SECTION 7 Bicycle Plan

A complete transportation network requires the coordination of the roadway, sidewalk and bicycle systems. The City of Georgetown does not have an adopted bicycle plan and the provisions set forth within the UDC do not adequately address a bicycle plan. While limited provisions for bicycle facilities have been accounted for in the UDC, there is not a plan to guide private land developers and the City in the construction of new roadways with bicycle facilities or to retrofit existing roadways with potential bicycle facilities. The bicycle system needs to be addressed to aid in the integration of these facilities.

In the creation of a Master Plan, the City needs to fully understand the various categories of on-street bicycle facilities. It should be noted that off-street facilities, typically located in parks or other public areas, fall under different guidelines and will not be addressed. The completion of the off-street plan should be a subsequent continuation of the on-street plan.

The following sections contain excerpts from the City of Austin's "Bicycle Facilities Toolbox", which was developed by Klotz Associates. The information summarizes the various categories of on- and off-street bicycle facilities. This information does not represent an overall plan, but does provide a guide for various bicycle facility design elements the City may want to consider when creating and adopting a city-wide bicycle plan. Information in this chapter was compiled from the *1999 Guide for the Development of Bicycle Facilities,* published by the American Association of State Highway and Transportation Officials (AASHTO), and the *2006 Texas Manual on Uniform Traffic Control Devices* (TMUTCD), published by TxDOT.

The information presented provides a foundation for deciding what bicycle plan elements are desired by the community. Subsequent sections address potential City-specific bicycle plan ideas. The bicycle plan should be tied to the priority elements as identified in the sidewalk plan and should address school, recreational and commercial access. Once the bicycle plan has been established, a more thorough review can be completed that considers off-street bicycle paths.

7.1 Bicycle Terminology

Bicycle Facility – A general term denoting improvements and provisions made by public agencies to accommodate and encourage bicycling. This includes roadway improvements for bicycle travel, bicycle parking facilities, and other bicycle-friendly improvements.

Bicycle Lane – A portion of a roadway that has been designated for bicycle use with signage and pavement markings. This lane is for the exclusive use of bicycles – vehicular parking, vehicular standing and driving is prohibited.

Bicycle Path (Shared-Use Path) – A bikeway separated from vehicular traffic by an open space of barrier within the highway or independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users.

Shared Roadway – A roadway that is open to both bicycle and motor vehicle travel. This may be an existing roadway with wide lanes or paved shoulders. A shared roadway may be signed as a route for bicyclists, if specific AASHTO criteria are met.

7.2 The Bicycle and Bicycle User

An operating space of five feet is assumed as the minimum width needed for any facility designed for the exclusive use of bicycle riders. The skill level, confidence and preference of cyclists vary dramatically. Some riders are confident riding anywhere they are legally allowed to operate (Type A); however, most adult riders prefer to use roadways with a more comfortable amount of operating space or shared use paths that are separated from traffic (Type B). Type C includes children. All classifications require smooth riding surfaces with bicycle-friendly roadway design.

Type A – Advanced or experienced riders generally use their bicycle as they would a motor vehicle. A number of these riders will commute via bicycle and they are comfortable riding with vehicular traffic, but need sufficient operating space on the travel way or shoulder. These more advanced riders are riding for convenience, speed and exercise.

Type B – Basic or less confident adult riders may also be using their bicycles for transportation purposes, but these riders prefer to avoid roads with fast or busy motor vehicular traffic. Basic riders are comfortable riding on neighborhood streets and shared use paths, but prefer designated facilities, such as bicycle lanes or wide shoulder lanes on busier streets.

Type C – Children require access to key destinations, such as schools, recreational facilities and convenience stores. Residential streets with low traffic and links with shared use paths can accommodate children on bicycles.

7.3 Bicycle Friendly Communities

The City of Georgetown has long sought to become a more bicycle friendly community. Given the rapid growth and development of the City and the region, the area is quickly becoming a desirable place for bicycle enthusiasts. The large number of urban parks coupled with the unprecedented growth and development ultimately requires consideration of bicycle traffic. The CSS discussion presented in Chapter 4 addresses bicycle facilities as they relate to the roadway character and adjacent land uses. The contexts presented herein allow for the consideration of these facilities and outlines the groundwork for their construction.

While the City of Georgetown does not have an adopted bicycle plan in place, the City should begin by addressing bicycle needs for each of the priority elements identified in the sidewalk discussion.

7.4 Facility Types

Planners and engineers recognize that bikeway design choices will affect the level of use, the type of rider and the level of access. Bicycle facilities should be planned to provide connectivity and consistency for all users. Priority consideration should be given to those priority elements that have limited or no bicycle access. For example, children residing within a school boundary but outside the bus ridership zone should be rated the highest priority. These children must find an alternative form of transportation to and from school and they often want to ride a bicycle. Providing a

safe, well-delineated and well-signed bicycle path will allow students the opportunity to ride their bicycles.

There are three distinctly different bicycle route designations; shared roadway (including the use of the "sharrow" designation), standard bicycle lane, and shared use paths. Each of these will be discussed in greater detail in the following sections.

7.5 Shared Roadways

These are the most common bicycle facility types for local and recreational travel. Many times signing and striping are not necessary; however, it is advisable to install some type of warning signage within the vicinity of a school, park or other area with a high number of children. Typically, cyclists use either a shoulder or a wide curb lane to travel along the desired route. Wide curb lanes are common especially within residential and local level street classifications.

The paved shoulder option provides a shoulder that is intended for bicyclists. This can be in a rural setting with open ditch design or along a curb and gutter section. For both options, AASHTO recommends a minimum of five feet in width with a four-inch solid white line separating the bicycle from the general vehicle travel lane. When vehicle travel speeds are greater than 50 MPH or there are roadside barriers, such as guardrails, the width should be larger. The wide curb lane is simply a wider outside travel lane, with no bicycle lane delineation or demarcation.

The outside travel lane should be wider that the 12-foot design width; a 14-foot width is recommended (not including gutter). The minimum width should be increased to 15 feet where steep grades, drainage barriers or other roadside barriers exist.

When on-street parking is allowed, the bicycle lane should be separated from the parking lane and the vehicular travel lane. A minimum 24-foot lane should be provided. This allows for an 8-foot parking lane, a 5-foot bicycle lane and an 11-foot travel lane.

Allowing both on-street parking and bicycle traffic should not be allowed unless the above accommodations can be made. It is not advisable to stripe for parking or bicycle traffic, but to allow for the mixed use of the facility.

In addition to on-street parking, there are many concerns with respect to shared roadways, including pavement quality, drainage grates and the presence of uneven roadway surfaces, such as those found in the Old Town district in Central Georgetown. Cyclists must be vigilant with respect to all of these and must be aware of the potential for opening car doors, maneuvering and oversized vehicles. Pavement surfaces provide a unique issue for bicyclists. The bicyclist rides on the outer edge of the outer lane where the pavement tends to wear and the riders often cannot easily discern the pavement conditions until they are right upon them. A small pavement irregularity can cause a rider to swerve, veer off course or lose control.

Shared roadways must be signed properly in accordance with local codes and standards. A signed shared roadway is a roadway that has been signed according to the adopted City bicycle plan or route map. This is the final step that the City of Georgetown has been missing. Once a bicycle plan has been established, it should be determined if the City will go so far as to assign route number and sign accordingly. A shared bicycle facility should not be signed unless it meets specific criteria as defined by AASHTO.

Sharrows

While sharrows are relatively new to the Central Texas region, they have been in use throughout the United States for many years. As shown in **Figure 7-1**, a sharrow is a pavement marking that is applied along the right side of the roadway travel path. There is no separate lane designation for the bicyclists as they are encouraged to ride within the same travel lane as a vehicle. This marking indicates to both motorists and cyclists that this lane is intended to be shared by both users. The sharrow pavement marking also encourages cyclists to ride toward the center of the travel lane to avoid parked cars; to ride on the street (as opposed to the sidewalk, avoiding pedestrians)

and in the same direction of traffic; and makes motorists aware of the cyclists' right to be in the lane and their potential presence in the lane.

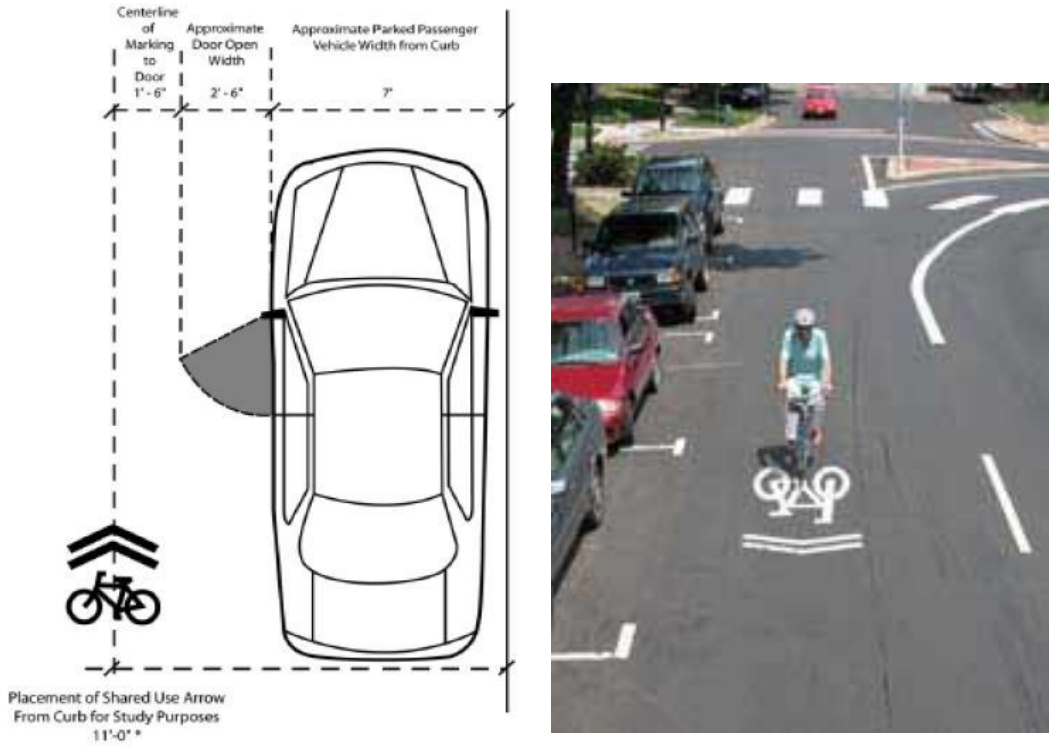

Figure 7-1: Sharrow Depiction and Roadway Placement

7.6 Bicycle Lanes

Bicycle lanes are used exclusively to define the road space available for the bicycle rider. Bicycle lanes are one-way facilities that allow bicyclists to follow the directional traffic flow and should be designated with a solid white line, pavement markings and appropriate bicycle lane signage (i.e. No Parking signs). However, this is not a requirement, as discussed in the following sections. If the roadway has curb and gutter or on-street parking the design criteria varies, but every effort should be made to separate the bicycle lane from the parking lane as shown in **Figure 7-2** and the photograph below.

Bicycle lanes are striped specifically for bicycle usage and no other uses are allowed in these lanes. Bicycle lanes should be striped for one-way riding in the same direction as vehicular traffic flow.

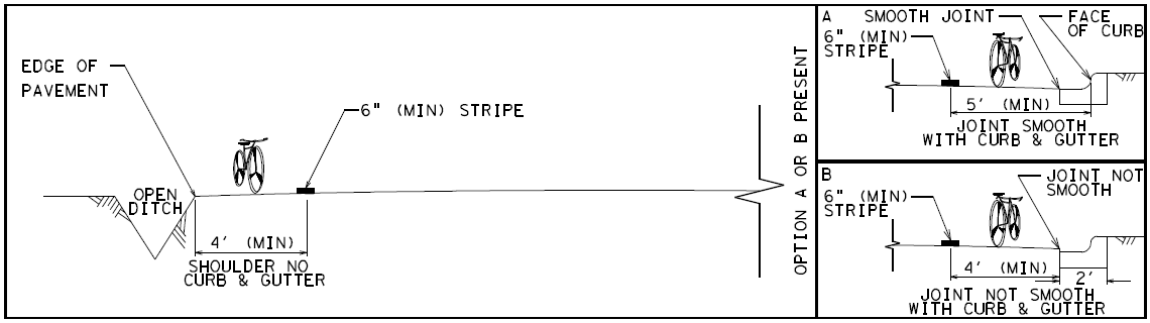

Figure 7-2: Bicycle Lane Design Depiction

If parking is not allowed, the bicycle lane should be a minimum of 4 feet wide without curb and gutter or 5 feet wide with curb and gutter. In either case, if the speed limit is greater than 50 MPH, the lane should be 5 feet wide.

Example of Exclusive Bicycle Lane

If on-street parking exists, but the lane is not striped separately, the shared area should be a minimum of 12 feet wide without curb and gutter or 13 feet wide with curb and gutter.

Bicycle lanes have many of the same concerns as shared roadways: on-street parking, pavement quality and uneven pavement conditions. Bicyclists must avoid opening car doors, oversized vehicles, and maneuvering vehicles. The minimum lane widths should be provided to safely accommodate both bicyclists and parked vehicles.

7.7 Shared Use Paths

Shared use paths are typically off the roadway network and used for mixed-use or recreational purposes. These paths tend to have their own dedicated or reserved right-of-way and minimal interaction with motor vehicles. These paths are shared by cyclists, skaters, and pedestrians – anything other than motorized vehicles. Shared paths should not be a replacement for on-road facilities, but rather a supplement to the existing system and an additional form of recreation. A shared path is a minimum of 10 feet wide, but heavily used paths (San Gabriel Park) should be wider; the typical width is 12 to 14 feet.

7.8 City of Georgetown Needs

The City of Georgetown currently has limited bicycle accommodations and the existing roadway operational characteristics provide limited availability for bicycle accommodations on existing inner city streets (between Leander Road and Williams Drive, just east and west of IH 35). Section 12.02.030 of the City's UDC addresses bicycle needs, but does not fully conform to AASHTO minimum standards. Thus, it is recommended that this section of the UDC be revised to include more thorough bicycle considerations. Revising Subsection 12.02.030 and Section 12.03 should be the highest priority. Section 12.02.030 indicates that bicycle lanes could be provided and Section 12.03 omits all references to bicycle lanes. Provisions for bicycle lanes should be designated in 12.03.020.

As AASHTO suggests, a bicycle lane should be a minimum of 3 feet in width (bicycle lane without adjacent parking lane) to 12 feet (non-striped parking lane). While many of the newer outlying developments have made provisions for bicycle lanes and off system trails, the central City area has limited possibilities. The City should strive to develop a Master Bicycle Plan that incorporates both the on-street network and off-street trail network. The development of this Master Plan should have a three pronged approach – inner City neighborhoods, new developments, and proposed developments. Each component should adhere to the requirements set forth in the UDC.

Inner City Neighborhoods

The inner city neighborhoods will require extensive discussions with neighborhood residents to determine which routes bicycle riders use and which city streets have street width available to accommodate a bicycle lane. A combination of shared bicycle lanes and sharrow lanes can easily be used in many of these areas. The shared lanes require a minimum of 12 feet width (no on-street parking), and 23 feet width (with on-street parking). This 23-foot width includes the minimum for each lane: parking (7 feet), bicycle (5 feet) and travel (11 feet). These widths should be increased when possible, especially on streets with high volume, high speed and potentially high parking turn over. The sharrow is a standard travel lane with the sharrow symbol. Caution should be used in the installation of sharrow symbols so that they are not overused. They should not be applied in residential areas (i.e. along Myrtle or Elm Street) as these areas have limited lane width and the residential nature encourages bicycle usage. Sharrows could be installed along Austin Avenue or Main Street where there are no existing provisions for bicycle riders. If provisions for riders were made along these streets, more riders might utilize the roadway to go into downtown, San Gabriel Park and other destinations.

Subdivision Development

The City could require the addition of bicycle lanes on all new subdivision roadways. This would include the addition of five feet of pavement to allow for an exclusive bicycle lane or the re-working of the proposed cross-section to allow for a shared lane. Under the current Street Classification Standards (12.03.020), the addition of the bicycle lane could be required on all streets with a classification of Major Collector and higher if the outside travel lane (a four-lane roadway) or both lanes of a two-lane roadway is a minimum of 14 feet in width.

Unified Development Code Adherence

The third element of the Master Plan development would be the inclusion of bicycle provisions within the UDC. This would require the revision of Section 12.03 – Streets and Section 12.02.030 – Geometric and Design Criteria for Bicycle Facilities.

In Section 12.03, the provision of bicycle lanes needs to be included within each of the classifications requiring bicycle lanes and on UDC Table 12.03.020. If the City desires bicycle lanes, the requirement needs to be specifically stated on the designated street classifications, similar to the sidewalk requirement. For example, it appears that a Major Collector could have a bicycle lane while a Residential Collector could not, based upon available pavement width and AASHTO requirements.

Section 12.02.030 should be revised to conform to the minimum AASHTO requirements and more thoroughly outline the bicycle requirements for the roadways throughout the City of Georgetown. Table 12.02.040, as depicted in the current UDC, is shown below in **Table 7.1**.

Table 7.1: UDC Table 12.02.040 Design Standards for Bikeways

Function of Bikeway	Bikeway Width	Required Right-of-Way	Measured From
Two-way Bikeway for bicycles only (non-roadway)	6.4'	8'	--
Sidewalk/Bikeway one-way only	4.8'	7.8'	Curb
Sharing street right-of-way with moving vehicles only	4.1'	4.1'	Edge of street right-of-way
Sharing street right-of-way with moving and parked vehicles against curb	5.3'	13.3'	Curb to outer edge of bikeway

Bicycle/Shared Path – Shared use paths are typically off the roadway network and have mixed-use or recreational purposes. While it would be ideal to have an exclusive bicycle path and an exclusive walking path, the typical setting of these paths leads to usage by both pedestrians and bicyclists. The width of this lane can vary widely since it is typically an off-street path. However, the typical width ranges from 10 to 12 feet or even higher.

Bicycle Lane - This is traditionally an on-street bicycle lane that is defined through striping and signage. The addition of this lane does require additional pavement but typically does not require additional right-of-way. The typical width for this facility

ranges from 3 feet (without on-street parking) to 12 feet (with non-striped on-street parking). Caution should be used in the implementation of this lane so that the bicycle lane does not appear to be a parking lane. The lane should be signed as a bicycle lane with "No Parking" signage when applicable.

Shared Lane – The shared lane is a typical vehicular travel lane that is greater in width to accommodate the presence of bicyclists. The width of a shared lane ranges from 4 feet (wide outside paved shoulder) to 22 feet (wide outside travel lane with on-street parking).

Functionality of Bikeway

The function of all bikeways is to provide safe and effective travel for bicycle users. While there are a variety of user types, the design should accommodate the most basic riders. The combination of sidewalk and bikeway should be discouraged. **Table 7.1** allows for a shared bikeway and sidewalk of 4.8 feet. These two user groups should not be combined unless it is on a wide off-street pathway. This standard should be separated into pedestrian and bicyclists needs.

Bikeway Width

The bikeway width for the "Two-way Bikeway for bicycles only (non-roadway)" should be changed to an off-road bicycle path. The typical park-like nature of the bicycle path allows for both bicyclists and pedestrians. If the off-street path was the goal of this standard, then the width should be increased to a minimum of 10 feet.

These are only two issues identified within **Table 7.1**. Given the confusion and lack of direction, it is recommended that UDC Table 12.02.040 be replaced with the information presented in **Table 7.2**.

Table 7.2: Design Standards for Bicycle Lanes

FACILITY TYPE	FACILITY DESCRIPTION	COMMENTS	MINIMUM WIDTH[2] (LF)	RECOMMENDED WIDTH[2] (LF)	Pavement Markings	Signs
Shared Roadway	**Paved Shoulder**	No curb & gutter (C&G)	**4**	**4 +**	Separated from traffic by 4 inch stripe	Bicycle route signs can be posted, if AASHTO criteria are met.
Shared Roadway	**Paved Shoulder**	Next to C&G, guardrail, etc. Do not include gutter width	**5**	**5 +**	Separated from traffic by 4 inch stripe	Bicycle route signs can be posted, if AASHTO criteria are met.
Shared Roadway	**Paved Shoulder**	If next to 50+ mph traffic, wider shoulders recommended	**5**	**5 +**	Separated from traffic by 4 inch stripe	Bicycle route signs can be posted, if AASHTO criteria are met.
Shared Roadway	**Wide Curb Lane**	Vehicles & bicycles in same lane. C&G width not to be included	**12**	**14**	If wider than 15 feet, striped bicycle lanes should be considered.	Bicycle route signs can be posted, if AASHTO criteria are met.
Shared Roadway	**Wide Curb Lane**	When steep grades, drainage grates or barriers exist	**12**	**15**	If wider than 15 feet, striped bicycle lanes should be considered.	Bicycle route signs can be posted, if AASHTO criteria are met.
Shared Roadway	**Wide Curb Lane**	Includes minimum of 12 feet for parked vehicles and bicyclists	**22**	**24**	If wider than 15 feet, striped bicycle lanes should be considered.	Bicycle route signs can be posted, if AASHTO criteria are met.
Bicycle Lane	**Without Parking**	No C&G	**4**	**5 +**	Separated from traffic by 6 inch stripe	See TMUTCD[3], chapter 9.
Bicycle Lane	**Without Parking**	Next to C&G, guardrail, etc. Do not include gutter width	**3**	**5 +**	Separated from traffic by 6 inch stripe	See TMUTCD[3], chapter 9.
Bicycle Lane	**With Striped Parking**	If next to 50+ mph traffic, an additional 1 to 2 feet is recommended	**5**	**7**	Striped bicycle lane between vehicle traffic and parking lane	See TMUTCD[3], chapter 9.
Bicycle Lane	**With Non-Striped Parking**	No C&G	**11**	**13**	If high volume of parking, add 1 to 2 feet.	See TMUTCD[3], chapter 9.
Bicycle Lane	**With Non-Striped Parking**	Next to C&G	**12**	**14**	If high volume of parking, add 1 to 2 feet.	See TMUTCD[3], for intersection crossings.
Shared Use Path	**Two-Way Use**	Not recommended, if adjacent to existing roadways	**10**	**12 +**	Can have center line striping and direction markings	See TMUTCD[3], for intersection crossings.

Source: AASHTO Guide for the Development of Bicycle Facilities, 2012

7.9 Recommendations

The following recommendations are made for consideration as a preliminary step in the creation of a city-wide Master Bicycle Plan. There are a few roadway specifics offered, but the City should meet with residents to aid in the identification of specific locations for potential bicycle lanes, primarily for the older, established neighborhoods within the central city. Once the bicycle standards are in place and are required of specific roadway classifications, the adoption of a Master Bicycle Plan can be completed within a matter of months.

Sharrow lanes should be considered along sections of Austin Avenue and Main Street. This can be applied to the entire length of the roadway or just the areas going into and out of the downtown area and San Gabriel Park.

The construction of bicycle lanes is not advised along Williams Drive unless additional pavement is provided. This roadway appears to be a good candidate for bicycle lanes, but the high vehicular volume, high travel speeds and the large number of driveway access points could be a safety problem for bicyclists. Shoulders are the "bike lanes"

Bicycle lanes should be available on all roadways **within** the Rivery and Wolf Ranch developments. This is especially true for the entire length and both sides of Rivery Boulevard and Rivery Driveway. Roadways "within" these developments are not public roads.

Bicycle lanes should be considered along both sides of SH 29, west of IH 35. While it is ideal to continue the bicycle lanes east of IH 35, right-of-way limitations prevent their construction. The outer lanes could be converted into shared lanes with the sharrow symbol and appropriate signage.

There is a wide outside shoulder along D B Wood Road that could be converted into a bicycle lane. This would allow for continuous bicycle access from SH 29 to Williams Drive. With additional pavement, bicycle lanes could be constructed along Shell Road from Williams Drive to SH 195, completing a north-south route within the City. If the shoulders are used, the appropriate signage should be installed.