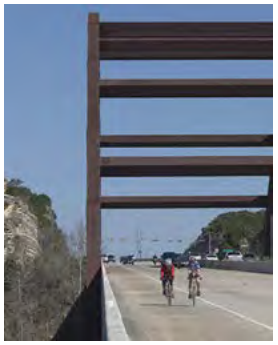
Texas Department of Transportation

Strategic Direction Report: Opportunities for TxDOT's Bicycle Program

TxDOT Bicycle Advisory Committee



December 2015

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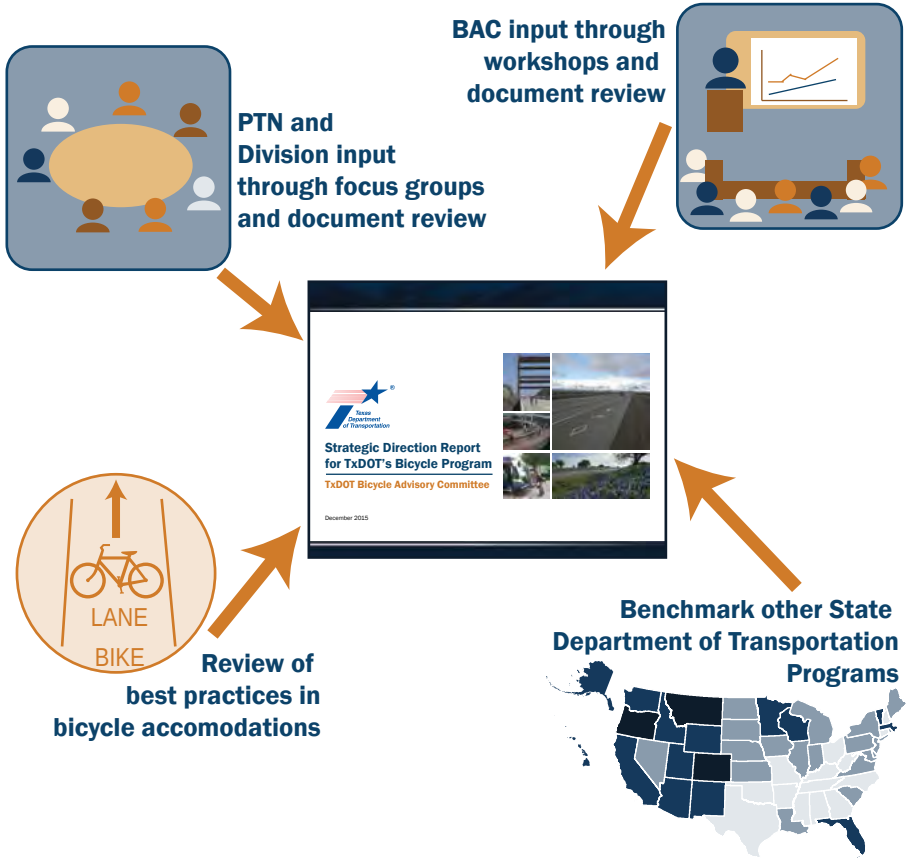
Cover Photos (from left to right): Pennybacker Bridge, Loop 360, Austin, TX; Texas Loop 375, Transmountain, El Paso, TX; Town Lake Trail, Austin, TX; Parker Road Station, DART, Plano, TX

Introduction

The Strategic Direction Report: Opportunities for TxDOT's Bicycle Program identifies near-term actions that TxDOT can take to support bicyclists and pedestrians. It was prepared in collaboration with TxDOT's Bicycle Advisory Committee (BAC), TxDOT's Public Transportation Division (PTN) and CH2M as the consultant.

Figure 1 - Strategic Direction Report Development Process



From the Bicycle Advisory Committee Chair

The TxDOT Bicycle Advisory Committee (BAC) is comprised of bicycle advocates from across Texas. The BAC advises the Texas Transportation Commission (Commission) on bicycle issues to help ensure that bicyclists are considered in the design, construction and maintenance of TxDOT facilities. By involving representatives of the public, including bicyclists and other interested parties, the BAC helps TxDOT maintain communication with the bicycling community.

On behalf of the BAC, I am excited to present the Strategic Direction Report (SDR): Opportunities for TxDOT's Bicycle Program. The SDR is an important first step toward improving bicycle and, in many cases, pedestrian access throughout the state.

The SDR identifies actions to improve bicycle and pedestrian accommodations. The report highlights some important first steps and long-terms goals to make bicycling safer and more attractive for residents across the state, and at the same time enhance tourism and economic development.

The BAC was involved throughout the development of this report. Workshops were held at the quarterly BAC meetings in May and July 2015, leading to a committee endorsement at the October 27, 2015, BAC meeting. The BAC looks forward to working with TxDOT and the Commission to implement recommendations from the report.

Best regards,

Billy Hibbs, Chair
TxDOT Bicycle Advisory Committee

Report Purpose and Scope

This report was created to advance the consideration of bicyclists and pedestrians. This report represents a call to action, providing short-term guidance to assist TxDOT with the development of a more robust bicycle program. Although TxDOT has worked to develop its Bicycle Program, opportunities exist to grow the program into a "best in class" bicycle program. Creating an effective program will include:

- Integrating bicycle needs into TxDOT's planning processes
- Understanding how bicycle users interact with other users, such as pedestrians, motorists, truck drivers, especially on a shared transportation network
- Identifying a statewide bicycling network and understanding how that network connects with other modes
- Creating project selection criteria that will assist in prioritizing bicycle projects and investments
- Identifying additional federal, state and local funding for bicycle facilities
- Advancing pilot programs to test innovative ideas
- Expanding TxDOT's bicycle accommodation design criteria in order to design safer facilities for walking and bicycling
- Improving coordination among the state, MPOs and other government entities on bicycle projects
- Taking a leadership role in the development of a common language and guidelines for use by bicycle planning professionals throughout Texas

This report summarizes the state of bicycle policies, planning and programming in Texas by comparing TxDOT's practices with best practices from other states and identifying gaps where program improvements may be needed.

In order to understand the best choices for investment, this report first answers the following questions:

- What are some of the current trends and needs for bicycling?
- How is TxDOT currently accommodating bicyclists?
- What improvements could TxDOT consider to better accommodate pedestrians and bicyclists over the next three to five years?

While policies, plans and programs concerning bicycle transportation are often interconnected with pedestrian transportation and elements of both modes must be considered, the primary focus of this report is on bicycle transportation.

Figure 2 - Strategic Direction Report Focus

Bicycling and TxDOT Strategic Plan Goals

This report provides high-level planning and policy options that TxDOT can use to advance bicycle transportation over the next five years. This report begins to gather the information TxDOT will need to guide planning and programming decisions statewide. Recommendations are tied to focus areas that advance TxDOT's agency goals.

TxDOT routinely adopts a set of goals with its Strategic Plan. The goals adopted for the 2015-2019 Strategic Plan are listed below.

Texas Loop 375, Transmountain, El Paso, TX

Table 1 - TxDOT 2015 – 2019 Strategic Plan Goals and Objectives

Goals	Maintain a Safe System	Address Congestion	Connect Texas Communities	Become a Best in Class State Agency
Objectives	Reduce crashes and fatalities on the system through innovations, technology and public awareness	Partner with local officials to develop and implement congestion mitigation plans in Texas	Support efficient multimodal options that serve the transportation needs of metropolitan, urban and rural communities and their economies	Ensure the agency deploys its resources responsibly and has a customer service mindset
	Maintain and preserve the transportation assets of the state of Texas	Ensure consideration of all modes of transportation in the development of more reliable solutions for moving people and goods	Improve freight movement, enhance international trade and expand access to markets to support the economic competitiveness of Texas	Focus on work environment, safety, succession planning and training to develop a great workforce

Source: TxDOT 2015-2019 Strategic Plan, Adopted by Teas Transportation Commission July 2014

In an effort to address TxDOT's Strategic Plan goals, a list of focus areas has been developed as part of this report. These focus areas can be linked directly to the Strategic Plan goals to help TxDOT plan and design safer accommodations for bicyclists and pedestrians, address congestion, connect communities and become a "Best in Class" state agency. These focus areas are explained in greater detail within this report and include recommended steps to guide implementation (See *Moving Forward* chapter).

Report Development

This report was developed in coordination with TxDOT's:

- Bicycle Advisory Committee
- Public Transportation Division
- Design Division
- Environmental Division
- Traffic Operations Division and
- District staff (including District Bicycle Coordinators and Transportation Alternatives Program (TAP) Coordinators)

The BAC endorsed this report at the October 27, 2015, Bicycle Advisory Committee meeting.

Figure 3 - TxDOT Bicycle Program: Strategic Direction Report Focus Areas

Expand the bikeway network

Build safer and better bicycle and pedestrian accommodations

Provide training for engineers, planners and construction staff

Educate the public on safe driving, bicycling and walking

Encourage people to walk and bicycle

Develop statewide management systems for bicycle and pedestrian information

Fund bicycle and pedestrian projects

Benefits of Bicycling

Bikeways have a number of benefits for users, property owners and businesses. Adding bicycle and pedestrian accommodations has been shown to increase property values. Businesses benefit from locating near bicycle and pedestrian facilities due to added foot traffic and increased access. Improvements to the regional bicycle and pedestrian network have the potential to increase the real value and development potential of property in the region.

Studies have investigated property value effects when bicycle and pedestrian facilities are nearby. In Indianapolis, Indiana, houses located closer to multi-use paths sell for an average of 11 percent more than similar houses in other locations. A multi-use path has a positive, statistically significant effect on home values.[1] A study of property values near multi-use paths in the state of Delaware found that properties within 50 meters of a bike path sold for an average of $8,800 more than other similar homes.[2]

The National Association of Realtors & National Association of Home Builders (2000) found in their "Consumer's Survey on Smart Choices for Home Buyers," publication that 36% of 2,000 home buyers designated multi-use trails as either an "important" or "very important" community amenity. Having access to a walking and bicycling path outranked 16 other options, including security, parks, and access to shopping or business centers.[3]

Investing in Bicycle Tourism

Investing in denser, more connected, bicycle and pedestrian facilities creates tourism destinations for walking and bicycling. According to Canada's "Bike on Tours" website (2013), elements that attract bicycle tourists include the following:

- Bicycle-friendly streets and paths that are wide enough for bicyclists and other users
- Access to scenic roads, natural areas, waterfront, cultural and historic attractions
- Route maps and effective advertising

Interconnected bikeways also foster tourism by providing an easy-to-use and connected system within cities.

In Canada, a 2014 study by UQAM's Transat Chair in Tourism in Quebec Province found that cycle tourists spent an average of $214 per day ($163 US) while cycling La Route Verte network. Numerous states have quantified the economic impact of bicycle-based tourism and events.[7]

Shared use paths have been shown to be particularly beneficial in promoting physical activity among women and people in lower-income areas.[4]

People who live near shared use paths are 50% more likely to meet physical activity guidelines and 73-80% more likely to bicycle.[5]

People who live in neighborhoods with sidewalks on most streets are 47% more likely to be active at least 30 minutes a day.[6]

Current Conditions - Users

This section of the report provides a snapshot of existing conditions and trends regarding bicycle transportation. This section will help answer the following questions:

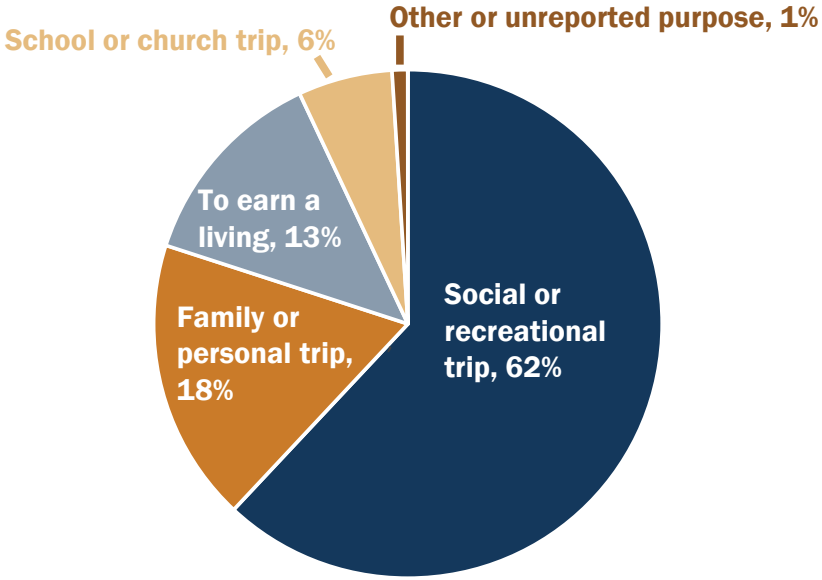
- Why are people bicycling?
- How many people are bicycling?
- Who is bicycling?
- How safe is bicycling in Texas?
- Where do bicycle facilities currently exist?

Town Lake Trail, Austin, TX

Why are people bicycling?

There is limited data nationally and at the statewide level on the number of people bicycling for various purposes. It is estimated that about 1 percent of all trips taken in the U.S. are made by bicycle. Of those trips, approximately 80 percent of bicycle trips are for social, recreation, family or personal reasons. Approximately 13 percent of all bicycle trips are for commuting purposes, identified as "to earn a living" in the National Household Travel Survey.[8]

Figure 4 - Bicycle Trips by Purpose



Source: US DOT, 2009. National Household Travel Survey

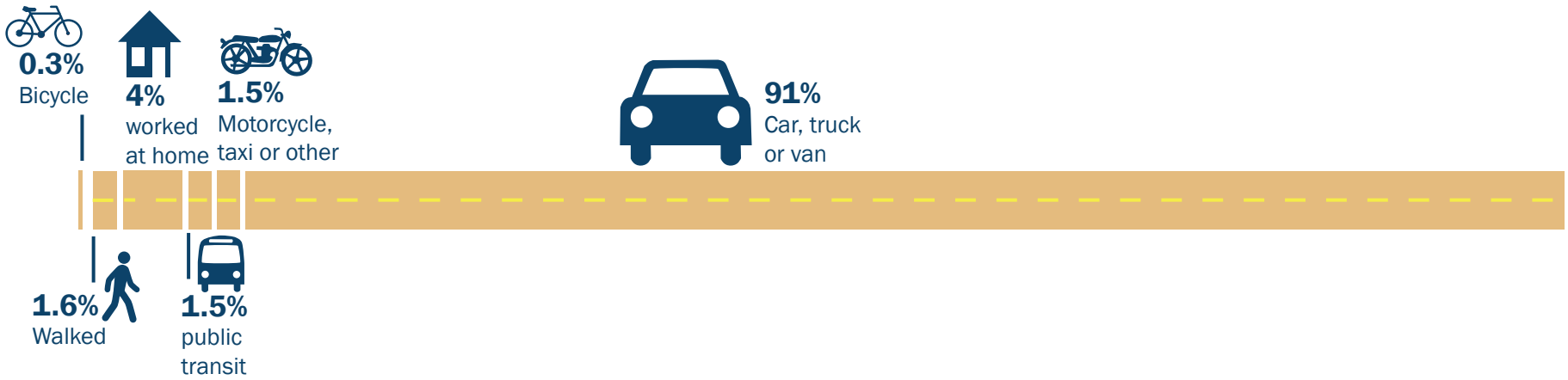
How many people are bicycling?

Most of the regional and statewide data on the number of trips being made by bicycle only includes bicycle trips for commuting purposes. This data is captured through the American Community Survey (ACS) by the U.S. Census and for travel demand models where individuals are asked to keep a diary of their trips, which generally focuses on commute trips only. For this reason, bicycling activity is generally underestimated since many trips are made for reasons other than commuting to work. TxDOT maintains its own travel demand model but it does not estimate the number of trips being made by bicycle. Therefore, the only estimates available on statewide bicycle use come from the ACS.

Around 0.62 percent of workers in the U.S. commute by bicycle. In Texas, it is estimated that 0.3 percent of commuting trips are made by bicycle or approximately 30,400 commuters in 2013. An estimated 91 percent of Texans are commuting by car, truck or van.[9]

Lady Bird Lake Trail, Austin, TX

Figure 5 - How do Texans Commute to Work?

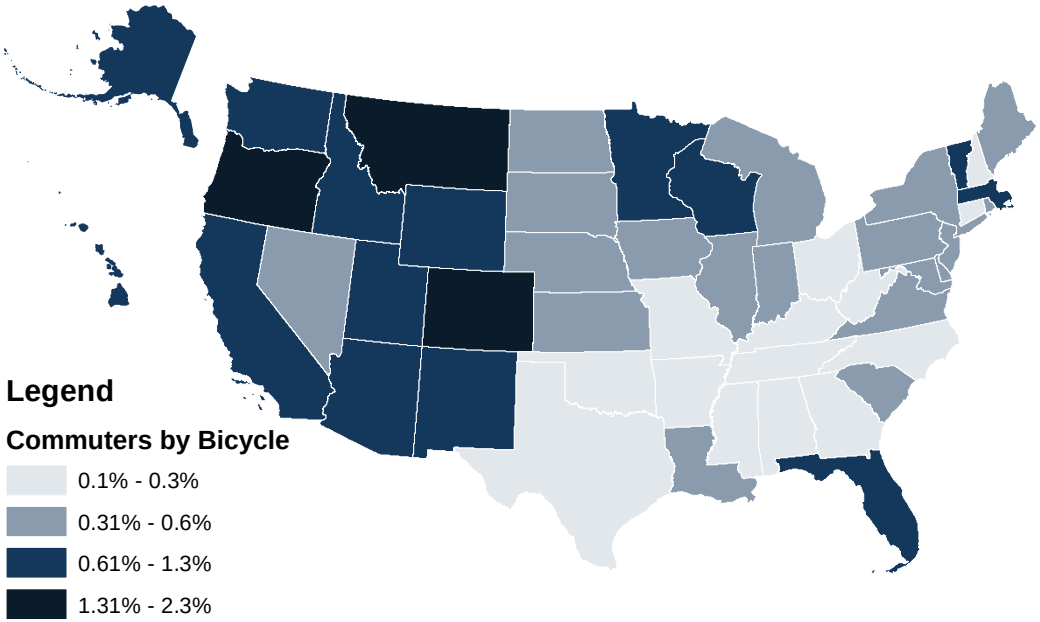


Source: US Census, 2013 American Community Survey, 5 Year Estimate, Means of Transportation to Work

Texas ranked 39th in the nation, with 0.3 percent of its workforce commuting by bicycle, based on results from the 2009-2013 ACS. When looking at cities across the state, Austin is the only large Texas city with a relatively significant percentage of its workers commuting by bicycle when compared to other large US cities; Austin ranked #19 with 1.4 percent of its commuters biking to work.[9] Austin was also awarded the "gold" ranking by the League of American Bicyclists in 2015, it is the only city in the state with this designation.

The League of American Bicyclists ranks the top 70 largest cities in the U.S. with regard to percentage of bicycle commuters. Texas cities included in the list, along with their national rank and 2012 percentage of bike commuters can be seen in Table 2 below. Most Texas cities rank at the bottom of the list with relatively low bicycle mode share.

Figure 6 - Commuters by Bicycle by State



Source: US Census, 2013 American Community Survey, 5 Year Estimate, Means of Transportation to Work

Table 2 - Top 70 Largest Cities and Bicycle Commuter Share (2013)

City	Rank	% of Commuters are Bicyclists	Population	% of Growth in Bicycle Commuting 1990 – 2013	% of Growth in Bicycle Commuting 2000 - 2013
Austin, TX	19	1.40%	885,415	76.80%	48%
Houston, TX	34	0.80%	2,197,374	139.30%	83.40%
San Antonio, TX	57	0.30%	1,409,00	114.10%	100%
Dallas, TX	59	0.30%	1,257,676	84.20%	111.90%
Fort Worth, TX	65	0.20%	794,189	0.13%	25.90%
El Paso, TX	67	0.10%	674,438	-0.59%	16.40%
Arlington, TX	68	0.10%	379,565	-0.19%	-23.10%
Plano, TX	69	0.10%	273,519	-0.67%	36.30%
Corpus Christi, TX	70	0.00%	316,389	-0.82%	-81.50%

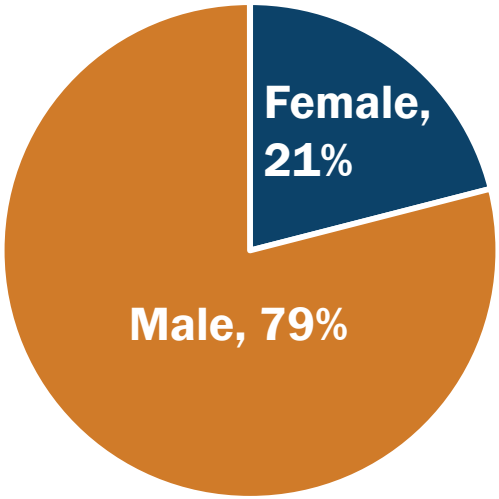
Source: League of American Bicyclists, Where we Ride – Analysis of Bicycling in American Cities, 2014

Who is bicycling?

Bicycle trips tend to be taken in higher percentages by men and younger people. Estimates from the National Highway Transportation Survey in 2009 indicate that youth under age 16 make up 39 percent of bicycle trips, while they only make up 21 percent of the U.S. population. On the other end of the spectrum, individuals over 65 are only making 6 percent of bicycle trips while they are 13 percent of the population.

The majority of bicycle commuters in Texas and nationally are men. 79 percent of all bicycle commuters in Texas are male and 21 percent of bicycle commuters are female.[9]

Figure 7 - Bicycle Commuters in Texas by Gender



Source: US Census, 2013 American Community Survey, 5 Year Estimate, Means of Transportation to Work

Shifting Gears: More People are Bicycling

More and more people are bicycling in the United States. This is seen in the national data from the U.S. Census and also observationally as more and more bicyclists are using roads and off-road paths for recreation, commuting to work, running errands and to meet friends.

- The number of U.S. workers who traveled to work by bicycle increased from about 488,000 in 2000[10] to about 786,000 in 2008–2012[9]
- The combined rate of bicycle commuting for the 50 largest U.S. cities increased from 0.6 percent in 2000 to 1.0 percent in 2008–2012

Young people (16- to 34- years old) are driving less and riding transit and bicycles more. Between 2001 and 2009, young people drove 23 percent less and were riding public transportation (20 percent per capita increase) and bicycling (24 percent increase) more. It has become “hip” to bike as evidenced by increased bicycle accommodations, bike-share programs, “bike-in” events and even bicycle-themed merchandise.[11]

How safe is bicycling in Texas?

While crash data provides considerable information to help guide safety program and countermeasure development, the data represents a limited number of actual crashes that occur on public roadways and likely represents only the most severe crashes. Specifically, crash data may exclude crashes that occur at non-roadway locations, such as sidewalks and bicycle or pedestrian falls that do not involve a motor vehicle. These missed crashes are substantial because more bicyclists are injured in bicycle-only events than in collisions with motor vehicles. Falls are a leading cause of injury for people of all ages, especially the elderly. FHWA states that there is evidence that many pedestrian and bicycle motor vehicle collisions that occur on public roadways are not reported in police crash files.[12] For these reasons, qualitative data and stakeholder input are important supplements to reported crash data. Moreover, if conditions are perceived as hazardous by potential pedestrians or bicyclists, they may avoid the facility altogether, therefore, crash data is not the sole indicator of safety concerns.

Actual and Perceived Safety

Adding facilities separated from traffic, removing physical barriers and providing improved crossings will enhance the actual and perceived safety of people walking and riding bicycles. To increase pedestrian and bicycling mode share, new dedicated infrastructure such as sidewalks and multi-use paths are needed to increase safety and encourage more people to walk and bike for daily trips.

Most of the bicycling population prefer off-street separated paths because of the perceived safety benefits. Those perceptions may lie close to reality. Cyclists riding on streets are at increased risk of conflicts with motor vehicles and those injured in crashes involving a motor vehicle sustain more severe injuries.

Safety is a top priority for TxDOT. The agency regularly reviews the number of bicycle-related accidents and fatalities. In 2013, Texas averaged 0.18 bicycle fatalities per 100,000 residents—slightly lower than the national rate of 0.24 bicycle fatalities per 100,000 residents. Table 3 provides a snapshot of fatality rates for bicyclists in the years 2008 and 2013. Bicycle fatality rates are lower in Texas than nationally. However, fewer people are bicycling in Texas, therefore the fatality rate should take that into consideration.

Table 3 - Bicyclist Fatalities, Texas and U.S. Totals

Location	Year	Bicycle Fatalities	Percent Bicyclist of Total Traffic Fatalities	Bicyclist Fatalities per 100,000 Population
Texas	2008	53	1.52%	0.22
U.S. Total	2008	718	1.92%	0.24
Texas	2013	48	1.42%	0.18
U.S. Total	2013	743	2.27%	0.24

Source: NHTSA Traffic Safety Facts (2013 and 2008 Data)

The Alliance for Biking and Walking's *Bicycling and Walking in the United States – 2014 Benchmarking Report* ranks all 50 states in regard to bicycling and walking safety. The report utilizes National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS) and American Community Survey data. Of the 50 states, Texas is ranked #39 in regard to bicyclist fatality rates and #41 in regard to pedestrian fatality rates, this means they have a comparatively lower fatality rate than most states.

The following crash summary was developed after analyzing TxDOT's crash data for bicyclists from 2010 – 2014. The data represents accidents that were reported as part of TxDOT's Crash Record Information System (CRIS). Many bicycle and pedestrian accidents go unreported and therefore the information contained in this summary underestimates the number of crashes in Texas.

Bicycle crashes have remained relatively constant over the past 5 years, as seen in Table 4 below.

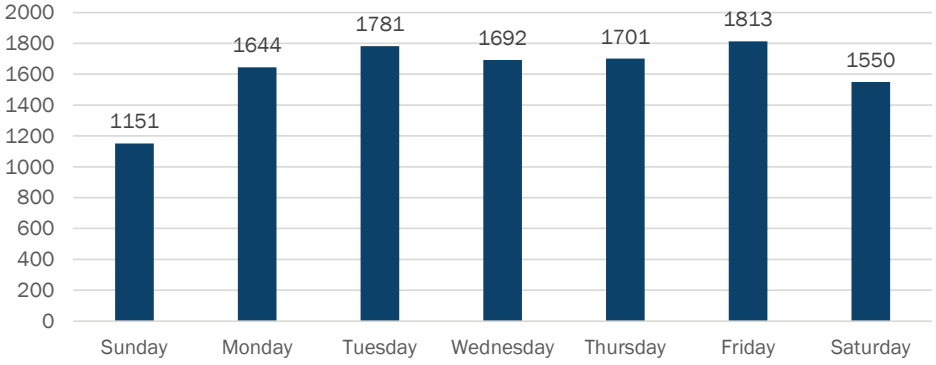
Table 4 - Texas Crash Data Summary – Bicycle Crashes (2010 – 2014)

Year	Bicycle Crashes	Deaths
2010	2,001	42
2011	2,100	45
2012	2,414	56
2013	2,408	48
2014	2,426	50
Totals	**11,349**	**244**

Sources: NHTSA, Fatality Analysis Reporting System; Crashes: TxDOT Crash Record Information System, note that there was a discrepancy between the reported deaths, FARS was prioritized

Bicycle crashes in Texas occurred more frequently during the work week from 2010 – 2014.

Figure 8 - Crashes Involving Bicyclists in Texas, By Day of Week (2010 – 2014)

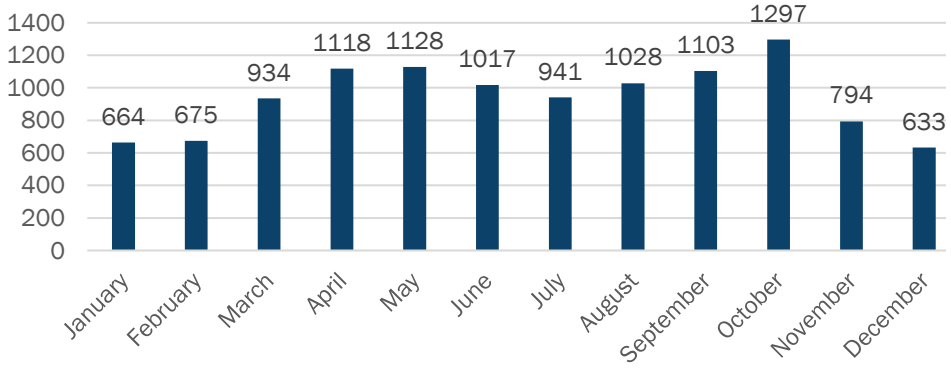


TxDOT Crash Record Information System (2010 - 2014)

San Angelo, TX

From 2010 - 2014 more accidents occurred from March to October with October having the most recorded bicycle accidents.

Figure 9 - Crashes Involving Bicyclists in Texas, By Month (2010 – 2014)



TxDOT Crash Record Information System (2010 - 2014)

In general, counties with higher populations also had more bicycle accidents. This is intuitive given that more populated counties generally have more urban infrastructure and presumably more bicyclists. Harris County has the most recorded accidents involving bicyclists, with 2,224 accidents from 2010 – 2014.

Figure 10 - Bicycle Accidents by County (2010 – 2014)

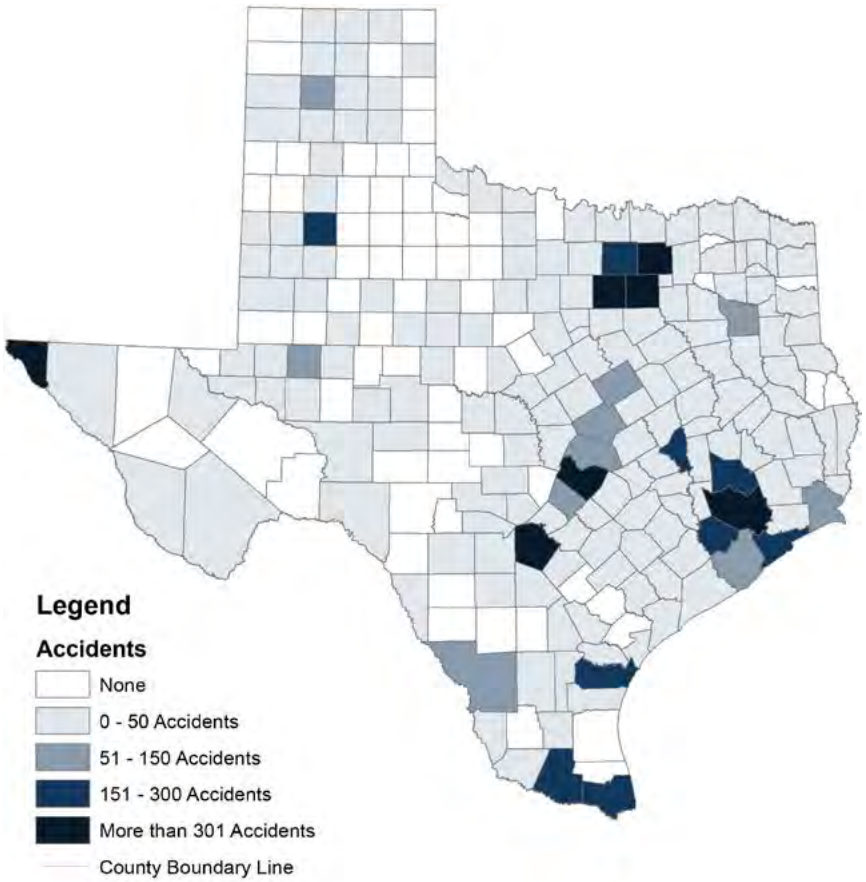
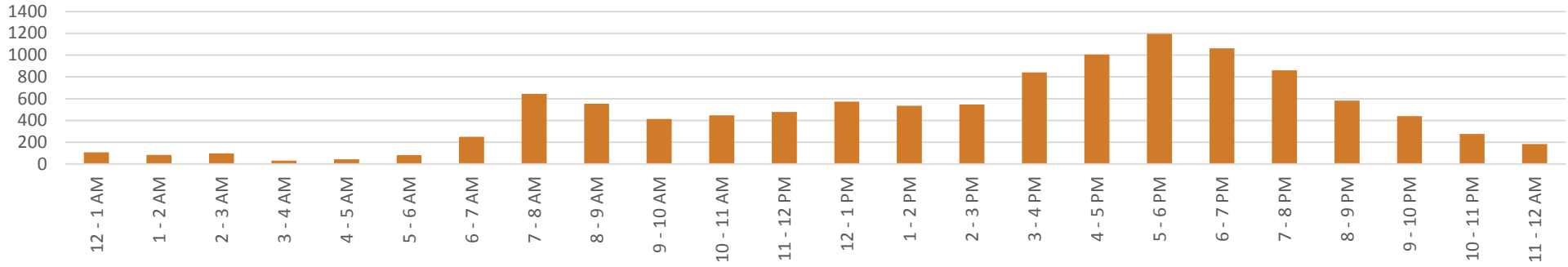


Figure 11 - Crashes Involving Bicyclists in Texas, by Time of Day (2010 – 2014)

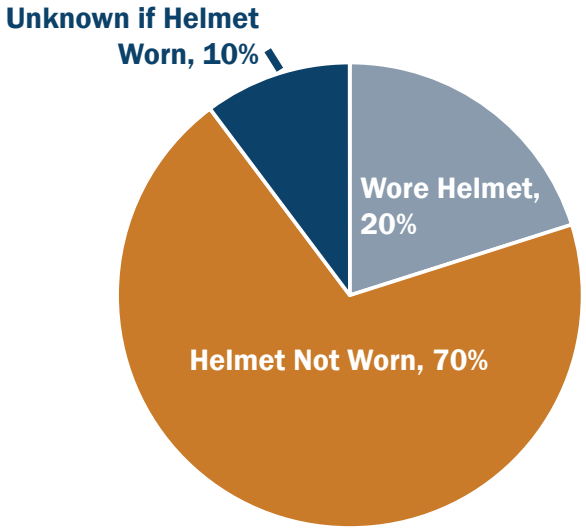


TxDOT Crash Record Information System (2010 - 2014)

The highest number of bicycle accidents occurred during the evening from 4 p.m. to 7 p.m. from 2010 to 2014.

It is uncertain how many fatalities were or could have been avoided if the bicyclist was wearing a helmet. 1 in 5 bicyclists killed were wearing a helmet from 2010 - 2014 in Texas.

Figure 12 - Bicyclist Fatalities in Texas, Helmet Status

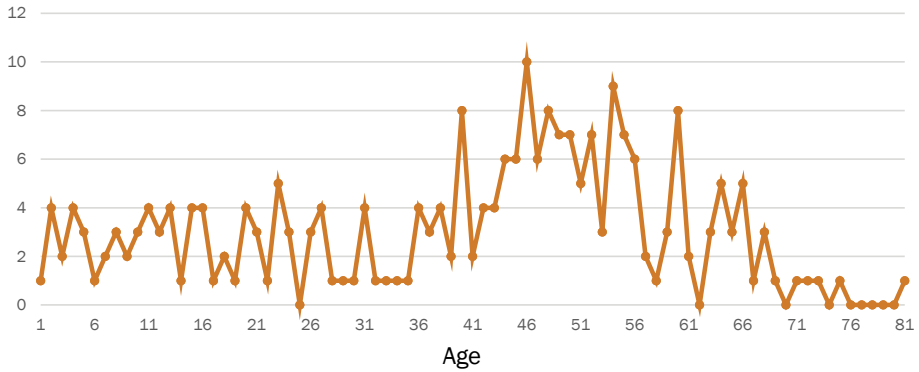


TxDOT Crash Record Information System (2010 - 2014)

The average age of bicyclists killed in Texas was 43 from 2010 – 2014. The median age was 49.

The youngest person killed was 5. The oldest person killed was 85.

Figure 13 - Number of Bicyclists Killed by Age in Texas (2010 – 2014)



TxDOT Crash Record Information System (2010 - 2014)

Where do bicycle facilities currently exist?

Providing safe, interconnected and well-maintained pedestrian and bicycle facilities is essential for creating livable and sustainable communities, for improving residents' quality of life and for supporting the use of walking and bicycling as viable travel options.

Facilities specifically designated for bicyclists and pedestrians are more commonly located in urban and suburban areas. Bicyclists and pedestrians in rural areas may use sidewalks, where available, but often travel on roadways and roadway shoulders. Some of these roadways were not designed for shared use which can create unsafe conditions for both motorists and bicyclists. Metropolitan Planning Organizations (MPO) and cities vary in their interest and commitment to supporting the use of bicycle and pedestrian modes. Larger metropolitan areas and smaller communities associated with colleges and universities tend to place more emphasis on bicycle and pedestrian planning and investment.

While bicycle and pedestrian projects are implemented primarily by local governments, TxDOT has made positive strides toward requiring consideration for bicycle and pedestrian accommodations on all major construction and reconstruction roadway projects.

TxDOT is in the process of developing a complete Geographic Information System (GIS) inventory and mapping of bikeways on state maintained roadways.

The inventory and map is being developed using roadway information from current TxDOT databases and bikeway information from TxDOT districts. The initial map includes designated bikeways that are located on TxDOT right-of-way only. Collected bikeway data includes:

- From/To Description
- Surface Type
- Width
- Bikeway Type (chosen from the list below):
    - Shared Roadway
    - Bike Lane
    - Shoulder
    - Shared Use Path
    - Cycle Track
- Route Name
- Ownership
- Maintenance Responsibility
- Length

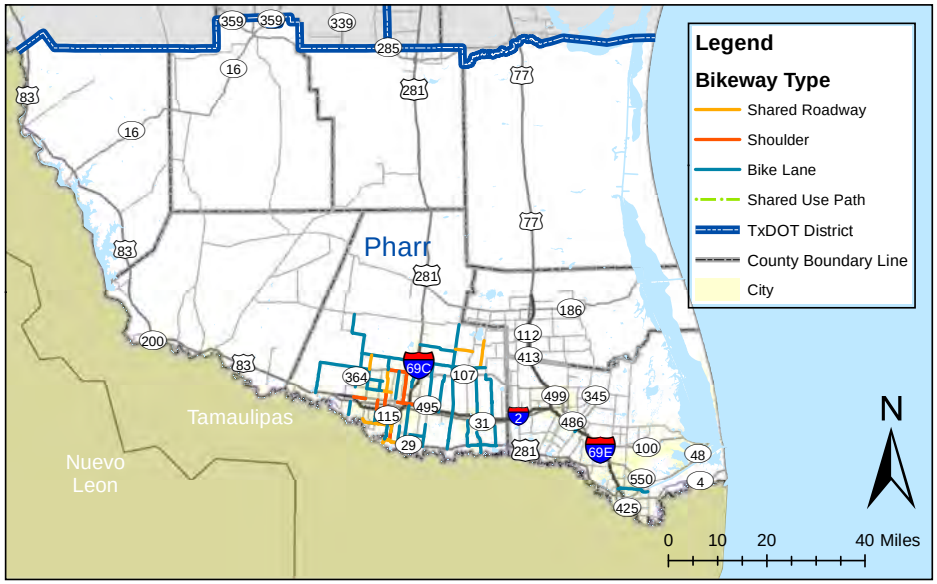
Table 5 - Statewide TxDOT District Bikeway Map Data Collection, August 2015

Bikeway Type	Miles of Bikeway Type
Shared Roadway	120 miles
Bike Lane	163 miles
Shoulder	399 miles
Shared Use Path	49 miles
Cycle Track	0 miles

This first phase of data collection helped provide TxDOT with a baseline of bikeway accommodations on TxDOT right-of-way. Future data collection and analysis is planned to support planning and programming needs and to ultimately produce an interactive bikeway map for the entire state. This to-be-built interactive map will include information on amenities and conditions to help bicyclists make informed decisions on route selection.

Museum Reach of San Antonio Riverwalk, San Antonio, TX

Figure 14 - Statewide TxDOT District Bikeway Map Data Collection, Pharr Example



Source: TxDOT District reported data, map produced by CH2M, September 2015

What is needed to make Texas more bicycle friendly?

As previously discussed, the data necessary to analyze bicycle and pedestrian usage, system performance and condition is lacking, particularly at a statewide level. Emphasis on these modes varies among cities and MPOs, which results in varying levels of travel information and dramatically different analyses of bicycle accommodations and needs throughout the state.

A more comprehensive analysis of needs throughout the state is needed to build a more bicycle-friendly transportation system. Analysis done for TxDOT's multimodal long range transportation plan, the Texas Transportation Plan 2040, adopted by the Texas Transportation Commission in February 2015, included identification of some bicycle needs throughout the state. These needs were developed based on Metropolitan Planning Organizations' (MPO) planned bicycle project information, including projects in Regional Transportation Plans, which are fiscally constrained. There are many more needs throughout the state, in addition to those prioritized for funding at the MPO level. TxDOT will need more information and a detailed analysis to identify bikeway needs across the state. The figure below shows an example of how statewide bikeway needs could be developed.

Figure 15 - Identification of Bicycle Network Needs

Current Conditions - TxDOT

Bicycles are an important part of Texas' transportation system. TxDOT has a State Bicycle Program Coordinator and a Bicycle Advisory Committee. In addition, each of its 25 state districts have a District Bicycle Coordinator to serve as a point of contact internally and with the public on local biking matters.

This section of the report provides an overview of what TxDOT is currently doing when it comes to bicycle projects.

Project Development, Planning & Programming

Transportation projects may be developed through a number of ways. Often they are proposed by a locality but they can also be proposed by TxDOT. For example, a local entity may identify a need for a bicycle path along a state highway. The local entity may choose to fund the construction of the path themselves or pursue funding from state or federal revenue sources. Regardless of the method of funding, if the bikeway is within the state's roadway right-of-way, the local entity will need to coordinate the construction and maintenance of the project with TxDOT. If the local entity receives state or federal funding (either through TxDOT or an MPO) the project will be included in TxDOT transportation planning documents and the planning documents of the MPO (where applicable).

TxDOT has specific design guidelines that were put in place in March 2011 via an administrative memorandum entitled "Guidelines Emphasizing Bicycle and Pedestrian Accommodations." This memo provides guidance for bicycle and pedestrian accommodations as follows:

- Need and purpose of a project defined during the National Environmental Policy Act process, taking into consideration existing and anticipated bicycle and pedestrian facility systems and needs. If no bicycle and pedestrian facilities are planned, the managing office shall state why no such facilities are planned.
- Plans, specifications and estimates (PS&Es) shall also ensure that proposed designs include these accommodations, if applicable, and are constructed according to Texas Accessibility Standards and Americans with Disabilities Act Accessibility Guidelines (TAS/ADAAG), *AASHTO Guide for the Development of Bicycle Facilities* (AASHTO Bike Guide) and *TxDOT's Roadway Design Manual* (RDM).
- Bicycle and pedestrian facilities shall be considered when the project is scoped. Public input, when applicable, as well as local city and metropolitan planning organization bicycle and pedestrian plans shall be considered.

In urban settings, the following guidance is provided:

1. For construction projects within existing right-of-way and when the scope of work is limited to within the roadway typical section, the project plans should:

- Remove barriers to accommodate pedestrians according to TAS/ADAAG and TxDOT's Pedestrian Facilities standard sheets; and,
- Accommodate for bicyclists by restriping the existing roadway typical section to provide a 14-foot wide curb lane for shared use when practical.

2. For construction projects within existing right-of-way, but when the scope of work includes pavement widening, the project plans should:

- Accommodate bicyclists by widening the pavement to either provide a 14-foot wide curb lane for shared use or a 5-foot wide bicycle lane;
- Include necessary work to ensure all existing ADA curb ramps comply with current standards; and
- Reconstruct or add sidewalks and crosswalks to ensure a continuous ADA compliant pedestrian route.

3. For full reconstruction or new construction projects, where new right-of-way is acquired, the project plans should provide the desired roadway, bicycle and sidewalk, geometric values shown in the RDM, AASHTO Bike Guide and TAS/ADAAG for each facility type.

4. On new construction projects and where practical on reconstruction projects, which construct a raised median, a 6 foot median width should be provided for pedestrian refuge in accordance with the Public Rights-of-Way Accessibility Guidelines (PROWAG).

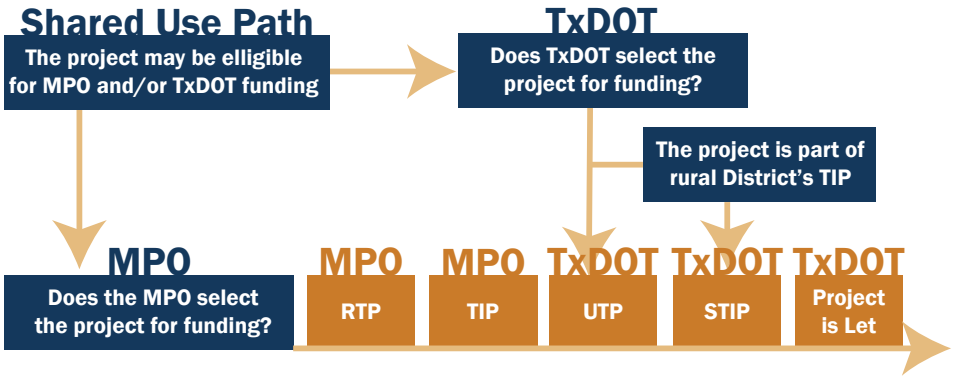
The usable lane width for shared use in a wide curb lane is 14 feet and is measured from the edge stripe to the lane stripe or from the longitudinal joint of the gutter pan to lane stripe (the gutter pan should not be included as usable width). The curb offset is not included as part of the usable lane width for a shared use in a wide curb lane. When restriping or widening existing pavement to achieve a wide curb lane for shared use, the appropriate lane widths for the remaining lanes and curb offsets as defined in RDM should be maintained. The dimensions shown above for a wide curb lane or a bicycle lane are minimum values. Where traffic volumes or speeds are high, wider lanes for bicycles may be needed.

In rural settings, on off-system roadways with greater than 400 Average Daily Traffic (ADT) and on all on-system roadways where bridges are being replaced or bridge decks are being replaced or rehabilitated, a 5-foot shoulder shall be provided on the structure and along the adjacent barrier.

These guidelines apply to all projects which are currently in planning and design stages and projects whose environmental documents are approved after August 31, 2011. For projects whose environmental documents are approved on or prior to August 31, 2011, the use of these guidelines is at the option of the district.

For the most part, bikeway planning is generally done at the local or MPO level. Funded bicycle projects are included in MPO Regional Transportation Plans (RTP), Transportation Improvement Programs (TIP) and subsequently in TxDOT's Unified Transportation Plan (UTP) and the Statewide Transportation Improvement Program (STIP). This may result in a bikeway project being scheduled for construction, or "let" for construction by TxDOT. Figure 15 shows how a bicycle project is incorporated in to state and MPO planning documents.

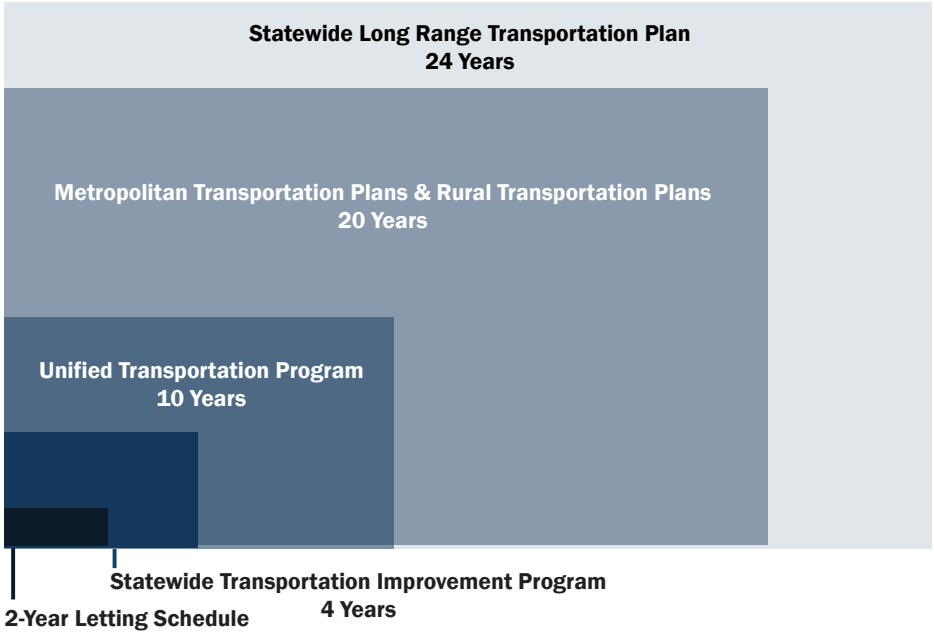
Figure 16 - Incorporating a Bicycle Project into Planning Documents



MPOs are responsible for developing their own planning and project selection processes that lead to projects being included in their RTP and TIP. In accordance with federal and state requirements, the RTP and TIP must be fiscally constrained, meaning that projects can only be included when funding is designated for the project. Many MPOs and localities have stand-alone bicycle plans that are not fiscally constrained and identify future needs and projects regardless of funding availability.

There are various planning horizons (2 years, 5 years, 10 years, etc.) for transportation planning documents at the state, regional and local levels. The Figure 15 shows the planning horizon for state and MPO planning documents. In keeping with federal guidance, planning documents must all be consistent and require regular updates.

Figure 17 - Planning Document Planning Horizon



TxDOT's Statewide Long Range Transportation Plan is a policy-level planning document that identifies statewide goals, needs and performance measures for the multimodal transportation system. The Texas Transportation Plan 2040 (TTP), which was adopted in February 2015 by the Texas Transportation Commission, identifies statewide bicycle needs based on MPO information received during the development of the TTP 2040. The performance measure identified in the TTP for bicycle infrastructure is based on the percent of (MPO identified) projects completed. The TTP does not identify specific projects but helps to guide future project selection and programming. Bicycle needs extend beyond what is included in MPO RTPs and as discussed earlier in the report, a more comprehensive analysis of bicycle accommodation needs will help TxDOT better address needs across the state.

Projects are scheduled for construction based on project readiness and the availability of funds. Some projects are let for construction by the local entity while other projects are let for construction by TxDOT.

TxDOT operates a statewide computer network that allows all districts and Austin headquarters to maintain project data in a common format. The Design and Construction Information System (DCIS) is one of TxDOT's many automated information systems and serves as a resource for project information. Beginning in the Fiscal Year (FY) 2016, DCIS project data entry will include bikeways. This will include identification of the bikeway type and width (ex: shoulder, shared use lane, bike lane, shared use path).

FM 3423, Temple, TX

Operations and Maintenance

At this time, if a bikeway is on-system (ex: bicycle lane, shoulder or parallel shared use path), the condition data is limited to what is available for the roadway. Currently, there is no condition data for adjacent facilities such as shared-use paths and sidewalks. TxDOT maintains bikeways within the roadway footprint (bike lane, shoulder) and a maintenance agreement is generally executed with the local entity for accommodations adjacent to the roadway. Maintenance is handled at the district level.

Safety

Crash data is reported by local law enforcement agencies directly to TxDOT through the departments Crash Records Information System (CRIS). Only those crashes that involve motor vehicles are included in this database, therefore a number of bicycle and pedestrian crashes are not represented. CRIS information is reported to the Federal Highway Administration (FHWA). Individuals can request bicycle crash information through TxDOT's website.

Each year, TxDOT prepares the *Texas Strategic Highway Safety Plan: A Report of Progress* (SHSP). This report is required by FHWA and updated annually with the most current crash data. The SHSP is developed to implement programs that will reduce fatalities from year to year. However, if there is an increase, the goal is for the increase to be less than or equal to 2% or better than the National percentage change in fatalities. The SHSP includes specific analysis for bicycle and pedestrian crashes and provides objectives for reductions in bicycle and pedestrian crashes. For 2015, the objective was to reduce the number of fatal and incapacitating injury crashes involving bicycles by 10 percent, as compared to 2010. The SHSP includes specific countermeasures that are to be considered to help reach the established objective, for 2015, these bicycle-related countermeasures include:

Engineering

- Integrate bicycles into transportation system (improve connectivity).
- Increase the use of paved shoulders.

Education

- Conduct public involvement and educational (PI&E) campaigns on bicycle traffic laws and the use of bicycle safety equipment for both bicyclists and non-biking motorists.
- Increase enforcement of bicycle right-of-way traffic laws.
- Conduct bicycle training programs for school age children and adults using bicycles for both recreation and transportation.
- Increase motorist awareness of bicycles: "Share the Road."
- Improve bicycle and bicyclist visibility by conducting PI&E campaigns.

EMS

- Increase participation of Emergency Medical Services (EMS) personnel in helmet and other safety equipment use advocacy.

Public Policy and Other

- Improve bicyclist safety in and around school zone areas.
- Encourage local ordinances regarding bicycle helmet use.
- Encourage municipalities to pass vulnerable road user statutes.

Right-of-Way

Bicycle facilities constructed within TxDOT right-of-way may be initiated by TxDOT or by a local project sponsor in coordination with TxDOT. Regardless of who is sponsoring or maintaining the project, bicycle projects within TxDOT right-of-way must conform to TxDOT's design criteria, right-of-way rules and regulations.

Funding Programs and Opportunities

Bicycle and pedestrian accommodations are eligible for most state and federally funded programs. TxDOT uses a variety of funding programs to fund bicycle and pedestrian improvements.

Texas spent 1 percent of the funding it receives from the Federal Highway Administration on bicycle and pedestrian projects from Fiscal Years (FY) 2010 – FY 2014. The national average was 1.9%. The table below shows how much TxDOT spent on bicycle and pedestrian projects from various federal funding categories. However, these figures may not account for bikeway accommodations/improvements done as part of a roadway project.

Table 6 - Obligated Federal-Aid Bike/Ped Spending in FY2010 - FY2014

Program	Bike/Ped Obligations	Total Program Obligations	Bike/Ped
Transportation Alternatives Program	$ -	$3,000,000	0.00%
CMAQ	$20,668,936	$541,387,948	3.80%
HSIP	$ -	$732,089,596	0.00%
STP TE	$67,247,085	$159,350,425	42.20%
STP Non-TE	$36,483,355	$4,895,526,429	0.70%
High Priority Projects	$14,846,725	$254,639,151	5.80%
Safe Routes to School	$6,253,603	$68,635,825	9.10%
Recreational Trails Program	$ -	$9,394,178	0.00%
ARRA TE	$14,847,366	$12,722,455	116.7%
ARRA Non-TE	$4,728,178	$1,000,779,807	0.50%
TIGER	$ -	$ -	0.00%
State Planning and Research	$ -	$180,791,658	0.00%
Highway Bridge Program	$ -	$603,009,852	0.00%
Other	$6,946,065	$7,937,516,209	0.10%

Source: FHWA FMIS Database, http://www.fhwa.dot.gov/federalaid/projects.pdf

Most federal funding categories can be used toward bicycle and pedestrian projects. A detailed table of what funding categories can be used for specific project types is included (see Appendix B). Federal funding categories eligible for bicycle projects include:

- Transportation Investment Generating Economic Recovery Discretionary Grant program (TIGER)
- Federal Transit Administration Capital Funds (FTA)
- Associated Transit Improvement (1% set-aside of FTA) (ATI)
- Congestion Mitigation and Air Quality Improvement Program (CMAQ)
- Highway Safety Improvement Program (HSIP)
- National Highway Performance Program/National Highway System (NHPP/NHS)
- Surface Transportation Program (STP)
- Transportation Alternatives Program/Transportation Enhancement Activities (TAP/TE)
- Recreational Trails Program (RTP)
- Safe Routes to School Program (SRTS)
- Statewide or Metropolitan Planning (PLAN)
- State and Community Highway Safety Grant Program (402)
- Federal Lands and Tribal Transportation Programs (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program) (FLTTP)

Lady Bird Lake Trail, Austin, TX

Although it is not reflected in the federal data, TxDOT allocated approximately 2.4% of its State Planning and Research (SP&R) funds toward bicycle and pedestrian research projects in FY2010 – FY2014.

While TxDOT can choose to fund bicycle and pedestrian projects through a number of programs, TxDOT's Transportation Alternatives Program (TAP) rules designate funding for bicycle and pedestrian infrastructure projects exclusively. The TAP is a federally funded program authorized as part of Moving Ahead for Progress in the 21st Century Act (MAP-21). The TAP program consolidates several legacy funding programs (Transportation Enhancements, Safe Routes to Schools and Recreational Trails). TAP funds are distributed directly to MPOs in large urbanized areas with populations over 200,000 and to state DOTs for populated areas less than 200,000. MPOs and state DOTs are responsible for selecting their own projects.

On January, 16, 2015, TxDOT conducted its first TAP Call for Projects with projects due to TxDOT on or before May 4, 2015. TxDOT received 121 project nominations for the estimated $52 million available TAP funding managed by TxDOT (Federal FY 2013, 2014, 2015 and 2016 funds). TxDOT manages TAP funding for small urban and rural areas with populations less than 200,000 that are outside of the 2010 U.S. Census Urbanized Area boundaries.

Eligible TAP activities include:

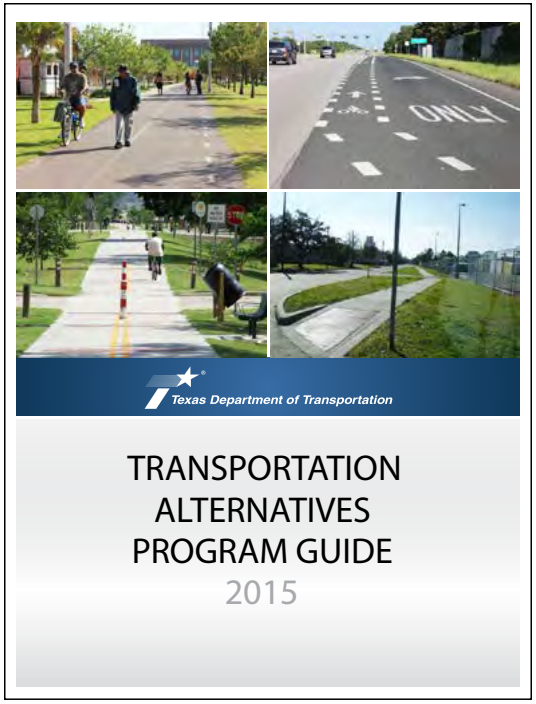
1. Construction of on-road and off-road trail facilities for pedestrians, bicyclists and users of other nonmotorized forms of transportation, including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure and transportation projects to achieve compliance with the Americans with Disabilities Act of 1990;

2. Construction of infrastructure-related projects and systems that will provide safe routes for non-drivers, including children, older adults and individuals with disabilities to access daily needs;

3. Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other non-motorized transportation users; and

4. Construction of infrastructure-related projects to improve the ability of students to walk and bicycle to school, including sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street bicycle and pedestrian facilities, secure bicycle parking facilities and traffic diversion improvements in the vicinity of schools.

The Department is particularly interested in TAP projects that:



- Enhance bicycle and pedestrian safety
- Propose a direct connection to important community destinations (such as schools, employment, shopping and recreational areas)
- Provide access to or link existing community investments in bicycle and pedestrian facilities, public transportation, or other mobility options
- Reflect a high degree of collaboration and community consensus while directly contributing to the department's safety and connectivity goals
- Contribute as an individual project to a larger investment consistent with Complete Streets Design

TAP funds set aside for the Recreational Trails Program are administered by Texas Parks and Wildlife Department.

Moving Forward

In the following sections, this report will present some of the best practices when it comes to accommodating bicycles. This includes a comparison of some of the most highly regarded state bicycle programs. Following this, the report highlights seven focus areas and potential next steps for TxDOT. This section identifies specific actions that could be done to implement these focus areas.

Bicycle and pedestrian planning and engineering is an area of innovation and continued development. TxDOT relies on the American Association of State Highway and Transportation Officials (AASHTO) bicycle and pedestrian design guides in conjunction with the *Texas Manual on Uniform Traffic Control Devices* (TMUCTD) as the primary resources for planning, designing and operating bicycle and pedestrian facilities, which is the case nationally as well. The National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide* builds upon the flexibilities provided in the AASHTO guides to provide additional recommendations to help communities plan and design safer and more convenient accommodations for pedestrian and bicyclists. FHWA supports the use of these resources to further develop non-motorized transportation networks, particularly in urban areas. Many jurisdictions that provide bicycle and pedestrian facilities have and continue to experiment with innovative facility types. For example, providing colored bicycle lanes was at one point experimental, but as more demonstration projects grew and were evaluated, they became generally accepted; they are expected to be included in the next update of the *Manual on Uniform Traffic Control Devices* (MUTCD).

Lady Bird Lake Trail, Austin, TX

Best practices for accommodating bicyclists is included in Appendix A of this document. The best practice descriptions, benefits, tradeoffs, resources and considerations, were developed based on a review of nationally adopted bikeway guides and locally-tested innovations.

Bikeway Guides

AASHTO Guides

AASHTO publishes two guides that address pedestrian and bicycle facilities:

- *Guide for the Planning, Design and Operation of Pedestrian Facilities*, July 2004, (AASHTO Pedestrian Guide) provides guidelines for the planning, design, operation and maintenance of pedestrian facilities, including signals and signing. The guide recommends methods for accommodating pedestrians, which vary among roadway and facility types and addresses the effects of land use planning and site design on pedestrian mobility.
- *Guide for the Development of Bicycle Facilities 2012*, Fourth Edition (AASHTO Bike Guide) provides detailed planning and design guidelines on how to accommodate bicycle travel and operation in most riding environments. It covers the planning, design, operation, maintenance and safety of on-road facilities, shared use paths and parking facilities. Flexibility in design is provided to encourage development of accommodations that are sensitive to local context and incorporate the needs of bicyclists, pedestrians and motorists.

NACTO Guide

NACTO first released the *Urban Bikeway Design Guide* (NACTO Guide) in 2010 to support more recently developed bicycle design treatments and techniques being used in urban areas. It provides options that can help create "complete streets" that better accommodate pedestrians and bicyclists. While not directly referenced in the AASHTO Bike Guide, many of the treatments in the NACTO Guide are compatible with the AASHTO Bike Guide and demonstrate new and innovative solutions for urban settings across the country.

The vast majority of treatments illustrated in the NACTO Guide are either allowed or not precluded by MUTCD/TMUTCD. In addition, non-compliant traffic control devices may be piloted through the MUTCD experimentation process. That process is described in Section 1A.10 of the MUTCD and a table on the FHWA's bicycle and pedestrian design guidance Web page is regularly updated (FHWA Bicycle and Pedestrian Design Guidance) and explains what bicycle facilities, signs and markings are allowed in accordance with the MUTCD. Elements of the NACTO Guide will be considered in the rule-making cycle for the next edition of the MUTCD and TMUTCD.

State Bicycle Programs – Best Practices

All state departments of transportation have some sort of bicycle program; however, the level of support to accommodate bicycle transportation varies dramatically from state to state. As of May 2015, thirty-three states have adopted bicycle plans or have planning efforts underway. In general, most bicycle plans are policy-level documents and/or plans. They have goal areas that support safety, increase bicycle mode share and fund bicycle accommodations. Many plans include goal areas that are supportive of active transportation for health, environmental, social equity, economic and increased connectivity benefits. Goal areas may also be linked to objectives and all plans link goal areas to specific actions that are to be implemented to help achieve the goal areas of the plan. Texas does not have a bicycle plan. As stated previously, this document is TxDOT's first bicycle planning document.

Every year, the League of American Bicyclists (LAB) assesses all 50 states as part of their Bicycle Friendly America program. The LAB surveys state agencies and advocacy organizations on the status of bicycle accommodations within each state and then evaluates the states against each other by numerically ranking states 1 – 50. Each state gets a "report card" that highlights their regional ranking, category scores, top 10 signs of success and provides feedback on what the state could do to enhance its bicycle program. The rankings for 2014, released in May 2015, are as follows:

Table 7 - League of American Bicyclists – Bicycle Friendly America State Rankings (2014)

1	Washington	15	Maine	29	New York	43	Hawaii
2	Minnesota	16	Ohio	**30**	**Texas**	44	South Carolina
3	Delaware	17	Vermont	31	Nevada	45	Oklahoma
4	Massachusetts	18	Michigan	32	Mississippi	46	Montana
5	Utah	19	Arizona	33	Louisiana	47	Nebraska
6	Oregon	20	Tennessee	34	Missouri	48	Kansas
7	Colorado	21	Idaho	35	Wyoming	49	Kentucky
8	California	22	Connecticut	36	Arkansas	50	Alabama
9	Wisconsin	23	North Carolina	37	Indiana		
10	Maryland	24	Florida	38	South Dakota		
11	New Jersey	25	Georgia	39	North Dakota		
12	Pennsylvania	26	Rhode Island	40	New Mexico		
13	Virginia	27	New Hampshire	41	Alaska		
14	Illinois	28	Iowa	42	West Virginia		

Figure 18 - League of American Bicyclists, 2014 Report Card

BICYCLE FRIENDLY STATE

REPORT CARD

Texas

RANKING # 30

REGIONAL RANKING » SOUTH #6

GOVERNOR: Greg Abbott

DOT COMMISSIONER: Lt. Gen. Joe Weber

BICYCLE/PEDESTRIAN COORDINATOR: Teri Kaplan

STATE ADVOCACY GROUP: Bike Texas

CATEGORY SCORES — SCORING: 5 = HIGH 1 = LOW

3	LEGISLATION AND ENFORCEMENT
3	POLICIES AND PROGRAMS
1	INFRASTRUCTURE AND FUNDING
4	EDUCATION AND ENCOURAGEMENT
1	EVALUATION AND PLANNING

TOP 10 SIGNS OF SUCCESS — = NEW IN 2015

	1% OR MORE OF PEOPLE COMMUTING BY BIKE
	SAFE PASSING LAW (3 FEET OR GREATER)
✓	COMPLETE STREETS POLICY
	DEDICATED STATE FUNDING
✓	ACTIVE STATE ADVOCACY GROUP
	STATE BICYCLE PLAN (ADOPTED 2005 OR LATER)
✓	SHARE THE ROAD CAMPAIGN
	VULNERABLE ROAD USER LAW
✓	BICYCLE SAFETY EMPHASIS IN STRATEGIC HIGHWAY SAFETY PLAN
	2% OR MORE FEDERAL FUNDS SPENT ON BIKE/PED

OVERALL POINTS

35 of 100 — 2014: 31 of 100

FEEDBACK

- TxDOT has planned some investments in tools that will support bicycle plan development such as a GIS inventory all of the bikeways by facility type in the state and a consultant to develop a Strategic Direction Report for their Pedestrian and Bicycle Program. Make sure that these investments lead to the development of plans and performance measures that can contribute to short and long-term visions, goals, and policies that will advance bicycling and walking.
- TxDOT should update its Engineering Design Standards to include protected bike lanes and other measures to accommodate bicycles on TxDOT system roads. Explore what changes might be necessary to allow the routine construction of newer types of bike infrastructure, such as protected bike lanes, bike specific traffic signals, and bike boxes on TxDOT system roads. This may include a formal adoption, endorsement, or policy statements regarding the NACTO Urban Streets Design and Bikeway Design Guides.
- Texas was one of the first states to adopt a statewide Safe Routes to School program. Identify dedicated funding to maintain this program for both infrastructure and educational investments.
- Adopt a mode share goal for biking to encourage the integration of bicycle transportation needs into all transportation and land use policy and project decisions.
- Dedicate state funding for bicycle projects and programs, especially those focused on safety and eliminating gaps and increasing access for bicycle networks.
- The state could spend more federal funding on bicyclists and pedestrians. Adopt project prioritization criteria for federal funds that incentivize bicycle projects and accommodations.

The Bicycle Friendly States ranking is based on a comprehensive survey completed by state departments of transportation and state bicycling advocates. It asks comprehensive questions across 5 categories: Legislation and Enforcement, Policies and Programs, Infrastructure and Funding, Education and Encouragement, Evaluation and Planning. The results listed above provide only a snap shot of the full application. They are intended to offer some ideas for further growth in bicycle friendliness. For more information, visit www.bikeleague.org/states or contact Ken McLeod at (202)-822-1333 or ken@bikeleague.org.

THE LEAGUE OF AMERICAN BICYCLISTS since 1880

Source: http://bikeleague.org/content/report-cards

Table 8 - Texas' Ranking by LAB's Bicycle Friendly America

Year	Ranking
2014	30
2013	33
2012	22
2011	27
2010	32
2009	41
2008	36
2007	30

To provide some perspective on what other states are doing and provide potential options for TxDOT, Table 9 presents a side-by-side comparison of the LAB's 2014 top-ranked state bicycle programs with Texas. This includes information on Utah, Massachusetts, Delaware, Minnesota and Washington's bicycle programs. Actions that could help TxDOT improve its "Best in Class" standing as a bicycle-friendly state are included in the column entitled "Takeaways for Texas."

Table 9 - Comparison of LAB Top 5 "Bicycle Friendly America" States and Texas

Bicycle and pedestrian program elements	Texas	Utah	Massachusetts	Delaware	Minnesota	Washington	Takeaways for Texas
League of American Bicyclists 2014 Ranking	30	5	4	3	2	1	Texas is ready to move up in the rankings
% commute by bike (as of 2012)	0.3%	0.8%	0.8%	0.4%	0.8%	0.8%	Increasing mode shift will likely help Texas' standings
Program Staff	■ Statewide Bicycle Coordinator ■ District Bicycle Coordinators	Bicycle and Pedestrian Coordinator	District- specific bicycle and pedestrian coordinators	■ Bicycle Coordinator ■ Pedestrian Coordinator	■ Bicycle Program Director ■ Bicycle and Pedestrian Coordinators ■ Landscape Architect ■ Support staff	■ Three Active Transportation Coordinators ■ Safe Routes to School Coordinator	TxDOT's Bicycle Program could benefit from additional staff and resources
Technical assistance to local jurisdictions—aid to local jurisdiction with planning, design and maintenance, as well as navigating grant processes	TxDOT provides assistance on an ad hoc basis. Trainings and presentations include workshops and sessions on at statewide planning and engineering conferences/events	Road Respect Community Forums help community groups (including local city and/or county planning, law enforcement agencies and cycling advocacy groups) understand how the Utah Department of Transportation (UDOT) functions. The forums empower communities to take the lead, with UDOT support, to develop active transportation plans and activities	The Massachusetts Department of Transportation (MassDOT) has sponsored a series of workshops on Complete Streets. The training attendees include municipal public works and planning staff, local elected leaders, professional designers and MassDOT employees from throughout the Commonwealth	None noted	Minnesota DOT (MnDOT) provides technical assistance to local units of government in planning and developing bikeways through trainings, workshops and technical guides	Washington State DOT (WSDOT) offers assistance to localities in developing SRTS grants, in addition to technical assistance for the design and development of bicycle and pedestrian facilities	With additional staff and resources, TxDOT could expand the amount of technical assistance provided

Continued from the previous page

Bicycle and pedestrian program elements	Texas	Utah	Massachusetts	Delaware	Minnesota	Washington	Takeaways for Texas
Complete Streets Policy—Complete Streets policies aim to develop integrated, connected, networks of streets that are safe and accessible for all people, regardless of age, ability, income, ethnicity, or chosen mode. Complete Streets make active transportation, walking and bicycling, convenient. Complete Streets affects planning, design, maintenance and funding decisions	No	Currently being developed within Utah Collaborative Active Transportation Study (UCATS)	■ GreenDOT Policy ■ In 2006 adopted Complete Streets approach in their Project Development and Design Guide ■ Healthy Transportation Policy Directive passed in Sept 2013 requires that MassDOT projects be designed and built so that all MassDOT "customers have access to safe and comfortable healthy transportation options	Established December 2009	Complete Streets policy was passed in May 2010 ■ A Complete Streets Coalition, started in 2009, collaborate with MnDOT and local communities and engineers to implement Complete Streets	Complete Streets Act went into effect July 2011 ■ Creates a program that provides grants to communities that met street design criteria. ■ New transportation package earmarked $106M for program	TxDOT does not have a Complete Streets Policy. Bicyclists could benefit from more inclusive design guidelines
Network identification-Networks could be an inventory or statewide bicycle routes, trails and/or multi-use paths	TxDOT is in the process of developing an interactive State Bikeway Map	■ Interactive statewide map ■ Individual trail maps	■ Bicycle Facility Inventory (BFI) GIS Database ■ ·Regional Bike maps are available on the Executive Office of Energy and Environmental Affairs website	■ A statewide map used for route planning is available through a GoogleMap interface ■ Delaware DOT (DelDOT) maintains PDF versions of county maps on their website	■ Minnesota has Cyclopath, an interactive bicycle map that offers personalized trip planning showing bicycle facilities and associated amenities. It is produced with data from MnDOT, localities and users ■ MnDOT maintains bicycle maps in PDF by region for the entire state	■ Full state PDF maps offered on WSDOT site, including by region and more detailed Puget Sound area maps	TxDOT could benefit from additional bikeway mapping and inventories

Continued from the previous page

Bicycle and pedestrian program elements	Texas	Utah	Massachusetts	Delaware	Minnesota	Washington	Takeaways for Texas
State Bicycle/ Pedestrian Plan·	No	■ Adopted in 2014, the Utah State Bike Plan is comprised of separate Bike Plan for each UDOT region. ■ Extensive Bicycle and Pedestrian guide (2008) ■ ·Currently being developed: Utah Collaborative Active Transportation Study (UCATS)	2008 Massachusetts Bicycle Transportation Plan	■ Delaware Bicycle Master Plan published Oct 2005	■ Current Bicycle Modal plan was adopted in 2005 ■ Currently updating their bicycle/ pedestrian plan ■ Statewide Pedestrian System Plan is currently in development	Washington Bicycle Facilities and Pedestrian Walkways Plan, adopted in 2008	TxDOT could benefit from adopting a bicycle plan
State Design Guidelines—provides guidance or standards for the design of bicycle and pedestrian facilities on state and local roadways	No, default to AASHTO guidance	·Utah Bicycle and Pedestrian Master Plan Design Guide, adopted inn 2011	·Healthy Transportation Engineering Directive adopted in 2014 adds new specific design requirements related to sidewalk presence, sidewalk width and bicycle accommodation	·Addressed in DelDOT Design Manual & Bicycle Plan (3.2)	■ Bicycle Facility Design Manual was adopted in 2007 ■ Best practices for Pedestrian and Bicycle safety, adopted in 2013, also had some design guidelines ■ Other guidelines used include AASHTO and ADA	■ WSDOT has endorsed NACTO Urban Bikeways Design, which is considered leading edge in bicycle and pedestrian planning ■ Other guidelines used include AASHTO, FHWA and MUTCD	TxDOT should consider adopting statewide design guidelines/standards and developing typical sections for bikeways
Vulnerable Road User Law-- increased protection for bicyclists and other road users who are not in cars	No	Yes. Drivers found guilty of offense will have to: pay a fine up to $2,000, participate in an accident prevention course and do 100 hours of community service directly related to improving interactions between motorists and vulnerable road users	No	■ Signed into effect Aug 2010 ■ Includes: pedestrians, workers and cyclists in addition to individuals using skateboards, skates, scooters, mopeds, motorcycles, farm tractors or similar farm vehicles and those riding on animals	No	■ Went into effect July 2012 ■ Includes bicyclists, pedestrians, people on motorized wheelchairs, scooters or others ■ Drivers may face an automatic fine of up to $5,000 and a 90-day suspension of his or her driver's license	A Vulnerable Road User Law may improve Texas' rating as a "bicycle friendly state"

Continued from the previous page

Bicycle and pedestrian program elements	Texas	Utah	Massachusetts	Delaware	Minnesota	Washington	Takeaways for Texas
Safe Passing Law (3 feet or greater)	No	Yes	No	Yes	Yes	No	Enacting a Safe Passing Law may make conditions safer for bicyclists.
"Share the Road" campaign	Texas currently has an extensive "Share the Road" campaign called "Drive Friendly. Drive Safe"	Utah has a program called RoadRespect, with a website that promotes safety and education among cyclists and motorists	Bicycle and Pedestrian Safety and Awareness Program 2014	Yes, campaign is called Share the Road Motorist and Cyclists	Campaign includes child education about rules of the road	Specialized license plates available that support safety and education programs	An active campaign is already in place
Dedicated state funding for bicycle/ pedestrian- State level funding	No	Safe Sidewalk Program	Dedicated funding for Complete Streets certification program	Walkable Bikeable Delaware - as of May, 2011, $5M has been directed to make strategic investments in walking and bicycling routes	Safe Routes to School Grants	■ A 16-year transportation package was passed in 2015 ■ A combined total of $320M has been earmarked for biking, walking and SRTS ■ $89M is earmarked for bike/ped projects	Texas "bicycle friendly state" rating will likely improve with dedicated funding for bicycle and pedestrian projects
Active state advocacy organization	Bike Texas	Bike Utah	Massachusetts Bicycle Coalition (MassBike)	Bike Delaware, Inc.	Bicycle Alliance of Minnesota	WashingtonBikes	BikeTexas although there are many active advocacy organizations throughout the state
State sponsored Safe Routes to School Program	No. The federal Safe Routes to School (SRTS) program was not reauthorized under MAP-21. TxDOT has not dedicated funding to the SRTS program although many SRTS projects are eligible under the Transportation Alternatives Program or other programs	Yes, although funding is not currently available	Yes	■ DelDOT maintains a number of materials to assist localities and schools with SRTS programs ■ There is no additional funding allocated as a grant program in lieu of the federal program lapse	■ Yes, Minnesota has chosen to dedicate state funding to SRTS grants ■ SRTS will be distributing $2M in grants in 2016	■ Yes, Washington has chosen to dedicate state funding to SRTS grants ■ SRTS will be distributing over $8M in grants for 2015 – 2017	Texas "bike friendly state" rating will likely improve with continuation of the SRTS program and additional funding will drive the development of more bicycle facilities

Focus Areas

TxDOT has a number of programs and policies in place that support bicycle and pedestrian transportation. One of the purposes of this report is to identify priority areas where TxDOT could work to improve information sharing and ultimately improve accommodations for walking and bicycling in Texas. Through a collaborative process including the TxDOT Bicycle Advisory Committee, TxDOT staff and in consultation with advocacy organizations and local entities, the following priorities were developed. This list of priorities is not exhaustive, it represents a starting point for the agency and should be expanded upon after initial implementation efforts. These focus areas are consistent with TxDOT's Strategic Plan goals.

This report recommends emphasis on the following priorities that support bicycle and pedestrian transportation across the state:

Expand the bikeway network

Build safer and better bicycle and pedestrian accommodations

Provide training for engineers, planners and construction staff

Educate the public on safe driving, bicycling and walking

Encourage people to walk and bicycle

Develop statewide management systems for bicycle and pedestrian information

Fund bicycle and pedestrian projects

There are a number of ways TxDOT can work to address these focus areas, On the following pages, each focus area is described in greater detail with specific actions and outcomes listed. Implementation of these focus areas will require coordination with MPOs, counties, cities and other local entities to build on work already done.

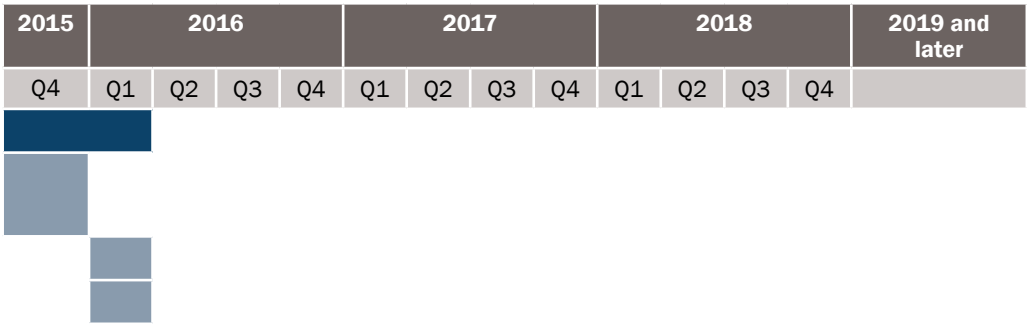
Focus Area: Expand the bikeway network

Description: To expand the bikeway network in Texas it is first important to identify existing bikeways in a consistent manner and establish an inventory. Once existing on-system bikeways have been identified and mapped, TxDOT can:

- Work with MPOs, counties and cities to adopt consistent bikeway terminology and attributes
- Establish a statewide network
- Leverage connectivity to local and regional bikeway networks
- Identify needs and gaps in connectivity
- Prioritize future investment

Stakeholders: TxDOT will take the lead on identifying and prioritizing the statewide network including areas of expansion. Data will be needed from TxDOT districts, MPOs, cities and counties to establish a statewide network. In prioritizing projects, TxDOT will solicit feedback from TxDOT district staff, local entities and bicyclists to consider current and future usage and providing connectivity.

Recommended Actions:



Identify existing bikeways

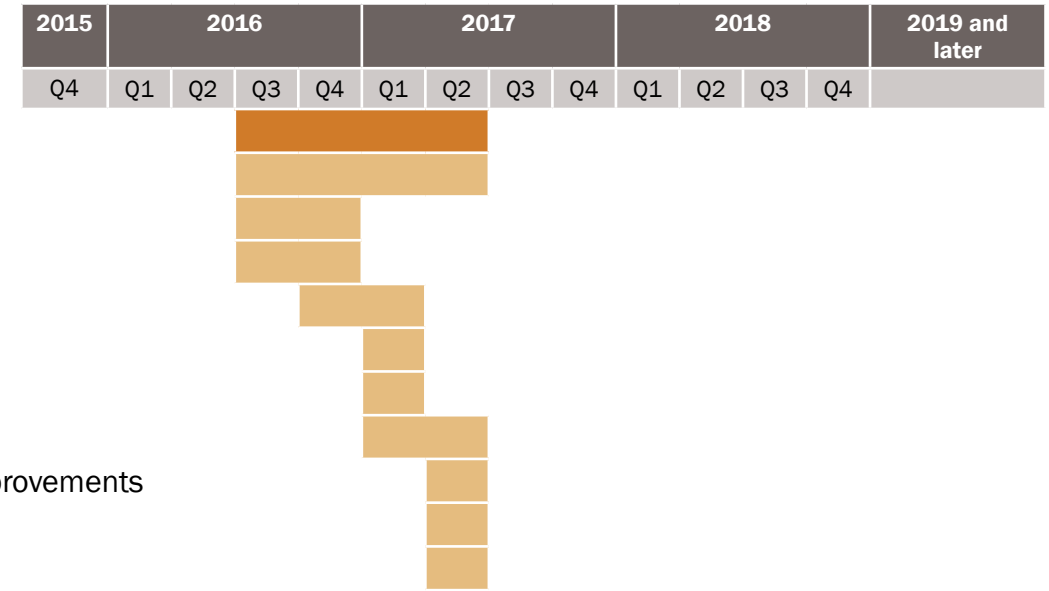
Solicit information from TxDOT districts, MPOs, counties and cities

Create a bikeway map with attributes

Identify data needs for future planning

[Recommended Actions continued on the next page]

[Continued Recommended Actions from previous page]



Prioritize statewide network/corridors

- Develop multidisciplinary team to review existing bikeways (1)
- Establish methodology for identifying needed bikeways
- Establish criteria for bikeway inclusion as "state route"
- Identify additional data needed
- Establish statewide bikeway network
- Identify needs/gaps in bikeway network
- Identify needed projects
  - Establish methodology for selecting projects and corridor improvements
  - Obtain needed data
  - Prioritize future investments

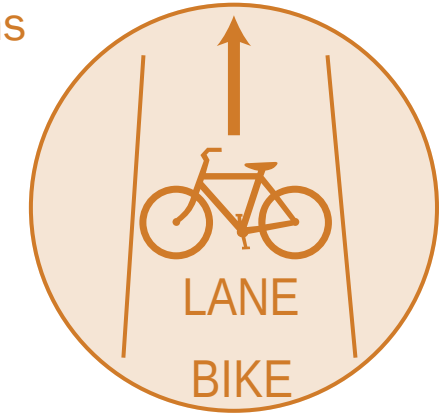
Potential Outcomes:

Outcomes may include but are not limited to the following:

- Interactive bikeway map with descriptions of accommodations
- District bikeway maps
- Identification of existing rail facilities that would be good Rails-to-Trails conversions
- Identification of future bikeway investments
- Create statewide bikeway route designations

(1) The multidisciplinary team would include representatives from various TxDOT Divisions and District representation. This team would be used to help advise the Statewide Bicycle Program Coordinator on various initiatives.

Focus Area: Build safer and better bicycle and pedestrian accommodations

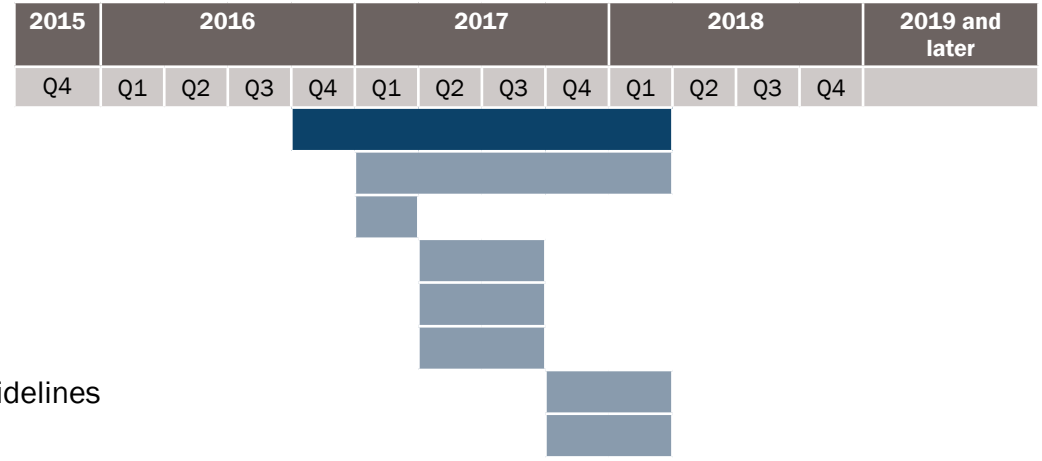


Description: Safety is TxDOT's number one priority. Building safer and better bicycle and pedestrian accommodations is also a top priority for TxDOT, in order to do this a number of activities need to take place including, but not limited to:

- Identification of safety concerns and safety hot spots
- Adoption of design guidelines that support safe facilities
- Review how staff considers bicycle accommodations during all phases of project development
- Development of safer bicycle and pedestrian accommodations

Stakeholders: TxDOT bicycle program staff will work with a multi-disciplinary team that may include TxDOT's Traffic Operations, Design, Environmental Affairs and Construction Divisions as well as District staff to identify and prioritize safety concerns based on crash data. Through this multi-disciplinary team, TxDOT can review current design guidelines, make recommendations on new guidelines and develop typical sections that include example bikeway sections and traffic data to better educate planners, engineers and users on recommended design criteria.

Recommended Actions:



Potential Outcomes:

Outcomes may include but are not limited to the following:

- TxDOT Complete Streets Policy
- Endorsement of the National Association of City Transportation Officials (NACTO) Guide
- More bicycle lanes and shared use paths
- Guidelines staff must follow when considering bicycle and pedestrian accommodations
- Identification of traffic calming measures
- Road or lane diets for some roadways
- Typical sections for bicycle design

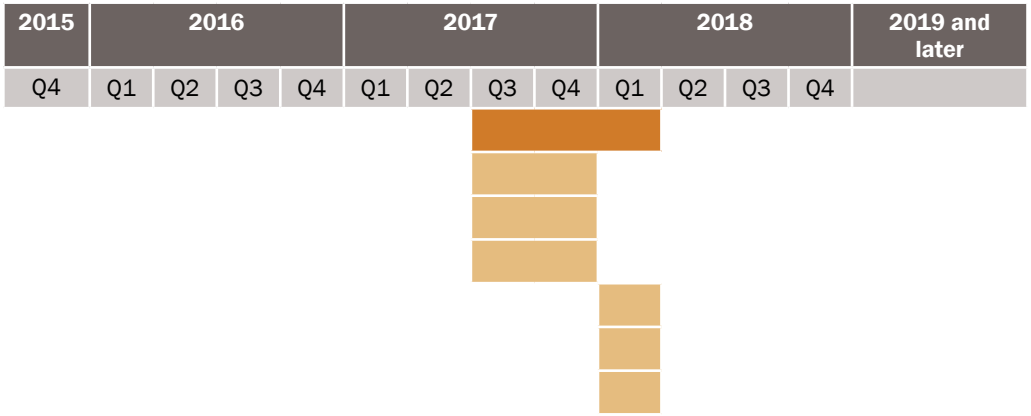
FM 170, the River Road, Brewster County, TX

Focus Area: Provide training for engineers, planners and construction staff

Description: There are many ways TxDOT can train its engineering, planning, environmental and construction staff on the provision of bicycle accommodations. Through meetings with the previously discussed multidisciplinary team and regular interactions with department staff, the TxDOT's bicycle program will gain visibility and consideration as projects are planned, developed and constructed.

Stakeholders: TxDOT bicycle program staff will work with department staff to identify training needs and develop training materials.

Recommended Actions:



Develop training program

- Review department needs
- Review best practices
- Develop training materials
- Identify individuals to provide training
- Identify training opportunities (ex: short course, webinars, etc.)
- Schedule training

Potential Outcomes:

Outcomes may include but are not limited to the following:

- More and improved bicycle and pedestrian accommodations
- More inclusive roadway designs, earlier integration, better coordination
- Staff will become more familiar with the bicycle program and the associated resources to design better bikeways

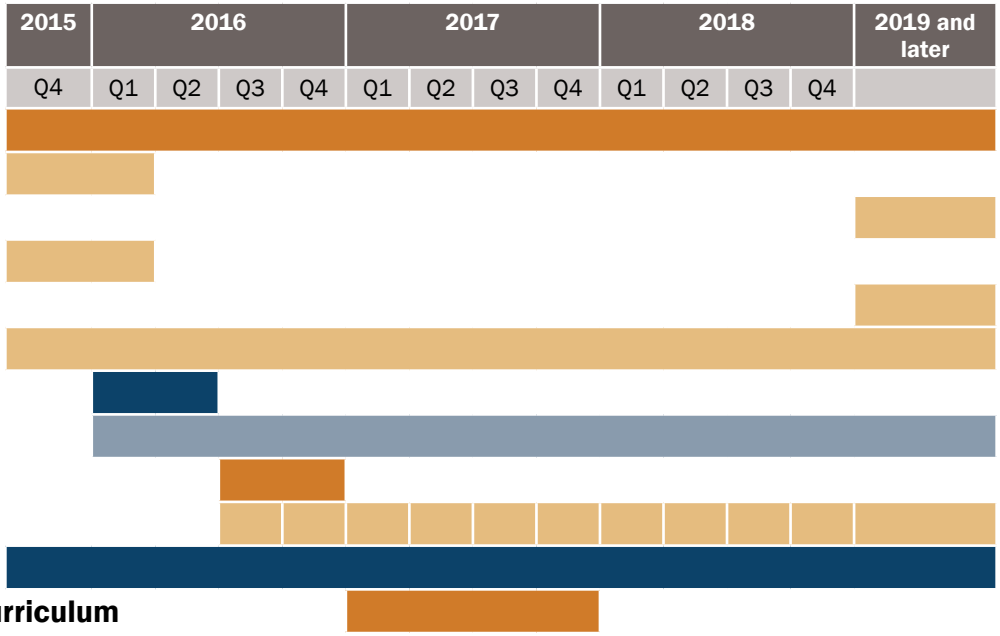
Focus Area: Educate the public on safer driving, bicycling and walking

Description: TxDOT currently has an established outreach and education program to educate the traveling public. The bicycle program will build upon current efforts to develop materials and programs specifically for bicycling and walking. The target audience will include:

- Motorists
- Bicyclists and pedestrians
- Law enforcement

Stakeholders: TxDOT bicycle program staff will work with department staff, advocacy, health and law enforcement organizations to develop materials and programming.

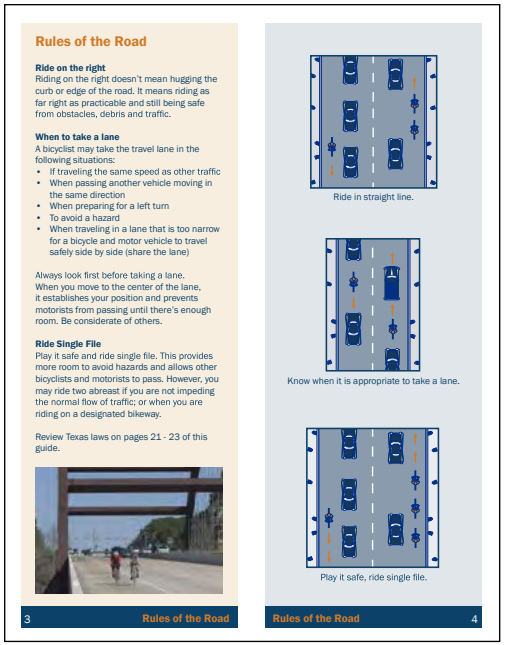
Recommended Actions:

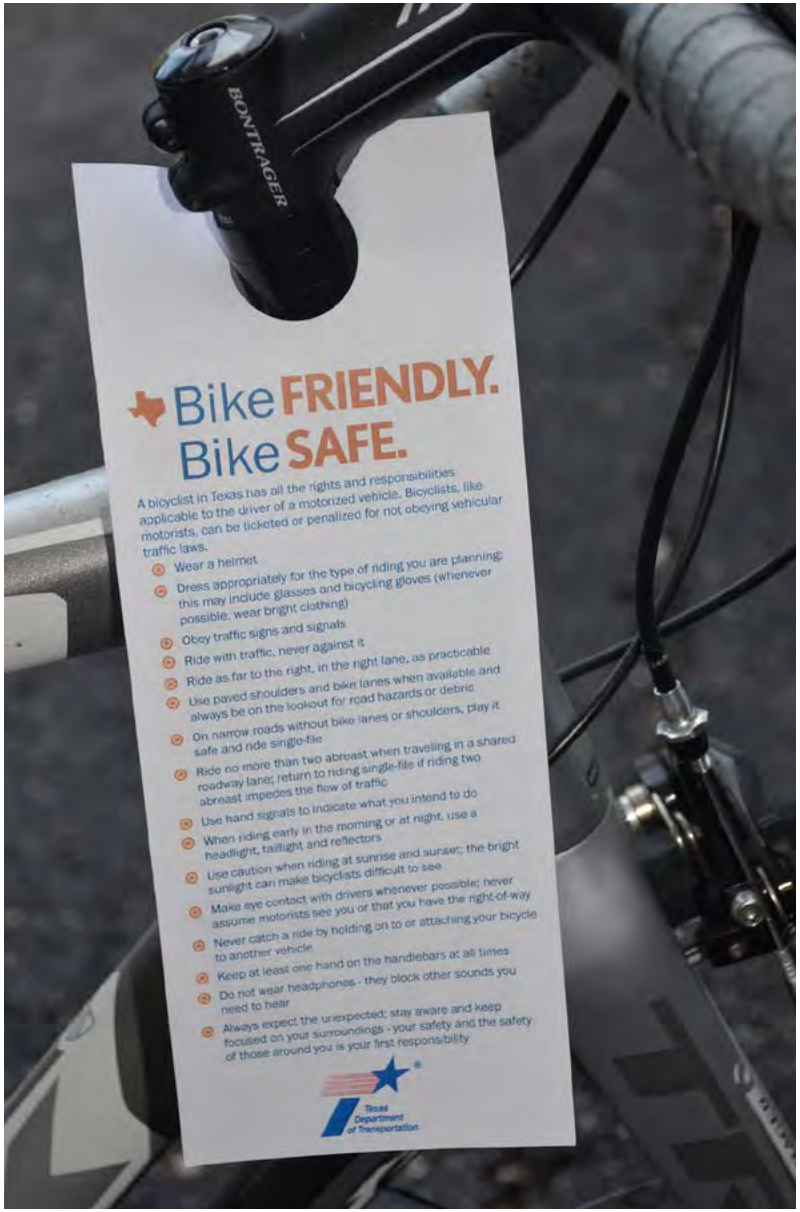


Potential Outcomes:

Outcomes may include but are not limited to the following:

- Bicycle safety guide
- Handlebar hanger
- Interactive bikeway map
- Information and materials on TxDOT website
- Quarterly email newsletter and District Bicycle Coordinator contact list
- Support for educational programs (ex: Please Be Kind to Cyclists)
- Funding for safety and education programs (ex: safe passing distance, cell phone ban)
- Materials for law enforcement health care training





Handlebar Hanger Prototype

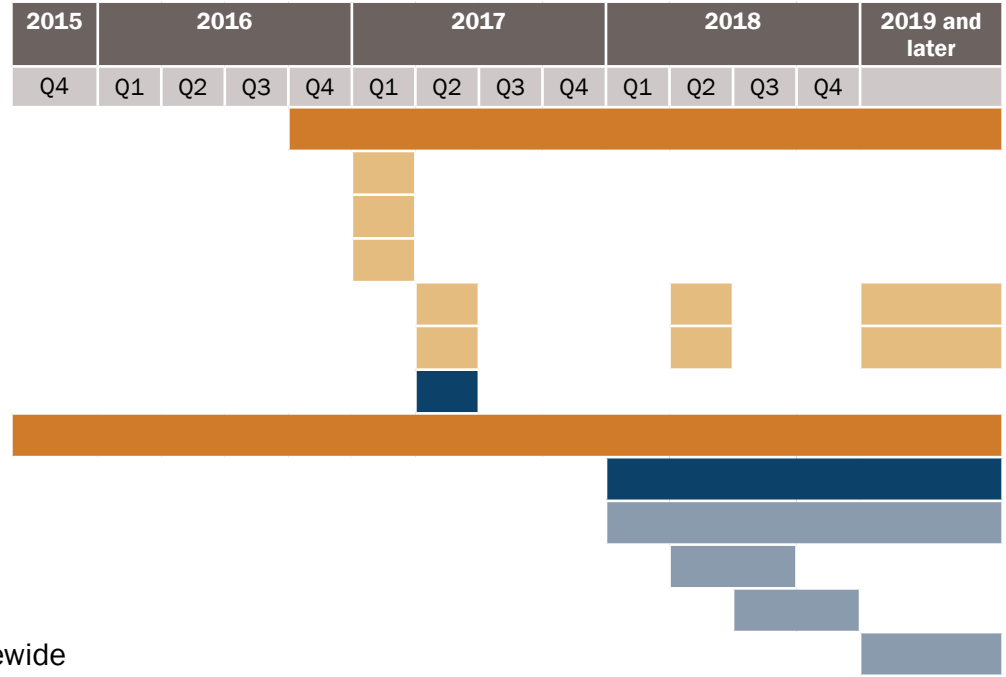
Focus Area: Encourage people to walk and bicycle

Description: TxDOT will work to encourage more Texans to walk and bicycle. In addition to statewide programming, TxDOT will specifically work to increase walking and bicycling for its employees. There are many benefits to active transportation, including reduced emissions, improved health, reduced congestion, reduced need for parking facilities and many more.

Stakeholders: TxDOT bicycle program staff will work to support bicycling and walking throughout the state, supporting programs that encourage active transportation. TxDOT will work to establish a Transportation Demand Management program for its employees that incentivizes biking and walking to work and during lunch.

Bike to Work Day

Recommended Actions:



Lead statewide Bike to Work Day
- Contact MPOs to discuss statewide event coordination
- Work with statewide advocacy organizations on statewide event
- Develop statewide workgroup for Bike to Work Day
- Develop webpage and materials for Texas Bike to Work Day
- Update Bike to Work Day webpage and materials annually

Work with state tourism office to link to interactive bike map

Develop support materials that encourage bicycling and walking

TxDOT Transportation Demand Management Program (TDM)
- Identify level of administration support for TDM
- Identify Employee Coordinators
- Develop TxDOT employee TDM toolbox
- Work with TxDOT to disseminate information on the program statewide

Potential Outcomes:

Outcomes may include but are not limited to the following:

- Statewide Bike to Work Day
- Statewide bicycle map to support bicycle tourism
- Partnerships with law enforcement and health organizations
- Support for efforts that quantify health and economic impacts of walking and bicycling
- Funding for Safe Routes to School projects: sidewalks and bikeway infrastructure
- TxDOT Employer-based Transportation Demand Management Program

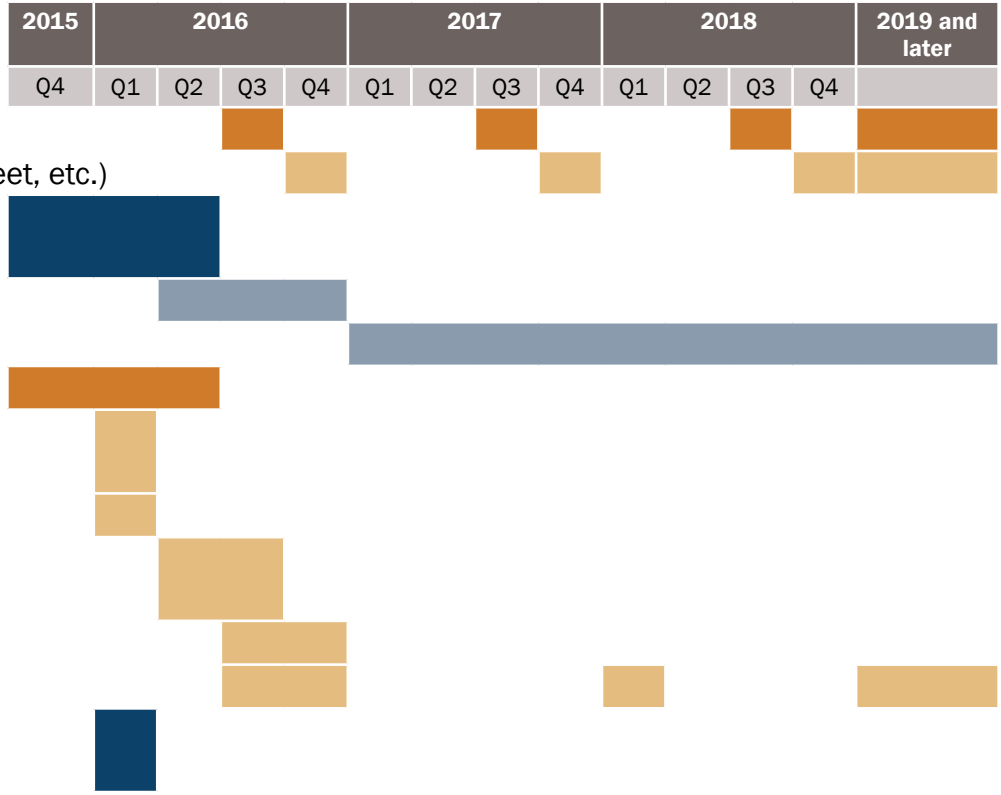
Brazos Bend State Park Trail, Needville, TX

Focus Area: Develop statewide management systems for bicycle and pedestrian information

Description: TxDOT will create a management system to regularly collect, analyze and report on bicycle and pedestrian related data. This will include safety, usage and facility data. This data will be used in decision making and in the creation of materials available to the public. TxDOT will establish guidelines for collecting data statewide. TxDOT will research methods and equipment used to collect bicycle and pedestrian counts.

Stakeholders: TxDOT bicycle program staff will work with agency staff to gather information on safety, usage and facilities. TxDOT will also work with MPOs, cities and counties to gather data and serve as a statewide resource.

Recommended Actions:



Potential Outcomes:

Outcomes may include but are not limited to the following:

- Annual safety briefing materials
- Guidelines for gathering pedestrian and bicycle data (counts, identification of bikeways, etc.)
- Map including descriptions of existing bicycle accommodations
- Map, list and descriptions of planned accommodations
- State-owned count equipment
- Repository for all bicycle-related information
- Data on bicycling and walking usage and mode share

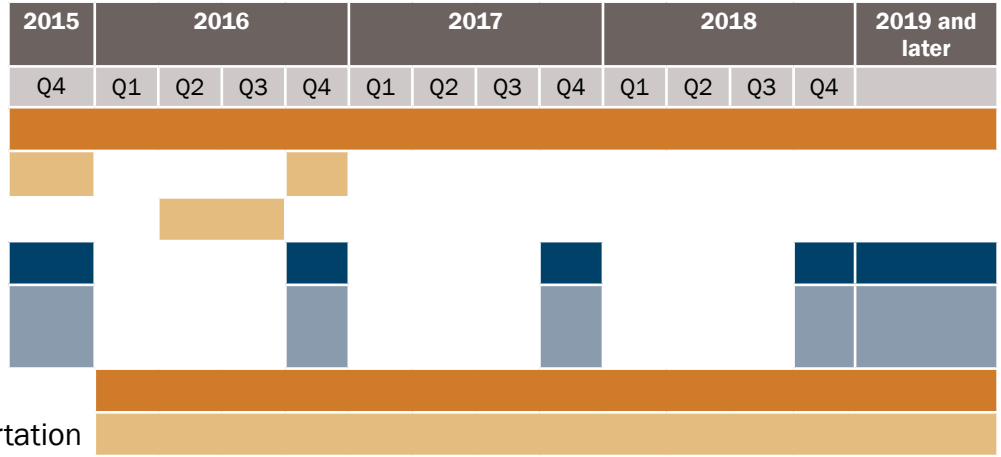
TxDOT Bicycle Advisory Committee Meeting, May 2015

Focus Area: Fund bicycle and pedestrian projects

Description: TxDOT will work collaboratively with others to identify additional funding sources for bicycle and pedestrian accommodations. In addition, TxDOT may choose to pilot programs to test bicycle initiatives before rolling them out statewide. This will allow TxDOT to test ideas and refine potential programs before making statewide investments. TxDOT will also produce a newsletter to highlight projects being planned and constructed and to identify funding opportunities.

Stakeholders: TxDOT bicycle program staff will work with others to identify additional funding sources and make those opportunities known to potential grantees including local entities, health and advocacy organizations. In addition, TxDOT will help educate project nominees on how to prepare project nominations.

Recommended Actions:



Potential Outcomes:

Outcomes may include but are not limited to the following:

- Continued bike/pedestrian funding through the Transportation Alternatives Program (TAP)/Surface Transportation Program (STP) Set-aside
- Additional funding available (ex: Highway Safety Improvement Program)
- Bicycle program pilot programs with policies, programs and projects that could be implemented statewide

Next Steps

Across the United States, bicycle use is on the rise as more people are choosing active transportation. TxDOT can do more to support the development of safer bicycle facilities and comprehensive programs for all users of the transportation system. There is not an established method of portraying bikeways on maps and bicycle and pedestrian data is not collected in a consistent manner; more uniformity is needed amongst government entities statewide in order to be able to share information. TxDOT is well-positioned to lead coordination efforts between these entities and establish a common bicycle language to be used across the state. TxDOT should become the state's facilitator of great bicycle transportation planning, programming and engineering.

Through the implementation of the following focus areas, TxDOT will make positive strides toward a "Best in Class Bicycle Program."

Expand the bikeway network

Build safer and better bicycle and pedestrian accommodations

Provide training for engineers, planners and construction staff

Educate the public on safe driving, bicycling and walking

Encourage people to walk and bicycle

Develop statewide management systems for bicycle and pedestrian information

Fund bicycle and pedestrian projects

This report provides the foundation for implementing the priorities identified above. TxDOT's Bicycle Advisory Committee (BAC) endorsed this report at its October 27, 2015 meeting. The next step for TxDOT is to refine the proposed actions into a manageable timeline in consultation with TxDOT staff and TxDOT's BAC.

TxDOT Bicycle Advisory Committee Membership
October 2015

Allison Blazosky

Russ Frank

Robert Gonzales

Ramiro Gonzalez

Billy Hibbs

Allison Kaplan

Joseph Pitchford

David Steiner

Shawn Twing

Karla Weaver

Anne-Marie Williamson

References

1. Lindsey et al. 2004. “Property Values, Recreation Values, and Urban Greenways,” Journal of Park and Recreation Administration, V22(3) pp.69-90.
2. Delaware Center for Transportation. 2006. Property Value/Desirability Effects of Bike Paths Adjacent to Residential Areas http://128.175.63.72/projects/DOCUMENTS/bikepathfinal.pdf
3. National Association of Realtors and National Association of Home Builders. 2002. Consumer’s Survey on Smart Choices for Home Buyers
4. Brownson, R., et al., 2000.“Promoting physical activity in rural communities: Walking trails access, use, and effects,” American Journal of Preventive Medicine, 18, 235-241
5. Sallis J, Bowles, H, Bauman A, et al. 2009. Neighborhood environments and physical activity among adults in 11 countries. American Journal of Preventative Medicine, 36 (6):484-490, June 2009.
6. Huston et al., Pierce et al., and Moudon et al. 2009. - in “Active Transportation: Making the Link from Transportation to Physical Activity and Obesity,” Active Living Research research brief, Summer, 2009
7. Velo Quebec. 2015. Cycle tourists: Quality tourists for regions throughout Quebec. http://www.velo.qc.ca/en/pressroom/20150428145143/Cycle-tourists-Quality-tourists-for-regions-throughout-Quebec
8. US DOT. 2009. National Household Travel Survey
9. US Census. 2013. American Community Survey. 2009 – 2013, Means of Transportation to Work
10. US Census. 2000. Journey to Work: 2000
11. Plumer, Brad. 2013. Why Aren’t Younger Americans Driving Anymore? Washington Post.
12. FHWA. 1999. Injuries to Pedestrians and Bicyclists: An Analysis Based on Hospital Emergency Department Data. Accessed from: http://www.fhwa.dot.gov/publications/research/safety/pedbike/99078/chapter1.cfm

Appendix A: Facility Best Practices

Bicycle Accommodation Best Practices: Bicycle Lane

Fort Collins, CO

Source: bicyclesafetyinstitute.org

Chicago, IL

Source: nacto.org

Description

Bike lanes designate a portion of a roadway for preferential or exclusive use by bicyclists. They are distinguished from the portion of the roadway for motor vehicle traffic by a paint stripe and pavement markings, curb, or other devices. Bike lanes can also be colored to draw roadway user's attention to the presence of cyclists.

Bike lane width is ideally, 7 feet and can vary from 4 feet to 7 feet, depending on curb feature and parking options on the roadway. A 5 foot bike lane is standard, but not always comfortable for use.

Benefits

- Provides a dedicated space for bicyclists
- Enables bicyclists to ride at their preferred speed without the pressure of vehicular traffic, which would otherwise change lanes
- Facilitates predictable behavior and movements between bicyclists and motorists
- Visually reminds motorists of bicyclists' right to the street
- Most important in the uphill direction, when cyclists would be riding significantly slower than traffic

Resources

MUTCD

AASHTO – included in Guide for the Development of Bicycle Facilities, 4th Edition

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- Not all users may be comfortable in a bike lane, because a 5 foot lane may not provide comfortable separation from vehicles
- Lanes located next to on-street parking create risk of car dooring conflicts
- Greater enforcement required to prevent motorists from parking in the bike lane
- Travel or parking lanes may require modification or elimination to provide space for a bike lane

Other Considerations

When planning a bike lane, other considerations may include the placement of "bike route" signs, left side bike lanes, colored pavement markings, bike boxes, intersection treatments, passing lanes and in dense urban areas, contra flow lanes.

Left turning vehicles, at driveways and intersections, have the potential to turn into bicyclists.

At intersections and driveways, bicyclists in bike lanes can be in conflict with right turning vehicles. To mitigate this, if there is a right turn lane, the bike lane should be on the left side of the right turn lane. A bike box may be used at a signalized intersection to help increase the visibility of cyclists.

Narrow bike lanes can feel uncomfortable, expose cyclists to hazardous drafting conditions if a large vehicle such as a truck or bus drive by and can expose cyclists to a sideswipe incident.

Bicycle Accommodation Best Practices: Buffered Bicycle Lane

Seattle, WA

Source: Seattle DOT

Dallas, TX

Source: dallasnews.com

Description

Buffered lanes are conventional bike lanes with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane.

Minimum dimensions should be the same as a conventional bike lane (5 to 7 feet) with an additional 2 to 3 feet painted buffer.

Benefits

- Increased separation of motorists and cyclists, which should be considered on high speed facilities
- Informally provides space for faster bicyclists to pass without encroaching into the vehicle travel lane
- Allows bicyclists to ride outside of the dooring zone when buffer is between parked cars and bike lane
- Appeals to a wider cross-section of bicycle users, due to greater comfort and safety

Resources

MUTCD – section 3D-01

AASHTO – included in Guide for the Development of Bicycle Facilities, 4th Edition

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- More right-of-way is needed
- Debris may accumulate more in a standard bike lane requiring additional maintenance

Other Considerations

When planning a buffered bike lane, other considerations may include “bike lane” signs, colored pavement markings, intersections treatments, uphill placement (see bike lanes) and lane and buffer width.

Bicycle Accommodation Best Practices: Green Colored Pavement

Newark, NJ

Source:Newark Department of Transportation

Description

Colored pavement can be utilized as a corridor treatment along the length of a bike lane or cycle track, or as a spot treatment, such as a bike box, conflict area, or intersection crossing marking. In areas of transition or potential conflict between motor vehicles and bicycles, skip-striping/coloring is used.

Benefits

- Increases the visibility of the bikeway
- Clarifies expectation of bicyclists and vehicles for all users
- Reinforces priority to bicyclists in conflict areas
- Increases motorist yielding behavior

Best used to alert drivers to the presence of cyclists in the following situations:

- The cyclist travels straight ahead and the motorist crosses the path of the cyclist to exit a roadway, such as at an off-ramp situation
- The cyclist travels straight and the motorist crosses over the cyclist path to enter a right turn lane. Bike lane should be on left side of a right turn lane
- The cyclist travels straight and the motorist crosses the bicycle lane to merge onto a street from a ramp

Resources

MUTCD – Section 1A.10

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- Colored pavement may require additional maintenance

Other Considerations

Some considerations include type of paint used for marking and using solid or stripped marking for conflict points. Although other colors may be considered for pavement coloring, green has become the model in the U.S. for bike lanes, bike boxes and potential bicycle conflict areas.

Bicycle Accommodation Best Practices: Cycle Track

Seattle, WA

Source: downtownseattle.com

Washington, DC

Source: City of Minneapolis

Description

An exclusive bicycle facility that has elements of a separated path and on-road bike lane. A cycle track, while still within the roadway, is physically separated from motor traffic with bollards, car parking or other physical barrier and is distinct from the sidewalk.

Desired minimum width for a one-way cycle track facility is 5-7 feet. Raised cycle tracks should be at least 6.5 feet and a two way cycle track should be 12 feet or wider depending on its location.

Benefits

- Dedicates space and protects bicyclists
- Eliminates risk and fear of collisions with vehicles
- Prevents double-parking
- Attractive for bicyclists of all levels and ages
- Limited maintenance costs due to limited vehicle wear
- Ideal for areas with few intersections or driveways or where driveways can be consolidated

Resources

FHWA – Separated Bike Lane Planning and Design Guide, 2015

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- Street sweeping may require special equipment
- Require considerations at crossings of driveways and minor intersections

Other Considerations

A cycle track can feature different protection strategies like tubular markings, movable planters, parking and raised curbs. Cycle tracks can be a one- or two-direction lane(s) and may be raised above street level. When planning these facilities, you may also consider colored payment, width of painted buffer, street treatments, along with accommodations for driveways and on-street parking.

Bicycle Accommodation Best Practices: Bike Boxes

Portland, OR

Source: streetsblog.org

Description

A bike box is a designated area at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

Bike boxes are typically 10 to 16 feet wide (the width of a travel lane) and are generally painted green. They may include a white bicycle symbol placed within the box.

Benefits

- Increases visibility and safety of cyclists by allowing them to position themselves in front of vehicles
- Reduces right-turn conflicts between bicyclists and motorists at intersections; at a red light, cyclists may move to stay ahead of vehicles providing greater visibility of the cyclist
- Facilitates the transition from a right-side bike lane to a left-side bike lane during red signal indication. This only applies to bike boxes that extend across the entire intersection
- Pedestrians benefit from reduced vehicle encroachment into the crosswalk

Resources

MUTCD – Section 1A.10

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- Right turns on red may be prohibited which may not be compatible at intersections with high volume of right-turning vehicles
- Cyclists and motorists unfamiliar with bike boxes may find them confusing, education may be needed

Other Considerations

Bike boxes require strict MUTCD requirements for placement, color markings and symbols. Bike boxes may be combined with a green colored pavement background.

Bicycle Accommodation Best Practices: Shared Lane Markings/Sharrows

Austin, TX

https://austintexas.gov/department/transportation/faq

Description

Shared lane markings or "sharrows" are road markings used to indicate a shared lane environment for bicycles and automobiles. They are not a facility type but are used to support a complete bicycle network. Shared lane markings are most appropriate for lower volume, lower speed streets.

A minimum of 11 feet from the edge of the curb should be planned for sharrow markings where on-street parking is present.

Benefits

- Reinforces the legitimacy of bicycle traffic on the street
- Assists bicyclists with lateral positioning away from the door zone & other hazards
- May be configured to offer directional and wayfinding guidance
- Requires no additional street space
- Reduces the incidence of sidewalk riding and wrong-way riding

Resources

MUTCD – Section 9C.07 and 9B-2

AASHTO – Guide for the Development of Bicycle Facilities, 4th Edition, Section 4.4

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- Does not dedicate exclusive use for bicyclists

Other Considerations

Shared lane markings or sharrows have been evolving in their use, design and popularity. Perceptions on what the marking actually means vary greatly and education is needed for drivers and cyclists.

Bicycle Accommodation Best Practices: Bicycle Boulevard

	Description	Benefits
Columbus, OH	Bicycle boulevards are designed using a number of treatments, such as speed management to reduce traffic speeds, volume management to reduce traffic volumes, re-orientation of stop-signs to allow for continuous bicycle travel with traffic calming, wayfinding signage and street crossing treatments to reduce bicycle delay. A bicycle boulevard is best when considered for destination on a local street that offers a continuous and direct route having low-traffic volume.	■ Bicyclists can be routed along low-traffic streets that are parallel to arterials with route destinations ■ Provides a low-stress, direct route ■ May be configured to offer directional and wayfinding guidance ■ May not require additional street space ■ If on local, residential streets, traffic calming is valued by adjacent residents ■ Can be branded as part of a bikeway network. Names throughout North America include: neighborhood greenways, bicycle priority streets, family-friendly bikeways and neighborhood parkways
	Resources	**Tradeoffs**
	MUTCD – Referenced, but not considered a traffic control device AASHTO – Guide for the Development of Bicycle Facilities, 4th Edition, Section 4.10 NACTO – Urban Bikeway Design Guide, 2nd Edition	■ Traffic calming measures can divert vehicular traffic to other roadways ■ There may be opposition from business owners where vehicular access is restricted.

Bicycle Accommodation Best Practices: Shared Use Path

Houston, TX

Source: James Nielsen, Chronicle

Description

A walkway/bikeway physically separated from motorized vehicular traffic by an open space or barrier. Shared-use paths may be used by pedestrians, skaters, joggers, or other non-motorized users.

Shared use paths are an additional and complimentary transportation option that supports the roadway network.

Benefits

- Completely separated from motor vehicle traffic
- May be used for recreational purposes
- Limited intersections and as a result, safer for bicyclists/ pedestrians than paths located adjacent to roadways or on-street bike lanes.
- Appeal to users of all ages and abilities

Resources

AASHTO – included in Guide for the Development of Bicycle Facilities, 4th Edition

TMUTCD

Tradeoffs

- May not be the most direct transportation route
- Attract a variety of user groups including commuters and recreational riders

Other Considerations

Shared-use paths include are often located along abandoned railroad rights-of-way, greenways along waterways and utility rights-of-way. Things to consider when planning a shared use path include lighting, vertical and horizontal alignment of the path, pavement markings and vertical obstructions.

Bicycle Accommodation Best Practices: Median Refuge Islands/Mid-Block Crossings

Asheville, NC

Source: WALC Institute via aarp.org

Description

Median refuge islands are protected spaces placed in the center of the street to facilitate bicycle and pedestrian crossings, including mid-block crossings. Refuge areas allow bicyclists and pedestrians to navigate one direction of traffic at a time on a two-way street.

Benefits

- Calms traffic and provides space for safer bicycle and pedestrian crossing
- Allows bicyclists and pedestrian to cross while focusing on one direction of traffic at a time
- On two-way streets allows bicyclists to take advantage of gaps in one direction of traffic at a time

Resources

AASHTO – Guide for the Development of Bicycle Facilities, 4th Edition

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- May restrict left-turn movements of automobiles
- Requires right-of-way that may result in loss of parking or a travel lane

Other Considerations

When planning a refuge island, some considerations include reflective markings, width of island, installation of diverters for vehicles, landscaping, lighting and placement of bike signals for crossing.

Bicycle Accommodation Best Practices: Grade Separated Over and Under-Crossings

Utah County, UDOT

Source: www.bowencollins.com

Description

A grade-separated crossing eliminates a barrier and provides continuity for a bicycle/pedestrian facility. For high-volume roads and/or roads with fast-moving traffic, a grade-separated crossing is recommended.

Under-crossings should be a minimum of 14 feet wide and 10 feet high to allow for access of all users and maintenance vehicles when necessary.

Benefits

- A safer way to cross rivers, streets and railroads
- Reduced delay for all transportation users
- Physical barriers are eliminated
- Provides continuity of the bicycle or pedestrian facility
- Often require less ramping and elevation change
- These crossings can also provide crossings for wildlife

Resources

MUTCD – can be implemented at present time

AASHTO's Guide for the Development of Bicycle Facilities, 4th Edition

AASHTO Guide Specifications for the Design of Pedestrian Bridges, 2nd Edition, 2015 Interim Revisions

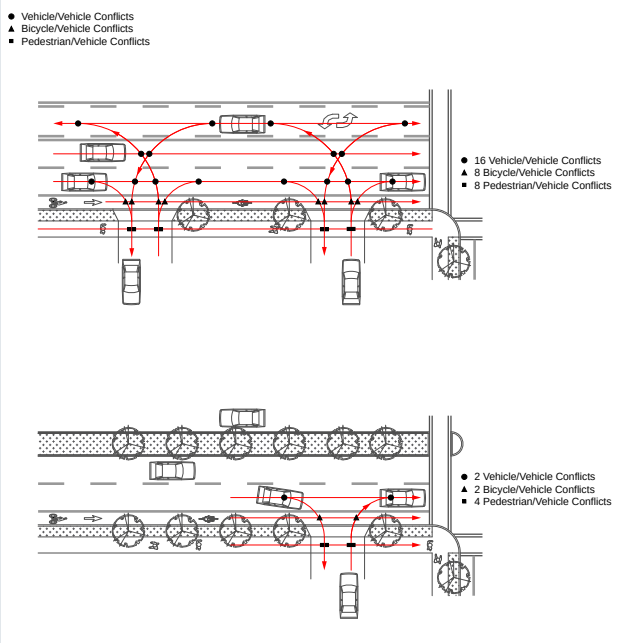
Tradeoffs

- Due to reduced visibility, users may feel vulnerable.
- If the crossing is not convenient or does not serve a direct connection, it may not be well utilized
- Relatively high construction cost

Other Considerations

Considerations for grade separated crossings include street access, visibility, placement of lights, pavement markings, grade requirements by state or region, fencing and height and width of underpass or overpass.

Bicycle Accommodation Best Practices: Access Management



Description

Most pedestrian/motor vehicle collisions occur on busy streets at points of intersecting movements, such as roadway intersections and driveways. Where unlimited vehicle access exists, the level of conflict increases for pedestrian/bicycle crashes with motorized vehicles.

Pedestrians crossing the roadway need gaps in the traffic stream, but with unlimited access, vehicles entering the roadway quickly fill the available gaps.

Limiting driveways reduces conflict points among pedestrians, bicyclists and motorists, increasing safety and comfort for all.

Techniques:

- Reducing driveways or consolidating driveways to parking areas and businesses.
- Providing raised or landscaped medians or concrete barriers to control turning movements from the street, creating right-in, right-out driveways.

Benefits

- Decreasing conflict points will Increase safety and comfort for pedestrians, bicyclists and motorists. Center medians and/or concrete barriers may be used to reduce the number of conflicts between left-turning vehicles and bicyclists and pedestrians.
- Improved traffic flow may reduce the need for roadway widening, allowing more space within the right-of-way for use by pedestrians, bicyclists and enhancements and maintaining fewer travel lanes to cross at intersections
- Limiting driveways creates gaps in traffic allowing pedestrians and bicyclists to cross more easily. Pedestrians crossing the roadway need gaps in the traffic stream, but with unlimited access, vehicles entering the roadway quickly fill the available gaps.
- Pedestrian access to transit may also be complicated by excessive driveway access points. Limiting the frequency of driveways improves pedestrian access to transit
- Accommodating people with disabilities becomes easier when the number of driveways are reduced

Resources

AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities

TxDOT Design Manual

Tradeoffs

Parcel owners want unlimited driveway access

Other Considerations

Frontage and backage roads are a way to provide local access, while keeping accesses off of higher order streets.

Bicycle Accommodation Best Practices: Bicycle Parking (Bicycle Lockers and Bicycle Racks)

Austin, TX

Source: University of Texas

Milwaukee, WI

Source:Urbanmilwaukee.com

Description

Bike parking is critical to bicycling use and can be provided on and off-street. Bike parking can accommodate both long-term and short-term parking. Short-term parking is meant to accommodate visitors or customers who will depart within two hours. Long-term parking is meant to accommodate employees, students, residents or commuters who will be parked for more than two hours.

Benefits

Short-term parking - Bike Racks

- Low cost and fast implementation
- Requires little maintenance
- Visible and close to building entrances

Long-term parking - Bike Lockers

- Highly secure, with low risk of vandalism or theft
- Offers protection from the elements and weather related damage and corrosion
- Reserved spaces allow for consistent availability for daily cyclist commuters

Resources

AASHTO – Guide for the Development of Bicycle Facilities, 4th Edition

Association of Pedestrian and Bicycling Professionals - Essentials of Bike Parking

Tradeoffs

Short-term parking - Bike Racks

- Bicycle is not completely secure and parts can be removed by vandals
- Cannot be reserved and may not be consistently available for daily commuting
- Bicycle is typically exposed to the elements and possible weather damage such as rust

Long-term parking - Bike Lockers

- High construction and maintenance costs

Other Considerations

Off-street bicycle parking is implemented through land use and development code.

Different users prefer different types of parking. For example, a casual rider may prefer on-street facilities that are easily accessible while a commuter with an expensive bicycle may prefer a bicycle box or something that is secure.

Bicycle Accommodation Best Practices: Bicycle Activated Signals

City of Alexandria

Source: alexandriava.gov

Description

An electric powered signal used with existing conventional traffic signals to indicate bicycle signal phases and other bicycle-specific timing strategies.

Interval clearance calculations should be performed, but in absence of local data, intervals can be set at 9.5 miles per hour (14 feet per second).

Benefits

- Prioritizes bicycle movements at intersections, especially at critical conflict points
- Allows bicycle to make safe movements through an intersections, without conflicting automobile turns

Resources

AASHTO – Guide for the Development of Bicycle Facilities, 4th Edition

Tradeoffs

- Can create longer intersection phasing and introduce delay.

Other Considerations

Bicycle signal considerations include interval length (dependent on bicycle speeds), number of signal heads at far-side and near-side placements.

Bicycle Accommodation Best Practices: Bicycle Detectors

Seattle, WA

Source: westseattlebikeconnections.org

Description

Detectors placed to alert signal controllers that a bicycle crossing is needed. Detectors can be placed in the ground, as push-buttons, with cameras, or using radar.

Benefits

- Discourages red light running by bicyclists
- Reduces delays for bicyclists
- Increases safety

Resources

MUTCD, 9C-7

AASHTO – Guide for the Development of Bicycle Facilities

FHWA – Manual on Uniform Traffic Control Devices

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- Loop detector sensitivity needs to be monitored and adjusted regularly

Other Considerations

Loop detectors have many types and sizes and should be placed where cyclists are intended to travel. Loop detectors can also be placed in conjunction with bush buttons or cameras for better signal prioritization.

Bicycle Accommodation Best Practices: Active Warning Beacon

Lincoln, NE

Source: City of Lincoln, NE

Description

These signals are activated by users and turn on amber flashing lights that function as warning lights and are generally used at mid-block crossings

Benefits

- Low cost alternative to a traffic signal
- Increases driver yielding behavior to pedestrians and cyclists

Resources

MUTCD– 1A-11

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- Requires a pedestrian to actively engage the beacons (push-button) to be operational
- Pedestrians misinterpreting flashing lights and/or not waiting for traffic to stop prior to entering crosswalk

Other Considerations

Rectangular Rapid flash beacons have higher compliance rates of yielding than conventional beacons. Considerations of traffic volume on street must be taken to determine placement of crossing. Other considerations include combining beacons with raised median pedestrian refuge area with stop bar pavement markings.

Bicycle Accommodation Best Practices: Countdown Pedestrian Signals

Source: University of California, Irvine

Description

This facility features a visible countdown clock on pedestrian walk signals. Countdown numbers indicate the seconds remaining to cross a roadway.

Benefits

- Safer crossings for pedestrians, with less risk of collision with a vehicle.
- Helps improve driver's behavior of entering a crosswalk during a yellow signal by letting them know how long they have to cross

Resources

MUTCD- 2009, Chapter 4E.01

Tradeoffs

- Can cause pedestrian to run or take risky measures when numbers are counting down

Bicycle Accommodation Best Practices: Streetscape

Pearl Street, Boulder, CO

Bicycle and Pedestrian Bridge

City of Austin, TX

Description

Creating an active and comfortable streetscape is an important part of making walking and biking desirable in a community. There are both permanent and interim design options for street improvements that can help build an interesting and attractive space for people.

Options for streetscaping include amenities such as benches, parklets with additional seating and wider sidewalks for more pedestrian heavy areas, bike corrals for bicycle friendly streets, public plazas and bioswales for storm-water and traffic calming measures.

Benefits

- Creates an attractive location for people to gather, energizing public spaces
- Encourages people to visit locations, increasing revenue to local business and providing an overall economic development appeal within an area
- Encourages private-public partnerships between business owners and the City to develop public areas
- Lowers traffic speeds and mitigates potentially dangerous locations
- Increased awareness and safety when pedestrian activity is present

Resources

NACTO – Urban Bikeway Design Guide, 2nd Edition

AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities

Tradeoffs

- May require more right-of-way
- Costly to develop and maintain
- Access may need to be restricted depending on use (ex: bicycles may be restricted if heavy pedestrian traffic)
- May impact business access and take up space in front of storefront

Other Considerations

The minimum required clear space for pedestrians, free of obstructions, is 3 feet, as required by ADA.

Bicycle Accommodation Best Practices: Wayfinding Signage

South Bend, IN

Source:bikemichiana.wp.ibsinternet.com

Description

A wayfinding signage system consists of comprehensive signing and/or pavement markings to:

- Designate a system of transportation routes
- Designate a continuous or preferred transportation route
- Provide location specific guidance

Benefits

- A cost-effective yet highly-visible treatment that can improve the walking and bicycling environment
- Identifies the best routes to destinations
- Can help brand a network of bicycle and pedestrian connections

Resources

MUTCD – Chapter 9, section 9B.20

AASHTO Guide for the Development of Bicycle Facilities, 4th Edition, Section 4.11

NACTO – Urban Bikeway Design Guide, 2nd Edition

Tradeoffs

- When used alone, bike route signs convey little meaning. Bike route signs are more effective when used on well-designed bikeways with appropriate pavement markings

Bicycle Accommodation Best Practices: Lighting

Madison, WI

Source: continuingeducation.construction.com

Description

Roadway and right-of-way lighting of the street system can increase safety for all users. Lighting poles and fixtures should be designed to be context sensitive.

Recommendations generally call for a level of lighting between 0.5 and 2.0 foot-candles along pedestrian travel ways.

Benefits

Lighting of the street system, including adjacent sidewalks, walkways and bike lanes, increases security and comfort of pedestrians.

Resources

AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities

Tradeoffs

Pedestrian or ornamental lighting may be more costly over typical street lighting.

Other Considerations

Can be a feature of design.

TxDOT requires illumination on state roadway to be sufficient for roadway and sidewalks (single pole)

Bicycle Accommodation Best Practices: Vegetation and Landscaping

Austin, TX

City of Austin

Description

Landscaping and street trees in planting buffers and along streets can greatly enhance the pedestrian environment and provide shade and shelter.

- Using low height shrubs and upward branching trees will maintain good visibility and sight distance at intersections and driveways.
- Street trees are typically spaced evenly along the street, 25 to 50ft apart

Benefits

- Provides shade and shelter
- Provides a sense of enclosure and a buffer from motorized traffic
- Aesthetically appealing

Resources

AASHTO Guide for the Planning, Design and Operation

of Pedestrian Facilities

Tradeoffs

- If the appropriate landscape materials are not used, vegetation can be an obstruction to visibility
- Cost
- Maintenance

Other Considerations

Consideration and selection of plant material must be based on the availability of irrigation water, minimal maintenance requirements and community input. This may include the use of native species, informal plantings and ornamental or formal landscapes.

Additional design considerations relate to type of landscaping adjacent to pedestrian facilities, including recommendations to select plant materials that will minimize root damage.

Appendix B: Bicycle and Pedestrian Funding Opportunities: US Department of Transportation, Federal Transit and Federal Highway Funds

Bicycle and Pedestrian Funding Opportunities / Federal Transit and Federal Highway Funds

Activity	TIGER	FTA	ATI	CMAQ	HSIP	NHPP NHS	STP	TAP TE	RTP	SRTS until gone	PLAN	402	FLTTP
Access enhancements to public transportation	$	$	$	$			$	$					$
ADA/504 Self Evaluation / Transition Plan	$plan						$	$	$		$		$
Bicycle and/or pedestrian plans	$plan	$					$	$			$		$
Bicycle lanes on road	$	$	$	$	$	$	$	$		$			$
Bicycle parking	$*	$	$	$		$	$	$	$	$			$
Bike racks on transit	$	$	$	$			$	$					$
Bicycle share (capital and equipment; not operations)	$	$	$	$		$	$	$					$
Bicycle storage or service centers	$*	$	$	$			$	$					$
Bridges / overcrossings for bicyclists and/or pedestrians	$	$	$	$*	$	$	$	$	$	$			$
Bus shelters	$	$	$	$			$	$					$
Coordinator positions (State or local)				$ Limit									
Crosswalks (new or retrofit)	1 per State			$	$ as SRTS		$						
Curb cuts and ramps	$	$	$	$*	$	$	$	$	$	$			$
Counting equipment	$	$	$	$*	$	$	$	$	$	$			$
Data collection and monitoring for bicyclists and/or pedestrians	$plan	$	$		$	$	$	$	$	$	$*		$
Helmet promotion (for bicyclists)	$plan	$	$		$	$	$	$	$	$	$*		$
Historic preservation (bicycle and pedestrian and transit facilities)							$	$ as SRTS		$		$	
Landscaping, streetscaping (bicycle and/or pedestrian route; transit access)	$	$	$				$	$					$

KEY: $: Funds may be used for this activity.

$plan = Eligible for TIGER planning funds.

$* = Eligible, but not competitive unless part of a larger project.

Activity	TIGER	FTA	ATI	CMAQ	HSIP	NHPP NHS	STP	TAP TE	RTP	SRTS until gone	PLAN	402	FLTTP
Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project)	$*	$	$				$	$					$
Maps (for bicyclists and/or pedestrians)	$	$	$		$	$	$	$	$	$			$
Paved shoulders for bicyclist and/or pedestrian use		$	$	$			$	$		$	$*		
Police patrols	$			$*	$	$	$	$		$			$
Recreational trails							$ as SRTS	$ as SRTS		$		$	
Safety brochures, books	$*						$	$	$				$
Safety education positions							$ as SRTS	$ as SRTS		$	$*	$	
Separated bicycle lanes*							$ as SRTS	$ as SRTS		$		$	
Shared use paths / transportation trails	$	$	$	$	$	$	$	$		$			$
Sidewalks (new or retrofit)	$	$	$	$*	$	$	$	$	$	$			$
Signs / signals / signal improvements	$	$	$	$	$	$	$	$	$	$			$
Signed bicycle or pedestrian routes	$	$	$	$	$	$	$	$		$			$
Spot improvement programs	$	$	$	$		$	$	$		$			$
Storm-water impacts related to pedestrian and bicycle projects	$	$			$		$	$	$	$			$
Traffic calming	$	$	$		$	$	$	$	$	$			$
Trail bridges	$	$			$	$	$	$		$			$
Trail/highway intersections	$			$*	$	$	$	$	$	$			$
Training	$			$*	$	$	$	$	$	$			$
Tunnels / under-crossings for bicyclists and/or pedestrians				$			$	$	$	$	$*	$	

KEY: $: Funds may be used for this activity.

$plan = Eligible for TIGER planning funds.

$* = Eligible, but not competitive unless part of a larger project.

Activity	TIGER	FTA	ATI	CMAQ	HSIP	NHPP NHS	STP	TAP TE	RTP	SRTS until gone	PLAN	402	FLTTP
Signed bicycle or pedestrian routes	$	$	$	$*	$	$	$	$	$	$			$
Spot improvement programs	$	$			$		$	$	$	$			$
Storm-water impacts related to pedestrian and bicycle projects	$	$	$		$	$	$	$	$	$			$
Traffic calming	$	$			$	$	$	$		$			$
Trail bridges	$			$*	$	$	$	$	$	$			$
Trail/highway intersections	$			$*	$	$	$	$	$	$			$
Training				$			$	$	$	$	$*	$	
Tunnels/under-crossings for bicyclists and/or pedestrians	$	$	$	$*	$	$	$	$	$	$			$

KEY: $: Funds may be used for this activity.

$plan = Eligible for TIGER planning funds.

$* = Eligible, but not competitive unless part of a larger project.

ADA/504: Americans with Disabilities Act of 1990 / Section 504 of the Rehabilitation Act of 1973

TIGER: Transportation Investment Generating Economic Recovery Discretionary Grant program

FTA: Federal Transit Administration Capital Funds

ATI: Associated Transit Improvement (1% set-aside of FTA)

CMAQ: Congestion Mitigation and Air Quality Improvement Program

HSIP: Highway Safety Improvement Program

NHPP/NHS: National Highway Performance Program/National Highway System

STP: Surface Transportation Program

TAP/TE: Transportation Alternatives Program / Transportation Enhancement Activities

RTP: Recreational Trails Program

SRTS: Safe Routes to School Program

PLAN: Statewide or Metropolitan Planning

402: State and Community Highway Safety Grant Program

FLTTP: Federal Lands and Tribal Transportation Programs (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program)

* TIGER: Subject to annual appropriations.

* CMAQ: See the CMAQ guidance at www.fhwa.dot.gov/environment/air_quality/cmaq/ for a list of projects that may be eligible for CMAQ funds. Several activities may be eligible for CMAQ funds as part of a bicycle and pedestrian-related project, but not as a highway project. CMAQ funds may be used for shared use paths, but may not be used for trails that are primarily for recreational use.

* STP and TAP: Activities marked “as SRTS” means the activity is eligible only as an SRTS project benefiting schools for kindergarten through 8th grade.

* Planning funds must be for planning purposes: Maps: System maps and GIS; Safety brochures, books: As transportation safety planning; Training: bicycle and pedestrian system planning training.

* Separated Bicycle Lanes also may be known as “protected bike lanes” or “cycle tracks”. [Line inserted September 26, 2014]

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm

Appendix C: Memo: Guidelines Emphasizing Bicycle and Pedestrian Accommodations

MEMORANDUM

Texas Department of Transportation

TO: District Engineers **DATE:** March 23, 2011

FROM: John A. Barton, P.E. John A. Barton, P.E.

SUBJECT: Guidelines Emphasizing Bicycle and Pedestrian Accommodations

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A recent federal policy statement on Bicycle and Pedestrian Accommodations Regulations and Recommendations by USDOT signed on March 11, 2010, emphasizes an increased commitment to, and investment in, bicycle facilities and walking networks to help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities. This USDOT policy encourages the incorporation of safe and convenient walking and bicycling facilities into transportation projects.

With this stronger emphasis for multimodal transportation facilities, TxDOT is committed to proactively plan, design and construct facilities to safely accommodate bicyclists and pedestrians. It is critical that bicycle and pedestrian accommodations be considered and discussed as the need and purpose of a project is defined during the National Environmental Policy Act (NEPA) process, taking into consideration existing and anticipated bicycle and pedestrian facility systems and needs. In the NEPA document, the managing office should include a discussion in the project description of proposed bicycle and pedestrian facilities and linkages to transit stops and corridors. If no bicycle or pedestrian facilities are planned, the managing office shall state why no such facilities are planned. Plans, specifications, and estimates (PS&Es) shall also ensure that proposed designs include these accommodations, if applicable, and are constructed according to Texas Accessibility Standards and Americans with Disabilities Act Accessibility Guidelines (TAS/ADAAG), AASHTO Guide for the Development of Bicycle Facilities (AASHTO Bike Guide) and TxDOT's Roadway Design Manual (RDM).

The inclusion of bicycle and pedestrian facilities shall be considered when the project is scoped. Public input, when applicable, as well as local city and metropolitan planning organization bicycle and pedestrian plans shall be considered.

For all urbanized settings, regardless of the type of improvement, the following guidance is provided:

1. For construction projects within existing right-of-way and when the scope of work is limited to within the roadway typical section, the project plans should:
   - remove barriers to accommodate pedestrians according to TAS/ADAAG and TxDOT's Pedestrian Facilities (PED) standard sheets, and;
   - accommodate for bicyclists by restriping the existing roadway typical section to provide a 14-foot wide curb lane for shared use when practical.

2. For construction projects within existing right-of-way, but when the scope of work involves pavement widening, the project plans should:
   - accommodate bicyclists by widening the pavement to either provide a 14-foot wide curb lane for shared use or a 5-foot wide bicycle lane;
   - include necessary work to ensure all existing ADA curb ramps comply with current standards; and
   - reconstruct or add sidewalks and crosswalks to ensure a continuous ADA compliant pedestrian route.

3. For full reconstruction or new construction projects, where new right-of-way is acquired, the project plans should provide the desired roadway, bicycle and sidewalk geometric values shown in the RDM, AASHTO Bike Guide and TAS/ADAAG for each facility type.

4. On new construction projects, and where practical on reconstruction projects, which construct a raised median, a 6 foot median width should be provided for pedestrian refuge in accordance with the Public Rights-of-Way Accessibility Guidelines (PROWAG).

The usable lane width for shared use in a wide curb lane is 14 feet and is measured from the edge stripe to the lane stripe or from the longitudinal joint of the gutter pan to lane stripe (the gutter pan should not be included as usable width). The curb offset is not included as part of the usable lane width for a shared use in a wide curb lane. When restriping or widening existing pavement to achieve a wide curb lane for shared use, the appropriate lane widths for the remaining lanes and curb offsets as defined in RDM should be maintained. The dimensions shown above for a wide curb lane or a bicycle lane are minimum values. Where traffic volumes or speeds are high, wider lanes for bicycles may be needed.

For projects in a rural setting, the following guidance is provided:

For off-system roadways greater than 400 ADT and all on-system roadways, where bridges are being replaced or bridge decks are being replaced or rehabilitated, a 5-foot shoulder (4' shoulder and 1' barrier offset) shall be provided on the structure and along the adjacent barrier.

These guidelines apply to all projects which are currently in the planning and design stages and projects whose environmental documents are approved after August 31, 2011. For projects whose environmental documents are approved on or prior to August 31, 2011, the use of these guidelines is at the option of the district.

Questions related to the use of bicycle and pedestrian accommodations may be directed to Maria Burke, Design Division at (512) 416-2703 or Tom Beeman, Design Division at (512) 416-2673. Future manual(s) updates will reflect this bicycle and pedestrian accommodation guidance as appropriate.

cc: Amadeo Saenz, Jr., P.E., ADM
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Appendix D: Briefing Materials from TxDOT Bicycle Advisory Committee Strategic Direction Report Workshop

Briefing Materials for TxDOT Bicycle Advisory Committee Strategic Direction Report Workshop

May 1, 2015 Workshop

The information on the following pages is suggested reading prior to the May 1, 2015 Bicycle Advisory Committee (BAC) meeting. This will help facilitate an informed discussion at the meeting. The briefing pages are not comprehensive in nature; they begin to discuss what TxDOT is currently doing and what could be improved upon to address TxDOT's Strategic Plan goals through its bicycle and pedestrian program.

Purpose of the Workshop

The workshop with the BAC will provide an overview of the Bicycle and Pedestrian Strategic Direction Report's purpose and give BAC members the opportunity to provide feedback on programs, policies, laws and events that could be implemented in support of bicycling and walking in Texas.

Workshop Overview

The workshop will be facilitated by consultant staff. Sixty minutes have been allotted to the workshop. The workshop will begin with a ten minute PowerPoint presentation providing an overview of the Strategic Direction Report's purpose and introducing the facilitated exercise to follow.

The facilitated exercise will use flip charts with "Strategic Issue Areas" listed on the top. These issue areas are identical to TxDOT's 2015 – 2019 Strategic Plan goals:

- Maintain a safe system
- Address congestion
- Connect Texas communities
- Become a best in class state agency

BAC members will be asked for ideas on how TxDOT can support these goals with strategies specifically for bicyclists and pedestrians. Staff will write these ideas under the corresponding flip charts. Staff will continue to capture ideas until all ideas are listed or there is only twenty minutes left for the workshop. At that time, staff will distribute ten "dots" to each BAC member; members will be asked to place one dot next to the areas/ideas they identify as areas that should be of most significance for TxDOT.

After the placement of dots, the BAC will be invited to take a five minute break, during that time staff will count up the ideas that received the most dots. That information will be presented on the projector and BAC members will be invited to provide any additional discussion.

Next Steps

The information obtained from the May BAC Workshop will be used in the development of TxDOT's Bicycle and Pedestrian Strategic Direction Report. A draft of the Report will be sent via email to the BAC members for review prior to the August 2015 BAC meeting.

On the following pages you will find a discussion of what TxDOT is currently doing to support bicycling and walking in Texas or could improve upon. This information is organized under each of the 2015-2019 TxDOT Strategic Plan goals.

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TxDOT Strategic Plan Goal: Maintain a Safe System

What it means to TxDOT.

TxDOT lists the following objectives to meet their safety goals.

- Reduce crashes and fatalities on the system through innovations, technology and public awareness.
- Maintain and preserve the transportation assets of the state of Texas.

What can TxDOT do to maintain a safe bicycle and pedestrian system?

TxDOT has a number of programs and policies in place that support a safe non-motorized transportation system. Some of those programs and policies are noted below along with potential areas of improvement.

Engineering

On March 23, 2011, John Barton delivered a memorandum to TxDOT district engineers entitled *Guidelines Emphasizing Bicycle and Pedestrian Accommodations* for planners and engineers "...to proactively plan, design and construct facilities to safely accommodate bicyclists and pedestrians." It is critical that bicycle and pedestrian accommodations be considered and discussed as the need and purpose of a project is defined during the National Environmental Policy Act (NEPA) process, taking into consideration existing and anticipated bicycle and pedestrian facility systems and needs." Requirements for the provision of facilities were made for both urban and rural settings. These requirements make positive strides toward the provision of facilities; however, additional engineering guidelines could be developed to support safe bicycle and pedestrian facilities. Amendments to the Texas MUTCD and TxDOT's design standards may be needed to better support safe non-motorized infrastructure.

Education

Drive FRIENDLY. Drive SAFE.

Through the *Drive Friendly. Drive Safe. campaign*, TxDOT has customized its "share the road" campaign to educate roadway users to share the road responsibly with pedestrians and bicyclists, exercise caution in work zones and drive at speeds appropriate to road conditions.

TxDOT provides funding for bicycle safety education programs through BikeTexas and Please Be Kind to Cyclists. Additionally, TxDOT is in the process of producing the *Texas Guide to Safe Bicycling*. Additional safety education programs may be recommended to target law enforcement training, driver education and/or support for Safe Routes to School programs.

Encouragement

TxDOT's first call for projects under the Transportation Alternatives Program (TAP) closes on May 4, 2015. This program will fund non-motorized infrastructure projects in population areas of less than 200,000 throughout the state. Eligible TAP entities are encouraged to develop projects that support walking and bicycling. Non-motorized safety projects may be eligible for funding through TxDOT's Highway Safety Improvement Program (HISP). However, a specific HSIP funding category for bicycle or pedestrian projects does not currently exist. Additional funds could be allocated to bicycle and pedestrian projects and programs throughout the state. TxDOT may consider highlighting outstanding non-motorized projects throughout the state through its bicycle program, to encourage local entities to provide and improve non-motorized accommodations.

Evaluation and Planning

TxDOT has management systems in place that track crashes throughout the state. Those management systems include bicycle and pedestrian crashes. While the data is continuously evaluated more can be done to identify where safety "hot spots" exist and design effective bicycle and pedestrian programs to reduce accidents. Unfortunately many bicycle crashes are not reported.

Maintaining bicycle and pedestrian infrastructure is an important safety consideration. When maintenance is not done regularly, facilities can become unsafe for the traveling public. Through the development of a comprehensive database of bicycle and pedestrian accommodations on state owned right-of-way. TxDOT would then be able to monitor asset conditions and prioritize investments to build and maintain a safer network of walking and bicycling accommodations.

In some cases, facilities that can physically accommodate bicyclists and pedestrians may be unsafe or uncomfortable for walking or biking. An example of this is a roadway shoulder along a high-speed highway. Texas agencies might consider collaborating to develop a bicycle or pedestrian "suitability index" to evaluate how appropriate a facility is for bicycles or pedestrians. In addition, TxDOT might consider developing and maintaining data on ADA facilities to identify gaps and guide future planning and programming decisions.

Enforcement

Texas has a number of laws in place in support of non-motorized transportation; these laws support bicyclists by giving them the same rights as a motorist and provide them with access to most roadways. However, through additional legislation, Texas could be safer for bicyclists and pedestrians, new legislation could address vulnerable road users, distracted driving, safe passing distance and helmet use. Laws that are aimed at making it safer to bike or walk must also be enforced. Additional training may be needed for law enforcement across the state.

What are Others Doing to Improve Safety?

Training for Engineers and Planners
The Washington DOT offers training to local agencies through the Local Technical Assistance Program. This program offers a variety of courses which have included courses specifically designed to educate engineers and planners on designing safe bicycle and pedestrian infrastructure.

Bicycle Safety Education Programs
The North Carolina DOT has a safety education program for bicyclists. Materials are organized by the targeted age level for which they are most appropriate. Within each age level, you can find an assortment of pamphlets, handouts, tests, curriculum, information sheets, posters, videos and other miscellaneous items.

Many cities and a couple of states have adopted **Vision Zero** programs, these programs are aimed at reducing injuries and fatalities on all roads.

Allocating State Funding to Non-motorized Projects
Many states allocate state funding toward bicycle and pedestrian projects. For example, Minnesota has decided to fund a Safe Routes to School Program even after the federal program expired under MAP-21. Maryland DOT has established a Bikeways grant program to fund bicycle infrastructure across the state.

Locating "Areas of Concern"
Hawaii DOT's Statewide Pedestrian Plan was an outgrowth of its Strategic Highway Safety Plan, which had identified the relatively high rate of pedestrian fatalities on the Hawaii road network. Hawaii prioritized projects in the plan by first looking at locations with identified safety deficiencies (in addition to other criteria such as the location and intensity of pedestrian attractors, and vulnerable populations). By structuring its plan this way, Hawaii focused on its most important goal, which was to improve pedestrian safety statewide.

Vulnerable Road User Laws: In most cases, when a pedestrian or bicyclist is seriously injured or killed by a motorist it is considered "an accident" and motorists might expect a minor fine, at most, and receive no criminal penalties. Vulnerable road user laws are enacted to penalize reckless drivers that injure or kill vulnerable road users. At least nine states have adopted Vulnerable Road User Protection Laws, including Nevada, Tennessee, Washington, Oregon, Illinois, Maryland, Delaware, New York and Hawaii. Texas passed one through the legislature in 2009 but it was vetoed by the Governor.

TxDOT Strategic Plan Goal: Address Congestion

What it means to TxDOT.

TxDOT lists the following objectives with this goal.

- Partner with local officials to develop and implement congestion mitigation plans in Texas
- Ensure consideration of all modes of transportation in the development of more reliable solutions for moving people and goods

What can TxDOT do to address congestion?

TxDOT has a number of programs and policies in place that support and promote consideration of non-motorized modes of transportation. Some of those programs and policies are noted below along with potential areas of improvement.

Engineering

Non-motorized improvements are often included in congestion mitigation plans. Additional emphasis could be placed on identifying non-motorized projects in these plans and in all highly congested corridors.

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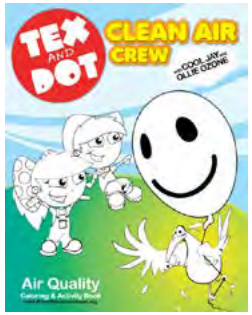
Education

TxDOT currently does not have bicycle or pedestrian education or outreach centered on reducing congestion and increasing non-motorized mode share. Many MPOs throughout the state have travel demand management (TDM) programs that educate individuals and employers on the benefits of transportation options. A statewide educational program to get more people to bike and walk to reduce congestion and improve air quality would also be in alignment with TxDOT's Strategic Plan goals.

Encouragement

Some states and MPOs promote bicycling and walking as a means to reduce congestion. Whether through statewide bike months, bike-to-work days or other initiatives, these programs aim to encourage individuals to bike or walk and reduce congestion. Some states use Congestion Mitigation and Air Quality (CMAQ) funds for these programs in addition to directly funding bicycle and pedestrian infrastructure.



TxDOT and the Texas Commission on Environmental Quality (TCEQ) launched the statewide Drive Clean Texas initiative in 2001, with the goal of raising awareness about the impact of vehicle emissions on air quality and motivating drivers to take steps to help keep the air clean. While there is mention of bicycling or walking to reduce congestion and emissions, it is only ancillary and more emphasis could be placed on the overall use of non-motorized transportation in reducing emissions and congestion.

Evaluation and Planning

Through alternatives analysis in the environmental review phase of project development, planners and engineers must consider bicycle and pedestrian accommodations. Additional emphasis could be placed on the provision of non-motorized infrastructure in the environmental review process.

TxDOT and other transportation agencies have the ability to place additional emphasis on bicycle and pedestrian projects that reduce congestion as part of the scoring criteria used in project selection. Examples might include regionally significant projects, projects that provide facilities to divert peak-hour traffic or projects that provide the "first/last mile" in conjunction with transit, ride share or rail transportation.

Enforcement

There are few laws or policies that are directly related to congestion reduction and non-motorized transportation. Several states have enacted laws that require additional planning for Greenhouse Gas Emissions (GHG) and air quality, although they are not directly linked to non-motorized programs or planning. Several states have enacted Trip Reduction Laws, these laws enact statewide targets for reductions to vehicle miles traveled (VMT) and often require businesses to offer programs and facilities to employees that incentivize alternative transportation.

What are Others Doing to Reduce Congestion?

Engineers and Planning
SB 375 in California links GHG emission reduction targets to regional plans. It requires MPOs to develop sustainable communities strategies to meet congestion and air quality targets.

Education and Encouragement
In Georgia, the Clean Air Campaign, which is funded in part by Congestion Mitigation and Air Quality funds, serves as a statewide non-profit, educating the public on transportation demand management strategies. The Clean Air Campaign offers several programs aimed at reducing congestion through bicycling and walking.

Allocating State Funding to Non-motorized Projects
Many states allocate state funding toward bicycle and pedestrian projects. Wisconsin DOT funds bicycle and pedestrian projects through its statewide Congestion Mitigation and Air Quality Improvement Program. Projects must reduce vehicle trips or miles traveled, reduce emissions or reduce the per mile rate of vehicle emissions.

Trip Reduction Law
Washington State's Commute Trip Reduction Law (CTR) is designed to reduce traffic congestion, pollution and fuel consumption. Employers in major urban areas with more than 100 employees at a worksite are required to develop CTR programs that encourage employees who drive alone to work to consider using an alternative commute mode such as buses, vanpools, carpools, biking, walking, teleworking and flexible work schedules.

Funding for Congestion Relief Projects
A large portion of Montana's statewide Congestion Mitigation and Air Quality and Transportation Enhancement programs have gone to bicycle and pedestrian projects. Montana recognizes that "bicycling and walking can provide alternative means of transportation and have the potential to help to reduce roadway congestion and air pollution in some areas."

TxDOT Strategic Plan Goal: Connect Texas Communities

What it means to TxDOT.

TxDOT lists the following objectives with this goal.

- Support efficient multimodal options that serve the transportation needs of metropolitan, urban, and rural communities and their economies
- Improve freight movement, enhance international trade, and expand access to markets to support the economic competitiveness of Texas

What can TxDOT do to connect Texas communities?

TxDOT has a number of programs and policies in place that promote consideration of non-motorized modes of transportation. Some of those programs and policies are noted below along with potential areas of improvement.

Engineering

As mentioned previously, John Barton's March 23, 2011 memorandum directs district engineers to consider bicycle and pedestrian improvements in the NEPA process, during project scoping and in the development of project plans, specifications and estimates (PS&Es). Additional engineering guidelines may be recommended to develop support for non-motorized modes. Amendments might be considered to the Texas MUTCD and TxDOT's design standards to better support development of non-motorized infrastructure. Additional emphasis could be placed on providing non-motorized accommodations to connect communities, some facilities having regional significant.

Context Sensitive Solutions (CSS) or Complete Streets (CS) guidance or policies could establish requirements for the inclusion of non-motorized infrastructure on or near TxDOT roadways. Although TxDOT does not currently have a stand-alone CSS or CS policy, many states and local governments do. Studies have found strategies such as reducing speed limits and making engineering changes including roundabouts and pedestrian medians can significantly reduce pedestrian and bicyclist crashes with severe injuries and deaths. Additionally, engineering studies have found that American cities with more bicycle- and pedestrian-friendly infrastructure see more bicycling and walking. These activities contribute to a healthier and more social community (i.e. an improved quality of life).

Education

TxDOT currently does not have bicycle or pedestrian education or outreach centered on connecting Texas communities. If TxDOT were to improve upon current programs, they might consider implementing a statewide education program to get more people to use bicycles or walk, this might be most applicable to "first and last-mile" considerations such as providing bicycle and pedestrian facilities near rail and transit stations or park-and-rides.

Statewide bicycle and pedestrian funding opportunities might be prioritized toward projects that promote regional connectivity and coordination between neighboring jurisdictions.

Encouragement

Bicycle and pedestrian infrastructure promote walkable and livable communities. Some states encourage smart growth policies that promote connectivity between communities. There may be intergovernmental coordination requirements for transportation and land use planning that help to encourage communities to work together and provide connected transportation systems. This can be very beneficial for regional trail projects.

Evaluation and Planning

TxDOT has in inventory of roadway infrastructure throughout the state; the creation of an inventory of bicycle infrastructure is being planned by TxDOT. This will help TxDOT identify where planned bikeways exist and where there are gaps that should be addressed to better connect communities.

The state of Texas currently does not have a local assistance grant program for planning. Such a program would provide incentives for localities to produce their own plans, which should include non-motorized transportation elements.

Each TxDOT district office has a bicycle coordinator; this person serves as a resource at the district on bicycle projects and programs. Although the District Bicycle Coordinator should be knowledgeable of local projects and help serve as a regional resource, for most, this job is only one of many hats they wear. Through the development of a database of regionally planned projects, District Bicycle Coordinators could serve as the "go-to" person in each district to ensure proper coordination is occurring between localities, MPOs and the state.

Many Texas cities have designate bicycle routes. Some cater more to recreational users while other routes are more suited for the commuter bicyclist. TxDOT does not have many designated bicycle routes on the state highway system. However, TxDOT, in coordination with localities, could designate bicycle routes throughout the state. These routes may cross jurisdictional boundaries and could bring consistency to future development, maintenance and help users navigate. In addition, design requirements (width, surface type, accessibility and safety considerations) should be developed based upon roadway traffic volumes, posted/actual speed, and vertical/horizontal alignment to accommodate the average cyclist.

Enforcement

TxDOT's ability to enforce laws and policies directed at connecting Texas communities through bicycle and pedestrian infrastructure is limited. However, through incentive programs and policies, TxDOT can help encourage localities and its districts to provide facilities that help connect communities and provide access.

What are Others Doing to Connect Communities?

Complete Streets
30 states have Complete Streets policies in place. These laws, resolutions, agency policies, and planning and design documents establish a process for selecting, funding, planning, designing, and building transportation projects that allow safe access to destinations for everyone, regardless of age, ability, income or ethnicity, and no matter how they travel. West Virginia adopted their Complete Streets Act in 2013. The Act states "All transportation projects receiving federal or state funds should strive to improve safety, access and mobility for users of all ages and abilities, defined to include pedestrians, bicyclists, public transportation vehicles and their passengers, motorists, movers of commercial goods, persons with disabilities, older adults and children." West Virginia created a Complete Streets Advisory Board to make recommendations to the Division of Highways on implementing the policy as well as tracking and reporting on progress in the state.

Livability Index
AARP developed a livability index which measures the quality of life in American communities across multiple dimensions: housing, transportation, neighborhood characteristics, environment, health, opportunity and civic and social engagement. The livability index allows users to compare communities. Walk Score is another tool that ranks the walkability of areas across the country.

Supporting Livable Communities
LiveWell Colorado's community investments strategy funds community coalitions working on healthy eating and active living strategies at the local level. LiveWell Colorado provides technical assistance and opportunities for shared learnings and collaborations. Since 2005, the community investments program has directly benefited more than a million Coloradans by implementing policy and environmental interventions critical to making health eating and active living the accessible and easy choice. Many implemented projects focus no active transportation. For example, in Wheatridge, CO, Livewell funded an evaluation of where gaps existed for bicycle commuters.

TxDOT Strategic Plan Goal Become a Best in Class State Agency

What it means to TxDOT.

TxDOT lists the following objectives with this goal.

- Ensure the agency deploys its resources responsibly and has a customer service mindset
- Focus on work environment, safety, succession planning, and training to develop a great workforce

What can TxDOT do to connect Texas communities?

TxDOT has a number of programs and policies in place that support and promote the consideration of non-motorized modes of transportation. Some of those programs and policies are noted below along with potential areas of improvement.

Engineering

TxDOT is responsible for a vast multi-modal transportation system. There are not enough funds to maintain the current system in good or better condition into the future while also providing for new infrastructure. In order to best meet the needs of a growing state, TxDOT will have to make tough choices about where to spend money. Through performance-based planning, TxDOT can evaluate multi-modal projects against each other and promote the best investment package. This will include bicycle and pedestrian infrastructure. Performance-based planning will help TxDOT deploy its resources responsibly. Currently, TxDOT is in the process of developing a pilot performance-based project evaluation tool that evaluates multi-modal projects across the state.

Linking Performance Based Planning to Project Selection

Source: Texas Transportation Plan 2040

While training opportunities exist for planners and engineers on the provision of non-motorized infrastructure, additional training could help the agency stay current on emerging engineering practices and develop the best non-motorized facilities for users.

Education

TxDOT has educated the public through the most recent Transportation Alternatives Program (TAP) call for projects, many additional funding sources exist for localities looking to fund bicycle and pedestrian infrastructure. If improving conditions for walking and bicycling become a priority for the agency, TxDOT will need to develop materials and tools (website, newsletter, etc.) to educate and inform localities, advocates, and the general public about funding opportunities, programs, emerging trends or exciting projects.

Encouragement

TxDOT has an opportunity to serve as a leader when it comes to encouraging their employees and contractors to bike and walk whenever possible. Developing an employer-based transportation demand management program has numerous benefits for the agency including:

- Improved employee wellness
- Reduced facility costs (less parking required)
- Happier employees
- Smaller environmental footprint
- Cost savings for employees

The agency could assign transportation coordinators at each office and develop a toolkit for those coordinators to help implement an agency-wide program.

Evaluation and Planning

TxDOT has impressive management systems in place that catalog facilities, crashes, forecasted travel demand and programmed projects. Ensuring that these management systems talk to one another will lead to better planning decisions.

TxDOT has the opportunity to become the "go-to" agency for bicycle and pedestrian information in Texas. The agency is in the process of developing a statewide bicycle map and a number of other initiatives to lead the way in promoting safer bicycle and pedestrian transportation.

Best practices need to be established for the provision and maintenance of bicycle and pedestrian infrastructure owned or funded by TxDOT. Additionally, bicycle and pedestrian count data is collected inconsistently and not at regular intervals or locations across the state. A best practice manual could be developed with guidelines for collecting count data; TxDOT or another agency could serve as the repository for that data for the state. Just like motor vehicle counts, counting bicyclists and pedestrians at specific locations helps to more accurately estimate demand, measure the benefits of investments, and design projects. This information will also help TxDOT improve traffic models.

Enforcement

The state of Texas could benefit from enacting a number of laws to support being a safer place to bike and walk. Other states have a number of laws in place that support non-motorized transportation. A number of cities across the state have enacted laws that are leading the way to promote non-motorized transportation.

What are Others Doing to Connect Communities?

Training for Engineers and Planners
The Michigan DOT offers "Training Wheels" courses around the state designed to educate communities interested in providing on-road bicycle facilities.

Serving as a Statewide Resource
The Ohio DOT has developed a statewide listserv to communicate updates and provide technical information with the bicycle and pedestrian community.

Statewide Bicycle Map
Many states maintain statewide bicycle maps. The Missouri DOT maintains statewide and regional bicycle maps that include information on Amtrak stations, bus stations, camping locations and hospitals. These maps can be downloaded from the Missouri DOT website.

Counting on Bicyclists
The Washington State Documentation Project occurs annually in the early fall. Bicycle and pedestrian usage of specific intersections in cities throughout the State are counted and documented, similar to the National Documentation Project.

An Idaho Stop
In Idaho, if a cyclist approaches a stop sign, he or she needs to slow down and look for traffic. If there's already a car or another bike there, then the other vehicle has the right of way. If there's no traffic, however, the cyclist can slowly proceed. Basically, for bikers, a stop sign is a yield sign. If a cyclist approaches a red light, meanwhile, he or she needs to stop fully. Again, if there's any oncoming traffic, it has the right of way. If there's not, the cyclist can proceed cautiously through the intersection. Put simply, red light is a stop sign.