

San Angelo Area Bicycle & Pedestrian Plan

prepared for the

Metropolitan Planning Organization
San Angelo, Texas

by

Wilbur Smith Associates

Economist, Planners, Engineers

Table of Contents

	<u>Page</u>
CHAPTER 1 – INTRODUCTION	
Purpose and Need	1-1
Public Input	1-2
Public Information	1-3
CHAPTER 2 – GOALS AND OBJECTIVES	
Goal Statement	2-1
Objectives	2-2
CHAPTER 3 – EXISTING CONDITIONS	
Related Planning Documents	3-1
Existing Conditions for Pedestrians	3-2
Existing Conditions for Bicyclists	3-3
Existing Barriers	3-6
Origins and Destinations	3-8
Bicycle and Pedestrian Crashes	3-8
The “Design Bicyclist”	3-11
The “Design Pedestrian”	3-13
Current Facility Design Practice	3-13
CHAPTER 4 – BICYCLE AND PEDESTRIAN FACILITIES DESIGN	
Design Standards	4-1
Bicycle Facility Types	4-2
Sidewalks	4-7
Safe Rotes to School	4-8
Roadway Intersection Design	4-9
Roadway Intersection Design for Pedestrians	4-9
Roadway Intersection Design for Bicyclists	4-10
Minimum Green Time	4-10
Amber Clearance	4-11
Signal Detectors	4-11
Signage and Striping	4-12
Pedestrian Accommodation Policies and Programs	4-13
Safe Routes to School	4-13
Sidewalks and Pedestrian Districts	4-15
Typical Facility Development Costs	4-15
CHAPTER 5 – PROGRAM OF BICYCLE AND PEDESTRIAN FACILITIES	
Facilities Development Criteria	5-1
Proposed On-Street Facilities	5-2
Proposed Pedestrian Routes	5-4
Pedestrian Districts	5-6
Proposed Off-Street Facilities (Bike Paths and Multi-Use Paths)	5-6
Bike Routes for Commuter and Long-Distance Bicyclist	5-8
Supporting Amenities and Programs	5-13
Bicycle Parking	5-13
Bicycles and Transit	5-

Table of Contents

14		
Prioritization for Implementation		5-14
		<u>Page</u>
CHAPTER 6 – IMPLEMENTATION PLAN		
Action Area 1. Organize a Bicycle/Pedestrian Program		6-1
Action Item 1.1 – Institutionalize the Role of Bicycle and Pedestrian Coordination within Local Government		6-2
Action Item 1.2 – Promote Land Use Patterns and Zoning that Encourage Walking and Bicycling to Destinations		6-3
Action Item 1.3 – Promote Bicycle- and Pedestrian-Friendly Urban Development and Design that Facilitate Walking and Bicycling		6-3
Action Item 1.4 – Adopt Public Right-of-Way Design Standards that Accommodate Bicycling and Walking		6-3
Action Item 1.5 – Educate Planners, Local Enforcement Officers, Designers and Other Officials		6-4
Action Area 2. Plan and Construct Needed Facilities		6-4
Action Item 2.1 – Adopt a Bicycle and Pedestrian Plan		6-5
Action Item 2.2 – Identify/Coordinate Funding Sources		6-5
Action Item 2.3 – Construct, Improve and Maintain Facilities		6-8
Action Item 2.4 – Provide Facilities to Accommodate Bicycle/Transit Joint Use		6-9
Action Area 3. Promote Bicycling and Walking		6-10
Action Item 3.1 – Prepare and Disseminate Public Information on Bicycle and Pedestrian Routes and Programs		6-10
Action Item 3.2 – Participate in National Programs		6-10
Action Item 3.3 – Foster the Development of Local Bicycling and Walking Events and Programs		6-10
Action Item 3.4 – Adopt Public Policies		6-11
Action Area 4. Educate Bicyclists, Pedestrians and Motorists		6-11
Action Item 4.1 – Dissemination of Available Safety and Education Materials		6-11
Action Area 5. Enforce Laws and Regulations		6-12
Action Item 5.1 – Target Areas for Enforcement and Encouragement of Proper Behaviors		6-12
Appendices:		
A – Listing of Bicycle/Pedestrian Facilities		
B – Prioritization of Future Projects		
C – ADA Transition Plan Framework		
D – Financing Opportunities		
E – Policy Statements		



Bicycle and Pedestrian Plan

Purpose and Need

States and Metropolitan Planning Organizations across the country are completing plans to address bicycle and pedestrian issues, in part to respond to the requirements of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) and its successor, the Transportation Equity Act of the 21st Century (TEA21). Many of these plans are adopting the overall goal targets set by the U.S. Department of Transportation in April of 1994: (1) to double the percentage of trips made by foot and bicycle in the United States; and (2) to simultaneously reduce the number of injuries and fatalities suffered by bicyclists and pedestrians by ten percent.

The Metropolitan Planning Organization (MPO) for the San Angelo urbanized area recognizes that transportation planning includes addressing the access and mobility needs of bicyclists and pedestrians to travel to work and non-work destinations - including education centers, commerce, entertainment, and recreation - within and in close proximity to neighborhoods. The MPO selected Wilbur Smith Associates to work with the MPO to prepare a bicycle and pedestrian plan for the San Angelo metropolitan planning area consisting of the city of San Angelo and extending into the surrounding unincorporated areas of Tom Green County. The Plan provides the region with a strategy for creating an environment where people could choose to bicycle or walk to their destinations and provide recreational opportunities for walking and bicycling to encourage a healthy and active lifestyle. The Plan provides guidance for the development and implementation of an interconnected network of designated on-street bicycle facilities as well as off-roadway trails and a system of sidewalks.

Public Input into Development of the Plan

Local needs for bicycling and pedestrian facilities were determined through an advisory committee of local advocates, as well as discussions with representatives of specific bicycle and pedestrian destinations. General public input and commentary were received through the MPO website and during two public meetings and are summarized in **Appendix A**.

Bicycle/Pedestrian Advisory Committee - Local walking, running and bicycling advocates have over the years been providing encouragement and input to the city of San Angelo for the development of the existing and proposed trail facilities and amenities in the city. Many of these advocates agreed to serve as an advisory group to the development of the Bicycle and Pedestrian Plan. The Bicycle/Pedestrian Advisory Committee (BPAC) also included representatives from the City of San Angelo Public Works and Parks Departments and the San Angelo District of the Texas Department of Transportation. The BPAC provided initial input on potential on-street and off-street facilities, and advice and feedback on needed programs and approaches to implementation.



Special Generators – Discussions were held with representatives of Angelo State University, Goodfellow Air Force Base, and San Angelo State Park regarding their generation of bicycle and pedestrian trips and the relationship to the San Angelo Bicycle and Pedestrian Plan.

Public Meetings – Two public open house meetings were held on weekdays from late afternoon into early evening, one on the north side of town at Lincoln Junior High School and one toward the southwest side of town at the San Angelo District of



the Texas Department of Transportation. At these public meetings, various static displays were presented, including:

- educational materials on the health and social benefits of bicycle and pedestrian activities.
- imagery on existing conditions for walking and examples of good treatments.
- Information on non-motorized access to schools and transit service, and an interactive display by the Safe Kids Coalition.
- A map of the potential network of multi-use paths and on-street bikeways and information on typical designs of these facilities.
- Examples of pedestrian district concepts for various neighborhoods.
- A timeline for implementation of the various programs and facilities.

An opinion survey was conducted after visitors were escorted through the displays to gather information on their walking and bicycling activities and some attitudes towards the activities and facilities. The information gathered is summarized in Appendix A.



Public Information – The general public was provided with opportunities to receive information and provide input through the local media, presentations at San Angelo Planning Commission and MPO Board meetings, presentations to Kiwanis Club and PTA meetings, and information displayed or made available at local restaurants, grocery stores, and the public library. The MPO website hosted a survey on bicycling and walking activities and comments – the same survey conducted at the public meetings - the results of which are tabulated in Appendix A.





Chapter 1

Introduction



Chapter 2 Goals and Objectives of the Plan

Bicycle and Pedestrian Plan

The first step toward advancing bicycle and pedestrian mobility and safety in the San Angelo metropolitan area is to establish a common vision or goal statement for non-motorized transportation, and to define a set of objectives by which progress in achieving desired outcomes can be measured. These goals and objectives guide not only the development of the Bicycle and Pedestrian Plan, but also its implementation.

Goals Statements

Based on guidance from the Bicycle and Pedestrian Advisory Committee (BPAC), and with confirmation from other advocates, agency staff and the general public, the following goals were established for the San Angelo urbanized area to make it a better and safer place to walk and ride bicycles.

- Goal #1.** Improve bicycle access, mobility and safety for transportation, health and recreational uses.
- Goal #2.** Improve pedestrian access, mobility and safety for transportation, health and recreational uses.
- Goal #3.** Enhance San Angelo for tourism, economic development and as a “healthy” place to live by improving upon and promoting bicycle and pedestrian activities.

Objectives

To achieve these goals, objectives were identified by the BPAC, local agency staff, and from user groups and the general public to set targets and provide measures of the success of the plan towards meeting the stated goals.

1. Objectives to improve bicycle access, mobility and safety for both transportation and recreational uses:

- 1.1 Create and adopt bicycle master plan that integrates and institutionalizes bicycling as part of the transportation system.
- 1.2 Create a bicycle recreation network that also serves the bicycle transportation network.
- 1.3 Identify key bike routes and assign priority according to ease of implementation, visibility and potential to serve as a “catalyst” to achieve other objectives.
- 1.4 Provide continuity between these bike routes and connections to key attractors.
- 1.5 Establish and institutionalize collaboration between the City of San Angelo and Tom Green County, the MPO and TxDOT to optimize opportunities to implement bicycle facilities.
- 1.6 Encourage bicycle use through City-and community-sponsored education and promotion programs.
- 1.7 Educate the motoring public about traffic laws pertaining to sharing the road with bicyclist, and safe and courteous driving responding to bicyclists traveling along the roadway.
- 1.8 Research and identify all potential sources of funding for implementing bicycle facilities and programs.
- 1.9 Codify bicycle infrastructure requirements in all private and public development and redevelopment processes.
- 1.10 Strategically and systematically develop the network of on-street and off-street bicycling facilities and support programs.

2. Objectives to improve pedestrian access, mobility and safety for transportation, health and recreational uses:

- 2.1 Create and adopt pedestrian master plan that integrates and institutionalizes walking as part of the transportation system.
- 2.2 Identify key “pedestrian districts” and inventory sidewalk / trail needs. Examples of potential pedestrian districts include:
 - Central Business District

- Concho River Trail corridor
 - Red Arroyo Trail corridor
 - Museums, visitor’s center, destination parks
 - Senior Citizens and retirement facilities
 - Disabled citizen’s housing areas if clustered
 - Areas of the city with high transit use
 - Goodfellow Air Force Base
 - Government facilities per the Americans with Disabilities Act
- 2.3 Create intra-and inter-neighborhood connections to key attractors such as parks, retail, and transit stops.
- 2.4 Develop safe routes to school plans for each school service area.
- 2.5 Identify and prioritize the most important locations for building sidewalks and improving pedestrian safety.
- 2.6 Develop designs and programs to utilize the Red Arroyo, Concho River, utility easements, creeks, etc. for developing an “interesting” trail network for recreation and exercise walking.
- 2.7 Prepare an inventory of needs and designs to retrofit existing sidewalks with curb ramps and other ADA-required improvements to comply with pending federal ADA rules pertaining to the accessibility of public right-of-way.
- 2.8 Create long-term sidewalk implementation plan (for both new road construction and alterations to existing roadway corridors).
- 2.9 Codify sidewalk requirements in all private and public redevelopment processes.
- 2.10 Educate the motoring public about traffic laws pertaining to pedestrians and safe and courteous driving vis-à-vis pedestrians.
- 2.11 Enforce the traffic laws regarding yielding to pedestrians at crosswalks, slowing through school zones and other critical interfaces with pedestrians.
- 2.12 Research and identify all potential sources of funding for implementing pedestrian facilities and programs.
- 2.13 Strategically and systematically develop the network of sidewalk and trail facilities and support programs.

3. Objectives to enhance San Angelo for tourism, economic development and as a “healthy” place to live by improving upon and promoting bicycle and pedestrian activities:

- 3.1 Create and/or update existing maps of trails, walking routes.
- 3.2 Develop comprehensive wayfinding schemes and signs for the network of hike and bike trails and selected pedestrian districts.
- 3.3 Create a promotion / communication plan within the bicycle and pedestrian master plans.
- 3.4 Educate the public about the connection between bicycling and/or walking and health.
- 3.5 Promote bicycling and walking as viable transportation modes to raise the respect for walkers and bicyclists among the general public.
- 3.6 Address the needs of all of San Angelo’s demographic groups in prioritizing projects and programs for bike / ped improvements, e.g., income, age, ethnicity, Goodfellow residents, ASU students, and other socioeconomic groups.

Each of these related objectives is associated with the development of the Bicycle and Pedestrian Plan. These objectives are concise statements providing guidance for achieving the goal of the bicycle and pedestrian plan.

Targeted Focus Areas

The objectives identify several focus areas that should be addressed by the plan and subsequent plan refinements.

Accessibility - Providing access to multiple areas of the city for all citizens is an important consideration in development of transportation facilities. Access should be provided at the neighborhood, area, and regional levels to accommodate access for cycling and walking to major employment centers and activity centers; recreational facilities; community facilities such as schools, libraries, community centers, and transit facilities; and other

major destinations. Planning for pedestrian access should also incorporate the needs of mobility impaired persons, including blind, deaf, and wheelchair-bound individuals. The following needed work areas specify the intent of providing access through the development and implementation of the bicycle and pedestrian plan.

Safety - Safety considerations must be an integral part of the development of a bicycle and pedestrian plan. The provision of safe and well maintained facilities for cyclists and pedestrians is of prime importance. Safety literature and safety programs need to be provided to cyclists, motorists, and pedestrians.

Design Considerations - Proper design of bikeway and walkway facilities will encourage and facilitate bicycling and pedestrian activity. Use of uniform development standards and coordination of existing programs and facilities are critical for successful implementation of the bicycle and pedestrian plan.

Interagency Coordination and Policies - There are numerous governmental jurisdictions and public services entities that have control of public rights-of-way, which may potentially be used to provide bicycle and pedestrian facilities. It is important to coordinate with these agencies and organizations and to understand their internal policy framework and the legislative mandates that they must operate within. Public entities as well as organizations in the private sector can and should become partners in the development and implementation of the bikeway and walkway system.

Education - Education of the citizenry and public agency staff regarding the bicycle and pedestrian plan is important for several reasons. Cyclists must be provided information and guidance in regard to proper and safe use of the bikeway system. Pedestrians must know how to properly use and share sidewalks and trails, and should understand the importance of visibility in their efforts to cross roadways. Motorists must understand and respect the presence of cyclists when traveling along roadways on or off the designated bikeway system. Public agencies must make informed decisions to include consideration of cyclists and pedestrians in transportation and access

planning. Developing and disseminating information is a key component to a successful education and safety program.

Funding – The ability to fund the implementation of the Plan elements is often the largest stumbling block towards creation of a bicycle and pedestrian community. The collective will to plan, encourage, and uphold the precepts of the Plan will determine the success of the implementation of the vision presented in this Plan.

The following chapters describe the development of the plan, outlining the needs and resources of the community and recommendations for facilities and implementation strategies.



Chapter 3 Existing Conditions

Bicycle and Pedestrian Plan

The existing conditions for bicycle and pedestrian activities, as well as any planned improvements, were reviewed and are described in the following paragraphs to provide a baseline condition for facility development.

Related Planning Documents

Several studies and reports have been previously prepared which pertain to bicycle and/or pedestrian accommodations and activities in the San Angelo urbanized area. The following materials were reviewed and utilized as a point of beginning to create the Bicycle and Pedestrian Plan:

- Parks Master Plan for San Angelo by the San Angelo Parks Department (2002). This extensive inventory of the city's existing parks and identification of needs contains a chapter on trails within and connecting to city parks;
- Concho River Corridor Study by the San Angelo Park and Recreation Department. This study of the river corridor environment includes recommendations for hike and bike trails;
- San Angelo Metropolitan Transportation Plan, Fiscal Year 2000-2025, by the Angelo Metropolitan Planning Organization (January 2000) contained a chapter entitled "Bicycle and Pedestrian Plan";
- San Angelo Thoroughfare Plan by the City of San Angelo (2003), which defines the functional classification of each street and typical design sections for each classification; and
- Red Arroyo Trail Funding Nomination by City of San Angelo (2002), which detailed a trail alignment across the south central part of San Angelo.
- Conditions Assessment of the North Concho River Hike & Bike Trail by KDC-Turner Partners for the City of San Angelo (2003).

These and other documents and input from various agencies provided historical information, projections of future conditions, and a framework for creation of the bicycle and pedestrian plan.

Existing Conditions for Pedestrians

Existing Sidewalks - Within the core of downtown, sidewalks surround each major building. However, outside of downtown very few sidewalks exist. Some older parts of town contain remnants of sidewalks, but few and scattered sidewalks exist in the city.

Existing Public Multi-use Trails - A well-utilized public walking, jogging, and bicycling trail currently exists in the center of San Angelo, just south of Downtown, along the Concho River. A Visitor Center has been constructed along the south side of the river near the midpoint of the existing trail. The 2001 Parks, Recreation, and Open Space Master Plan for the City of San Angelo identified the North and South Concho Rivers as “high priority” locations for preservation, conservation, and trail development.

In 2003, the City of San Angelo retained KDC-Turner Partners to assess the conditions of the existing hike/bike trail of the North Concho River including:

- a. Surface condition of the trail
- b. Compliance with the ADA and Texas Accessibility Standards
- c. General safety issues
- d. Existing lighting conditions
- e. Existing parking availability and quality
- f. Existing signage placement
- g. Aesthetics

The study also identified a proposed list of trail improvements to address some of the deficiencies identified in the assessment, as well as concepts for extensions of the existing trail system including linkages to existing public parks, schools, and drainage corridors.

The following are excerpts or paraphrases of the issues identified by KDC-Turner Partners in the study regarding the trail system:

Surface Condition of the Trail - The existing trail system is composed of different media including crushed limestone, poured concrete, and





interlocking concrete pavers. The limestone is in good condition in many locations, but has been eroded and washed away in other locations. The concrete borders on either side of the limestone are uneven in spots, which allows grass and weeds to encroach upon the trail. Virtually all of the areas where the trail is concrete are in very good condition, as are the areas with the interlocking concrete pavers. KDC-Turner Partners recommended that all

future trail additions be constructed out of concrete and be eight (8') feet wide whenever possible in order to comply with State and AASHTO standards.

Compliance with the Americans with Disabilities Act (ADA) - The trail system lacks proper ADA and Texas Accessibility Standards (TAS) compliance along virtually its entire length. Even though picnic tables in certain areas have begun to be upgraded to meet ADA compliance, the substandard access to and from trailhead parking facilities would usually eliminate wheelchair or other physically disabled users from interacting with the trail system. Additionally, many regions of the trail system utilize slopes that are too extreme for compliance with ADA and TAS standards. Handicap ramps have been placed in some locations, but these often simply lead to grassed areas that are non-compliant. The few pedestrian crosswalks along the trail system are extremely dangerous and not in compliance with current standards.

Existing Lighting - The majority of the trail system is inadequately lit. Many lights along the trail have been removed for reasons unknown. Three (3) different lighting standards have been utilized along the trail system. Effort should be made to completely replace the old lighting

system along the trail length, while maintaining one (1) independent style in the area surrounding the museum in order to give this unique area additional character.

“Parking Availability and Condition - The existing parking areas along the trail are few and far between and generally are in total non-compliance with the ADA. Some areas could be brought into compliance fairly easily, while others will need to be demolished and constructed anew. Information kiosks with maps placed in each parking area would be of great benefit to the visitors of the trail system.

Erosion Issues – The study noted erosion of the riverbanks caused by several factors, including sheet drainage, inadequate bank vegetation, construction, and river channel erosion. The addition of specific vegetations, the re-grading of areas of the riverbanks, and the construction of stone retaining walls should be initiated to avoid further deterioration of the trail

New Non-Motorized Vehicle Bridge - A former narrow street bridge at Avenue K across the Concho River has been made obsolete by the construction of a new roadway bridge across the Concho River on Avenue L. This former TxDOT-roadway bridge has been converted to ownership by the City of San Angelo, and has been scheduled for conversion to non-motorized use only. This bridge is adjacent to public utility properties along the Concho River and near to a park just south of Avenue L. This bridge is targeted for use as a focal point of trails to connect along the Concho north to the existing Concho Trails and south along the Concho River and to the proposed Red Arroyo Trail.

Existing Conditions for Cyclists

A bicycle is legally recognized by the State of Texas (and many other states) as a vehicle, with all the rights and responsibilities for roadway use that are also provided to motor vehicles. As such, cyclists can legally ride on any of the streets in San Angelo, except those specifically precluding them, such as could be established along controlled access highways. However, certain roadways are more attractive to riders than others.

Basically, local and collector streets can be suitable for use by most adult bicycle riders, as long as traffic volumes are not high and speeds are less than 35 miles per hour. Arterial streets typically carry higher traffic volumes with speeds of 35 to 45 miles per hour, and are used by only the more skilled and assertive bicyclists. Rural arterials with shoulders and/or very low traffic volumes attract cyclists that are interested in longer-distance travel with fewer interruptions (stops).

Many of the rural arterials, primarily those with shoulders greater than four feet in width, could be designated as bike routes after careful consideration of safe bicycle accommodations at intersections. Many existing local and collector streets could also be designated as bike routes after review of traffic volumes and speeds on those roadways. However, by definition, these roadways are open to bicycle travel now and should be maintained as such.

Unfortunately, many roadways that have wider cross sections and/or shoulders are being overlaid with an open-graded sealcoat, such as was done on Loop 306, that is very rough for bicyclists to ride on. Use of a finer-graded mix design should be considered in future applications, and TxDOT San Angelo District has indicated that it is planning to make that adjustment for future facility shoulder and frontage road overlays.

Existing Barriers to Mobility

The crossing of barriers to mobility is one of the most important features of a bicycle and pedestrian plan for the community. Freeways, major arterials, railroads, water features, and topography can all impose significant barriers to bicycle access and mobility. The San Angelo urbanized area poses several significant barriers to safe and convenient bicycle and pedestrian travel. These include:

Limited Access Freeways - Without a grade separated crossing, it is impossible to cross limited access freeways; as a result, the limited number of vehicular crossings concentrate traffic at these funnel points. These freeways include:

- **Houston–Harte** –The following streets cross Houston-Harte: Bell, Baze, Oakes, Bryant, Garfield, and Arden cross over the main lanes, while Main, Jefferson, Van Buren, Howard and Glenna cross under the main lanes. While conditions on the overpasses are generally improved to provide ADA accessible sidewalks, traffic lanes are not wide enough to be shared by motorist and bicyclist. The underpasses appear to accommodate neither bicyclist nor pedestrian in their design. The crossings at Baze, Garfield, Jefferson and Van Buren are lower volumes streets that could be targeted for bicycle and pedestrian improvements.

The frontage roads of this limited access freeway are continuous except at the railroad crossing and are generally suitable for advanced bicyclists to ride, with an extremely wide outside lane along both frontage roads for most of its length. Posted speeds along the frontage road are 40 to 45 MPH and some lane width constraint occur near ramps and intersections. No sidewalks are

provided along the frontage roads, though some foot paths have been observed in the grass.

- Loop 306 – Crossings of the limited access portion of Loop 306 are provided less frequently than on Houston-Harte. Southwest, College Hills, Knickerbocker Road (FM 584) and Foster Road are the only crossings in the four miles between Houston-Harte and the Concho River. The frontage roads are discontinuous at the Concho River, that begin again at the Ben Ficklin Road intersection.

Concho River Forks and the Red Arroyo - Waterways present a natural barrier that must be bridged to be traversed by land-based vehicles. The investment required to construct such a bridge and the private ownership of shoreline properties limit the number of crossing points and, again, focuses traffic at those points. The Concho River, the South Concho River, the Red Arroyo, Main Canal, the sprawling Lake Nasworthy and numerous smaller ditches and streams provide obstacles for mobility in general, and a concentration of traffic at provided crossings.

Railroads - The railroad companies have allowed a limited number of street crossings of their tracks to minimize the exposure to railroad crossing accidents with motor vehicles. Though crossing points tend to be more frequent for the railroads, the effect on concentrating traffic at crossings is similar to that of the freeways. The South Orient Railroad cuts diagonally northeast at the San Angelo Rail Yard to southwest across San Angelo, and also from along Old Balinger Highway into the north side of downtown and then along the north side of the Concho River.

Heavily Traveled Arterials - The many major arterial roadways in San Angelo can also present challenges to crossing, and tend to focus traffic to signalized intersections. In general, arterial streets carrying high volumes of

traffic at high speeds are a safety concern for pedestrians and bicyclist traveling along the roadway and crossing the roadway. Some type of traffic control (stop signs or traffic signals at intersections) is typically needed for the safe crossing of such roadways by cyclists and pedestrians. At uncontrolled locations, a pedestrian refuge area such as a raised median of the roadway, can enhance the safety of the crossing. There is a trade-off that must be considered between the needs of bicyclists and pedestrians and the delays imposed to significant volumes of motor vehicle traffic.

Origins and Destinations

The existing roadway network has been developed to provide access from where people are to where they want to go. Historical focus on mobility by the personal automobile and motorized transport has resulted in roadbeds being the predominant feature in the rights-of-way established for the transport of goods and people. However, anywhere a roadway goes is a potential destination for cyclists and, in many instances, pedestrians. High areas of interest for access by bicycle include schools, libraries, and parks. Pedestrian access should be provided to all destinations that are within walking distance (about one-quarter mile) of where people live and/or work. Key existing or potential destinations for walking or bicycling include downtown, the Concho River Trail, Goodfellow Air Force Base, Angelo State University, public schools, libraries, parks, recreations centers, and concentrations of commercial development.

In addition, cycling as a form of non-polluting recreation and sport can make advantageous use of the shoulders and service roads of many roadways and highways. The development of loop routes in the area will accommodate the needs of the longer-distance cycling activities.

Bicycle and Pedestrian Crashes

One of the national goals of the U.S. Department of Transportation (DOT) is to reduce the number of bicycle and pedestrian accidents, which the DOT describes as "crashes". The *National Bicycling and Walking Study - Transportation choices for a Changing America* presents a plan of action for activities at the Federal, State, and local levels for meeting two concurrent goals:

- To double the current percentage of total trips made by bicycling and walking; and,
- To simultaneously reduce by ten percent the number of bicyclist and pedestrians killed or injured in traffic crashes.

Nationally, approximately 6,500 pedestrians and 900 bicyclists are killed each year as a result of collisions with motor vehicles. As a group, pedestrians and bicyclists comprise more than 14 percent of all highway fatalities each year. Pedestrians account for as much as 40 to 50 percent of traffic fatalities in some large urban areas. The 1991 General Estimates System (GES) data indicate that 92,000 pedestrians and 67,000 bicyclists were injured in this type of crash.

If bicycling and walking are to be promoted in the community, it is imperative that they be made safer than current conditions provide, or an increase in accidents can be expected. To establish a baseline for future assessment of success of the bicycle and pedestrian program, accident reports for motor vehicle accidents involving bicyclists or pedestrians are summarized.

During the four year period 2001 through 2004, there were a total of 124 reported motor vehicle - pedestrian crashes in San Angelo, including 4 fatalities. In the same time period, there were 60 reported motor vehicle - bicycle crashes in San Angelo, but no fatalities. Depending on the details of each accident, facility design, unsafe driver behavior, or cyclist or pedestrian

error may be the primary causing factor. The following discussion of nationwide studies on bicycle accidents provides insight into the causal factors of accidents involving bicyclists.

A study of pedestrian and bicycle collisions with motor vehicles was conducted for the Federal Highway Administration in 1997. The study investigated in detail 3,000 bicycle-motor vehicle collisions and 5,000 pedestrian-motor vehicle collisions sampled from reports from cities in California, Florida, Maryland, Minnesota, North Carolina and Utah. The study categorized fifteen different groups of car-bike collision types. The most frequent bicycle crash types were as shown in Table 1.

Table 1
National Motor Vehicle-Bicyclist Crash Types

<u>Crash Type Group</u>	<u>% of All Crashes</u>
<u>Parallel Path Crashes:</u>	
Motorist turned or merged into the cyclist's path	12.2%
Motorist overtaking the cyclist	8.6%
Cyclist turned or merged into the motorist's path	7.3%
Other	28.1%
Total <u>All</u> Parallel Path Crashes:	35.5%
<u>Crossing Path Crashes:</u>	
Motorist failed to yield to cyclist	21.7%
Cyclist failed to yield to motorist	16.8%
Cyclist failed to yield to motorist, midblock (ride-out)	11.8%
Other	50.3%
Total <u>All</u> Crossing Path Crashes	57.5%

Similar statistics were tabulated for pedestrian-motor vehicle crashes. The data for pedestrian crashes has a wide range of contributing factors as well including alcohol impairment (which was a factor in over ten percent of all crashes), age, lighting, time of day, rural or urban. The most frequent pedestrian crash types were as shown in Table 2.

Table 2
National Motor Vehicle-Pedestrian Crash Types

<u>Crash Type Group</u>	<u>% of All Crashes</u>
<u>Intersection-Related:</u>	
Vehicle turn/merge	9.8%
Intersection dash	7.2%
Driver violation	5.1%
Walking in road prior to impact	3.1%
Multiple threat or trapped	2.1%
Total <u>All</u> Intersection-Related	32.1%
<u>Mid-block:</u>	
Dart-out	5.4%
Mid-block dash	8.7%
Walking in road prior to impact	3.9%
Pedestrian walks into vehicle	1.5%
Total <u>All</u> Mid-Block	26.4%
<u>Other:</u>	
Walking along roadway	7.9%
Off-road crashes	8.6%
Backing vehicle	6.9%
Working/playing in roadway	3.0%
Disabled vehicle related	2.1%

In order to address specific localized safety issues, it would be necessary to closely study local crash reports to determine the major crash causes, the involved age groups, and other important factors. These factors would be very useful in developing specific localized design treatments and to prepare targeted education and awareness-building programs.

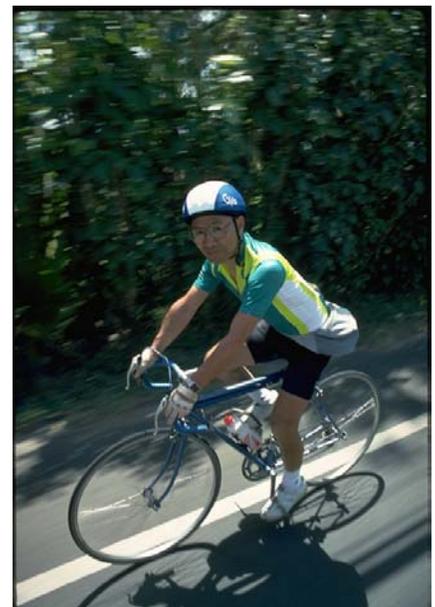
The "Design Bicyclist"

Nearly 100 million people in the United States own bicycles. Fewer than five percent would likely qualify as experienced or highly skilled cyclists. Since the federal policy goal is to accommodate existing cyclists

and encourage increased bicycle use, there will be more novice riders than advanced cyclists using the roadway system. Therefore, any roadway treatments intended to accommodate bicycle use must address the needs of both experienced and less experienced riders. In the FHWA manual, "Selecting Roadway Design Treatments to Accommodate Bicycles", the concept of a "design cyclist" was developed and a classification system was adopted for bicycle users such as the following:

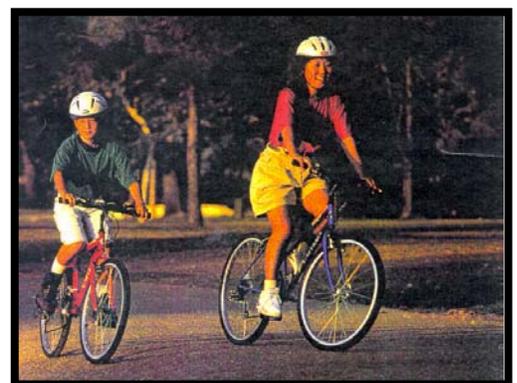
Group A - Advanced Bicyclists: These are experienced riders who can operate under most traffic conditions. They comprise the majority of the current users of collector and arterial streets, and are best served by the following:

- Direct access to destinations usually via the existing street and highway system;
- The opportunity to operate at maximum speed with minimum delays; and
- Sufficient operating space on the roadway or shoulder to reduce the need for either the bicyclist or the motor vehicle operator to change position when passing.



Group B - Basic Bicyclists: These are casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Some will develop greater skills and progress to the advanced level, but there will always be many millions of basic bicyclists. They prefer:

- Comfortable access to destinations, preferably by a direct route, using either low-speed, low traffic-volume streets or designated bicycle facilities; and
- Well-defined separation of bicycles and motor vehicles on arterial and collector streets (bike lanes or shoulders) or separate bike paths.





Group C - Children: These are pre-teen riders whose roadway use is initially monitored by parents. Eventually they are accorded independent access to the system. They and their parents prefer the following:

- Access to key destinations surrounding residential areas, including schools, recreation facilities, shopping, or other residential areas;
- Residential streets with low motor vehicle speed limits and volumes; and
- Well-defined separation of bicycles and motor vehicles on arterial and collector streets using sidewalks or separate bike paths.

The "Design Pedestrian"

Everybody is a pedestrian to some extent during their journeys each day, whether at either end of their trip or at points along the way. Many persons walk or jog for personal fitness or enjoyment, as these activities are part of a healthy lifestyle. It has been observed that pedestrian activity along the city streets are the life signs of a thriving community.

A large percentage of the pedestrian population consists of children and elderly persons. The requirements of the Americans with Disabilities Act must also be incorporated into design. Ample consideration must be given to the needs of these pedestrians when determining such parameters as: pedestrian crossing time at intersections; placement of street furniture and signs; curb cuts at street crossings; pathway width and slopes; and maintenance of the pathway.

Current Facility Development Practice

When investing in public infrastructure for transportation, consideration must be given to all modes, not just cars, trucks, and buses. The need for sidewalks on each side of a roadway and accommodations for bicyclists must

be considered. This is the national policy as envisioned under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), and reinforced under the Transportation Efficiency Act for the Twenty-First Century (TEA 21).

Historically, the Texas Department of Transportation (TxDOT) has not participated financially in the construction of sidewalks along roadways that are part of the State Highway System. Use of roads by cyclists has not previously been considered a serious design factor. ISTEA mandated that a bicycle coordinator be designated by each state DOT. TxDOT has established a bicycle/pedestrian coordinator at the state level, and has also designated persons with bicycle coordinator responsibilities at each of its district offices as well. TxDOT is increasingly considering bicycle and pedestrian accommodations on its existing facilities and new projects, but primarily at the request of the local agencies.



Chapter 4 Bicycle and Pedestrian Facilities Design

There is a wide range of facility improvements which can enhance bicycle and pedestrian transportation. 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). The major feature of the design for a bicycle or pedestrian facility is its location (i.e., whether it is on a roadway or follows its own independent alignment). Roadway improvements such as bicycle lanes depend on the roadway's design. On the other hand, bicycle paths are located on independent alignments; consequently, their design depends on many factors, including the performance capabilities of the bicyclist and the bicycle.

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.

Design Standards

All bicycle and pedestrian facilities should meet the minimum standards recommended by the American Association of State Highway and Transportation Officials (AASHTO) in the publication Guide for the Development of Bicycle Facilities, 1999, or its most current edition. Pavement striping, signage, and signals should be in accordance with the most current Texas version of the Manual on Uniform Traffic Control Devices (MUTCD). Hike and bike trails and sidewalks should be accessible and traversable by physically disabled persons and should comply with the guidelines set forth by the American with Disabilities Act of 1990 (ADA), as

enforced in Texas by the Architectural Barriers Section of the Texas Department of Licensing and Regulation.

**Table 3
Facility Types**

Classification	General Description	Description of Each Type
Park Trail	Multipurpose trails located within greenways, parks and natural resource areas. Focus is on recreational value and harmony with natural environment.	Type I: Separate/single-purpose hard-surfaced trails for pedestrians or bicyclists/in-line skaters. Type II: Multipurpose hard-surfaced trails for pedestrians bicyclists/in-line skaters. Type III: Nature trails for pedestrians. May be hard or soft surfaced.
Connector Trails	Multipurpose trails that emphasize safe travel for pedestrians to and from parks and around the community. Focus is as much on transportation as it is on recreation.	Type I: Separate/single-purpose hard-surfaced trails for pedestrians or bicyclists/in-line skaters located in independent ROW Type II: Separate/single-purpose hard-surfaced trails for pedestrians or bicyclists/in-line skaters. Typically located within road ROW.
On-Street Bikeways	Paved segments of roadways that serve as a means to safely separate bicyclists from vehicular traffic.	Bike Route: Designated portions of the roadway for the preferential or exclusive use of bicyclists. Bike Lane/Shoulder: Shared portions of the roadway that provide separation between motor vehicles and bicyclists.
All-Terrain Bike Trail	Off-road trails for all-terrain (mountain) bikes.	Single-purpose loop trails usually located in larger parks and natural resource areas.
Equestrian Trail	Trails developed for horseback riding.	Loop trails usually located in larger parks and natural resource areas. Sometimes developed as multipurpose with hiking and all-terrain biking where conflicts can be controlled.
Sidewalks	Parallel to streets, adjacent to curb or separated by grassy area.	Provides for walking and child cyclists. Crossing at intersections should be identified by markings or textured pavement, ADA ramps.

Bicycle Facility Types

The types of facilities that may be provided for bicycle mobility include shared roadways, bicycle routes, wide curb lanes as a special class of bicycle routes, shoulder bikeways, bicycle lanes, and bike paths. These facilities are described in detail in the AASHTO Guide for the Development of Bicycle Facilities, and are briefly described in the following paragraphs.

Shared Roadway - Because a bicycle is a vehicle, any roadway (except limited access highways, freeways, and others specifically prohibiting bicycle traffic) may be considered part of the on-road bicycle network. Because existing roads typically offer the most direct route to many destinations, they tend to be favored by advanced (Group A) cyclists. Local streets that carry low volume, low speed traffic are generally suitable for all cyclists except for young children generally under the age of 10.

On-street parking along local streets in residential areas is compatible with bicycle use, although parking may be a conflict along streets in commercial areas.

Older roadways may still have drainage grates with longitudinal bars or slit openings parallel to the path of the bicycle that could trap the narrow wheel of a bicycle. Drainage grates should have openings that are perpendicular to the flow of traffic to ensure that bicycle tires do not become lodged in the grate.

Bicycle Route - Shared roadways designated as Bike Routes should be signed using standard MUTCD signage. Such designations are used to denote streets that can see significant bicycle usage or are a link in the bikeway network. Designation and improvement as a bike route may warrant a higher level of street maintenance than a shared roadway.

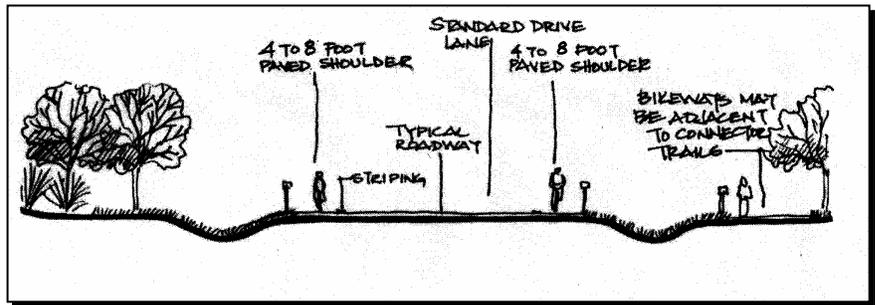
Wide Curb Lane - The standard width considered desirable for an outside traffic lane to safely accommodate bicycle and motor vehicle traffic is 14 feet, with an optimum width of 15 feet. This distance is typically measured from the curb face to the lane stripe, but the lane should be wide enough to allow safe passage for cyclists around obstacles such as drainage grates, parked cars, and longitudinal ridges between the pavement and curb and gutter. Lanes wider than 15 feet may encourage use by two motor vehicles and are not conducive to safe cycling.

To create on-road conditions amenable to bicycling, a wide right-hand lane of 14 to 15 feet width should be adopted as a standard design section for non-residential streets. On multi-lane roadways, a wider, 14 to 15 foot, right-hand lane should be provided depending on prevailing traffic conditions. A good guideline for determining when a wide curb lane is necessary is contained in the manual "Selecting Highway Design Treatments to Accommodate Bicycles," developed for FHWA in 1994 by the Bicycle Federation of America and the Center for Applied Research, Inc., and funded in part by the State of Texas.

Shoulder Bikeway - Advanced (Group A) and recreational (Group B)

bicycle riders who commute long distances or ride for sport or recreation can safely make use of smooth, paved roadway shoulders, where available.

Shoulders should be 6 to 8 feet

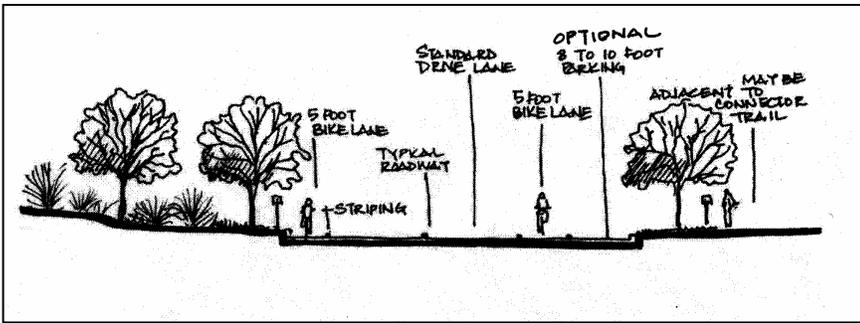


wide as a standard, but may be a minimum of 4 feet wide in constrained situations. Shoulders should be paved, all-weather surfaces with no ridges, seams or other obstructions, and should be generally smooth as opposed to rough in surface texture. Rumble strips, if provided on the shoulder, should occur within the first two feet from the edge line and should be either cut-in or ground-in grooves that are not disruptive to bicyclists, in keeping with guidelines prepared by the Federal Highway Administration (FHWA).

Bicycle Lane - Bike lanes are recommended for streets with motor vehicle speeds greater than 35 mph or with average daily traffic (ADT) volumes greater than 10,000 vehicles per day. Bike lanes are marked portions of the roadway that are designated for exclusive use by bicycles. Typically, bike lanes may be established on arterials and other major streets where bicycle use exceeds 50 bikes a day.

The standard width for a bike lane is 5 feet and the minimum is 4 feet, exclusive of any monolithic curb and gutter at roadway edge, in accordance with AASHTO. A bike lane between on-street parking and a motor vehicle travel lane should be 5 feet wide, minimum. Lanes wider than 6 feet may encourage parking or other inappropriate uses.

Bike lanes should be signed and marked with an 8-inch wide stripe and appropriate BIKE LANE and arrow markings in accordance with the Texas MUTCD and AASHTO standards. As vehicles, bicycles must ride with the flow of traffic. Bike lanes, therefore, are always one-way and should be clearly marked as such. Curbs, raised pavement, or raised buttons are



generally not recommended for use as bike lane markings, since they are a safety hazard to cyclists and interfere with the natural and mechanical sweeping of the bike lane.

A bike lane may be established adjacent to a parking lane, with bicyclists positioned between the travel lane and the parking lane. However, cars entering and leaving the parking lane will need to be mindful of the bike lane operation. The opening of car doors into the bike lane is also of concern to bicyclists, as the “dooring” of a bicyclist can happen very quickly and without advance indication.

Path - A path is an off-road facility that is physically separated from roadways by open space or a barrier. It may be within the roadway right-of-way, a utility right-of-way, or an independent right-of-way. These facilities are sometimes referred to as bike trails or hike and bike trails, depending on their intended use. Many types of paths can be developed. Multi-use paths are typically designed for the child and average bicyclist with fairly gentle grades and sweeping curves, and intended to accommodate pedestrian activities as well. Other types of paths may be designed for mountain bikes to provide differing levels of higher adventure and physical challenge, or for nature walks that seek access to the surrounding environment with minimal disruption or interference.

Multi-use paths should be 10 to 12 feet wide, as a desirable standard depending upon activity levels, with a minimum width of 8 feet. Maintenance vehicles driving on 8-foot wide paths tend to damage the edges.

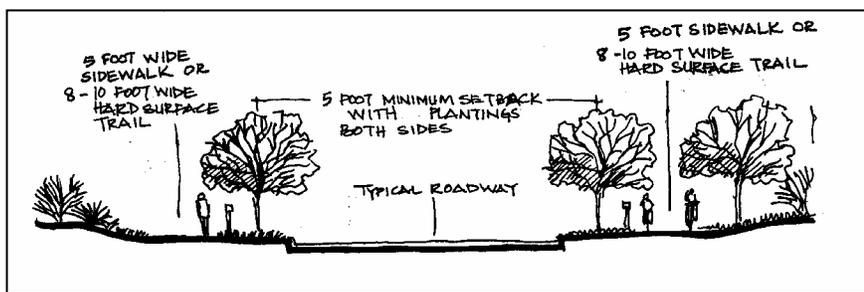
Therefore, 8-foot wide paths should be avoided unless physical limitations cannot accommodate a greater width. Bike paths with high traffic should be 12 feet wide or more, but should narrow



to ten feet in the vicinity of an intersection. One-way paths are difficult to police and should be avoided, if possible. Where they are used, they should be clearly signed as one-way, with a standard width of 6 feet and a minimum width of 5 feet. Bike paths should have an additional 2 feet of smoothly graded area on either side of the pavement. In addition, there should be 3 feet of horizontal and 10 feet (8 feet minimum) of overhead clearance on either side of the pavement.

To best accommodate all types of pedestrians and bicyclists, paths should be constructed of smooth, hard, all-weather paving such as concrete or asphalt. Although more expensive, concrete paths require less maintenance than asphalt paths, which can buckle, crack, and erode quickly, especially along drainage channels. Good maintenance is essential for paths to eliminate and avoid hazardous conditions. Other surfaces, such as compacted fine aggregates or stabilized earth materials, can be used for trails to create a more natural appearance or to provide a more flexible surface for joggers and walkers. However, some of the more flexible surfaces may require more frequent maintenance to maintain their appearance and surface quality, and may be less functional for use by persons with strollers, those in wheel chairs and other user groups.

It should be noted that paths that pass in close proximity to neighborhoods or provide high levels of recreational activity



can be expected to be multiple use trails. Conflicts between cyclists and skaters, joggers, pedestrians, animals, and less

experienced cyclists should be anticipated and considered in appropriate design.

Curb cuts and ramps for access to paths should be provided at all street intersections with the bike path. Slopes should comply with current requirements of the Americans with Disabilities Act (ADA). Curb cuts should be a minimum of 8 feet wide.

Sidewalks

A sidewalk is physically separated from an adjacent roadway by open space, a curb or a barrier. It can be paved or unpaved, though a majority of sidewalks are paved with concrete. Public sidewalks generally are placed parallel to a roadway within the public right-of-way for a street corridor. The space between the edge of the roadway and the edge of the right-of-way is typically shared by sidewalk pavement, sign posts, utility lines and fixtures, and landscaping, and any street furniture such as benches, mailboxes, and the like. Sufficient space should be allocated beyond the edge of pavement for all planned improvements.

The total width of the sidewalk corridor beyond the face of curb or edge of pavement of the roadway should be thought of in terms of three separate zones:

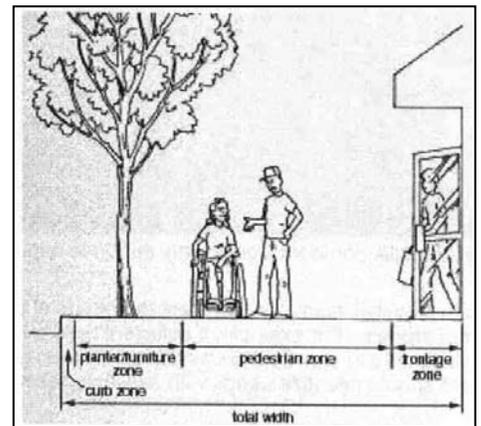
1. **The Landscape/Furniture Zone** – This area will need to be wide enough to contain all needed street signs, landscaping and

any benches, bus stop shelters and street lighting. The width of this zone should be at least 2 feet, not including the width of the curb, to buffer the pedestrian zone from the travel lanes. When parking is provided between the travel lane and the pedestrian zone, the 2-foot minimum width is needed for a buffer against opening car doors. This zone can be completely paved if so desired. When landscaping is planned for this zone, a minimum of 4 feet should be provided.

2. **The Pedestrian Zone** - This zone should be a minimum of 5 feet in width. For very active pedestrian areas, such as in the downtown area and adjacent to school campuses, this zone width should be increased to a minimum of 8 feet. Should an obstacle in the pedestrian zone be unavoidable, there must be a minimum of 36 inches of passable space throughout this zone.

Any utility access covers in the zone should be set flush with the pavement and maintained as such, with slip-resistant cover plates and any openings smaller than one-half inch diameter.

3. **The Frontage Zone** – This zone provides needed buffer between the pedestrian zone and obstacles at the property edge. For sidewalks adjacent to parks,



property setbacks, and other permanent open space, this zone can be eliminated. For fence lines and building edges placed on the property line, a minimum of 1 foot should be provided for this zone. Vegetation along the property edge should be required to be trimmed back off the public right of way by the adjacent property owner. For sidewalks along storefronts with doors

opening into the sidewalk corridor, two feet of width should be provided.

Utility requirements should be considered in regard to how they will be placed within each of these three zones, and any specific space requirements added to the overall width of the sidewalk corridor.

Slope requirements are as stated for multi-use paths, but become more crucial for the sidewalk environment. Ramps at intersections should direct the pedestrian toward the receiving sidewalk corridor on the opposite side of the street, regardless of whether a sidewalk has been paved.

Roadway Intersection Design

Statistical studies of bicycle-motor vehicle and pedestrian-motor vehicle accidents have indicated that a majority of these accidents occur at or near roadway intersections. Proper design of intersections to better accommodate cyclists and pedestrians must be introduced along with education of cyclists on how to properly position themselves and behave to proceed safely through the intersection. The primary need is to get the roadway designer to include consideration of the bicyclist and pedestrian in the design of the roadway; whether a designated bikeway is planned or not. An individual trained in the planning and design of bicycle and pedestrian facilities should be designated to review all roadway and intersection designs for street and highway improvements planned by developers, the City and TxDOT.

Intersection Design for Pedestrians – The design of safe roadway crossings for pedestrians is contained in many technical publications including A Policy of Geometric Design of Highways and Streets, last published in 2001 by AASHTO and Design and Safety of Pedestrian Facilities, published in 1998 by the Institute of Transportation Engineers. Another important reference to assure ADA compliance for access and

mobility by physical, visual or hearing impairments is Designing Sidewalks and Trails for Access, prepared by the Public Rights-of-Way Access Advisory Committee and published by the U.S. Architectural and Transportation Barriers Compliance Board in 2001. Current crosswalk design practices call for sidewalk ramps directed across the street to the opposing sidewalk ramp and no longer allow the corner ramp that directs visually impaired pedestrians into the middle of the intersection. Crosswalks exist by definition wherever sidewalks point at each other from opposing sides of the roadway. The striping of crosswalks, whether at corners or mid-block, should be provided where relatively high volumes of pedestrian traffic is anticipated at times, and generally where visibility of the crossing needs to be enhanced to improve safety of the crossing. Minimum green time for side streets needs to be set to allow adequate time for pedestrians to cross the major roadway. Pedestrian actuations by push button can be used to extend green times only when pedestrians are present to minimize delays to motor vehicles on the major roadway.

Intersection Design for Bicyclists – Three issues regarding traffic signals are recommended to be addressed by the jurisdiction’s traffic engineering staff: minimum green time, amber clearance time, and signal detectors.

Minimum Green Time - Due to the slower start-up and acceleration characteristics of bicycles, traffic signals at some minor street crossings of major arterials, especially when operating as an actuated phase, need to have a minimum green indication of approximately 7 to 10 seconds to accommodate bicyclists, depending on the approach conditions. Pedestrian crossing of arterials may require more green time for a side street than would normally be provided for the side street traffic alone.

Amber Clearance - The amount of time the yellow or amber signal indication is displayed as part of a signal sequence typically varies from 3 to 5 seconds depending on the approach speed of vehicular traffic and the width of the intersection. For some of the wider street sections, bicyclists crossing with the signal may need to be allowed a longer clearance interval (including all red) to keep from being hit by motorists (illegally) leaving the stop line on the far side.

Signal Detectors - To bring up an actuated signal phase, a detector mechanism needs to be tripped by an approaching vehicle. The older trip-bars could not be actuated by a bicycle and are fortunately being phased out and remaining installations are rare. Due to the scarcity of metals in the bicycle and the configuration of the bicycle, in-pavement detector loops often do not sense the arrival of a bicycle. The straight slender bicycle passes across the end wires of the typical detector loop parallel to the field created and often does not sufficiently interrupt the electro-magnetic field of the loop detector to actuate the signal phase. Riding over the side wires crosses perpendicular to the field and will be detected. The Texas Transportation Institute (TTI) has investigated this issue for the Texas Department of Transportation and has proposed some solutions. As reported in TTI Research Report 1163-3F, the researchers found that simply cutting into the pavement a parallelogram with the end wires at a 45-degree angle, rather than the basic rectangular shape, will detect bicyclists crossing the end wires at an angle, thus better interrupting the electro-magnetic field and actuating the traffic signal. Other loop designs that incorporate this same concept are the quadripole (figure 8) and the circular loop. Pavement markings to highlight the proper crossing of the detector loop can also serve to inform cyclists of how to position themselves to actuate the signal. Video and other remote sensing detectors can provide more reliable detection of bicyclists.

Signage and Striping

Signs and pavement markings for bicycles encourage use and advertise the bicycle as a vehicle on the road. They help legitimize the presence of bicycles in the eyes of motorist and potential bicyclists. All signage and lane striping should be in general accordance with the current edition of the Texas Manual of Uniform Traffic Control Devices Part IX (MUTCD).

Signage - The basic bike route sign should be used on all local designated bike routes. For the longer regional routes, the numbered bikeway sign should be utilized. One scheme used in some cities is to number bike routes sequentially east to west and north to south, with north-south routes having odd numbers and east-west routes having even numbers.

Other communities have developed special signs. Most notable is the "SHARE THE ROAD" warning sign for on-street facilities, which has been adopted within the 2003 National Manual on Uniform Traffic Control Devices (NMUTCD). Some communities, such as Dallas, have even placed a special logo or shape on their route designation signage. Some communities have numbered their regional bicycle routes, as states have done for regional highways. Austin has developed a "share the road" sign using a State of Texas color scheme and capital building silhouette. The regional numbered bike route signs would also be good candidates for a specially designed sign.

Striping - Striping of bike lanes should be in conformance to the MUTCD, Part IX. All multi-use paths which are 10 feet in width or greater should receive a yellow center line stripe.

Jiggle Bars - Jiggle bars, which are raised pavement markers placed horizontally across roadway pavement shoulders to alert non-attentive motorists that they have drifted outside the travel lane, impede the passage of bicycles on the shoulder and should not be placed entirely across the

shoulder, if used at all. A four-foot wide clear passage should remain for bicyclists to ride along the shoulder.

Speed Humps – Speed humps are used on local streets and some collector streets to slow traffic or reduce cut-through traffic. Speed humps are not a problem for bicyclists, and in fact the calmer street operation is better for bicyclists as a result.

Pedestrian Accommodation Policies and Programs

The provision of sidewalks to accommodate and encourage pedestrian activities can be accomplished through the normal capital improvements program. Two particular mechanisms for advancement of sidewalks are the Safe Routes to Schools program and the creation of Pedestrian Districts.

Safe Routes to School – School districts typically review where students attending each school live and how they can be expected to get to school. In this manner, school bus routes are established to collect qualifying students. Safe walking routes should also be established for each student within walking distance of the school. Students should have a sidewalk to walk on, rather than walking in the road. They should have designated street crossing locations, preferably enhanced with crosswalks and crossing aids (signals, crossing guards, pedestrian refuge islands) to make their crossing safer. School speed zones on roadways around the school that must be crossed are typically established for school entry and exit time periods.

The Safe Routes to School (SRS) Program resulted from the enactment of House Bill 2204, 77th Legislature, 2001. HB 2204 added Transportation Code, §201.614 directing the Texas Department of Transportation (TxDOT) to establish the Safe Routes to School Program. The overall purpose of this program is to improve safety in and around school areas. While Safe Routes to School on the national level is an overall concept that includes education, enforcement, and safety construction improvements, TxDOT's Safe Routes

to School Program implemented by HB 2204 will only address safety construction improvements. The rules that established the SRS program were adopted by the TXDOT Commission and became effective July 18, 2002.

Project proposal applications shall only be submitted by a political subdivision. School districts should contact their city or county offices to develop a project proposal. The proposal must be submitted to the District Engineer in the proper TxDOT District Office, using the application form approved by the department and must be submitted within the published deadline. Applications and the rules for submission and selection will be available at each district office, at the division office in Austin and on this web site.

Projects may be located on or off the state highway system, but must be located on public property. The project must be located within a two mile radius of a school. Federal funds requested will be limited to \$500,000. Projects can cover multiple school sites if similar work is performed at each site. Local project funding match of 20% is required unless the project is located on the state highway system in which case TxDOT will provide the match. A project on the state highway system will not be eligible if the district finds that the project interferes or disrupts any planned improvements or existing infrastructure. There are six categories of work eligible for funding:

- Sidewalk improvements
- Pedestrian/Bicycle crossing improvements
- On-Street bicycle facilities
- Traffic diversion improvements
- Off-Street bicycle and pedestrian facilities
- Traffic calming measures for off-system roads

Sidewalks and Pedestrian Districts - A Pedestrian District identifies areas with predisposition for walking, based upon geographic, socioeconomic, and development conditions. A Pedestrian District will be a target area for funding of pedestrian facilities. 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.

Sidewalks should be developed in conjunction with all future development in accordance with the established ordinances of the cities. Many areas have been developed in the past without the provision of sidewalks. There are areas of residential and commercial concentration in San Angelo that could have the propensity for people to walk to nearby destinations.

Typical 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 which 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. 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 3** represents basic cost units for various facility types.

Table 3
Typical Unit Costs of Construction for Bicycle and Pedestrian Facilities

Improvements	Typical Unit Costs
Roadway restriping (wide curb lanes or designated bike lanes)	\$20,000 to \$30,000 per mile
6' wide paving of existing gravel shoulder along roadway in both directions	\$200,000 to \$250,000 per mile
10' wide paving of separated trail facility	\$90,000 to \$150,000 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



Chapter 5 Program of Bicycle and Pedestrian Facilities

Facilities Development Criteria

The factors to be considered in selecting the proper type and location of bicycle and pedestrian facilities are 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. Serve high latent demand;
 - b. Improve access points to and from the facility;
 - c. Provide direct route, minimize delay; and,
 - d. Cross physical barriers to provide opportunities for bicycling and walking.
2. Promote Safe Walking and Bicycling:
 - a. Minimize conflicts by design;
 - b. Minimize potential for number and severity of collisions;
 - 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;
 - 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.

Proposed Multi-Use Paths

This type of facility provides a path of travel, separated from the roadway within street right-of-way or on separate right-of-way, which is for exclusive use of bicycles or for combined bicycle and pedestrian use, as on hike & bike trails. Many of the paths that have been proposed along stormwater drainage ditches, Red Arroyo and Concho River can be expected to function as multiple-use (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.

Paths along drainage ditches or utility rights-of-way can be used jointly by maintenance vehicles for inspection and upkeep of the utilities and right-of-way. Occasionally, ditch maintenance or utilities repair work may interrupt use of the path, at which time safety precautions and advance signage should be provided. Repairs may also remove portions of the path, but the path should be replaced when repair work is completed; agreement for who is responsible for path repairs should be worked out in advance in a joint-use agreement. Trails can be established along some narrower drainage corridors by installing underground conduits for conveyance of the stormwater, and then landscaping over the top of the conduit to add the path.

The network of proposed paths is conceptually shown on the map in the pocket at the back of this report.

1) South Concho River Trail from North Concho River to Red Arroyo – The trails along the North Concho River should be extended along the South Concho River, connecting to South Concho Park and Glenmore Park and the converted bicycle/Pedestrian bridge and connecting routes and trails into the adjacent neighborhoods and Goodfellow AFB and tying to potential trails along the Red Arroyo.

2) Red Arroyo from South Concho River to Amber-ton Parkway - The entire Red Arroyo corridor has outstanding potential for a trail system, to

be used for both recreation and transportation. Some channel crossings of the Red Arroyo may need to be upgraded to provide a grade separated crossing of major roadways.

3) Branch of Red Arroyo to Sunset Drive – A tributary of the Red Arroyo running to the west and south of the main channel at Red Arroyo Park provides access to several neighborhood streets and open space.

4) Southwest Drive Extension Trail - Possible trail through utility right-of-way from Twin Mountain Drive to Red Bluff Road. The Southwest Drive corridor runs through the middle of a neighborhood, crosses Loop 306 and Southwest Drive. In conjunction with other proposed trails, this trail could provide non-motorized connections all the way from downtown, past Goodfellow AFB, past Angelo State University to Lake Nasworthy.

5) O.C. Fisher Dam – The paved surface of the dam serves as a multi-purpose path and is a very popular walking, running, and bicycling area. The multi-purpose path is very remote from residential areas and access points are limited, making use of the trail challenging to all but longer distance recreational users. If made part of a circuit of facilities, the O. C. Fisher Dam trail could become quite an attraction to long-distance bicyclists looking for uninterrupted workouts. The surface on top of dam would need to be improved for that use. Additional bicycle and pedestrian access points to the path should be provided, including one at the North Concho River spillway and from the neighborhoods across Glenna Drive.

6) Middle Concho Park routes - There are many potential bicycling/walking/running/hiking routes within Middle Concho Park and in the open spaces to the north of the park. There's a combination of City-owned parcels, utility easements and private land all which could be utilized

for a trail system connecting Middle Concho Park and Lake Nasworthy to the neighborhoods to the north.

7) South Concho River Trail – The feasibility of extending trails along the South Conch River south of the Red Arroyo to Lake Nasworthy, should be further examined. Soil conditions, the infrastructure for Ben Ficklin Dam and Metcalf Dam, right of way constraints and other limitations could make this corridor difficult to accomplish. However, there are numerous connections to neighborhoods and crossings of highways that could be accomplished, connecting these areas to the rest of the trail and bikeway network.

8) Concho River Trail extend the existing trail along the Concho River westward from 14th Street to 29th Street to tie to the new park scheduled for development along the river at 29th Street. The trail should be at least on one side of the river and connect to adjacent neighborhoods. Eventually, the trail would connect to the trail alongside the top of the dam.

9) Other smaller potential path facilities include:

- Concho River Trail continuation from Bell east to city limits.
- Brentwood Park access to Concho River Trail - Follow branch of river/creek or go through neighborhood.
- Central High School access to Civic League Park across Pecos.

Proposed Sidewalks and Roadside Paths

In addition to the Off-Street Trails listed above, the following have been identified as priority pedestrian routes through discussions with the Bicycle/Pedestrian Advisory Committee, Angelo State Uuniversity, Goodfellow AFB, and at pubic meetings:

- 1) Southwest Blvd to Lamar Elementary - Need sidewalks on both sides for Safe Route to School. (This is one example of many needed safe routes to school that should be brought forward by the school district).
- 2) Downtown District.
- 3) University area and area between university and downtown. Live Oak Street has been identified as a potential street corridor for modification to enhance bicycle and pedestrian travel.
- 4) Additional crossings of Paint Rock Road for access to Goodfellow A.F.B from the residential area just north of the base, as well as connecting sidewalks and trails from residential areas just east of the base.
- 5) Sidewalks are needed in essentially every neighborhood, though some streets are more in need of dedicated walking space than others. These improvements should be developed further in neighborhood meetings to discuss bicycle/pedestrian as well as other issues.
- 6) Repair and upgrading of existing sidewalks must be considered in the City's long-range plan to comply with the Americans with Disabilities Act. Federal rules for the ADA pursuant to the right-of-way are expected to go into effect within the next two years. An inventory of sidewalk conditions would be conducted and a Transition Plan established for compliance with ADA.
- 7) Trail connectors or sidewalks are proposed along 14th Street, 19th Street and 29th Street between MLK Drive and the Concho River trail, connecting the residential areas east of Bryant Street to the trails amenities and parks along the Concho River.
- 8) Trail along MLK Drive, 29th Street, Travis Street and 50th Street to serve as a spine through the north part of town. A current Safe Routes to

School project would be incorporated into the corridor, along with potential extensions of that project.

9) Potentially, all neighborhoods within a one-half mile distance of a trail corridor should be evaluated for the potential and desire to have a trail connector into their neighborhood.

Pedestrian Districts

To give focus to the extensive effort of providing sidewalks in the walkable areas of San Angelo, the identification of specific neighborhood areas were formulated, with City of San Angelo Planning Department staff input, to envision Pedestrian Districts. As described in Chapter 4, a Pedestrian District identifies areas with predisposition for walking, based upon geographic, socioeconomic, and development conditions. A Pedestrian District will be a target area for funding of needed new or improved pedestrian facilities.

The following pedestrian districts have been identified for beginning this effort. An initial prioritization of these districts is included in Appendix B.

Pedestrian District #1	Martin Luther King area
Pedestrian District #2	Santa Rita area
Pedestrian District #3	Rio Vista area
Pedestrian District #4	near Goodfellow AFB
Pedestrian District #5	College Hills area
Pedestrian District #6	Lakeview area
Pedestrian District #7	Belaire area
Pedestrian District #8	Jefferson Heights/River Park area
Pedestrian District #9	Southland Hills area
Pedestrian District #10	Downtown area

A recommended approach to addressing the needs of these pedestrian districts would be to conduct the needs assessment, community involvement,

and conceptual design of the identified improvements for one district at a time over the course of a six month time frame. Then, replicate the needs assessment and design concept development on another district each subsequent six months. The timeline for installation of the improvements would be dependent upon the availability of funding.

Proposed On-Street Bicycle Facilities

The network of proposed on-street bikeways is conceptually shown on the map in the pocket at the back of this report. On-road facilities utilize roadways that have been established to accommodate existing or projected vehicular travel demand. As such, an on-road bikeway network will access the places people want to go, connecting neighborhoods to adjacent destinations and other neighborhoods and crossing significant barriers. However, the needs of Advanced bicyclists and Basic bicyclists are targeted using different facility types and locations. The facilities are listed in Appendix A. Some of the more significant facilities are listed below.

Bike Routes for Neighborhood Connectivity – To address the needs of Basic bicyclists, neighborhood connections by designated bike route can be accomplished using local and collector streets, occasionally installing short trail connectors to cross gaps, and where necessary providing additional traffic control devices at strategic crossings of major arterial streets that bisect neighborhoods. The following potential network of neighborhood routes would be examples of such a neighborhood collector route:

- 1) Jefferson, Van Buren, Howard and Garfield Streets are local collector streets that provide grade separated crossings of Houston-Harte without carrying excessive volumes of motorized traffic. Safety improvements may be needed to enhance some of these crossings, particularly the underpasses.

2) Pecan Street, Preusser Street, Roosevelt Street, and other local streets for connectivity from neighborhoods to rest of the on-street and off-street network.

3) Goodfellow AFB access from Lone Wolf Bridge - The main roadway accessing Goodfellow AFB from Central San Angelo (Paint Rock Road) currently does not accommodate bicyclists well (narrow, with high traffic volumes). Since TxDOT is turning over the Lone Wolf Bridge to the City, it could serve as a bike route connector across the South Concho River at Avenue K, providing a continuous route from neighborhood streets on the west side to neighborhood streets east of the river and south of Paint Rock Road. A bicycle route could then lead into Goodfellow AFB from this neighborhood by following South Concho Park Drive and connecting to State Street. The base representative has also indicated a willingness to move their fence lines to accommodate trails on their side of Paint Rock Road and other adjacent streets to facilitate access to the base.

Bike Routes for Commuter and Long-Distance Bicyclists – Some existing or soon to be improved collector or minor arterial roadways could serve the more advanced bicyclist to access destinations. Other roadways, such as freeway service roads, could serve as facilities to accommodate bicyclists as they have a wide outside lane and extend for long distances uninterrupted. Many of these facilities could be designated as bike routes as they are, or could be enhanced with bike lanes by re-striping the existing roadway.

Some proposed on-road bikeways consist of allowing additional space for bicyclists at the right edge of the roadway on urban arterial streets or on the shoulders of rural roadways. The improvement on urban streets 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 anything but a neighborhood street.

According to the manual, "Selecting Highway Design Treatments to Accommodate Bicycles," developed for FHWA in 1993, a bike lane should generally be provided to accommodate basic bicyclists on roadways with speed limits greater than 35 miles per hour or that experience traffic levels greater than 10,000 vehicles per day. Bike lanes become important for advanced bicyclists when vehicle speeds exceed 45 miles per hour. The following potential bike lanes could be developed:

Such facilities are recommended to include:

1) Southwest Blvd from Sherwood Way to Walnut Hill Drive is classified as a minor arterial street and is a key north/south route through neighborhoods in the southwest part of town. Ultimately, Southwest will connect to the New West Road bypassing the southwest side of town, but in the meantime, there is an excess of street capacity provided. Riding conditions on Southwest currently are fine for advanced (Type A) and basic (Type B) cyclists, so this corridor can serve as a bike route on an interim basis. When this roadway connects to the proposed New West Road that will bypass the southwest part of town, the traffic volumes on this roadway may warrant reconsideration of the on-street facility.

2) College Hills Blvd from Arden Rd to Valley View Road is a key north/south corridor traversing several neighborhoods and serving Angelo State, the shopping mall, and also a key crossing of Loop 306. The roadway is a minor arterial north of Loop 306 and a major collector to the south, and generally consists of four lanes with a wide outside lane. One section has been configured with narrower lanes and a center turn lane and should be

reconsidered to re-stripe to match the rest of the corridor to allow a continuous bicycle-friendly street with wide curb lanes.

3) College Hills ends at a signalized intersection with Avenue N. Across the five-legged intersection begins the residential section of Beauregard Avenue. A signed bike route is proposed on Beauregard from Avenue N to Campus Drive which has four lanes with a very wide outside lane. Campus Drive has a similar roadway section and is proposed to be designated as a bike route from Sherwood to Avenue N, with a signalized crossing into campus.

4) Southland Boulevard - Southland from Knickerbocker to beginning of HWY 2288, continuing as bike route to San Angelo State Park - Key east/west corridor through residential area, paralleling Loop 306, and accessing the State Park. One section of Southland has San Angelo's only striped bike lane in place. Bike lanes are proposed to be extended throughout the length of this roadway, eliminating the center turn lane between Knickerbocker to Blue Ridge, adding pavement width in the segment west of the fire station, and otherwise re-striping lanes to accommodate bike lanes for the corridor from Knickerbocker to San Angelo State Park.

5) Knickerbocker Road (FM 584) - The section of this arterial of most concern at the moment is south of Johnson Road. Due in part to the railroad running parallel to it, Knickerbocker is the most direct north/south route in this area of town and has few convenient parallel alternate routes nearby. This is a key bike route since it's the only way to reach park and roads near Lake Nasworthy. Shoulder lanes are proposed along Knickerbocker from Loop 306 to Spillway Road. A suggestion has been made to add a trail along side Knickerbocker from Loop 306 to Fidherman's Road to provide access for runners and Basic cyclists that want to traverse the corridor to access provided facilities.

6) Red Bluff Rd is the connecting access roadway to Middle Concho Park and is a key link in the access to this significant recreation area. The roadway typically carries low traffic volumes, but speeds are relatively high due to the hilly terrain and the lanes on the two-lane roadway are too narrow for motorists and bicyclists to share. Four-to-six foot wide shoulders should be provided and designated for bicyclists.

7) Rural roadways on the outskirts of town mostly, in the south east and southwest, and mostly on TxDOT roads, including FM 388 (Paint Rock Road), FM 765 (Eola Road), FM 1223 (San Antonio Highway, also VFW Highway), Fairview School Road and Spillway Road. On the north side, SH 208 provides an excursion rout out of town. Many of these roadways already have ample shoulders and are used by bicyclists now, and should receive signage designating them as bicycle routes to alert the public that they can expect to see bicyclists on these roadways. Those roadways with shoulders less than four feet in width or with rough sealcoat should be targeted for improvement by TxDOT.

8) Gun Club Road - Popular recreation cycling route as well as running route. While car traffic is currently light, the road is narrow with no shoulder. Options for enhancing this roadway include converting to one-way and striping off one travel lane and shoulder areas for bicycling and running.

9) West Texas Training Center access - The center is an attractor for students and is a key employer. Situated near access roads to Houston Harte Expressway/ HWY 67, which creates serious barrier for cyclists coming from the center of San Angelo. Requires some combination of on-street and off-street route, and perhaps grade separation.

10) Johnson Street to ASU - A key north/south minor arterial that joins Knickerbocker to Avenue N and fronts Angelo State University. North

of Avenue N, Johnson Street is a wide two lane street, though still a minor arterial, and connects to Sherwood Way. A bike route is proposed for Johnson Street as a placeholder calling for a bicycle facility along Johnson Street in the ongoing update to the ASU Campus Master Plan. Ultimately, this corridor may be considered for conversion to a focused non-motorized access corridor with linkage to the Red Arroyo Trail at Knickerbocker.

11) Sunset Drive from Southwest Boulevard to Sherwood Way is a five lane major collector with slightly wide outside lanes, and three lanes with a striped shoulder from Sherwood Way to Houston-Harte Expressway frontage road, and a posted speed limit of 35 MPH. This roadway can be used as is by advanced (Type A) bicyclists, with additional signage for motorists to share outside lane with bicyclists.

12) Walnut Street/14th Street from Jefferson Street to Main Street is a two lane minor collector street with wide outside lanes. A bike route is recommended for the corridor, though a lane could also be striped once further discussions are held with the neighborhood. An adjacent trail is proposed along 14th Street from Martin Luther King Boulevard to the North Concho River trail.

13) Armstrong Street is a minor collector that has four lanes with very wide outside lanes. This corridor is proposed to be designated as a bike route, but could ultimately be striped with bike lanes if that were the desire of the local residents and businesses.

14) Main Street from 26th Street to Houston Harte Expressway is a two lane street with wide outside lanes with access to Baptist Memorial Hospital.

15) Houston-Harte Expressway (US 67) frontage roads are useful for advanced bicyclists as a corridor with few stops. There is a discontinuity in the frontage roads at the railroad overpass. Two options are possible to keep

bicyclists off the mainlanes of the freeway: build a connecting at-grade bicycle path crossing of the railroad, or route the bicyclists onto local roads. Due to the difficulty of obtaining permission from railroad companies to add at-grade crossings, even for trails, the latter may be necessary.

16) Bell Street from Houston Harte Expressway to Paint Rock Road is an existing four-lane minor arterial street. It is proposed to convert the four lane street to a three lanes street (one lane in each direction with a center turn lane) and add bike lanes. A traffic study should be conducted to verify that the current and forecast traffic volumes can be accommodated.

Supporting Amenities and Programs

Bicycle Parking - Bicycle parking should be provided, by the City of San Angelo ordinance, at all public buildings that are potential cyclist destinations. Bicycle parking should be encouraged, potentially by ordinance, at privately owned facilities that are potential bicyclist destinations.

There are two basic types of bicycle parking equipment: bicycle racks and bicycle lockers. Bicycle racks may be provided where parking needs are short term and some provisions are made for security or surveillance. Lockers would be desired for all-day parking if the location is remote from the destination and where the desired level of security is higher than that provided.

Bicycle racks that are most useful for cyclists are of the type 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 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 local transit agency should consider purchasing bike carrier racks for its buses to enable cyclists to combine trips by bus and bicycle.

Prioritization for Implementation

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; 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.

The following considerations will determine the criteria for creating facility and program implementation priorities:

Connectivity of Demand - Provides a connection between significant bicycle and pedestrian activity centers (e.g. neighborhoods, town centers, public facilities, transit facilities, parks, other trails or routes, commercial developments).

Elimination of Barriers - Eliminates or crosses an existing or a potential barrier to pedestrian or bicycle travel.

Public Support/Commitment - Includes general public and political support for the individual project as an indication of the potential usage and thus benefits of the facility.

Using these criteria, the Bicycle and Pedestrian Advisory Committee and the general public voiced their opinions on the relative priorities of the various future projects of the bicycle and pedestrian plan. The results of these prioritization efforts are included in **Appendix B**.



Chapter 6 Implementation Plan

Bicycle and Pedestrian Plan

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

Action Area 1: Organize a bicyclist/pedestrian program.

Action Area 2: Plan and construct needed facilities.

Action Area 3: Promote bicycling and walking.

Action Area 4: Educate bicyclists, pedestrians, and the public.

Action Area 5: Enforce laws and regulations.

Following this basic framework, a plan for implementation of the San Angelo Metropolitan Area Bicycle and Pedestrian Plan is 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.

Action Area 1. Organize a Bicycle/Pedestrian Program

The San Angelo MPO should formally establish a Bicycle and Pedestrian Advisory Committee (BPAC) consisting of representatives from each of the urbanized cities and the two counties, and should meet regularly to discuss regional coordination and common issues. The committee should meet regularly to follow-up on overseeing the implementation and further refinement of the Plan of their cities.

Action Item 1.1 Institutionalize the Role of Bicycle/Pedestrian Program Coordination within Local Government - The MPO, county and city staff members, including Planning and Development, Public Works/Engineering and Parks Department 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. Ideally, the role would eventually be "institutionalized," becoming part of the planning, design, construction, and maintenance concerns of all responsible agencies. The following responsibilities, as a minimum, should be addressed by designated persons with authority to give advice or 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, pedestrian access ramps, traffic signal indications, and median refuge areas;
- 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 the local San Angelo transit service to provide appropriate bicycle and pedestrian connections from bike routes and trails to transit stops and stations, and to promote bicycle-on-bus programs; and,
- Review design and location of extensive utility projects for the potential to incorporate multi-use paths in design.

Action Item 1.2 – Promote Land Use Patterns and Zoning that Encourage Walking and Bicycling to Destinations - Local and 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. Conversely, clustered patterns tend to promote shorter trip lengths that more readily enable walking 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 the San Angelo MPO planning area.

Action Item 1.3 – Promote Bicycle- and Pedestrian-Friendly Urban Development and Design that Facilitate Walking and Bicycling - Street layout is important in the encouragement of safe bicycling and walking. Subdivision development guidelines that call for sidewalks, green space, local trail networks, and collectors that connect across arterial streets can greatly improve the environment for safe and efficient bicycling and walking. Street alignments shown in new subdivision plats should be reviewed to ensure they will accommodate cyclists and pedestrians as well as motor vehicles.

Action Item 1.4 – Adopt Public Right-of-Way Design Standards that Accommodate Bicycling and Walking - Standards and guidelines for designing streets and sidewalks to accommodate bicycle and pedestrian travel are critical to bicyclists and pedestrians. Pedestrian and bicycle considerations should be incorporated into local planning and design policies, manual, and standards. As a minimum, the planning for public streets and facilities should follow the 1991 *Guide for the Development of Bicycle*

Facilities by the American Association of State and Highway and Transportation Officials (AASHTO).

Pedestrian-oriented design of all sidewalks, trails, and public places should comply with requirements of the Americans with Disabilities Act of 1990. Non-compliance with these standards and guidelines should be by exception, just as any other established design standard. Guidelines for reviewing and modifying existing public facilities and rights of way are outlined in **Appendix C**.

Action Item 1.5 - Educate Planners, Local Enforcement Officers, Designers, and other officials - 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.

Action Area 2. Plan and Construct Needed Facilities

The San Angelo metropolitan planning area, in compliance with federal and state regulations under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), 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.

Action Item 2.1 – Adopt a Bicycle and Pedestrian Plan - Bicycling and walking information on local desired facilities and destinations are

needed to justify projects, to track trends, and to measure success. Beaten footpaths are indicators of pedestrian desire lines. High accident locations may indicate significant conflicts and/or high use. Studies of access routes to known bicycle and pedestrian destinations can lead to insight on needed improvements. The map of proposed facilities for the San Angelo MPO area was developed from discussions with local community staff and intersected area bicyclists. The city of San Angelo should adopt and update their portion of the regional bicycle and pedestrian plan.

Action Item 2.2 - Identify/Coordinate Funding Sources - The San Angelo MPO should work in conjunction with Texas Department of Transportation (TxDOT) to plan and program funding opportunities, especially those available under TEA21 and its successor. Bicycle and pedestrian 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 4 and 5**. 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 selection criteria and timelines of each of these funding sources be fully understood in order to make advantageous use of their availability.

The counties, cities and MPO 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.

Table 4

Federal Funding Sources for Bicycle and Pedestrian Projects

National Highway System (NHS) Funds (Section 1006) 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).

Surface Transportation Program (STP) Funds (Section 1007) 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. Ten percent of STP funds are used for "Transportation Enhancements" which include the provision of facilities for bicyclists and pedestrians.

Congestion Mitigation and Air Quality Improvement (CMAQ) Programs Funds (Section 1008) 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.

Federal Lands Highway Funds (Section 1032) 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.

Scenic Byways Program Funds (Section 1047) may be used to construct facilities along scenic highways for the use of pedestrians and bicyclists.

National Recreational Trails Fund (Section 1032) 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.

Section 402 Funding Pedestrian and bicyclist safety remain priority areas for highway safety program funding. Title II, Section 2002, of the TEA21 addresses state and community highway safety grant program funds. The priority status of safety programs for pedestrians and bicyclists expedites the approval process for these safety efforts.

Federal Transit Funding Title III, Section 25 of TEA21, continues to allow transit 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.

Source: National Bicycling and Walking Study

Table 5

Example Sources of Local Funds

1. **Transportation Department funds** - These are the predominant sources of local funds. The capital improvement program budget in Tucson for bikeways was \$240,000 in 1990. The bicycle programs in Madison and Palo Alto are part of the overall DOT budget - there is no itemized budget for bicycle facilities.
2. **Sales tax** - Voters in San Diego and Los Angeles Counties, California approved local sales tax increases to fund transportation improved bicycle paths.
3. **Open space bonds** - In 1989, voters in Seattle and surrounding King County approved a five-year bond issue of which \$33 million was reserved for trail development.
4. **Mitigation measures** - Developers may be charged to pay for mitigating negative project impacts. In Los Angeles County, mitigation fees are taken from developers whose projects do not conform to Congestion Management Plan guidelines, and the funds may be used for such projects as bicycle facilities.
5. **Developer dedications** - These require the developer 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.
6. **Restorations** - Some local agencies require that developers restore rights-of-way for non-motorized users.
7. **Public agency land and funds.**
8. **Motor vehicle taxes.**
9. **Street utility tax** - The City of Seattle has implemented such a tax on area employers and households. The money will be used to repave existing streets. Those streets that are important to bicyclists will receive priority treatment.
10. **Parks and recreation department funds** - In San Angelo as in many cities, the Parks and Recreation Department is responsible for trail maintenance.
11. **Donations (from the public and corporate sectors)** - In 1990, the Broward County, Florida Bicycle Advisory Committee created a special fund to receive public and corporate donations for the county bicycle and pedestrian programs.
12. **Fund-raising rides and events** - The annual Thunder Road Bikeathon in the Dayton, Ohio area raises funds to pay the salary for the Miami Valley Regional Bicycle Committee's executive director and for small-scale projects.

Source: National Bicycling and Walking Study

Additional information on funding opportunities is contained in **Appendix D**.

The Bicycle/Pedestrian Program should be established with a dedicated source of local 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.

Volunteer programs may substantially reduce the cost of implementing some of the proposed trails and pathways. Local schools or community groups may use the bikeway or pedestrian project as a project for the year, possibly working with a local designer or engineer. Work parties may be formed to help clear the right-of-way where needed. A local construction company may donate or discount services. A challenge grant program with local businesses may be a good source of local funding, where corporations ‘adopt’ a bikeway and help construct and maintain the facility.

Action Item 2.3 – Construct, Improve, and Maintain 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, multi-use paths, and sidewalks form the bulk of the circulation system for bicyclists and pedestrians.

Future road widening and construction projects are one means of providing bike lanes and pedestrian infrastructure. To ensure that roadway construction projects provide bike lanes where needed, appropriate and feasible, it is important that an effective review process is in place so that new roads meet the standards and guidelines presented in the update of the San Angelo MPO Bicycle and Pedestrian Master Plan.

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, or other high density settings need to address the issue of where to store bicycles while at home.

The city of San Angelo should take the lead to provide adequate bicycle parking at all public-access facilities. Bicycle parking provisions should be encouraged, but not required initially, at work places and commercial development in the urbanized area.

Action Item 2.4 – Provide Facilities to Accommodate Bicycle/Transit Joint Use - The transit agency 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.

Action Area 3. 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.

Action Item 3.1 - Prepare and Disseminate Public Information on Bicycle and Pedestrian Routes and Programs - As implementation of the hike and bike route network proceeds, prepare a *San Angelo Bicycle and Pedestrian Guide* showing bike routes and facilities. Widely distribute copies of the guide to residents and visitors.

Action Item 3.2 - Participate in National Programs – Nationally, there are bike-to-work days, bike weeks, walk to school days and may other events to raise the awareness of bicycle and pedestrian safety and mobility issues.

Action Item 3.3 - Foster the Development of Local Bicycling and Walking Events and Programs – From fund raising walks and runs to

higher-end races and potential mountain biking events, local events promote the advancement of pedestrian and bicycling activities in the region.

Action Item 3.4 – Adopt Public Policies - To formalize the establishment of a bicycle and pedestrian program within each of the two counties and the urbanized cities in the of San Angelo MPO area, it will be desirable to have public comment and city councils and county commissions adoption of certain policies that will guide the region’s development of bicycle and pedestrian facilities and programs. Example public policy statements are included in **Appendix E**.

Action Area 4. Educate Bicyclists, Pedestrians, and the Public

Closely tied to promoting bicycling and walking, the education of 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.

Action Item 4.1 - Dissemination of Available Safety and Educational Materials - Assemble and distribute targeted safety and educational materials in many forms and venues, drawing upon available resources such as:

- Texas Department of Transportation (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" created with cooperation from the Texas Bicycle Coalition;
- 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 the American Automobile Association (AAA);

- Parent-Teacher Associations may serve as avenues for disseminating information on safety for pedestrian and bicycle activities to parents of school-age children; and
- Working with the San Angelo area Independent School Districts and State Department of Education, the program may identify materials for distribution through the area 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.

Action Area 5. 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.

Action Item 5.1 – Target Areas for Enforcement and Encouragement of Proper Behaviors - 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.

Implementation Strategy

Many of these action items can be advanced and accomplished simultaneously. The advancement of these efforts is depicted in **Figure 1**, and consists of the following work areas:

- Safe Routes to Schools Program should be advanced by the local School District school safety and transportation officials. The MPO can help to facilitate the efforts and solicit Safe Routes to Schools funding and other sources of funds.
- Pedestrian Districts should be targeted every six months to develop concurrence on needed improvements including sidewalks, access to trails and other related neighborhood livability issues.
- Access to Transit should be assessed at all access points to local transit service, and priorities established based upon high patronage routes and the nature of service destinations.
- ADA Transition Plan should be developed as soon as possible for all public facilities, including buildings, parks, and sidewalks.
- Bike Routes should be formalized where placement of signs and proper attention to pavement surface and maintenance is needed, then implementation of needed shoulders and trail connectors should be programmed.
- Multi-purpose paths should be programmed for funding and implementation.

Appendix A

Public Response to Survey and Public Comments

The following information summarized responses to a survey administered at public meetings and on the MPO website. Also included in the Comments section are comments received from the public in addition to those directly from the survey.

1. How often do you normally ride a bicycle?

- 8% Commuter – I ride just about every day to get places I want to go.
- 13% Training – I ride as much as I can, often for long distances, looking for few stops.
- 18% Recreational – I ride on weekends mostly, just for fun.
- 38% Infrequent Bicyclist – I own a bicycle, but don't ride much.
- 30% Non-Bicyclist – I don't own or don't ride a bicycle.
- 4% No response

2. How often do you walk or run for exercise, recreation, or to go places?

- 35% Just about every day.
- 30% A few days a week.
- 12% Mostly just on weekends.
- 20% Not very often.
- 1% No response

3. Where do you walk or run? (multiple responses)

- 70% Within my neighborhood.
- 22% At or to a nearby park.
- 5% At or to a nearby school.
- 22% Along the N. Concho River Trail.
- 11% On the trail along the dam.
- 25% Along the edge of street roadways.
- 20% Other
- 10% No response

5. Should more trails be constructed?

- 40% In parks
- 41% Between parks
- 52% Along rivers and creeks
- 21% Along drainage ditches
- 48% Near neighborhoods
- 30% Near schools
- 13% Other
- 13% No response

Gender	
75%	Female
22%	Male
4%	No response
Age	
3%	18 or less
4%	19-25
10%	26-35
21%	36-45
24%	46-55
14%	56-65
12%	66+
6%	No response
Zip Code	
50%	76905
21%	76901
20%	No response
2%	76905
1%	76935
1%	76966

Appendix A

Public Response to Survey and Public Comments

The following information summarized responses to a survey administered at public meetings and on the MPO website. Also included in the Comments section are comments received from the public in addition to those directly from the survey.

1. How often do you normally ride a bicycle?

- 8% Commuter – I ride just about every day to get places I want to go.
- 13% Training – I ride as much as I can, often for long distances, looking for few stops.
- 18% Recreational – I ride on weekends mostly, just for fun.
- 38% Infrequent Bicyclist – I own a bicycle, but don't ride much.
- 30% Non-Bicyclist – I don't own or don't ride a bicycle.
- 4% No response

2. How often do you walk or run for exercise, recreation, or to go places?

- 35% Just about every day.
- 30% A few days a week.
- 12% Mostly just on weekends.
- 20% Not very often.
- 1% No response

3. Where do you walk or run? (multiple responses)

- 70% Within my neighborhood.
- 22% At or to a nearby park.
- 5% At or to a nearby school.
- 22% Along the N. Concho River Trail.
- 11% On the trail along the dam.
- 25% Along the edge of street roadways.
- 20% Other
- 10% No response

5. Should more trails be constructed?

- 40% In parks
- 41% Between parks
- 52% Along rivers and creeks
- 21% Along drainage ditches
- 48% Near neighborhoods
- 30% Near schools
- 13% Other
- 13% No response

Gender	
75%	Female
22%	Male
4%	No response
Age	
3%	18 or less
4%	19-25
10%	26-35
21%	36-45
24%	46-55
14%	56-65
12%	66+
6%	No response
Zip Code	
50%	76905
21%	76901
20%	No response
2%	76905
1%	76935
1%	76966

Survey Question #4. Have you encountered conditions that make it difficult to ride, walk or run? Were you discouraged from going somewhere you really wanted to go by bicycle or foot? Please describe.

Unable to walk because sports are being played & parents/spectators surround walking trail to watch games at parks.

Bicycling - Traffic proximity is dangerous most any time.
Walking/Running - Traffic proximity can be dangerous @ night and sunrise to sunset.

Walking/Running - Without neighborhood sidewalks (Brentwood) we walk in streets, and rough pavement has caused falls (2x).

Walking/Running - The streets are not a flat surface and there are no sidewalks.

Walking/Running - I mainly walk within ASU campus & when under construction this limits accessibility. Streets in neighborhoods are dangerous due to many curves, hedges near street, etc.

Walking/Running - Curved tops of streets (draining to the sides) create uneven surfaces for walking.

Bicycling - Traffic

Bicycling - Cars
Walking/Running - Cars

Bicycling - Cars/dogs
Walking/Running - Cars/Dogs

Bicycling - Yes, traffic.

Bicycling - Cars throwing things at me. Too many cars.
Walking/Running - Uneven pavement, too many cars.

Bicycling - Skunks on both sides of Mertzson Hwy. when I was walking.

Bicycling - No designated bike cross areas-traffic.

Bicycling - Major roads such as Sherwood, Sunset, Knickerbocker.

Walking/Running - It is really difficult to walk along Ricks road in the Pal Ann subdivision when it rains because you have to walk in the streets. There is no sidewalk here and the traffic along Ricks road only increases by the day. I watch children walk along the road on there way to school. It's only a matter of time before something happens that could have been prevented.

Survey Question #4. Have you encountered conditions that make it difficult to ride, walk or run? Were you discouraged from going somewhere you really wanted to go by bicycle or foot? Please describe. (responses continued)

Bicycling/Walking/Running - No Sidewalks

Bicycling/Walking/Running - Traffic on Hillside

Walking/Running - No streetlights on Hillside Drive, no neighborhood sidewalks in College Hills.

Bicycling/Walking/Running - Traffic on Hillside

Bicycling - Cross traffic.

Walking/Running - Traffic, inconsiderate motorist.

Bicycling - Along frontage rds./neighborhoods

Walking/Running - Neighborhoods.

Bicycling - FM 2288 when construction began, TXDOT made no effort to accommodate cyclist drive through that area, only motor vehicles.

Walking/Running - Same thing businesses that only have drive thru's open late will not accept pedestrian traffic.

Bicycling - Knickerbocker Rd. from Loop 306 to Lake Nasworthy

Walking/Running - Knickerbocker Rd. from Loop 306 to Jackson St. Southwest Blvd. from Lamar School to Loop 306 Sherwood Way from Wal-Mart to West Ave. N.

Walking/Running - Difficult to walk on busy streets (College Hills, Sunset, Southwest) or to cross loop 306 while walking my dogs.

Bicycling - I am Afraid to bike or walk o Country Club Road and Grand Central Road. I will not let my children on these roads. It's too narrow with the traffic and I've seen bicyclist almost get killed. I'd ride more if there was a safe way to get out of the neighborhood.

Walking/Running - No weather - Health club

Bicycling - Yes traffic

Walking Running -Yes traffic

Bicycling - Knickerbocker Rd. between Loop 306 & lake is not friendly for bikers, joggers or walkers.

Bicycling - Country Club Dr.

Bicycling - Traffic, and no designated lanes or sidewalks

Walking/Running - Traffic

Survey Question #4. Have you encountered conditions that make it difficult to ride, walk or run? Were you discouraged from going somewhere you really wanted to go by bicycle or foot? Please describe. (responses continued)

Walking/Running - No sidewalks have to walk in streets

Walking/Running - No sidewalks !!

Bicycling - Don't feel safe on streets when riding bike in town with my young children.

Walking/Running - Trails in town.

Walking/Running - Sidewalks Needed!

Bicycling - Cars & Trucks

Walking/Running - Cars & Trucks

Walking/Running - No sidewalks not safe in winter when it's dark.

Walking/Running - Traffic

Bicycling - Cars do not yield as they should to bicycles, I stay on back streets mostly, but when crossing the river on e must use bridges that are extremely dangerous for bicycles. Streets with no parking lane are also extremely dangerous. A bicycle lane should be marked on all streets and bridges with no parking lane. Bicycle only lanes are needed on major, intermediate and minor streets.

Walking/Running - Yes, trying to cross a busy intersection without a light.

Bicycling - Sherwood way at 5:30 pm

Bicycling - Traffic

Bicycling - Motorist Unwilling to share road (no shoulder)

Walking/Running - Car traffic, people throwing beer cans at me cussing at me and children.

Walking/Running - There ware many unsafe areas along roads. We need more trails.

Walking/Running - Car traffic throwing beer cans, cussing at children, opening doors throwing trash out.

Walking/Running - No sidewalks, forced to run on the street with traffic.

Bicycling - Lanes badly needed along roadways & trails

Walking/Running - Not enough good trails or sidewalks.

Bicycling - While driving home from work I witnessed & helped an injured bicycler "blown off" the road Knickerbocker by a truck. His shoulder was injured and his bike was broken by the fall. He got on the shoulder as far as he could but there was just not enough room

Survey Question #4. Have you encountered conditions that make it difficult to ride, walk or run? Were you discouraged from going somewhere you really wanted to go by bicycle or foot? Please describe. (responses continued)

Bicycling - Total Lack of shoulder on major roads make biking, running, walking dangerous.

Walking/Running - Walking along Sherwood Way near Southwest Blvd. in traffic! Running River Trail where it crosses Irving St. and Rio Concho Dr. vehicular traffic is San Angelo does not ever yield to a runner!

Walking/Running - Lack of sidewalks & Trails.

Walking/Running - Sidewalks did not exist in town on outings.

Bicycling - Country roads are very rough sometimes no shoulder bicycling around town forget it not possible

Walking/Running - No sidewalks anywhere.

Bicycling - I inline skate a lot but there are very few safe locations to do so.

Walking/Running - Some crossings along hiking trails (Concho River) are difficult (Cross traffic)

Bicycling - Auto drivers don't see bicycles until an accident occurs or almost occurs.

Walking/running - you must stay alert.

Bicycling - Congested vehicular traffic that travels fast

Walking/Running - Traffic & Dogs

Walking/Running - On streets between traffic!!! Must drive to parks

Walking/running - Everywhere in San Angelo is difficult to walk to.

Bicycling - Only way to cross San Angelo involves onto traffic.

Bicycling - I use to ride my bike out to the lake until I had to separate times that someone would throw items such as beer bottles out of there vehicle as they passed by.

Walking/running - Just lack of space on the streets.

Bicycle - Most San Angelo drivers seem completely unaware of the rules of the road regarding bicycles. Also lack of bike lanes and crosswalks make biking fairly hazardous.

Walking/Running - No sidewalks or side lanes along roads make doing either dangerous. Many drivers exceed the posted speed limit by a lot along Old Christoval Rd. where I usually run and appear to have no regard to pedestrians or runners.

Bicycling - From the base to the lake

Walking/Running From the base to the lake

Walking/Running - Street walker Cars & dogs

Survey Question #4. Have you encountered conditions that make it difficult to ride, walk or run? Were you discouraged from going somewhere you really wanted to go by bicycle or foot? Please describe. (responses continued)

Bicycling - Yes, due to safety factors. I would ride-walk 100% more to downtown businesses etc. with safer routes.

Walking/Running - Kids are on College Hills or bike/foot to get to Unidad Park with traffic, it appears extremely dangerous.

Walking/Running - Santa Rita Park

Walking/Running - Folks driving on the wrong side of the streets esp. around curves in along the river trail.

Bicycling - I would love sidewalks so many kids can walk from school or ride bikes. College Hills area has bad traffic & no sidewalks.

Bicycling - I ride to downtown sometimes & crossing the river can be a problem. You have to use the hike & bike pedestrian bridge to be the safest. I don't go down busy streets

Bicycling - Failure of motorist to recognize bicyclist as legit vehicles.

Walking/Running - Access to decent Level Bed Paths.

6. Should we spend money to build sidewalks along local streets in neighborhoods? Which ones?

Jefferson Heights

Yes (8 times)

No (11 times)

yes. All neighborhoods like in Lubbock

I think sidewalks, in general, help bring neighborhoods together.

Main routes to elementary schools

At Nasworthy Lake

yes, the Larger cross streets

Yes Arden Rd. South Land

Questionable, possibly where we have narrow streets.

Can you connect the northside of freeway to southside?

yes all neighborhoods

Yes new developments

Where ever needed

Hillside Dr., Lots of people walk there day and night on the road.

College Hills

Hillside Dr. lots of people walk there day and night on the road.

Where pedestrian/bicycle traffic is exposed to excess danger

Major streets, high traffic areas

yes. Along busy roadways such as Southwest Blvd, Sunset Dr. Southland Sherwood Way, Beaveregard, Chadbourne, MLK.

Yes, near schools and places of business (shopping centers)

Southwest Blvd. from Lamar School to Green Meadow Dr.

Not as necessary, nice to have

Along major throughfares

yes, require in case for new construction

Yes as many as possible, but at least in perimeter neighborhoods

Yes- All

Yes- All of them

Absolutely, I believe all local streets esp. Butler Farms should have a sidewalk.

Not absolutely necessary, I would rather have trails that were not along streets.

Yes - Southlans - Southwest to Bonham

Yes a few in each neighborhood

Bicycles belong in the street, but this would be a big help for walkers. All streets should have originally been designed with sidewalks. Therefore, all streets should have them installed eventually

Yes connecting corridor. Also all new subdivisions should have sidewalks, like the trails

Those with a higher traffic volume (Bermuda)

Yes along roads that lead to apartmetns that house aproximately college students.

Yes College Hills

There is no system at all in San Angelo for safe walking

Yes College Hills

Yes Millbrook

Yes all elementary schools

Yes the main ones traveled. Involve our TXDOT, healthcare facilities, large businesses, to promote this worthy project. It is vital for our health and growth.

Santa Rita, college Hills, ASU students need more non-motorized commuting options.

yes & developres should be required to build sidewalks in new neighborhoods.

Yes give children a way & safely walk to school and park

this could be challenging. It would probably only work in selected areas.

7. Should we spend the money to build sidewalks along major streets near development? Which ones?

Perhaps on heavy traffic streets. Most residential streets are fairly safe, except at intersections.

Yes marked on Map

No it would be too costly invest in new trails paths

All should be required by ordinance Look at Lubbock, TX

Which ones? The full length of Sherwood way, Beauégard, Oxford, Knickerbocker

Definetely. I think it would be great to have a few walking bridges, especially over Ave. L going from Old Christoval Rd. to the Rio Concho South Park (I think it's called) are. Also a few bridges over Knickerbocker and add bike lanes to Knickerbocker Rd. it would increase safety for school kids too.

Sul Ross

New Additions

yes Santa Rita

Neighborhoods

Yes, esp. near schools i.e. Santa Rita.

College Hills

No

Yes- All

Yes

Yes

Comments from Survey and from MPO Website:

Sidewalks- it is at all possible to have sidewalks on streets with a lot of traffic such as Bell, Paint Rock, Chadbourne. Just to have access to stores, bus stops, church, etc. would it be one of the healthiest types of transportation for all of us

Bike/Ped Comments- Wants sidewalk in front of house along CHB to end of HEB, older folks that walk and grandchildren that ride bikes.

Bike trails by Goodfellow from Paint Rock along Bell to Pulliam, along old Christoval Road (Paint Rock to Chadbourne), and from south entrance to Goodfellow to light at Christoval Road.

Transportation Plan- I saw on the news tonight that you are in the process of creating a new long term transportation plan. The news directed viewers to your website if we had any suggestions. I would like to see some type of pedestrian cross walk at Vista Del Arroyo and College Hills. We live on the East side of College Hills but enjoy walking down to the park quite often. College Hills is very busy and there isn't any sort of pedestrian crossing. I understand that this is just a plan; however if this area could be worked into the plan we would certainly appreciate it.

The routes that I use for cycling: I live on Threeawn and work North of San Angelo (near Grape Creek). I commute by bicycle, but not as often as I would like. I take Southwest Blvd. to Sherwood Way to Westwood to Mockingbird to Arden Road, Arden Road to Glenna (cross Houston Harte) to Mercedes. I Then get on the OC Fisher Dam and ride a peaceful 6.5 miles with no car traffic and just a few pedestrians. when I cycle with my elementary school age children, I use the residential streets in Southland, Bentwood, and the Bluffs. I also use Red Bluff Road. I often use Southland Blvd. to get to a common meeting place for performance oriented cyclist (TXDOT parking lot at corner of Knickerbocker and Loop 306).

I like to bike and I am very interested in the (Bicycle/Pedestrian) Plan. Would you add me to your email list so I can keep informed about the city transportation plans and needs.

We need more sidewalks, bike paths, pedestrian bridges and marked crosswalks. I live only one half mile from work yet must walk on a busy through street or walk on someone's lawn to avoid traffic. San Angelo is quite pedestrian/bike unfriendly. I do however applaud the work in the downtown area.

To Whom It May Concern, I heard on the news that the city is interested in making San Angelo more walking and bicycle friendly. I would like to make a suggestion concerning Southwest Blvd. I have through man times that the city should create a walking path, wither paved or even a dirt trail all along this street. Either one side or both. From the loop to the railroad tracks would be a great start but it would be awesome to see it run the entire street! I often see people traipsing through the weeds when they must walk. Now that Lamar elementary is open and many new homes have been built past Wildmill, there are lots of citizens that would benefit. My family and I walk, run and bike in this neighborhood at least twice a week and we always avoid Southwest at all cost due to the high traffic. (Even though the speed limit is 35 mph, it is often a racetrack.) I am a fitness instructor at Community Health Club and I would love to see more walking and biking lanes. Thank you for forwarding this to the City council or whomever needs to see.

Bike Lanes- To Whom It May Concern: in your planning please avoid the use of bike lanes. Bike lanes are a proven form of hazardous transportation to cyclist that use the lanes. I am a certified effective cycling instructor and a retired San Angelo police officer. I have ridden in the traffic of cities such as Austin, San Antonio, Dallas and several others. AS a E.C. instructor I know that the use of bike lanes cause confusion for both the riders and motorist. Bikes under Texas State Law are considered vehicles and must follow the laws set out for them and those laws for cyclist and motorist are the same. Cyclist not following the Texas state traffic laws is often found in violation when an accident occurs, that along with being injured or worse. being that there is already a set of rules for both motorist and cyclist the confusion is reduced and the only need is education for both motorist and cyclist to being them together on the roadways. Education is east when most people already know what the Texas vehicle laws are. They only need to understand that cyclists have and are required to follow the same laws. We already have drivers Ed classes for motorist - just add a few hours of instruction to the same classes to start the process. People wanting to get more understanding on cycling could find easy courses that are available to help them along. Please do not create situations that will cause people to be injured or to be killed. Do not use bike lanes in your planning. If in your shoes, I would not want to watch the news and see that the planning and use of bike lanes cause the injury or death of a cyclist. Without understanding there is fear, with knowledge there is understanding. Education is the way to go. I do hope you will seriously consider this idea. Thank you for your time and good luck in your planning.

Comments as a newcomer to San Angelo I cannot tell you how much I have enjoyed the ability to ride my bike along the downtown Concho River. Cycling is growing in popularity as a means of exercise and transportation. I would think in a city like San Angelo that has a school such as ASU that cycling and bicycle designated lanes, paths and areas designed for cyclist and joggers/runners to use is a growing need for residents, students and visitors. As a newcomer to San Angelo I would enjoy seeing an expansion of trails throughout the city for everyone to enjoy. I encourage the city to continue to expand this program and develop a system that will allow people to ride through the community with minimal vehicular interference. Many large metropolitan areas are very aggressive in this movement. Having moved here from Dallas, I can share with you the increasing expansion of that city's/efforts to expand there program. Cities such as San Angelo can better compete with! Other communities by providing improved life style benefits such as these to their community and it is an excellent sells took in attracting businesses who are looking not only at potential economic reasons but life style amenities for their employees.

I think this sounds like a great idea! I do have a few questions that I want answered. Are you going to put sidewalks in people\'s property? Or just designate sides of streets for these routes? I think that Live Oak is very, very busy and can't imagine biking or walking on it as apparently suggested on the map at the health club. Did I read it correctly? Would the path be on Johnson, a busy street? I appreciate your response to these few questions.

Public trails- I know this may seem a little over the top, but since you are looking for wishes for the wish list, what about horse riding trails? I realize that near as many people have horses as bikes, but in North Angelo (like Green Acres) lots of people have trail horses and would love some trails that loop around the city. We go regulatory to the State Park where there are about 60 miles of horse, bike, and hiking trails. In some cases the horses share trails with the hikers and sometimes the bikers. I think you will find these trails are well used even by out of town people. Maybe there would be a way to tie into the trails there (State Park) and run it into North Angelo. It might be a great way to bring in more visitors to San Angelo. I realize that this suggestion might be too expensive, but I would like for the commission to keep horse riders in the picture not just hikers and bikers.

I would like to lend my wholehearted support for the bike/pedestrian trail system that the Metropolitan Planning Organization has proposed for the city of San Angelo. Our city is way behind in providing safe routes for non-motorized transportation and recreational here, and MPO's proposal would go a long way in meeting these needs. You are probably familiar with the kinds of pathway systems that have been developed by enlightened cities such as Boulder Colorado. I often travel to Boulder primarily just to ride my bike, simply because I can tour the whole city in a safe and fun manner. By contrasts, I would never attempt to bike anywhere in San Angelo (except for the State Park), nor would my granddaughter be allowed to bike or walk to her school simply because it is too dangerous to do so. I sincerely hope that San Angelo will adopt the proposed network of pathways and routes. If there are ways that our family can help promote and support this plan, please let us know.

Bike Trail- My suggestion for a bike trail would be that any time a road in town is widened or improved (especially main roads) a bike lane should be included. Eventually all the main roads would be connected. I have ridden my bike around town and some areas are difficult and dangerous to navigate. Golf Course- If Central High School is going to be rebuilt, the city should negotiate a land trade is possible and then expand the downtown Santa Fe Golf Course to 18 holes (currently 9 holes) using Central High School property. This is a project that would eventually pay for itself and could actually generate income for the city in the future.

Hiking/Biking Trails- I reside in East San Angelo, close to GAFB. GAFB is such an important asset to our community, we really need to have improvements to the south side of Bell Street Park. I've often wondered why that area is "forgotten". Quite a few of the military personnel from GAFB reside in that area and use the park for exercise and recreation. We need pathways in the park as well as an upgrade to the playground equipment. Having a lake right in town is an enormous advantage and should be utilized. This area is large and has easy access to the river and lake. I realize Glenmore park is being updated, but it is not near the size of the park at S Bell. Yes, the improvements are great at Glenmore Park, but it is just not a big enough park for that number of people that would like to enjoy San Angelo. Thanks for your consideration.

Hike/Bike Trails- Myself and my neighbor alternate between hiking and biking every week day. We currently do this along the existing trail along the river from Bell St. to Beauregard and beyond through neighborhoods. Of course, we would benefit from an extension of the trail from Bell St. to the Loop. Another great place for us would be a plan that someone has already mentioned i.e. from Lone Wolf Bridge area along the river to S. Chadbourne.

Mail List- This person called addressing safety concerns (speeding) on Oxford between College Hills and Sherwood. She read the article in today's paper written by R. Smith. She has already spoken with PV and they told her since she was not close to a school, signs indicating children crossing, slow down sign or speed bumps could not be installed. I recommended she talk to her council member regarding the signage, etc. I have added her to the mail list.

Hillside Dr./Gun Club Rd. is a favorite for walkers, runners and bike riders. They even go out after dusk without wearing reflective gear. They walk 4 abreast with backs to traffic. This is very dangerous on a road filled with blind curves and hills. I fear someone is going to be badly injured or killed. We need a trail badly. Please consider.

This city needs to build us all some sidewalks, walking paths, etc. it is nearly impossible to walk to exercise without getting in your vehicle and driving to find a place. Walking in the alleys and streets is not safe and sure not pleasant. Anything you can do to help would be appreciated.

Hi, we are responding to Rick Smith's article on plans for the proposed hiking/biking trails. Our son and family lives close to a great hike/bike system in Ft. Worth; that because of its location close residential areas is in constant use by many people of all ages. this trail connects to the Trinity River Trail that connects several lake areas. in San Angelo I am in favor of building hiking and biking trails in the Red Arroyo area that at some point in time would connect to the river and lake. as I see it, trails in that area would be a great benefit to many because it is closeness to residential areas. it is my understanding that this plan was funded in the past but funding was moved to another area. Red Arroyo would be a great place to start this project! thanks for asking for our input in making San Angelo a better place to live.

We would love a walking path on Hillside drive where many people already walk day and night with no street lights and lots of traffic.

Greetings, I have looked at the web site and studied the map of proposed bicycle routes. I have a question. What is the difference between a "on-street bike route" and a on-street bike lane or shoulder? I f the "on-street bike route" does not include a marked area to ride i fear it will be useless. College Hills Blvd. and Southwest Blvd. are marked as "on-street bike routes" and they are very busy and extremely dangerous streets because they do not have a parking lane that can be used for riding. thank you for all the work you have done. it looks very promising and I hope we can get it done pretty quickly.

This person called addressing safety concerns (speeding) on Oxford between College Hills and Sherwood. She read in the article in today's paper written by R. Smith. She has already spoken with PV and they told her since she was not close to a school, signs indicating children crossing, slow down signs or speed bumps could not be installed. I recommended she talk to her council member regarding the signage, etc. I have added her to the mail list.

If possible a sidewalk down Sul Ross would be a wonderful and helpful thing. I live in the College Hills S. addition and walk all over the neighborhood. It is always quite exciting to walk down Sul Ross! I am always amazed at the lack of foresight used in developing that street no sidewalks? Well, there are very few sidewalks in our entire city and that is really problematic to me! Thanks for asking! Love the idea from my father-in-law about utilizing the Red Arroyo. That would be so awesome!

I had computer difficulties with the surveys so I thought I would re-tell you my thoughts on including equestrian participants in the groups to be able to use the trails. There is an organization in Texas that is dedicated to enhancing access to trails for horseback enthusiasts. The organization is the Texas Equestrian Trailriders. They have a website and the state is divided into regions with reps. in each reason. I do believe this organization could offer some assistance in volunteer workers and perhaps grant acquisition. I will try to get you the director of this region. I believe she is from Mason. I also have seen trails developed in cities in Illinois. I have seen trails in Des Plaines, Illinois that go along the Des Plaines River and through other cities surrounding Des Plaines. I thought they might be good resources. I do believe that San Angelo trail riding individuals would comment to doing labor to get more trails to ride in the city. It would be a possible area that could spawn a business that would provide horses to rent and ride on these new trails. Please do not forget horse enthusiasts in your planning.

One thing that would be good to explore at this time when the city is looking in to trails is the National Rails to Trails program. The Rails to Trails Conservancy is a leader in the fight to protect the federal Transportation Enhancements program, which is the largest source of funding for trail development. As I understand it the city was given the right of way from near Bentwood all the way to Sonora by the Santa Fe when they abandoned it. I also have been told that the city has plans for possible use of it for water pipe line. I am not sure if they also sought and received the right of way for the rail line to Bronte. This may be an excellent time to explore this overlooked property which also could bring grant money with it if we use it for part of the trail system. You can Google search for Rails to Trails and thousands of web sites pop up from cities and states that have taken benefit of this program.

Thanks to Rick Smith's column I'm able to offer a suggestion to you regarding your hike/bike trail planning. I'm sorry I wasn't able to be at the Lincoln Jr. High town hall on this project. I cut a portion of your on-line map for reference. The red line down the center is yours, and is on Southland Blvd. The green buffer is centered on Bonham Elementary. The neighborhood is Twin Oaks Addition. the homes on the streets Shingle Oak, Oak grove, and Pinon Ridge and all the streets in this area are patio homes. the majority of the residents are empty nesters who walk for exercise. My focus is on the portion of the arroyo that runs between Southland Blvd. and Green Meadow and east and south of Oak Grove Blvd. I marked it in bright purple, I've walked dogs on these streets for over 8 years and have had time to envision a plan. If you know Brentwood Park my description might make better sense. First, completely disregard the drainage pattern in the arroyo as it exists. My vision would have a meandering drainage channel from Southland Blvd. to Green Meadow created by engineers. The channel would obviously serve as a drainage path during rains, but when it's dry, the channel would be a paved path. The path might be a simple sidewalk, but more likely would be a sidewalk with curbs to channel the water. The path might even be a culvert a foot or so deep, paved on the bottom, with rock retaining walls. From the drainage path/culvert, the land would be grated at a shallow incline up to the street level. Landscaping? Whatever. Ideally the residents of the surrounding area could lay claim to a piece of dirt and plant things to their liking. For example I could plant a couple of pecan trees and name them after my dogs. My neighbor could plant an oak in memory of her deceased husband. Some might plant a hedge for a few feet or create a flower bed. In the fall we could have a pumpkin patch where citizens can just come and pick one. One neighbor I discussed this with thinks a low chain fence would be appropriate for a portion of the area. The idea is a dog park where any dog could run without going out into traffic. I would want to see some type of obstacle surrounding the entire area to keep 4 wheelers out. The obstacles could be split rail fencing with many gateways for entry/exit, or concrete bollards to tank traps. You get the idea. And if the city buys the riding mower, I bet neighbors would take turns mowing the area.

To add bike routes to existing traffic ways would only slow traffic and make dangerous situations exist for pedestrians and bicyclers. I would rather see a veloway strictly for the purpose of pedestrian and bicycle traffic with no access to motor vehicles. The Red Arroyo that runs from OC Fisher all the way to Kickerbocker would be an interesting location with various parking spots located along a route in that area. Overhead access to roads like College Hills Blvd. might make it feasible. It would bring attention to the natural plants and wildlife that live in that area and would be much safer for individuals wanting to exercise by walking or biking.

I have been meaning to send you my input on the bike/ped routes/trails/lanes

1. Children (elementary school age) and their families and non-performance oriented cyclist these would benefit the most from off-road bike trails in and near San Angelo, they do not go fast (<12 or maybe 15 miles/hour) Need more experienced before becoming comfortable riding in traffic.
 2. Transportation cyclist would probably not use off-road bike trails. Can do long distances usually travel at 15 to 20 miles/hour Should be safe enough and confident enough to ride in traffic.
 3. Recreational cyclist (performance oriented) would probably not use off-road bike trails because these cyclist prefer to go long distances (20+ miles) Usually travel at 18 to 20+ miles/hour. Prefer rural roads with smooth surfaces, little traffic or wide shoulder.
- off road bikes trails would be a benefit for Group 1.

Bike lanes on roads re detrimental and dangerous for Group 2. Group 1 will not likely use bike lanes because their speed is so much slower than cars, and they do not feel comfortable even riding close to car traffic. Group 3 will do much of their cycling outside the city limits. I believe the documented reports about the decreased safety for a cyclist using bike lanes (out of sight of most drivers) rather than behaving as a car in the same traffic lanes as the cars. I think off-road trails would also be a benefit for the growing group of running enthusiasts in San Angelo. It would also be good for walkers. A multi-use path (cyclist, runners, walkers, inline skaters) requires that users be considerate of one another. Group 1 cyclist travel at close to the same speed as runners, generally large differences in speed are problematic. Therefore, groups 2 & 3 cyclist should not be using the multi-use trail if they want to be going greater than 15 mph.

Plan comments

1. The proposed on street bike lane or shoulder loop around through Middle Concho Park and Spring creek park is great. However, the issue of requiring a bridge over the narrow park of the lake just below the spillway of Twin Buttes reservoir should be addressed up front. Some of the land in that area is private property.
2. The proposed on street bike routes on Gun Club road and Fisherman Road are already used by cyclist and runners. Are these simply being included on an *official* map, or am I missing something?
3. The section of on street bike land or shoulder that follows Knickerbocker Blvd. is great for experienced cyclist. However, it's too dangerous for casual riders, runners, and walkers. There also needs to be an off street route over the Lake Nasworthy bridge. I would suggest some option for an off street dedicated bike path to be investigated from north end of the bridge to Loop 306.
4. The proposed bike trail from Walnut Hill Drive to Knickerbocker would be a great improvement. However, why not propose that this bike trail continue straight southwest through the underdeveloped property so as to connect with Red Bluff Road?
5. The proposed on street bike routes that follow Southwestern Blvd. from north of Southland, College Hill north of Loop 306, Live Oak, and Oaks look good on paper, but in practice they are really problematic. These are high traffic roads (for San Angelo) with no shoulder. And I would never recommend that even experienced cyclist ride these streets on a regular basis. If any of these routes can be diverted to a parallel side street it might be safer.
6. Proposed bike trail (Red Arroyo trail at Brook Hollow lane): This need to be extended further SW so an to intersect with Southland Blvd. near the intersection of FM2288 and Hwy 67 (just south of the super Wal-Mart.)
7. I think the bike/ped plan is not considering some other long range planning that has been done by the city. For example, the map shown at www.wilbursmith.com/sanangelo/maps/jpegmaps/pages/thfareplan_jpg.htm shows a future planned new road that connects fro Knickerbocker Blvd. to Highway 67 across SW San Angelo. There are also some other future thoroughfare additions, and these routes need to be identified in the bike/ped plan so that the road construction plans will include non motorized transportation capability.

The other areas look good. I'm really pleased with the trails/routes on the west side of the city and along the Concho River(s) through the city. I guess my only other suggestion would be to present the city a priority list based on citizen input (i.e. baby steps in order with a cost estimate and tied to fiscal years. I think that it's important for both the city fathers and the general public to see "what if" picture of both the timeline and the cost.

Have you looked into utilizing existing utility rows for paths etc? Utility easements run through the vital parts of most commutes. I'm very much like the plan to add a route around lake Nasworthy. I believe the area has better recreation possibilities.

Having walking/running trails and sidewalks should be a top priority for our community. The epidemic of obesity that now invades our nation and is affecting children of younger and younger age is a direct result of our lack of exercise our ways to get from point A to point B need to change drastically as well as a safe easy way to get to our 30 min of daily cardiovascular activity. This is a great first step and we should be aggressive in implementing the changes we are envisioning.

Edmund Blvd. 29th is very busy street with no side walks. Pedestrian travel between home and school, park or store (Wal-Mart & convenience) is extremely difficult. Sidewalks are definitely needed.

Take skill level of cyclist into account. The same facility that serves an infrequent cyclist may be useless for a confident transportation cyclist.

As a RN and a staunch supporter of healthy practical activities in our community I whole heartedly agree to invest in bike and pedestrian trails. Over the past 18 years I have noticed and alarming increase in the numbers of obese children in our community and the number of cardiac patients that are in there 40's and 50's. we need to provide safe pavement for our potential walkers & bikers "then they will come". Involve our community groups in caring for the trails, and even constructing them count me in!

I urge the plan to include a "short term action inventory" identifying a few relatively inexpensive projects that may generate some interest (and a constituency) for doing more. Any such inventory of projects should include a mix of pedestrian and bicycle oriented projects aimed toward a mix of lower and upper income neighborhoods. Any inventory of short-termed action projects may include but should not be limited to"

Designated lanes on streets where an approximately 4-foot wide lane can be wedged between on-street parking (approximately 8 feet wide) and the motor vehicle lanes which should remain at least 11-12 feet in width....focused on the neighborhood between Angelo State University and the multi-use paths alongside the North Concho River.

Installation of sidewalks along certain streets (commercial or residential) where pathways have already been worn on the ground, by years of pedestrian trafficfocused on older areas of San Angelo where CDBG funds may be employed.

Installation of sidewalks on certain key "safe routes" to school in peripheral areas of San Angelo, such as on Southwestern Blvd's approach to Lamar Elementary School.

I would like to see sidewalks around Goodfellow AFB, Southside on S. Chadbourne St. and from S. Chadbourne down on Christoval Hwy to Paint Rock Rd. From that intersection (Christoval Hwy/Paintrock Rd.) to North side of Goodfellow. I would like to see sidewalk/bike trail from Paint Rock Rd. down Bell St. to Pulliam Intersection. We have numerous defenders with DWI's on hardships that can't drive and have to use a bike, cab, bus or walk to our building, it may be possible that our departments can provide labor fro these projects for community service hours.

I would like to see a walking path on Hillside Drive where lots of people are already walking day and night.

I would like to see a walking path on Hillside drive where people are already walking, running and biking all hours of the day and night.

Please consider building a path around Hillside Drive.

Hillside Drive walking path would be great where people are already walking day and night. Also the little lizards run there every Monday and the traffic is dangerous for the kids.

I have looked at the website and studied the map of proposed bicycle routes. I have a question. What is the difference between an "on-street Bike route and a On-Street lane or shoulder? If the On-Street Bike Route does not include a marked area to ride I fear it would be useless. College Hills Blvd. and Southwest Blvd. are marked as On-Street Bike Routes and they are very busy and extremely dangerous streets because they do not have a parking lane that can be used for riding. Thank you for all the work you have done. It looks very promising and I hope we can get it all done pretty quickly.

The addition of bike paths and lanes is long overdue, but even more we need sidewalks and crosswalks outside the old downtown area. Pedestrians are taking risks everyday because of the complete car-centric nature of street design in San Angelo. Try walking to HEB from the nearby residential areas without jaywalking it's not possible.

People walk around Parkview Lake many are in there 60-80 old age group Parkview needs sidewalks from Lindenwood to Vista Del Arroyo there is a partial sidewalk already also it would be good to have sidewalks for the entire loop as some of the older citizens are a bit unsteady on their feet.

A sidewalk from this area connecting to the trail would allow these folks to get to the multi-use trail.

Some of the older folks in the townhouses in Lindenwood & Sunset no longer drive. There is a shopping center (Southwest Plaza) near by, but sidewalks are needed on Lindenwood South. There are sidewalks needed down Sunset from Executive Dr. across Knickerbocker to Lindenwood South because of pedestrian traffic from the hospital/bank complex.

Appendix B

Prioritization of Future Projects

San Angelo Bicycle and Pedestrian Plan

Potential Project	From	To	Length, miles	Facility Type	Unit Cost, \$/mi	Estimated Cost, \$	Priority or Priority Group
-------------------	------	----	------------------	---------------	---------------------	-----------------------	----------------------------------

Appendix B

Prioritization of Future Projects

San Angelo Bicycle and Pedestrian Plan

Potential Project	From	To	Length, miles	Facility Type	Unit Cost, \$/mi	Estimated Cost, \$	Priority or Priority Group
On-Street Bikeways (PRIORITIZE WITHIN THIS GROUP AS HIGH, MEDIUM OR LOW)							
S. Concho Rd/Cntry Club Rd	Knickerbocker Rd	Grand Canal Rd	4.8	5' Shldrs	400,000	1,920,000	High
Grand Canal Rd	Country Club Rd	US-277	0.6	5' Shldrs	400,000	240,000	High
Knickerbocker Rd (FM-584)	Loop 306	Spillway Rd	4.7	8' Shlders	LS	1,000,000	Med
Spillway Rd	Knickerbocker Rd	Middle Concho Dr Conn	1.5	5' Shldrs	400,000	600,000	Med
Red Bluff Rd/Mid. Concho Dr	Knickerbocker Rd (FM-584)	Middle Concho Dr E-W	1.8	5' Shldrs	400,000	720,000	High
Middle Concho Park Conn	Middle Concho Dr	Spillway Rd	1.0	10' Trail	LS	1,000,000	Med
Southland Blvd	Knickerbocker Rd (FM-584)	US-67	2.8	5' Lanes	50,000	140,000	High
FM-2288	Loch Lomond St	US-67	3.0	5' Ln/Shldr	50,000	150,000	Med
Arden Rd (widened)	FM-2288	US-67	1.0	5' Shldrs	50,000	50,000	Med
EB US-67	Sunset Dr	N Baze St	5.5	6' Shldrs	10,000	55,000	Med
	N Bell St	Smith Blvd	1.0	6' Shldrs	10,000	10,000	Low
WB US-67	N Baze St	Arden Rd	4.7	6' Shldrs	10,000	47,000	Low
	N Bell St	Smith Blvd	1.0	6' Shldrs	10,000	10,000	Low
Armstrong St (FM 208)	50th St	14th St	2.3	8' Shldrs	20,000	46,000	Med
EB Loop 306	South West Blvd	Foster Rd	2.5	6' Shldrs	10,000	25,000	Med
WB Loop 306	South West Blvd	Foster Rd	2.5	6' Shldrs	10,000	25,000	Med
Chadburne St	Avenue N	Christoval Rd	1.1	5' Ln/Shldr	50,000	55,000	Med
San Antonio Frwy (FM-1223)	Christoval Rd	Loop 306	4.5	6' Shldrs	5,000	22,500	Low
Eola Rd (FM-765)	Loop 306	San Antonio Frwy (FM-1223)	1.6	6' Shldrs	5,000	8,000	Low
Paint Rock Rd (FM-388)	State St	Loop 306	2.5	6' Shldrs	5,000	12,500	Low
Spr. Creek Dr/Fishermans Rd	Spillway Rd	Knickerbocker Rd (FM-584)	2.0	5' Shldrs	400,000	800,000	Med
Hillside Dr	Gun Club Rd	Knickerbocker Rd (FM-584)	0.9	R (1-way)	25,000	22,500	Med
Gun Club Rd	Hillside Dr	Knickerbocker Rd (FM-584)	1.0	5' lanes	400,000	400,000	Med
Cntry Club Rd/Ben Ficklin Rd	Canal Rd	South Concho River Trail	1.4	R	5,000	7,000	Med
Fairview School Rd	Loop 306	San Antonio Frwy (FM-1223)	3.1	R	5,000	15,500	Med
Southwest Blvd	Valley View Blvd	Sherwood Way	2.3	R	5,000	11,500	High
Sunset Dr	US-67	Southwest Blvd	0.8	R	5,000	4,000	Med
College Hill Blvd	Valley View Blvd	Avenue N	2.8	R	5,000	14,000	High
Beauregard Ave	Avenue N	S Campus Blvd	0.5	R	5,000	2,500	Med
Mercedes St	Glenna St	Arden Rd	1.2	R	5,000	6,000	Med
Johnson Ave *	Knickerbocker Rd (FM-584)	Live Oak St	1.5	R	5,000	7,500	Med
Live Oak St	S Campus Blvd	River Dr	1.4	R	5,000	7,000	Low
Live Oak Conn	Live Oak St	Concho River Trail	0.1	trail bridge	LS	1,000,000	Med
S Campus Blvd	Harris Ave	Avenue N	0.5	R	5,000	2,500	Med
Garfield St	Beauregard Ave	Live Oak St	1.5	R	5,000	7,500	Med
Howard St	Pecos St	Edmund Blvd	1.7	R	5,000	8,500	Med
Garrett St	Pecos St	Live Oak St	0.4	R	5,000	2,000	Med
Pecos St	Howard St	Garrett St	0.1	R	5,000	500	Med
Van Buren St	Webster St	Live Oak St	1.2	R	5,000	6,000	Med
Jefferson St	Webster St	Live Oak St	2.2	R	5,000	11,000	Med
Webster St	Jefferson St	Field St	1.7	R	5,000	8,500	Med
Field St	Howard St	19th St Byp	1.0	R	5,000	5,000	Med
Millsbaugh St	19th St Byp	Webster Ave	0.3	R	5,000	1,500	Low
Juanita Ave	Millsbaugh St	End River Valley Ln	0.6	R	5,000	3,000	Low
14th St	Jefferson St	Armstrong St	1.7	R	5,000	8,500	Med
Oakes St	14th St	Avenue N	2.4	R	5,000	12,000	Med
Preusser St	Bell St	Main St	1.1	R	5,000	5,500	Med
W College Ave	Main St	1st St	0.7	R	5,000	3,500	Med
1st St	Park Dr	Martin Luther King Pkwy	0.4	R	5,000	2,000	Med
3rd St	Oakes St	Main St	0.3	R	5,000	1,500	Med
Pulliam St	Main St	Smith Blvd	2.1	R	5,000	10,500	Med
Christoval Rd	Avenue L	Glenmore Dr	0.3	R	5,000	1,500	Low
Glenmore Dr	Christoval Rd	Bell St	0.4	R	5,000	2,000	Med
Bell St	Glenmore Dr	Hughes St	2.6	R	5,000	13,000	Med
Hughes St	Bell St	N. Buchanan St	0.4	R	5,000	2,000	Low
Baze St	Hughes St	Upton St	0.4	R	5,000	2,000	Low
Culwell St	Baze St	N. Buchanan St	0.1	R	5,000	500	Low
Upton St	Bell St	Baze St	0.5	R	5,000	2,500	Med
Smith Blvd	Pulliam St	Gordon Blvd	0.8	R	5,000	4,000	Low
Gordon Blvd	Smith Blvd	Ricks Dr	0.1	R	5,000	500	Low
Ricks Dr	Gordon Blvd	McGill Blvd	0.3	R	5,000	1,500	Low
State St	Medina St	Paint Rock Rd (FM-388)	0.4	R	5,000	2,000	Low
Medina St	Ardmore St	State St	0.1	R	5,000	500	Low
Ardmore St	Riverside Ave	Medina St	0.3	R	5,000	1,500	Low
Riverside Ave	Woodruff St	Ardmore St	0.2	R	5,000	1,000	Med
Woodruff St	Riverside Ave	Ditch Trail	0.2	R	5,000	1,000	Med
River Dr	Edmund Blvd	S Randolph St	3.5	R	5,000	17,500	Med
S Randolph St	River Dr	Concho Ave	0.1	R	5,000	500	Med
Concho Ave-Concho Dr	S Randolph St	Bell St	1.8	R	5,000	9,000	Med
Roosevelt St	Concho Ave	Bell St	0.5	R	5,000	2,500	Low
S Concho Park Dr	Avenue K/Lone Wolf Br	Bell St	1.0	R	5,000	5,000	Med
Kennedy St	Bell St	Woodruff St	0.4	R	5,000	2,000	Low

Appendix B

Prioritization of Future Projects

San Angelo Bicycle and Pedestrian Plan

Potential Project	From	To	Length, miles	Facility Type	Unit Cost, \$/mi	Estimated Cost, \$	Priority or Priority Group
Pecan St	14th St	29th St	1.1	R	5,000	5,500	Med

Appendix C

ADA Transition Plan Framework

The Bicycle and Pedestrian Plan recommends that a plan of action be developed for the City of San Angelo to comply with Title II of the Americans with Disabilities Act. Title II is that part of the law which requires state and local government entities to make services, facilities and programs accessible to all individuals.

Background

Legislation:

The Americans with Disabilities Act was passed in 1990. All state and local government entities were required to create a Transition Plan for complying with ADA. The Transition Plan was to be in place by 1992; implementation of plan was to be completed by 1995. The city of San Angelo is now nearly ten years overdue with official compliance with the ADA.

Who Must Comply With Title II of the ADA?

Public entities defined as:

- 1) any state or local government
- 2) any department, agency, special purpose district or other instrumentality of a state or local government
- 3) certain commuter authorities and AMTRAK

What Activities are covered?

- The operation of all service and programs offered by the entity
- All aspects of the employment relationship
- Government services carried out by contractors
- Activities of state and local legislative and judicial branches
- Public transportation

Overview of Requirements

The requirements of Title II of the ADA fall into four broad areas:

- 1) general nondiscrimination requirements
- 2) equally effective communication
- 3) program accessibility
- 4) employment

The scope of this proposal is concerned only with the transportation aspect of Title II, #3 above, Program Accessibility. However, the steps included in the Transition Plan may be duplicated to achieve compliance in the other areas under Title II.

Steps for Development of a Transition Plan

There are four steps the City of San Angelo must complete before creating its transition plan:

- 1) Designate a responsible employee. This person is typically referred to as the ADA Coordinator. He/she may work in any department of the state or local entity, and the position may be full or part time. Contractors are not allowed to serve in this position, but may be hired to help create and implement the plan.

- 2) Provide notice of ADA requirements. All public entities must provide information to applicants, participants, beneficiaries, employees and other interested parties regarding the rights and protections afforded by Title II.
- 3) Establish a Grievance Procedure. All entities must adopt and publish procedures providing for prompt and equitable resolution of grievances arising under Title II.
- 4) Conduct a Self-Evaluation. All entities must complete a comprehensive review of its current practices, in this case, all its facilities. The City of San Angelo must identify any facilities that do not comply with ADA .(This self-evaluation was to have been completed by January 26, 1993.)
- 5) Create and Implement Transition Plan to make all of the City’s services, programs and facilities accessible to all individuals.

Action Steps for Transition Plan

- 1) Identify staff and/or consultants to review each facility for compliance.
- 2) Establish the process by which the disability community will participate. Most entities create a citizen’s advisory group or “task force” of people with various forms of disabilities to make sure all needs are considered.
- 3) Identify all facilities used by each of the City’s programs and services.
- 4) Map out the usage and specialized features of each facility. This includes walkways and approaches to each facility from parking lots, bus stops and other transportation; doors and entrances, restrooms, vertical access (elevators and stairways, drinking fountains, play and picnic areas in parks, etc.
- 5) Choose a survey “tool” or list of standards. This must include evaluating for access by wheelchair users and other mobility-impaired people, but also for blind and visually impaired as well as deaf and hard-of-hearing people.
- 6) Incorporate the City’s capital improvement plans. It’s important to know when other alterations, closings, new construction, etc is planned to efforts to comply with ADA may be incorporated more easily and less expensively.
- 7) Identify funding and timelines. Since the City of San Angelo is already over ten years delinquent in creating this plan, it’s recommended that these steps be taken as soon as possible.

Proposed Rules for ADA compliance in the Public Right of Way

The recommendation above applies to the parts of the ADA currently under Department of Justice rules and applies only to access to buildings and facilities. However, rules regarding making the public right-of-way accessible to all people are currently being evaluated. It is expected that within the next two years, all entities will be required to build ADA compliant sidewalks in all new road construction and possibly within roadway reconstruction and some routine maintenance activities.

In light of these proposed rules, it’s recommended that the City of San Angelo begin planning for additional capital expenditures and new policies and procedures that consider sidewalks, ADA compliant ramps, pedestrian signals, etc in all of its transportation projects. In addition, development codes for new private construction will likely have to consider these new federal rules concerning access in the right-of-way.

Appendix D

Financing Opportunities

There are a variety of potential funding sources including local, state, regional, and federal funding programs that can be used to construct the proposed bicycle and pedestrian improvements. Most of the federal, state, and regional programs are competitive, and involve the completion of extensive applications with clear documentation of the project need, costs, and benefits.

Federal Funds

The primary federal funding source for bicycle and pedestrian projects, TEA-21 is described below. This program will end in 2005, to be replaced by a new program, currently identified as SAFETEA.

Transportation Equity Act for the 21st Century (TEA-21) - Both houses of Congress adopted TEA-21 on May 22, 1998. The follow-up to ISTEA, TEA-21 offers some important funding opportunities. Federal funding through the SAFETEA program will provide the bulk of outside funding. TEA-21 currently contains three major programs, STP (Surface Transportation Program), TEA (Transportation Enhancement Activities), and CMAQ (Congestion Mitigation and Air Quality Improvement) along with other programs such as the National Recreational Trails Fund, Section 402(Safety) funds, Scenic Byways funds, and Federal Lands Highway funds.

1. The Surface Transportation Program (STP) was amended as follows:
 - Bicycle and pedestrian projects remain eligible, and must compete with other modes.
 - Sidewalk improvements to comply with the Americans with Disabilities Act (ADA) are now eligible for Surface Transportation Program funds.
 - 11.5% local match.
2. The National Highway System (NHS) program was amended as follows:
 - Pedestrian projects may now be funded with NHS funds.
 - NHS funds may be used on bicycle and pedestrian projects within Interstate corridors.

3. The Transportation Enhancement Activities (TEA) program was amended as follows:
 - Bicycle and pedestrian safety and education programs.
 - Tourist and welcome centers.
 - Environmental mitigation to provide wildlife corridors.
 - Requirement that each project be directly related to a surface transportation project.
 - Eighty percent federal matching requirement applies only to total non-Federal share rather than total project cost.
 - Twenty-five percent of the TE funds received over the amount received in FY 1997 may be transferred to other STP activities.
 - Eight specific projects are funded off the top of the TEA program, none in the Western United States.
4. The Recreational Trails Program was amended as follows:
 - 270 million dollars available nationwide over the next six years.
 - Bicycle project eligibility remains essentially the same.
 - In Texas, this program is administered through the Texas Parks and Wildlife Department.
5. Transportation for Livable Communities (TLC)
 - \$9 million/year available region wide.
 - Capital and planning grants to enhance a community's overall quality of life.
 - 11.5% local match required.
6. The Hazard Elimination Program was amended as follows:
 - Now can be used for bicycling and walking hazards.
 - Definition of a "public road" now expanded to include bikeways, pathways, and traffic calming measures.
7. A new category, Transit Enhancements Program, was created that calls for transit agencies in urbanized areas over 200,000 population to use one percent of their Urban Formula Funds for Transit Enhancements Activities. Up to 50 million dollars per year may be available for pedestrian access, walkways, bicycle access, bike storage facilities, and bike-on-bus racks. The program calls for 95 percent federal/five percent local match.
8. Scenic Byway, bridge repair, transit, safety (non-construction), and Federal Lands programs all remain essentially the same under TEA-21, with the amounts either the same or increasing from ISTEA.

9. Planning provisions for states and metropolitan planning organizations have been streamlined, with bicycle and pedestrian needs to be given due consideration in the development of comprehensive transportation plans. Specific policies include directives to not approve any project or regulatory action that will have an adverse impact on non-motorized safety, unless a reasonable alternative route is provided or already exists.
10. When state or local regulations permit, allow use of bicycle facilities by electric bicycles and motorized wheelchairs.
11. Railway-highway crossings should consider bicycle safety.

TEA-21 funding is administered through the state (TxDOT) and regional governments (San Angelo Metropolitan Planning Organization). Most, but not all, of the funding programs are transportation versus recreational oriented, with an emphasis on (a) reducing auto trips and (b) providing an inter-modal connection. Funding criteria often includes completion and adoption of a bicycle/pedestrian master plan, quantification of the costs and benefits of the system (such as saved vehicle trips and reduced air pollution), proof of public involvement and support, environmental compliance, and commitment of some local resources. In most cases, TEA-21 provides matching grants of 80 to 90 percent--but prefers to leverage other moneys at a lower rate. It will be critical to get the local state legislators briefed on these projects and lobbying TxDOT for these projects.

Community Development Block Grants - The Community Development Block Grant (CDBG) program is essentially the only major Federal government grant program that can be used for the ongoing construction of local infrastructure. However, CDBG funds may only be used in those areas of the region that meet certain economic or protected-class criteria. In addition, the amount of funding available for infrastructure construction is limited to about \$250,000 per year.

State Funds

The Texas Department of Health Comprehensive Community Chronic Disease Wellness Program set aside a small pot of money in 1999 that could be used to build trails. The program awarded up to \$5000 for projects that affected physical activity or nutritional changes reducing risk of heart disease, cancer or diabetes. Approximately 26 small trails, including exercise or wellness trails and small loops around schoolyards and baseball fields, were built over two

years with funding from this program. There is no funding for the program at this time and if money were secured for next year the Health Department would look to target areas with severe risk for heart disease, cancer and diabetes.

Another fund is the Texas Recreation and Parks Account (TRPA). Information on the various elements of this grant program is available below.

Texas Recreation Grants: Recreational Trails

Agency Name: Texas Parks & Wildlife Department (TPW)

Contact: TPW, 4200 Smith School Road, Austin, TX 78744, (512) 912-7124

Web Site: <http://www.tpwd.state.tx.us>

Eligible Projects: Construction of new recreation trails on public or private lands, trail restoration or rehabilitation, Americans with Disabilities Act upgrades, acquisition of easements, acquisition of property, maintenance of existing trails, environmental mitigation, and the development of trail-side and trail-head facilities (signs, restrooms, parking areas, water fountains, horse-watering, corrals, hitching posts, tool storage, bike racks, benches, picnic tables, and fencing).

Program Requirements: Matching grant funds (50%) are available to acquire and develop parkland or to renovate existing public recreation areas. The maximum grant awarded is \$500,000. Projects must be completed within three years of approval.

Grant Uses: Recreation, Trails, Open space, Capital Improvement/Purchase

Eligible Applicants: Local Governments

Application Deadline: June 31

Texas Recreation Grants: Small Community Grants

Agency Name: Texas Parks & Wildlife Department (TPW)

Contact: TPW, 4200 Smith School Road, Austin, TX 78744, (512) 912-7124

Web Site: <http://www.tpwd.state.tx.us>

Eligible Projects: Funds can be used by communities with populations of 20,000 or fewer people for trails including jogging and exercise trails; nature and hiking trails; bicycle, motorcycle and multiple purpose trails; observation stations; overlooks; bridges; low-water crossing; boardwalks; exercise stations; and interpretive and directional signage.

Program Requirements: This program provides a maximum \$50,000 grant in 50% matching funds to qualifying communities to acquire and develop parkland.

Grant Uses: Recreation, Open Space, Capital Improvement/Purchase

Eligible Applicants: Cities with 20,000 or fewer people

Application Deadline: January 31

Texas Recreation Grants: Regional Park Grants

Agency Name: Texas Parks & Wildlife Department (TPW)

Contact: TPW, 4200 Smith School Road, Austin, TX 78744, (512) 912-7124

Web Site: <http://www.tpwd.state.tx.us>

Eligible Projects: Regional Park Grant applications will be given priority if the proposed project: acquires large tracts of land to be set aside as parkland, has local matching funds from multiple political jurisdictions as well as non-profit organizations/private donations, is listed in local park master plans, will be used in a multiple jurisdictional manner, provides water-based recreation, links multiple jurisdictions with trails or greenbelts, and the project has a direct link to the mission of Texas Parks & Wildlife Department.

Program Requirements: Fifty percent (50%) of the actual expenditures, up to the approved grant amount is reimbursed during the project period as billings are submitted. There is no ceiling on match amounts, but grant awards are dependent on the number of applicants and the availability of funds. Past recipients for the Regional Park Grant have ranged from \$750,000 to \$1,200,000.

Grant Uses: Recreation, Trails, Open space, Capital Improvement/Purchase

Eligible Applicants: Cities, counties, water districts, and other local government

Application Deadline: January 31

Safe Routes to School - The Safe Routes to School (SRS) Program resulted from the enactment of House Bill 2204, 77th Legislature, 2001. HB 2204 added Transportation Code, §201.614 directing the Texas Department of Transportation (TxDOT) to establish the Safe Routes to School Program. The overall purpose of this program is to improve safety in and around school areas. While Safe Routes to School on the national level is an overall concept that includes education, enforcement, and safety construction improvements, TxDOT's Safe Routes to School Program implemented by HB 2204 will only address safety construction improvements. The rules that established the SRS program were adopted by the TXDOT Commission and became effective July 18, 2002.

Project proposal applications shall only be submitted by a political subdivision. School districts should contact their city or county offices to develop a project proposal. The proposal must be submitted to the District Engineer in the proper TxDOT District Office, using the application form approved by the department and must be submitted within the published deadline. Applications and the rules for submission and selection will be available at each district office, at the division office in Austin and on this web site.

Projects may be located on or off the state highway system, but must be located on public property. The project must be located within a two mile radius of a school. Federal funds requested will be limited to \$500,000. Projects can cover multiple school sites if similar work is performed at each site. Local project funding match of 20% is required unless the project is located on the state highway system in which case TxDOT will provide the match. A project on the state highway system will not be eligible if the district finds that the project interferes or disrupts any planned improvements or existing infrastructure. There are six categories of work eligible for funding:

- Sidewalk improvements
- Pedestrian/Bicycle crossing improvements
- On-Street bicycle facilities
- Traffic diversion improvements
- Off-Street bicycle and pedestrian facilities
- Traffic calming measures for off-system roads

Further information and application forms for Safe Routes to Schools are available at:

www.dot.state.tx.us/trafficsafety/srs

Other Funds

Houston Endowment Foundation - Grants are made only to nonprofit organizations which are tax-exempt under Sections 501(c)(3) or 170(c) of the Internal Revenue Code. The Houston Endowment Foundation does not make grants to individuals or loans of any type. Although the counties and cities in the San Angelo MPO would not be eligible, a non-profit organization supporting or advocating trails and open space would be. Grants are made only on the basis of written applications. Grant Department staff review and evaluate requests before they are presented to the Board of Directors. The Board of Directors does not entertain oral presentations from applicants.

An application form is not required. Applications should consist of a letter and other supporting documents, as outlined below. Eligible organizations seeking a grant should submit a letter on the letterhead of the organization. This letter of application must be signed by the chief executive officer (e.g., President, Executive Director, etc.) and should include a statement that the CEO: 1) has seen and approved the request, and 2) endorses the request as a strong priority of the organization for Foundation support.

In general, the form of the letter is less important than its content, which must include the following information:

- A brief description of the history and mission of the organization and the scope of current activities. Please indicate if the organization has in the past or is now operated under any name other than the name on the IRS determination letter.
- A statement concerning the need for the program or project. If statistics or opinions are included, the source or reference should be cited.
- A statement of the specific population that will benefit from the proposed program.
- A statement of the objectives of the program-what it is intended to accomplish.
- A brief description of the activities to be included as part of the project and the timetable for their accomplishment.
- A statement concerning the overall cost of the project for which funding is sought and the amount of funding requested from the Foundation. A separate sheet showing the project budget, including projected revenue and expenses, may be attached. The statement should discuss how the project will continue to be funded after the Foundation's funding ceases.
- A list of other sources of support (such as foundations, corporations, agencies, etc.) which have committed funding for the proposed project, including the amount of support committed.
- A list of other sources of support from which the organization has requested funding for the proposed project, including the amount requested, and for which a response is pending as of the date of application.
- The proposed method for evaluating the project's effectiveness.
- The name, title, and telephone number of the person with whom the Foundation should communicate regarding the request, if other than the chief executive officer.

The Board of Directors typically meets nine or ten times a year and considers grant requests at six meetings each year. The Foundation has not established external deadlines for grant requests to be included on specific meeting agendas. The review and decision process

typically takes three to six months. Accordingly, if funding is needed by a specific date, the request should be submitted four to six months in advance.

Additional information is available on their web site:
<http://www.houstonendowment.org/>.

Other foundation funding is also available to non-profit organizations. Such foundations include the North American Fund for Environmental Cooperation (NAFEC), the Pew Charitable Trust. A listing of various potential funds is located at
<http://www.foundationcenter.org/>.

Other potential funds can be found at
http://www.trailsandgreenways.org/TAG_active_pages/TechnicalAssistance/

A search found the following likely candidates:

Program Name: Land and Water Conservation Fund-States (L&WCF)
Agency Name: U.S. Department of the Interior National Park Service (NPS)
Contact: Inter-mountain (AZ, CO, MT, NM, OK, TX, UT WY)
12795 Alameda Parkway, Denver, CO 80225
(303) 969-2500

Program Name: Kleberg (Robert J., Jr. and Helen C.) Foundation
Contact: 700 N. Saint Mary's Street, Suite 1200, San Antonio, TX 78205
(210) 271-3691

Program Name: Hoblitzelle Foundation
Contact: 5956 Sherry Lane, Suite 901
Dallas, TX 75225-6522
(214) 373-0462
(214) 750-7412 fax

Program Name: Historic Preservation Fund (HPF) Grants-in-Aid
Agency Name: U.S. Department of the Interior National Park Service (NPS)
Contact: 2/306 Richardson Hall, University of Texas, Austin, TX 78712
(512) 471-1525

Program Name: Watershed Protection and Flood Prevention

Agency Name: U.S. Dept. of Agriculture Natural Resources Conservation Service

Contact: State NRCS Office, 101 S. Main Street, Temple, TX 76501-7602
(254) 742-9800 or (254) 742-9819

It is important to note that the majority of funding for bicycle and sidewalk projects is expected to be derived from Federal sources. These funding sources are extremely competitive, and require a combination of sound applications, local support, and lobbying on the regional and state level.

Local Funding Alternatives

The following section briefly discusses local alternatives to Federal and State funds.

Local Improvement Districts - The Local Improvement District (LID) is a method by which a group of property owners can share in the cost of transportation infrastructure and other improvements. The Downtown of San Angelo could be such an improvement district. Projects could involve paving the street, building sidewalks, and installing a storm water management system. An LID can also be used to install sidewalks on existing streets that previously have been accepted by the City.

Property owners are not charged for transportation infrastructure improvements until the work is complete. At that time a property owner may either pay the assessment in full, or choose to finance it. All participants in an LID are automatically eligible for financing; usually over 5, 10 or 20 years with monthly or semiannual payments. If property ownership changes, payment responsibility remains with the property, and does not follow the previous property owner. Assessments are secured by a lien on the property until paid. If the assessment is financed, the property owner will receive an annual statement of interest paid, which can be used to substantiate interest payments should the property owner choose to deduct these costs.

Property owners form an LID to build transportation infrastructure improvements to benefit their properties. Property owners join together and work with City staff to create an LID to build sidewalks or other transportation infrastructure that meets City standards. In most cases greater than 50% support of the property owners within the LID is necessary to form the LID. City Council holds a hearing on the proposed LID. Each property owner within the LID has an opportunity to share their feelings as to why the improvements are needed or why the LID should not be formed. City Council then votes as to whether to form the LID. Obtaining

majority support does not automatically mean that City Council will form the LID. But if a project is built, all property owners who are included in the LID and benefit from the project are asked to help pay for it to help make the improvements affordable for everyone.

Fee Alternative: Call-in of Sidewalk and Street Improvement Deferrals - The City Development Code may require that some new development construct public street improvements as part of their building permits and land use actions. At times, these exactions are deferred by the City until conditions are better suited for construction of public improvements. A common type of deferral is for sidewalk construction. An example would be a single family home building permit on an unimproved local street. The builder may request a deferral for building the sidewalk until such time as the street is to be improved to urban standards with curbs, sidewalks, and proper grade and width of pavement. The City calls in deferrals when it knows of street improvement projects for certain streets. This requires the builder/property owner to eventually be accountable for constructing the improvement.

Debt Financing Alternative: General Obligation Bonding - A General Obligation Bond is a form of debt financing where, upon voter approval, a city pledges the full faith and credit which is an unlimited promise to pay debt service requirements on the bond. General Obligation Bond revenues are only used for capital construction projects. Funding could be used for construction of missing sidewalks, replacement of existing sidewalks, local street improvements, and installation of street lights. However, it could not be used to care for street trees, right-of-way landscaping, or operation and maintenance of street lights.

Given the large amounts of funding required, the best use of General Obligation Bond funding would be to use it toward improving arterial, collector, and local streets that are currently unimproved. This would construct sidewalks on the most expensive type of streetscape projects, leaving an ongoing funding program to deal with the less expensive streetscape needs. Arterial and collector street projects that provide safe access routes to schools should be top priorities.

Debt Financing Alternative: Revenue Bonding - The difference between Revenue Bonding and General Obligation Bonding is that Revenue Bonds are based on a dedicated revenue stream of a government jurisdiction. Because they are not based on the larger community's assets, they do not require voter approval. The payment of Revenue Bonded debt takes precedence over any other expenditure of that particular revenue stream.

Appendix E Example Policy Statements

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.

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. ***Sidewalk locations should be checked on all site plans for new development and redevelopment.*** Generally, sidewalks should be installed if the following criteria are satisfied: a) the proposed development is located in the Central Business District, b) the proposed development is located on an arterial street, or high volume collector street, or c) sidewalks are already present on adjacent properties or within the same block.
4. ***Update city sidewalk design standards.*** The recommended urban sidewalk should be 5 feet in continuous width with a minimum of 3 feet of buffer between the edge of the roadway and the sidewalk. 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.
5. ***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 conveys a feeling of lack of security and fear for personal safety, often resulting in decreased facility usage with a possible increases in pedestrian accidents elsewhere due to the use of alternative, less safe routes.



EXCELLENCE
DESIGN
ENGINEERING

Wilbur Smith Associates

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.

