio	St	Existing Sidewalk	83	2	2	G	
	San Antonio	St	Existing Sidewalk	149	2	2	G	
	San Antonio	St	Existing Sidewalk	135	2	2	G	
	San Antonio	St	Existing Sidewalk	133	2	2	G	
	San Antonio	St	Existing Sidewalk	149	2	2	G	
	San Marcos	Pkwy	Existing Sidewalk	236	2	2	G	
	Sessom	Dr	Existing Sidewalk	284	2	4	G	
	Stagecoach	Trl	Existing Sidewalk	306	2	4	E	
	Stagecoach	Trl	Existing Sidewalk	193	2	4	E	
	Stagecoach	Trl	Existing Sidewalk	429	2	4	E	
			Existing Sidewalk	8				
	Stagecoach	Trl	Existing Sidewalk	1001	2	4	E	
	Stagecoach	Trl	Existing Sidewalk	255	2	4	E	
	Stagecoach	Trl	Existing Sidewalk	272	2	4	E	
	Stagecoach	Trl	Existing Sidewalk	360	2	4	E	
	Stagecoach	Trl	Existing Sidewalk	253	2	4	E	
	State Highway 123		Proposed Sidewalk	430	2	4	G	Sidewalk ends at Broadway
	State Highway 123		Existing Sidewalk	255	2	4	G	Sidewalk ends at Broadway
	State Highway 123		Existing Sidewalk	386	2	4	G	Sidewalk ends at Broadway
	Thorpe	Ln	Existing Sidewalk	153	2	4	G	Walking paths evident
	Thorpe	Ln	Existing Sidewalk	500	2	4	G	Walking paths evident
	Thorpe	Ln	Existing Sidewalk	337	2	4	G	Walking paths evident
	University	Dr	Existing Sidewalk	395	2	5	G	
	University	Dr	Existing Sidewalk	124	2	4	G	
	University	Dr	Existing Sidewalk	119	2	4	G	
	University	Dr	Existing Sidewalk	132	2	4	E	
	University	Dr	Existing Sidewalk	130	2	4	E	
	Uhland	Rd	Existing Sidewalk	447	2	2	G	
	Uhland	Rd	Existing Sidewalk	99	2	2	G	

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
	Uhland	Rd	Existing Sidewalk	110	2	2	G	
	Uhland	Rd	Existing Sidewalk	111	2	2	G	
	Uhland	Rd	Existing Sidewalk	160	2	2	G	
	Warden	Ln	Existing Sidewalk	249	2	2	G	
	West	Ave	Existing Sidewalk	438	2	2	G	
	Wonder World	Dr	Existing Sidewalk	411	2	5	G	
	Wonder World	Dr	Existing Sidewalk	234	2	5	G	
	Wonder World	Dr	Existing Sidewalk	242	2	5	G	
	Wonder World	Dr	Existing Sidewalk	611	2	5	G	
	MLK	Dr	Proposed Sidewalk	186				
	MLK	Dr	Proposed Sidewalk	85				
	MLK	Dr	Proposed Sidewalk	196				
	MLK	Dr	Proposed Sidewalk	134				
	MLK	Dr	Proposed Sidewalk	140				
	MLK	Dr	Proposed Sidewalk	229				
	MLK	Dr	Proposed Sidewalk	127				
	MLK	Dr	Proposed Sidewalk	120				
	MLK	Dr	Proposed Sidewalk	109				
	MLK	Dr	Proposed Sidewalk	102				
	MLK	Dr	Proposed Sidewalk	103				
	MLK	Dr	Proposed Sidewalk	107				
	Guadalupe	St	Proposed Sidewalk	186				
	Guadalupe	St	Existing Sidewalk	124				
	Guadalupe	St	Existing Sidewalk	126				
	Guadalupe	St	Existing Sidewalk	101				
	Guadalupe	St	Proposed Sidewalk	230				
	Guadalupe	St	Proposed Sidewalk	215				
			Existing Sidewalk	173				
			Existing Sidewalk	65				
			Existing Sidewalk	64				
			Existing Sidewalk	74				
			Existing Sidewalk	74				
			Existing Sidewalk	167				
			Existing Sidewalk	94				
			Existing Sidewalk	94				
	Porter	St	Proposed Sidewalk	204				
	Edward Gary	St	Proposed Sidewalk	123				
	Edward Gary	St	Proposed Sidewalk	128				
	Edward Gary	St	Proposed Sidewalk	128				
	Edward Gary	St	Proposed Sidewalk	284				
	Hopkins	St	Proposed Sidewalk	198				
	Cheatham	St	Proposed Sidewalk	124				
	Aquarena Springs	Dr	Proposed Sidewalk	351				
	C.M. Allen	Pkwy	Proposed Sidewalk	203				
	C.M. Allen	Pkwy	Proposed Sidewalk	418				
W	Hopkins	St	Proposed Sidewalk	103				
W	Hopkins	St	Proposed Sidewalk	104				

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
W	Hopkins	St	Proposed Sidewalk	201				
W	Hutchison	St	Proposed Sidewalk	62				
W	Hutchison	St	Proposed Sidewalk	109				
W	Hutchison	St	Proposed Sidewalk	205				
W	Hutchison	St	Proposed Sidewalk	128				
E	Hutchison	St	Existing Sidewalk	174				
E	Hutchison	St	Existing Sidewalk	128				
E	Hutchison	St	Existing Sidewalk	129				
W	Hutchison	St	Existing Sidewalk	120				
W	Hutchison	St	Existing Sidewalk	109				
W	Hutchison	St	Existing Sidewalk	168				
W	Hutchison	St	Existing Sidewalk	139				
W	Hutchison	St	Existing Sidewalk	206				
W	Hutchison	St	Existing Sidewalk	131				
W	Hutchison	St	Existing Sidewalk	152				
W	Hutchison	St	Existing Sidewalk	154				
W	Hutchison	St	Existing Sidewalk	123				
			Proposed Trail	471				
	Bugg	Ln	Proposed Sidewalk	115				
	Bugg	Ln	Proposed Sidewalk	104				
	Bugg	Ln	Proposed Sidewalk	135				
	Bugg	Ln	Proposed Sidewalk	147				
	Clarewood	Dr	Proposed Sidewalk	235				
			Existing Trail	1496				
	Bobcat	Dr	Proposed Sidewalk	197				
	Bobcat	Dr	Proposed Sidewalk	350				
	Aquarena Springs	Dr	Proposed Sidewalk	175				
	Aquarena Springs	Dr	Proposed Sidewalk	317				
	Aquarena Springs	Dr	Proposed Sidewalk	566				
	Riverside	Dr	Proposed Sidewalk	130				
	Riverside	Dr	Proposed Sidewalk	231				
	Riverside	Dr	Existing Sidewalk	158				
	Riverside	Dr	Existing Sidewalk	141				
	Hwy 80		Proposed Sidewalk	348				
	Hwy 80		Proposed Sidewalk	545				
			Existing Trail	606				
	LBJ	Dr	Existing Sidewalk	0				
	Endicott	St	Existing Sidewalk	0				
			Proposed Trail	0				
			Proposed Sidewalk	0				
	Franklin		Proposed Sidewalk	0				
	Franklin	Dr	Proposed Sidewalk	0				
	Holland	St	Existing Sidewalk	0				
	Academy	St	Proposed Sidewalk	0				
	Shulle	Dr	Proposed Sidewalk	0				
	LBJ	Dr	Proposed Sidewalk	0				
	Post	Rd	Committed	0				

PRE FIX	NAME	SUFFIX	STAGE	LENGTH	DIR	LNS	PV	COMMENTS
			Sidewalk					
	Aquarena Springs	Dr	Existing Sidewalk	361				
	Aquarena Springs	Dr	Proposed Sidewalk	611				
	Cape	Rd	Proposed Trail	0				
			Proposed Trail	0				
			Proposed Trail	0				
	De Zavala	Dr	Proposed Sidewalk	0				
			Proposed Trail	0				
			Committed Trail	2021				
	Craddock	Ave	Proposed Sidewalk	1008				

DIR = Direction
LNS = Lanes
PV = Pavement Conditions

Appendix D
Proposed Roadway Improvements
Project Evaluation Matrix

SAN MARCOS TRANSPORTATION MASTER PLAN
PROPOSED ROADWAY IMPROVEMENTS

● Favorable ⭘ Neutral ○ Unfavorable

EVALUATION CRITERIA	R-1 Widen Hopkins from CM Allen Pkwy. to IH 35 to 6 lanes (TxDOT)	R-2 Extend Craddock to Lime Kiln Rd. as 4 lane section	R-3 Realign Holland and Academy to provide Sessom connection to RM 12	R-4 Widen Post Road form Aquarena Springs to northern study area limit to 4 lanes (6 lanes needed w/o Loop)	R-5 Extend LBJ northward from Bishop Street to W. Outer Loop as 2 lane section	R-6 Widen Aquarena (Sessom to IH 35) to 6 lanes	R-7 Construct 4-lane freeway as E. Outer Loop	R-8 Construct 4-lane freeway as W. Outer Loop	R-9 Lime Kiln Widening from Hilliard east and realign to join Uhland as 4 lane divided section	R-10 Extend Lime Kiln Rd. to W. Outer Loop as 4 lane divided section	R-11 Extend River Ridge Parkway west as 2 lane section (IH 35 to Post Road)	R-12 Extend River Ridge Parkway east to Harris Hill near Airport as 2 lane section	R-13 Extend Beback Inn Road (Old Bastrop Hwy. to Centerpoint) as 2 lane section	R-14 Widen RM 12 from W. Outer Loop to Wimberley to 6 lanes (TxDOT)	R-15 Add U-Turn Lane for Transit Center Access	R-16 Widen River Rd. (SH 80 to new connection from Aquarena Springs) 4 lane section	R-17 Widen Comanche Street to 4 lanes (Sessom to Hopkins); improve 2-lane section (Hopkins to MLK)	R-18 Complete missing sections of University Drive (4 lane section) from Guadalupe to Comanche; long range complete section from Comanche to RM 12	R-19 Upgrade Old Bastrop Hwy south of E. Outer Loop to IH 35 South (4 lane divided) and interchange at Loop	R-20 Construct 4-Lane divided arterial from southwest corner of W. Outer Loop to meet Old Bastrop Hwy. (Project R-19) at IH 35 South	R-21 Widen SH 80 to 6 lanes from IH 35 to SH 21 (including underpass at IH 35)	R-22 Construct new east-west arterial between SH 21 and W. Outer Loop (4 lanes) - Thoroughfare Plan	R-23 River Road to Riverside underpass connection with IH 35/Cheatham improvements (2 lane underpass)	R-24 Extend Craddock South to Wonder World Drive (2 lane section)	R-25 Widen Thorpe Lane to 5 lanes from Aquarena Springs Dr - Hopkins St	R-26 Widen Hutchison to 3 lanes - CM Allen Pkwy to Moore St	R-27 Widen IH 35 overpass to 6 lanes	R-28 Widen Uhland to 3-4 lane section	R-29 Extend River Ridge Parkway from Post Road to Lime Kiln Road	R-30 Construct 4 lane north-south arterial east of IH 35 from Posey to SH 21 at SH 80	R-31 Realign, straighten and widen Yarrington Road to 4 lanes from SH 21 to IH 35	R-32 Extend Stagecoach Trail (Craddock to W. Outer Loop)	R-33 Construct Purgatory Parkway between Craddock South and Stagecoach Trail western extension	R-34 Widen Charles Austin to 4 lane undivided	R-35 Widen FM 621 to 3 lanes from SH 123 to Old Bastrop Hwy.	R-36 Realign and straighten Cape Road, including new bridge	R-37 Widen SH 21 to 6 lanes from SH 80 to Northern ETJ limit	R-38 Widen IH 35 to 8 mainlanes/3-lane frontage roads throughout ETJ
TRAFFIC																																							
Access to developments	●	●	⭘	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	⭘	●	●	●	●	●	●	●
Traffic Volumes	●	●	●	⭘	●	●	●	●	⭘	●	●	●	⭘	●	⭘	⭘	⭘	⭘	⭘	⭘	●	⭘	●	●	●	⭘	●	●	●	○	○	●	●	●	○	○	○	●
Level of Service	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	⭘	⭘	●	●	●	●	●	●	●	●	●	●	●	●
TRAFFIC AVG.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	⭘	●	●	●	●	⭘	●	●	●	⭘	⭘	⭘	●
ENVIRO.																																							
Terrain	●	⭘	●	●	⭘	●	●	⭘	⭘	⭘	●	⭘	●	⭘	●	●	●	●	●	⭘	●	●	●	⭘	●	⭘	●	●	●	●	⭘	⭘	⭘	●	●	⭘	●	●
Wetland/FloodPln	⭘	⭘	●	●	●	⭘	●	⭘	⭘	⭘	●	⭘	●	●	●	●	●	●	⭘	⭘	⭘	⭘	⭘	●	●	●	●	●	●	○	○	●	●	●	●	○	⭘	●
ENVIRO. AVG.	●	⭘	●	●	●/⭘	●/⭘	⭘	⭘	⭘	⭘	●	⭘	●	⭘	●	⭘	●	●	⭘	⭘	●	●	●	⭘	●	●	●	●	●	⭘	⭘	⭘	⭘	●	●	○	⭘	●
SOCIOECON																																							
Historic Neigh	●	●	●	●	●	⭘	●	●	●	●	●	●	●	●	⭘	●	●	⭘	●	●	●	●	⭘	●	●	⭘	●	●	●	⭘	●	●	●	●	⭘	⭘	●	●
Enviro Justice	●	●	⭘	●	⭘	●	⭘	●	●	●	●	●	●	●	●	●	●	●	⭘	●	●	⭘	●	●	●	●	●	●	●	○	⭘	●	●	●	○	○	●	●
Displacements	○	●	⭘	⭘	⭘	●	●	⭘	●	●	⭘	●	●	●	●	●	●	⭘	●	⭘	●	●	⭘	⭘	⭘	⭘	●	⭘	⭘	○	⭘	⭘	⭘	⭘	⭘	⭘	●	⭘
SOCIOECONAVG	●	●	⭘	●	●	●	●	●	●	●	●	●	●	●	⭘	●	●	⭘	●	●	●	●	⭘	●	●	⭘	●	●	●	○	⭘	●	●	●	⭘	⭘	●	●
ENGINEERING																																							
Constructability	●	⭘	●	●	⭘	●	●	⭘	●	●	●	●	●	●	●	●	⭘	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	⭘	●	●
Right-of-Way	○	⭘	○	●	⭘	●	●	⭘	●	●	●	●	●	⭘	⭘	●	⭘	⭘	●	●	●	●	●	⭘	●	⭘	●	⭘	●	⭘	●	⭘	⭘	⭘	⭘	⭘	●	⭘
ENGINEERAVG	⭘	⭘	⭘	●	⭘	●	●	⭘	●	●	●	●	●	●	⭘	●	●	⭘	●	●	●	●	●	●	●	●	●	●	●	●	⭘	●	●	●	⭘	⭘	⭘	●	●
TOTAL AVG	●	●	●	●	●	●	●	●/⭘	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●/⭘	●	●	●	⭘	⭘	●	●	●	⭘	⭘	⭘	●

Appendix E
Proposed Roadway Improvements
Project Cost Detail Sheets

Project I.D.	R-1
Description	Widen Hopkins/Hunter to six (6) through lanes from C.M. Allen Parkway to IH-35 (TxDOT)
Length	Approximately 0.85 miles and 0.12 miles of 2-lane and 3-lane widening, respectively
Existing Status:	
Pavement	Width ±60’ IH-35 to San Marcos River; ±48’ to C.M. Allen Parkway
R.O.W.	Width ±90’ IH-35 to San Marcos River; ±70’ to C.M. Allen Parkway
Proposed Status:	
Pavement	Width ±84’ IH-35 to San Marcos River; ±84’ to C.M. Allen Parkway
R.O.W.	Width ±130’ IH-35 to San Marcos River; ±130’ to C.M. Allen Parkway
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1-Bridge at San Marcos River crossing (36’ additional x 100’)
Street Intersections:	
Signalized:	4
RR Crossings:	
Signalized:	3
Grade Separated:	0

Project I.D.	R-2
Description	Extend Craddock Street to Lime Kiln as 4-lane divided section
Length	Approximately 2.35 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	2-24’ plus 23’ median
R.O.W.	140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 - Major culvert at Sink Creek crossing
Street Intersections:	
Signalized:	3
RR Crossings:	None
Signalized:	N/A
Grade Separated:	N/A

Project I.D.	R-3
Description	Realign Holland and Academy Streets to provide Sessom Drive Connection to RM 12 (as 4-lane undivided section)
Length	Approximately 0.52 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’
R.O.W.	100’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	1 (at RM12)
RR Crossings:	None
Signalized:	N/A
Grade Separated:	N/A

Project I.D.	R-4
Description	Widen Post Road from Aquarena Springs Drive to northern study area limit to 4 lanes (3 lane widening)
Length	Approximately 4.73 miles
Existing Status:	
Pavement	± 24’
R.O.W.	Varies ± 40’ to ± 75’
Proposed Status:	
Pavement	60’
R.O.W.	± 100’ (60’ max. additional)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 – Bridge at Blanco River crossing (60’ x 700’)
Street Intersections:	
Signalized:	2
RR Crossings:	None
Signalized:	N/A
Grade Separated:	N/A

Project I.D. R-5

Description NOT USED

Length

Existing Status:
Pavement
R.O.W.

Proposed Status:
Pavement
R.O.W.

Bike Lanes:
Sidewalks:

Bridges/Culverts:

Street Intersections:
Signalized:

RR Crossings:
Signalized:
Grade Separated:

Project I.D.	R-6
Description	Widen Aquarena Springs Drive (from Sessom Dirve to IH-35) to six (6) through lanes (2 lane widening)
Length	Approximately 1.27 miles
Existing Status:	
Pavement	± 75’
R.O.W.	± 100’
Proposed Status:	
Pavement	± 100’
R.O.W.	± 140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 – Bridge at San Marcos River crossing (± 24’ additional x 100’)
Street Intersections:	
Signalized:	5
RR Crossings:	
Signalized:	0
Grade Separated:	1 (120’ width x 400’ length)

Project I.D.	R-7
Description	Construct 4-lane freeway (divided) as East Outer Loop
Length	Approximately 13.32 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’ with 23’ median
R.O.W.	220’
Bike Lanes:	Both Sides
Sidewalks:	None
Bridges/Culverts:	4 (2 Bridges and 2 Major Culverts) 1 Bridge each at San Marcos River and Cottonwood Creek (100’ x 500’ each); 2 Major Culverts at ± $900,000 each
Street Intersections:	10
Signalized:	4
RR Crossings:	
Signalized:	0
Grade Separated:	1 at 220’ x 400’

Project I.D.	R-8
Description	Construct 4-lane freeway (divided) as West Outer Loop
Length	Approximately 14.65 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’ with 23’ median
R.O.W.	220’
Bike Lanes:	Both Sides
Sidewalks:	None
Bridges/Culverts:	5 (3 Bridges at 90’ x 500’ each and 2 Major Culverts)
Street Intersections:	8
Signalized:	2
RR Crossings:	
Signalized:	0
Grade Separated:	2 at 220’ x 400’ each

Project I.D.	R-9
Description	Lime Kiln Road widening from Hilliard Road east and realign to join Uhland Road as 4-lane divided section
Length	Approximately 1.55 miles
Existing Status:	
Pavement	± 30’ (Existing Lime Kiln Road)
R.O.W.	± 60’ (Existing Lime Kiln Road)
Proposed Status:	
Pavement	48’ with 23’ median
R.O.W.	140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 – Major Culvert at Sink Creek crossing
Street Intersections:	
Signalized:	1
RR Crossings:	None
Signalized:	N/A
Grade Separated:	N/A

Project I.D.	R-10
Description	Extend Lime Kiln Road to West Outer Loop as 4-lane divided section
Length	Approximately 1.12 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’ to 23’ median
R.O.W.	140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	1
Signalized:	Included in R-8
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-11
Description	Extend River Ridge Parkway west as 2-lane section (IH-35 to Post Road)
Length	Approximately 0.80 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	24’ (with ultimate 48’)
R.O.W.	80’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	2
Signalized:	1 (at IH-35)
RR Crossings:	
Signalized:	1
Grade Separated:	

Project I.D.	R-12
Description	Extend River Ridge Parkway east to Harris Hill Lane near Airport as 2-lane section
Length	Approximately 1.44 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	24’ (with ultimate 48’)
R.O.W.	80’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 - Bridge at Blanco River Crossing (50’ x 700’)
Street Intersections:	4
Signalized:	1 (at IH-35)
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D. R-13

Description NOT USED

Length

Existing Status:
Pavement
R.O.W.

Proposed Status:
Pavement
R.O.W.

Bike Lanes:
Sidewalks:

Bridges/Culverts:

Street Intersections:
Signalized:

RR Crossings:
Signalized:
Grade Separated:

Project I.D.	R-14
Description	Widen RM 12 from West Outer Loop to Wimberley to six (6) lanes (TxDOT)
Length	Approximately 10.70 miles to existing Blanco River bridge at Wimberley
Existing Status:	
Pavement	± 30’ + shoulders each side
R.O.W.	± 120’
Proposed Status:	
Pavement	± 60’ additional (± 90’ total)
R.O.W.	± 100’ additional (± 220’ total)
Bike Lanes:	Both Sides
Sidewalks:	None
Bridges/Culverts:	None
Street Intersections:	
Signalized:	1 (at RM 12 – RM 32 intersection)
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-15
Description	Add U-Turn Lane for Transit Center Access
Length	Approximately 0.15 miles (800 feet)
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	15’ ± additional
R.O.W.	20’ additional along Guadalupe Street (for turn in and out lanes)
Bike Lanes:	None
Sidewalks:	None
Bridges/Culverts:	None
Street Intersections:	2
Signalized:	0
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-16
Description	Widen River road (SH 80 to new connection from Aquarena Springs Drive) to 4-lane section
Length	Approximately 0.55 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’
R.O.W.	100’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	2
Signalized:	1 (At SH 80)
RR Crossings:	1
Signalized:	
Grade Separated:	1 (100’ x 400’)

Project I.D.	R-17
Description	Widen Comanche Street to 4 lanes (Sessom to Hopkins); improve 2 lane section (Hopkins to MLK)
Length	Approximately 0.58 miles of 2-lane widening and 0.20 miles of 1-lane widening
Existing Status:	
Pavement	± 24’
R.O.W.	± 40’ – 50’
Proposed Status:	
Pavement	48’ Sessom to Hopkins; 36’ Hopkins to MLK.
R.O.W.	40’ additional (80’ total); 20’ additional (60’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	1 (at Hopkins)
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-18
Description	Complete missing sections of University Drive (4 lane section) from Guadalupe to Comanche; long range complete section from Comanche to RM 12 (not included here)
Length	Approximately 0.10 mile (500+ feet)
Existing Status:	
Pavement	± 24’
R.O.W.	± 40’ – 50’
Proposed Status:	
Pavement	24’ additional (48’ total)
R.O.W.	40’ additional (80’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	0
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-19
Description	Upgrade Old Bastrop Highway south of East Outer Loop to IH-35 South (4 lane divided) and interchange at Loop
Length	Approximately 5.40 miles
Existing Status:	
Pavement	± 24’
R.O.W.	± 60’
Proposed Status:	
Pavement	36’ additional (60’ total with center left turn lane)
R.O.W.	60’ additional (120’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Bridge at IH-35 (80’ x 500’)
Street Intersections:	
Signalized:	2 (1 at IH-35; 1 at East Outer Loop)
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-20
Description	Construct 4-lane divided arterial from southwest corner of West Outer Loop to meet Old Bastrop Highway (Project R-19) at IH-35 South
Length	Approximately 4.84 miles
Existing Status:	N/A
Pavement:	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’ with 23’ median
R.O.W.	140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	2
Signalized:	1 (at IH-35)
RR Crossings:	
Signalized:	
Grade Separated:	2 (70’ x 400’ each)

Project I.D.	R-21
Description	Widen SH 80 to 6 lanes from IH-35 to SH 21 (including underpass at IH-35)
Length	Approximately 1.09 miles
Existing Status:	
Pavement	± 60’ (4 through lanes, 2 each direction, with center left turn lane)
R.O.W.	± 100’
Proposed Status:	
Pavement	36’ additional (3 lanes each direction with continuous center left turn) ± 84’ total
R.O.W.	60’ additional (± 100’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Bridge at Blanco River crossing (100’ x 700’); 1 bridge widening at IH-35 for underpass (± 30’ x ± 100’)
Street Intersections:	
Signalized:	3
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-22
Description	Construct new east-west arterial between SH 21 and West Outer Loop (4 lanes) – Thoroughfare Plan
Length	Approximately 3.97 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’ with 23’ median
R.O.W.	140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Bridge at Blanco River crossing (100’ x 700’) + 1 Major Culvert at ± $250,000
Street Intersections:	5
Signalized:	2
RR Crossings:	
Signalized:	1
Grade Separated:	

Project I.D.	R-23
Description	River Road to Riverside underpass connection with IH-35 / Cheatham Improvements (2 lane underpass)
Length	Approximately 0.30 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	30’
R.O.W.	60’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Bridge widening at IH-35 (for underpass) at 80’ x 120’
Street Intersections:	1
Signalized:	0
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-24
Description	Extend Craddock south to Wonder World Drive (2 lane section)
Length	Approximately 0.77 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	30’
R.O.W.	60’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	1 (at Wonder World Drive)
RR Crossings:	
Signalized:	None
Grade Separated:	

Project I.D.	R-25
Description	Widen Thorpe Lane to 5 lanes from Aquarena Springs Drive to Hopkins Street (2-lane widening)
Length	Approximately 0.68 miles
Existing Status:	
Pavement	Varies ± 36’ to ± 48’
R.O.W.	± 70’
Proposed Status:	
Pavement	30’ additional (for continuous 5-lane section)
R.O.W.	40’ additional (± 110’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	3
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-26
Description	Widen Hutchinson to 3 lanes from C.M. Allen Parkway to Moore Street
Length	Approximately 0.59 miles
Existing Status:	
Pavement	± 24’
R.O.W.	± 50’
Proposed Status:	
Pavement	12’ additional (36’ total)
R.O.W.	20’ additional (70’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	8
Signalized:	2
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-27
Description	Widen IH-35 overpass to 6 lanes (at SH 123)
Length	0.10 mile (500 ± feet)
Existing Status:	
Pavement	4 lanes at ± 15’ each with shoulders
R.O.W.	± 300’
Proposed Status:	
Pavement	6 lanes at ± 15’ each with shoulders
R.O.W.	No additional needed
Bike Lanes:	None
Sidewalks:	None
Bridges/Culverts:	Widen existing bridge for 2 additional lanes (30’ x 500’)
Street Intersections:	None
Signalized:	
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-28
Description	Widen Uhland Road to 3- 4 lane section (2 lane widening) from IH-35 to Post Road
Length	0.49 miles
Existing Status:	
Pavement	± 24’
R.O.W.	± 50’
Proposed Status:	
Pavement	24’ additional (48’ total)
R.O.W.	40’ additional (± 90’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	1 (at Post Road)
RR Crossings:	
Signalized:	1
Grade Separated:	

Project I.D.	R-29
Description	Extend River Ridge Parkway from Post Road to Lime Kiln Road
Length	1.26 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	30’ (48’ ultimate)
R.O.W.	80’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Major Culvert at Sink Creek tributary crossing
Street Intersections:	
Signalized:	1 (at Post Road)
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-30
Description	Construct 4 lane north-south arterial east of IH-35 from Posey Road to SH 21 at SH 80
Length	6.78 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’ with 23’ median
R.O.W.	140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	3 Bridges (1 at Blanco River 70’ x 700’; 1 at San Marcos River 70’ x 200’; 1 at Cottonwood Creek 70’ x 200’)
Street Intersections:	
Signalized:	3
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-31
Description	Realign, straighten and widen Yarrington Road to 4 lanes from SH 21 to IH-35
Length	2.67 miles
Existing Status:	
Pavement	± 24’ with shoulders
R.O.W.	± 60’
Proposed Status:	
Pavement	48’ with 23’ median
R.O.W.	140’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	2 (1 at IH-35; 1 at SH 21)
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-32
Description	Extend Stagecoach Trail from Craddock to West Outer Loop
Length	1.55 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	30’
R.O.W.	60’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Major Culvert at Purgatory Creek crossing
Street Intersections:	3
Signalized:	0
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-33
Description	Construct Purgatory Parkway between Craddock South and Stagecoach Trail western extension
Length	1.33 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	30’
R.O.W.	60’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None (Note: Minor culvert at Purgatory Creek tributary crossing)
Street Intersections:	2
Signalized:	0
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-34
Description	Widen Charles Austin to 4 lane undivided (2 lane widening)
Length	0.34 miles
Existing Status:	
Pavement	± 24’
R.O.W.	± 50’
Proposed Status:	
Pavement	24’ additional (± 48’ total)
R.O.W.	40’ additional (± 90’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	
Signalized:	2 (1 at Hopkins; 1 at Aquarena Springs)
RR Crossings:	1
Signalized:	1
Grade Separated:	0

Project I.D.	R-35
Description	Widen FM 621 to 3 lanes from SH 123 to Old Bastrop Highway
Length	2.40 miles
Existing Status:	
Pavement	± 24’
R.O.W.	± 50’
Proposed Status:	
Pavement	12’ additional (36’ total)
R.O.W.	20’ additional (70’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	7
Signalized:	1 at SH 123
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-36
Description	Realign and straighten Cape Road, including new bridge
Length	0.21 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	30’
R.O.W.	60’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Bridge 50’ x 200’ at San Marcos River crossing
Street Intersections:	1
Signalized:	0
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-37
Description	Widen SH 21 to 6 lanes from SH 80 to northern ETJ limit (3 lane widening)
Length	5.50 miles
Existing Status:	
Pavement	4 lanes at ± 15’ each = ± 60’ + shoulders
R.O.W.	± 120’
Proposed Status:	
Pavement	6 continuous lanes + center left turn lane at ± 15’ each = ± 105’
R.O.W.	60’ additional (±180’ total)
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	1 Major Culvert
Street Intersections:	
Signalized:	2 (1 at SH 80; 1 at Yarrington Road)
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-38
Description	Widen IH-35 to 8 mainlanes / 3 lanes frontage roads throughout ETJ
Length	14.20 miles
Existing Status:	
Pavement	6 mainlanes (3 each direction) at ± 15’ + shoulders = ± 115’ +; 2-lane frontage roads each side = ± 30’
R.O.W.	± 300’
Proposed Status:	
Pavement	2 additional mainlanes (8 total @ ± 15’ + shoulders = ± 150’) 1 additional frontage road lane (6 total = ± 90’)
R.O.W.	400’ total (100’ additional)
Bike Lanes:	None
Sidewalks:	None
Bridges/Culverts:	10 mainlane bridges at 30’ additional x 500’; 1 mainlane and frontage road bridge each at Blanco River crossing; 10 frontage road bridges at 30’ additional x 200’
Street Intersections:	N/A
Signalized:	
RR Crossings:	
Signalized:	2 (1 at each frontage road)
Grade Separated:	1 Mainlane

Project I.D.	R-39
Description	Construct Cottonwood Parkway from IH-35 to SH 123
Length	1.12 miles
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	48’
R.O.W.	80’
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	3 (1 at IH-35; 1 at Leah Avenue; 1 at SH 123)
Signalized:	0
RR Crossings:	None
Signalized:	
Grade Separated:	

Project I.D.	R-40
Description	Construct connection between San-Mar Plaza and Wal-Mart
Length	0.09 mile (± 500 feet)
Existing Status:	N/A
Pavement	N/A
R.O.W.	N/A
Proposed Status:	
Pavement	24’
R.O.W.	44’ access easement
Bike Lanes:	Both Sides
Sidewalks:	Both Sides
Bridges/Culverts:	None
Street Intersections:	0
Signalized:	
RR Crossings:	None
Signalized:	
Grade Separated:	

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