



# **Bicycle/Pedestrian Advisory Committee Meeting**

**November 8, 2016  
9:00 a.m.**

# Agenda



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## Killeen-Temple Metropolitan Planning Organization Bicycle/Pedestrian Advisory Committee (BPAC)

Tuesday, November 8, 2016  
Central Texas Council of Governments Building  
2180 North Main Street, Belton, Texas 76513

Regular Meeting: 9:00 A.M.  
AGENDA

1. Call to Order.
2. Opportunity for Public Comment. (1)
3. Staff Update:
  - a. 2040 MTP Reprioritization;
  - b. Bike Racks;
  - c. Air Quality.
4. **Action Item:** Regarding approval of minutes from September 13, 2016 BPAC meeting.
5. **Discussion and Possible Action Item:** Promotional information for bicyclists and pedestrians.
6. **Discussion and Possible Action Item:** Identify interconnectivity issues between parks.
7. **Discussion and Possible Action Item:** Fitness Friendly Business Program.
8. Member Comments.
9. Adjourn

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(1) The Killeen-Temple Metropolitan Planning Organization is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the KTMO office at 254-770-2200 24 hours in advance if accommodation is needed. (1) Citizens who desire to address the Board on any matter may sign up to do so prior to this meeting. Public comments will be received during this portion of the meeting. Comments are limited to 3 minutes maximum. No discussion or final action will be taken by the Board.

**Item #4:**

**Approval of Meeting Minutes**



**KILLEEN-TEMPLE METROPOLITAN PLANNING ORGANIZATION (KTMPPO)  
BICYCLE/PEDESTRIAN ADVISORY COMMITTEE (BPAC)**

Tuesday September 13, 2016  
9:00 a.m.

Central Texas Council of Governments (CTCOG)  
2180 North Main Street  
Belton, TX 76513

**Voting Members Present**

Chair Kara Escajeda—City of Nolanville	Robert Ator—Hill Country Transit District (HCTD)
Matt Bates—City of Belton	Jimmie McCormick—Team Roadkill
Joe Brown—City of Copperas Cove	Lindsey Anderson—Team RWB
Leo Mantey—City of Harker Heights	Marlene Maciborski—Team Roadkill
Brian Chandler—City of Temple	Peggy McIlvanie—Citizen Representative
Kris Long—Texas Dept. of Transportation (TXDOT) Waco District	

**Others Present**

Katelyn Kasberg—TxDOT Waco District	Jim Martin—KTMPPO
Jeff McIlvanie—Citizen	Cheryl Maxwell—KTMPPO
Jennifer Lawyer—CTCOG	John Weber—KTMPPO

**Meeting Minutes**

- 1. Call to Order:** Chair Kara Escajeda called the meeting to order at 9:07 a.m. and stated that a quorum was present.
- 2. Public Comment:** No comments were made from the public.
- 3. Staff Update:**

--John Weber stated that KTMPPO received 99 projects for the 2040 MTP reprioritization with 86 projects submitted for scoring and 13 to be listed as unscored projects. Out of the 86 projects, 67 are roadway and 19 are bike/ped projects.

--Mr. Weber stated that the fall edition of the KTMPPO newsletter has been published highlighting the City of Temple as the featured city.

--For air quality monitoring, July's ozone readings were 58 parts per billion (ppb) at the Temple station and 57 ppb at the Killeen station. August's readings were 55 ppb at the Temple station and 53 ppb at the Killeen station. The Design Value as of August 31<sup>st</sup>, 2016 is 67 ppb at the Temple station and 66 ppb at the Killeen station.
- 4. Action Item:** Regarding approval of July 12, 2016 meeting minutes.

**Brian Chandler made a motion to approve July 12, 2016 meeting minutes, seconded by Robert Ator; the motion passed unanimously.**

**5. Discussion and Action Items:** Regarding approval of resolution supporting October 2016 as International Walk to School Month and October 5, 2016 as National Walk to School Day.

John Weber discussed the draft resolution supporting October 2016 as International Walk to School Month and October 5, 2016 as National Walk to School Day. This resolution will be presented to the Transportation Planning Policy Board (TPPB). Feedback from the BPAC was requested. KTMPO staff will send the resolution to cities and school districts in the KTMPO region after approval from TPPB.

**Robert Ator made a motion to recommend approval of the resolution supporting October 2016 as International Walk to School Month and October 5, 2016 as National Walk to School Day, seconded by Brian Chandler; the motion passed unanimously.**

**6. Discussion and Action Item:** Regarding approval of prioritized list of objectives/activities.

John Weber provided BPAC members with a list of prioritized objectives/activities based on feedback from the July 12, 2016 BPAC meeting and additional comments since that meeting. The list of priorities is: 1) identify interconnectivity issues, i.e. parks/landscape features/gaps in the bicycle and pedestrian network/transit stops/complete streets, 2) School Safety Initiatives (Safety Town Program, Safe Routes to School), 3) Bike Rack locations, 4) Bike Friendly Business Initiative and 5) Promotional Events.

Mr. Weber provided BPAC with bicycle implementation strategies that are located in the Regional Thoroughfare and Pedestrian/Bicycle Plan and asked BPAC members to review and determine whether any of these should be included in the list of priorities. The floor was opened to discussion.

Kara Escajeda suggested including amenities at bike rack locations such as QR (quick response) tags to highlight the bike network and other bike related features and nodes. The BPAC members concurred.

**Brian Chandler made a motion to approve the prioritized list of objectives/activities with revisions as discussed, seconded by Lindsey Anderson; the motion passed unanimously.**

**7. Discussion and Action Item:** Regarding recommendation for the following:

- a) Preferred Bike Rack locations;
- b) Type/Style of Bike Racks

For bike rack locations, staff asked BPAC members to use the Bike/Ped Web Map to provide preferred locations. The Central Texas Air and Information Research Advisory Committee (CTAIR) is also receiving proposals for bike rack locations from area cities. BPAC members felt that certain criteria should be in place to prioritize locations if they cannot all be funded. The BPAC members went around the table identifying preferred locations, many of which were already submitted to CTAIR by the cities.

**Matt Bates made a motion to recommend to CTAIR the list of preferred bike rack locations provided by the cities and the BPAC members, seconded by Lindsey Anderson; the motion passed unanimously.**

For type/style of bike racks, KTMPO staff felt that the wave-style bike racks that were recommended at the May 10, 2016 meeting was not preferred due to security concerns. KTMPO presented two styles of bike racks, the inverted-U style and the bike docks and asked BPAC members for their input on these two

styles. BPAC members felt that the style of bike racks should be based on location. BPAC members suggested using simpler bike rack styles at schools and use either the inverted-U or the bike docks at public places.

**Kris Long made a motion to recommend the inverted-U style and the bike docks to the CTAIR Advisory Committee, seconded by Marlene Maciborski; the motion passed unanimously.**

**8. Other Comments:**

Peggy McIlvanie stated that the VIP Support Group and Heart of Central Texas Independent Living Center (HOCTIL) has partnered up to conduct the "Come Walk in My Shoes" event on October 8<sup>th</sup>. This event allows people to experience the world as a visually impaired person and is open to the public.

John Weber stated he is coordinating with a speaker to discuss Complete Streets and would provide updates to the BPAC on when that will occur.

Brian Chandler stated if there are any cost-saving alternatives to using wide shoulders as bike/pedestrian facilities to improve connectivity in the network. Staff will look into this as well

**9. Possible Dates and Times for Next Meeting.**

The next meeting will be held on November 8, 2016 at 9:00 a.m.

**10. Adjourn:** The meeting adjourned at 10:16 a.m.

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Kara Escajeda, BPAC Chair

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Cheryl Maxwell, KTMPO Director



**Item #5:**

**Discuss Promotional  
Information**





**Agenda Item No. 5**

**Discuss Promotional Information for Bicyclists and Pedestrians**

To promote bicycle and pedestrian information, KTMPO has compiled a list of resources to identify bicycle and pedestrian information.

KTMPO is asking BPAC for input on the promotional sheet.

**Discussion and Possible Action Item:** Discuss input on promotional information for bicyclists and pedestrians.



*Providing you with information on bicycle and pedestrian resources.*

*Whether it is learning how to organize a bike riding event, gathering information on local trails, or anything in between, this guide will help you find the information you need to succeed.*

## COMPLETE STREETS

Complete Streets are streets that provide equal usage to automobiles, cyclists and pedestrians. Communities that have implemented the Complete Streets concept experience less congestion, have healthier communities and enjoy economic success. The American Planning Association website provides you with more information about Complete Streets.

APA Website: <https://www.planning.org/>



## LANDSCAPE BUFFERS

The **USDA Forest Service** can provide guidelines for landscape buffers, greenways and other environmental bicycle and pedestrian infrastructure. Visit [www.usda.gov/](http://www.usda.gov/) for more details.

## BIKE RACK INFORMATION

Looking to purchase bike racks? Visit these sites for more information.

[www.groundcontrolsystems.com](http://www.groundcontrolsystems.com)

[www.bicycle.org](http://www.bicycle.org)

<http://www.dero.com/>

## BICYCLE AND PEDESTRIAN DESIGN GUIDES

<http://bikeplan.org/>

<http://nacto.org/>

<https://smartgrowthamerica.org/>

<http://www.railstotrails.org/>

## Planning on hosting a bike rodeo?

The National Center for Safe Routes to School website is a great tool to help you organize a successful bike rodeo. For all of your bike rodeo needs, visit [www.saferoutesinfo.org](http://www.saferoutesinfo.org).





## EDUCATION MATERIALS

<http://www.biketexas.org/>

<http://www.pedbikeinfo.org/index.cfm>

<http://saferoutespartnership.org>

<http://nationalsafetytown.com/>

<http://www.peopleforbikes.org/>

<http://www.ibike.org/education/>

## BICYCLE SAFETY

<http://www.nhtsa.gov/>

[http://safety.fhwa.dot.gov/ped\\_bike/](http://safety.fhwa.dot.gov/ped_bike/)

<http://www.txdot.gov>



## NATIONALLY RECOGNIZED BICYCLING AND WALKING EVENTS

For information on Bike to School Day and Walk to School Day, visit <http://www.walkbiketoschool.org/>.

For information on National Bike Month, visit <http://www.bikeleague.org/>.



Are you looking to ride or walk one of our local trails? Use the bike/ped web map to locate bike/ped facilities in our area. This map shows our regional network of bicycle and pedestrian infrastructure.

You can also make recommendations and tell us where bike and pedestrian infrastructure is needed. Your recommendations can then be used to fund projects when dollars become available.

Visit [www.ktmpo.org](http://www.ktmpo.org) for more information.

*Are you looking for bicycle rides in Texas? Visit [www.bicycleridestexas.com](http://www.bicycleridestexas.com) for more information.*

Visit [www.ktmpo.org](http://www.ktmpo.org) for more bicycle and pedestrian information.



**Item #6:**

**Interconnectivity Issues  
between Parks**

### **Identify Interconnectivity Issues between Parks**

The lack of bicycle and pedestrian trails make it difficult for bicyclist and pedestrians to travel throughout the KTMPO region by using non-motorized modes of transportation. Identifying gaps in the network on a regional scale will help spur development of a regional network of trails connecting area cities.

KTMPO is asking BPAC members to identify corridors in the KTMPO planning region that currently lack connections between parks, and if there are any potential projects that could fill in the gaps between regional parks.

Maps of current bicycle and pedestrian infrastructure will be presented at the meeting.

**Discussion and Possible Action Item:** Identify gaps between parks.



## Sidewalks and Walkways

### Description

Sidewalks and walkways are “pedestrian lanes” that provide people with space to travel within the public right-of-way that is separated from roadway vehicles. They provide places for children to walk, run, skate, ride bikes, and play. Sidewalks are associated with significant reductions in pedestrian collisions with motor vehicles. Such facilities also improve mobility for pedestrians and provide access for all types of pedestrian travel: to and from home, work, parks, schools, shopping areas, and transit stops. Walkways should be part of every new and renovated road facility and every effort should be made to retrofit streets that currently do not have sidewalks.



While sidewalks are typically made of concrete, less expensive walkways may be constructed of asphalt, crushed stone, or other materials if they are properly maintained and accessible (firm, stable, and slip-resistant). In more rural areas, in particular, a “side path” made of one of these materials may be suitable. In areas where a separated walkway is not feasible, a wide paved shoulder on a roadway can provide a place for pedestrians to safely walk.

Both the FHWA and the Institute of Transportation Engineers (ITE) recommend a minimum width of five feet for a sidewalk or walkway, which allows two people to pass comfortably or to walk side-by-side. The preferred width for paved shoulders is at least 6 feet. Wider sidewalks should be installed near schools, at transit stops, in downtown areas, or anywhere high concentrations of pedestrians exist. Sidewalks should be continuous along both sides of a street and sidewalks should be fully accessible to all pedestrians, including those in wheelchairs.



A buffer zone of four to six feet is desirable to separate pedestrians from the street. The buffer zone will vary according to the street type. In downtown or commercial districts, a street furniture zone is usually appropriate. Parked cars or bicycle lanes can provide an acceptable buffer zone. In more suburban or rural areas, a landscape strip is generally most suitable. Careful planning of sidewalks and walkways is important in a neighborhood or area in order to provide

adequate safety and mobility. For example, there should be a flat sidewalk provided in areas where driveways slope to the roadway.

### Purpose



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Pedestrians often walk along the roadway in areas where sidewalks or walkways are unavailable. Because there is no buffer between the pedestrian and the vehicular traffic, walking along the roadway can put a pedestrian at risk. It can also be difficult, if not impossible, for pedestrians with visual or mobility restrictions, as the road surface and gravel shoulders are generally not designed for pedestrian use. Sidewalks create the appropriate facility for the walking area of the public right-of-way and dramatically improve pedestrian safety.

**Considerations**

- While continuous walkways are the goal, retrofitting areas without them will usually occur in phases. Even small sidewalk projects can provide the groundwork for later development of a continuous system.
- Designers should consult the proposed [Accessibility Guidelines for Pedestrian Facilities in the Public Right-Of-Way](#) promulgated by the U.S. Access Board.
- In retrofitting streets that do not have a continuous or accessible system, locations near transit stops, schools, parks, public buildings, and other areas with high concentrations of pedestrians should be the highest priority.
- Street furniture placement should not restrict pedestrian flow.

**Cost**

Sidewalk costs can vary greatly, depending on the type of material, the scale, and whether it is part of a broader construction project. A concrete five-foot sidewalk is approximately \$32 per linear foot on average, but can range from \$2 to \$400. Using paving materials other than concrete can alter the cost substantially. More detailed cost information is provided [here](#).

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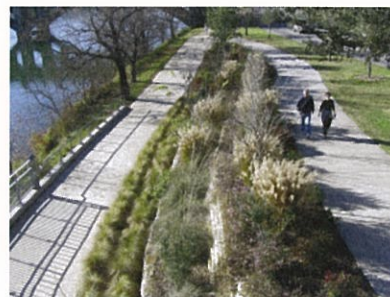
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## Shared-Use Paths/Sidepaths

### Description

Physically separated facilities such as sidepaths or shared-use paths for pedestrians and bicyclists are a great way to encourage more walking and bicycling. Shared-use paths provide off-road connections that can be used for recreation and commuting. These paths are often found along waterways, abandoned or active railroad and utility rights-of-way, limited access highways, or within parks and open space areas. Along high-speed, high-volume roads, sidepaths might be



safer and more desirable than sidewalks or bike lanes. Sidepaths might also be used when existing roads provide the only rights-of-way available. Paths immediately adjacent to roadways may cross numerous intersecting roads and driveways that create hazards and other problems for path users. Creating safe and accessible intersections between paths and the road network is one of the most challenging and critical aspects of design.



Shared-use paths tend to attract bicyclists with a wide range of skill levels, including young children. A path, even if designed primarily as a bike facility, also likely will attract a mix of other users including pedestrians, in-line skaters and others, depending on location and access. Special care must therefore be taken in the planning and design of such paths to provide a satisfactory experience for bicyclists, and safe sharing of the

facility with a variety of users of differing speeds and abilities.

Good planning and design of shared-use paths is crucial to provide for safe use, to maximize long-term benefits, and reduce future maintenance problems (such as erosion, water or edge deterioration). Pathways will never replace the road network for connecting to destinations, and some cyclists will prefer the road network for most riding due to the more direct route and fewer conflicts with slower path users.

A good process that incorporates input from future users and property owners may be the most important element to realizing a path that will maximize recreational and travel benefits and minimize potential problems. Good initial design is also crucial for minimizing future maintenance costs and problems. The process should engage the community so that the facility that is ultimately designed fits with local needs and with the local cultural, natural, and built environments.

### Purpose





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A separate shared-use path provides transportation links, recreation areas, and outdoor fitness opportunities for a variety of users, including bicyclists and pedestrians. While the separation from motor vehicles provided by shared-use paths reduces the risk of some crash types, careful design is required to ensure safe roadway and driveway crossings and safe interactions among the different path users.

**Considerations**

- Shared-use paths are a complement to the roadway network; they are not a substitute for providing access on streets.
- Connections to the regular street network are important, but a high number of crossings at intersections create potential conflicts with turning traffic.
- At intersections with roadways, paths should be signed, marked, and/or designed to discourage or prevent unauthorized motorized access.
- All users should be encouraged to stay right. An exception may be paths along waterways or other features that capture the attention of pedestrians. In these instances, markings and/or signage may be used to encourage pedestrians to stay on the side of the path closest to the attraction to reduce conflicts associated with pedestrians crossing the pathway.
- Since nearly all shared use paths are used by pedestrians, they need to meet the accessibility requirements of the Americans with Disabilities Act (ADA).
- In areas with extremely heavy pathway volume, it may be necessary to segregate pedestrians from wheeled users.

**Cost**

Costs can vary substantially based on the materials used, right-of-way costs, and other factors. A paved, multi-use trail can range in cost from approximately \$65,000 per mile to more than \$4 million per mile. An unpaved path can range from approximately \$30,000 to \$400,000 per mile. More detailed cost information is provided [here](#).

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## Paved Shoulder

### Description

Similar to bike lanes, paved shoulders provide separated space for the operation of bicycles. However, unlike bike lanes, paved shoulders are not considered travel lanes, and therefore may be used for temporary storage of disabled vehicles and vehicle parking, unless prohibited. Shoulder widths are typically a function of the amount of bicycle usage, motor vehicle speeds, topography, percentage of truck and bus traffic, etc., although widths are sometimes purely a function of



available right-of-way. More paved shoulder design details are given in the AASHTO Green Book and the AASHTO Guide for the Development of Bicycle Facilities. Prior research has shown that paved shoulders tend to result in fewer erratic motor vehicle driver maneuvers, more predictable bicyclist riding behavior and enhanced comfort levels for both motorists and bicyclists.

Rumble strips are often used as an inexpensive and effective countermeasure to reduce run-off-road crashes for motorists; however, installing rumble strips on a narrow shoulder causes bicyclists to have to ride in the travel lane rather than on the shoulder. If there is still rideable space on the shoulder, bicyclists may also have difficulty traversing the rumble strips without falling. Placing periodic gaps in the rumble strips allows for bicyclists to safely move between the shoulder and travel lane. Given the safety benefits for motor vehicles, rumble strips should be considered at locations with a demonstrated run-off-road crash risk, but should be designed to minimize the risk to bicyclists.

### Purpose

Paved shoulders create separated space for bicyclists and also provide motor vehicle safety benefits and space for inoperable vehicles to pull out of the travel lane.

### Considerations

- Shoulder width of at least five feet is recommended, but additional space should be provided on roads if there are higher levels of bicycle usage, if motor vehicle speeds exceed 50 mi/h, or if there is a higher percentage of truck and bus traffic.
- If the shoulder has rumble strips designed to alert swerving motorists, there should still be at least four feet of rideable surface for bicyclists. Periodic gaps in the rumble strips should also be provided to allow bicyclists to travel across the rumble strip as needed.
- Where paved shoulders are present, accommodations should be made for bicyclists through the intersection. If shoulders are dropped at the intersection approach to provide for a right-turn lane, signage should be used to indicate to motorists to

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expect bicycles and share the road. Parking should be restricted within the functional area of the intersection.

**Cost**

The cost varies, but often there are opportunities to include shoulder paving projects with resurfacing or reconstruction projects.

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## Bicycle Lanes

### Description

Bicycle lanes are designated by a white stripe, a bicycle symbol, and signage that alerts all road users that a portion of the roadway is for exclusive use by bicyclists. Bike lanes enable bicyclists to travel at their preferred speed and facilitate predictable behavior and movements between bicyclists and motorists. A bike lane is located adjacent to motor vehicle travel lanes or parking lanes, and flows in the same direction as motor vehicle traffic. Sometimes bike lanes are marked on the left side of a one-way street such as on streets where there are a high number of transit stops or vehicles on the right side, significantly more driveways, or where the majority of destinations are on the left side of the street.



Bike lanes are typically four to six feet wide. Wider bike lanes (six to seven feet) and/or buffers provide additional operating space and lateral separation from moving and parked vehicles, thus increasing bicyclists' sense of comfort and perceived safety and reducing the risk of "dooring" from parked vehicles. Buffers between the bike and motor vehicle lanes can be used to visually narrow a wide street and create a more attractive and comfortable bicycling environment. Colored pavement or a contrasting

paving material has also been used in certain situations to distinguish bike lanes from the motor vehicle lanes.

Design and countermeasure details are provided in the [AASHTO Bicycle Design Guide](#), [BIKESAFE](#), the [MUTCD](#), and the [NACTO Urban Bikeway Design Guide](#).

### Purpose

Bike lanes are used to create on-street, separated travel facilities for bicyclists. They can provide safety benefits to road users through separate operational space for safe motorist overtaking of bicyclists, particularly in narrow, congested areas. Bike lane presence also visually narrows the roadway or motor vehicle travel lanes to encourage lower motor vehicle speeds.



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**Considerations**

- Where bike lanes are to be considered, the road or street should be evaluated to determine if this facility is appropriate.
- Sidewalks may be appropriate for low-speed (less than 5 mph) bicyclists such as children while providing on-street bicycle facilities such as bike lanes may encourage higher speed bicyclists to not ride on sidewalks, thus reducing conflicts between pedestrians and bicyclists on sidewalks.
- Whenever possible, provide space between bike lane striping and the marked boundary of an adjacent parking lane to reduce door zone conflicts.
- Avoid termination of bike lanes where bicyclists are left in a vulnerable situation.
- Marked crosswalks should be extended across the bicycle lanes to let bicyclists know they must yield to pedestrians. Dashed bicycle lane markings may be continued through intersections or across turning lanes to indicate to drivers that vehicles must cross bicyclists' path.
- When a bicycle lane is located on the same side of the road as transit stops, a [separated bike lane](#) may be used to route bicyclists behind the stop. Pedestrian waiting areas should be provided between the separated bike lane and the roadway and crosswalks should be installed across the separated bike lane to reduce conflicts between bicyclists and pedestrians accessing the transit stop.
- Provide a smoothly paved surface and keep the bike lane free of debris. Avoid placing paving joints within the bike lane.

**Cost**

The cost of a five-foot bicycle lane can range from approximately \$5,000 to \$535,000 per mile, with an average cost around \$130,000. The costs can vary greatly due to differences in project specifications and the scale and length of the treatment. More detailed cost information is provided [here](#).

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## Separated Bike Lanes

### Description

Separated bike lanes (also known as cycle tracks or protected bike lanes) are separated bicycle facilities that run alongside a roadway separated from automobile traffic by a physical barrier, such as parked cars, bollards, a landscaped buffer, or a curb. A separated bike lane is for bicycle use only and is distinct from a sidewalk. Separated bike lanes may be one-way or two-way and can be raised or at street-level. One benefit of these facilities is that many bicyclists feel more comfortable being physically separated from car traffic, potentially attracting new riders. Separated bike lanes may also reduce cyclist collisions involving parked cars; they can prevent "doorings" by creating a 3+ foot gap between parked cars and the bicycle travel lane and also keep cars from parking in a bike lane.



When selecting streets for the installation of a separated bike lanes, consider locations with high bicycle traffic or locations of high bicycle stress from high motor vehicle speeds or motor vehicle volumes, or high rates of parking turnover. Two-way separated bike lanes should be considered for locations where they would reduce potential wrong-way riding due to out of direction travel, where there is a high concentration of destinations on one side of the street, or other reasons. Also consider the impact on network traffic operations when retrofitting a separated bike lane as the installation typically results in the loss of a motor vehicle travel lane.

One of the greatest concerns for separated bike lanes is at intersections and driveways, which should be clearly marked through a variety of intersection markings that could include [shared lane markings](#) (sharrows), combined right-turn/bike lanes, and colored pavement. Separated bike lanes are most effective in locations where there are fewer intersection and driveway conflicts as well as minimal loading/unloading activity. At signalized intersections, bike boxes and bicycle signal heads should also be considered, particularly with two-way separated bike lanes.

The Federal Highway Administration's [Separated Bike Lane Planning and Design Guide](#) (2015) includes an overview of the planning process and a menu of design recommendations with detailed graphics. The [Urban Bikeway Design Guide](#) by the National Association of City Transportation Officials (NACTO) also provides information and illustrations about designing separated bike lanes.

### Purpose

Separated bike lanes can provide an attractive bicycle facility for a range of abilities through the physical separation from motor vehicle traffic.

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Analysis**[Level & Quality of Service](#)[Intersection Safety Indices](#)[PBCAT](#)**Sample Policies &  
Plans**[Sample Policies](#)[Sample Plans](#)[Case Studies](#)[Resources](#)**Funding**[Government](#)[Non-Government](#)[Case Studies](#)[Resources](#)**Linking to Transit**[Access to Stations/Stops](#)[Transit Solutions for Bikes](#)[Transit Planning Resources](#)[Case Studies](#)[Resources](#)**Facility Design**[Pedestrian Facilities](#)[Bicycle Facilities](#)[Crossings](#)[Traffic Calming](#)[Streetscape](#)[Design Resource Index](#)[University Campuses](#)[Case Studies](#)[Resources](#)**Considerations**

- At intersections and driveways, make full use of signing and marking to improve awareness and guidance of the facility through these conflict zones.
- Ensure good visibility and sight lines at intersections and driveways through the use of no-parking zones and non-intrusive landscaping.
- Consider bicycle signal heads at signalized intersections to provide Leading Bicycle Intervals or contra-flow phasing.
- Ensure that the intersection has appropriate detection for bicyclists.
- The minimum desired width of a separated bike lane is five feet with a minimum buffer width of three feet. Widths of seven feet and greater are preferred as they allow for passing or side-by-side riding.
- Consider maintenance of the separated bike lane in the design; the width should be sufficient for street sweeping and snow removal equipment.
- When designing facilities such as separated bike lanes and contra-flow bicycle lanes, consideration should be given to alert pedestrians and motorists of where to expect bicyclists, especially at intersections and driveways.

**Cost**

The implementation cost is low if the project uses existing pavement and drainage, but the cost significantly increases if curb lines need to be moved. A parking lane is the low-cost option for providing a barrier. Other barriers might include concrete medians, bollards, tubular markers, or planters.

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## Bicycle Boulevards

### Description

Streets with low motorized traffic volumes and speeds that have been designated and modified to function as a through street for bicyclists. Bicycle boulevards use signs, pavement markings, and traffic calming measures to discourage through travel for motor vehicles. Bicycle boulevards maintain local access and many of the treatments also help create safer, more attractive local streets. Typical treatments may include traffic diverters, neighborhood traffic signals, wayfinding signs, or shared-lane markings.



### Purpose

Utilize local streets to provide low-stress, through routes for bicyclists. Bicycle boulevards can also provide connections between shared use paths, cycle tracks, and bike lanes.

### Considerations

- Bicycle boulevards should provide continuity for the distance of an average urban bicycle trip (about two to five miles). Connectivity is key to the success of a bicycle boulevard.
- Intersections along bicycle boulevards should minimize delay and improve safety.
- To reduce conflicts, intersections need traffic control and/or geometric design elements.
- These routes need signage and marking, especially since they might be less intuitive or visible compared to major parallel streets. Some cities have special branding for their bicycle boulevards.
- Consider opportunities to include green infrastructure, such as stormwater treatment facilities and street trees. These elements can provide an ecological and aesthetic enhancement.

### Cost

Costs vary, but bicycle boulevards offer a cost-effective use of existing roadways that also benefit residents and pedestrians.





### Bike Lanes

#### Best Use

Major roads that provide direct, convenient, quick access to major land uses. Also can be used on collector roads and busy urban streets with slower speeds.

#### Motor Vehicle Design Speed

Generally, any road where the design speed is more than 25 mph.

#### Traffic Volume

Variable. Speed differential is generally a more important factor in the decision to provide bike lanes than traffic volumes.

#### Classification or Intended Use

Arterials and collectors intended for major motor vehicle traffic movements.

#### Other Considerations

Where motor vehicles are allowed to park adjacent to bike lane, provide a bike lane of sufficient width to reduce probability of conflicts due to opening vehicle doors and objects in the road. Analyze intersections to reduce bicyclist/motor vehicle conflicts.



### Marked Shared Lanes

#### Best Use

Space-constrained roads with narrow travel lanes, or road segments upon which bike lanes are not selected due to space constraints or other limitations.

#### Motor Vehicle Design Speed

Variable. Use where the speed limit is 35 mph or less.

#### Traffic Volume

Variable. Useful where there is high turnover in on-street parking to prevent crashes with open car doors.

#### Classification or Intended Use

Collectors or minor arterials.

#### Other Considerations

May be used in conjunction with wide outside lanes. Explore opportunities to provide parallel facilities for less confident bicyclists. Where motor vehicles are allowed to park along shared lanes, place markings farther out to reduce potential conflicts with opening car doors.



### Off Street Shared Use Path (Trail)

independent right-of-way

#### Best Use

Linear corridors in greenways, or along waterways, freeways, active or abandoned rail lines, utility rights-of-way, unused rights-of-way. May be a short connection, such as a connector between two cul-de-sacs, or a longer connection between cities.

#### Motor Vehicle Design Speed

N/A

#### Traffic Volume

N/A

#### Classification or Intended Use

Provides a separated path for non-motorized users. Intended to supplement a network of on-road bike lanes, shared lanes, bicycle boulevards, and paved shoulders.

#### Other Considerations

Analyze intersections to anticipate and mitigate conflicts between path and roadway users. Design path with all users in mind, wide enough to accommodate expected usage. On-road alternatives may be desired for advanced riders who desire a more direct facility that accommodates higher speeds and minimizes conflicts with intersection and driveway traffic, pedestrians, and young bicyclists.



### Shared Lanes (wide outside lanes)

#### Best Use

Major roads where bike lanes are not selected due to space constraints or other limitations

#### Motor Vehicle Design Speed

Variable. Use as the speed differential between bicyclist and motorists increases. Generally any road where the design speed is more than 25 mph.

#### Traffic Volume

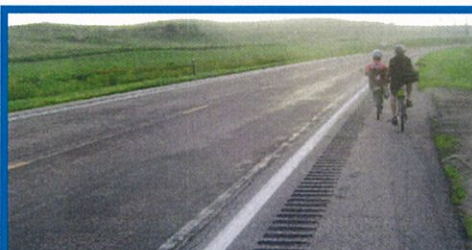
Generally more than 3,000 vehicles per day.

#### Classification or Intended Use

Arterials and collectors intended for major motor vehicle traffic movements.

#### Other Considerations

Explore opportunities to provide marked shared lanes, paved shoulder, or bike lanes for less confident bicyclists.



### Paved Shoulders

#### Best Use

Rural highways that connect town center and other major attractors.

#### Motor Vehicle Design Speed

Variable. Typical posted rural highway speeds (generally 40-55 mph).

#### Traffic Volume

Variable.

#### Classification or Intended Use

Rural roadways; inter-city highways.

#### Other Considerations

Provides more shoulder width for roadway stability. Shoulder width should be dependent on characteristics of the adjacent motor vehicle traffic, i.e. wider shoulders on higher speed and/or higher-volume roads.



### Off Street Shared Use Path (Sidepath)

adjacent to roadways

#### Best Use

Adjacent to roadways with no or very few intersections or driveways. The path is used for a short distance to provide continuity between sections of path on independent right-of-way.

#### Motor Vehicle Design Speed

The adjacent roadway has high-speed motor vehicle traffic such that bicyclists might be discouraged from riding on the roadway.

#### Traffic Volume

The adjacent roadway has very high motor vehicle traffic volumes such that bicyclists might be discouraged from riding on the roadway.

#### Classification or Intended Use

Provides a separated path for non-motorized users. Intended to supplement a network of on-road bike lanes, shared lanes, bicycle boulevards, and paved shoulders. Not intended to substitute or replace on-road accommodations for bicyclists, unless bicycle use is prohibited

#### Other Considerations

Several serious operational issues are associated with this facility type.



## NACTO

### Urban Bikeway Design Guide



#### Cycle Track

##### Best Use

Space that is intended to be exclusively or primarily used for bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks.

##### Motor Vehicle Design Speed

Streets with high motor vehicle speeds.

##### Traffic Volume

There are no US standards for the bicyclist and motor vehicle volumes that warrant cycle tracks, however several international documents provide basic guidance.

##### Classification or Intended Use

Dedicates and protects space for bicyclists in order to improve perceived comfort and safety.

##### Other Considerations

Cycle tracks may be one-way or two-way, and may be at street level, at sidewalk level, or at an intermediate level. If at sidewalk level, a curb or median separates them from motor traffic, while different pavement color/texture separates the cycle track from the sidewalk. If at street level, they can be separated from motor traffic by raised medians, on-street parking, or bollards.

## OTHER LOCAL FACILITIES

(Not included in AASHTO or Mobility 2035, The Metropolitan Transportation Plan)



#### Signed Bike Route

##### Best Use

A roadway or bikeway designated by the jurisdiction having authority, either with a unique route designation or with Bike Route signs, along which bicycle guide signs may provide directional and distance information.

##### Other Considerations

Decision signs should include destinations, directional arrows, and distance. Travel time required to reach the destination provides bicyclists with additional information and may also be included. It is recommended that a 10 mph bicycle speed be used for travel time calculations.<sup>1</sup>

1. NACTO Urban Bikeway Design Guide



#### Nature Trails, Equestrian Trails

##### Best Use

Natural areas where constraints prevent building of paved surface trails or a more natural experience is desired.

##### Classification or Intended Use

Hiking, horseback riding

##### Other Considerations

Primarily natural surface trails such as crushed aggregate, mulch, or dirt.



#### Bicycle Boulevards

##### Best Use

Streets with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority.

##### Motor Vehicle Design Speed

Bicycle boulevards should have a maximum posted speed of 25 mph.

##### Traffic Volume

Bicycle boulevards should be designed for motor vehicle volumes under 1,500 vehicles per day (vpd), with up to 3,000 vpd allowed in limited sections of a bicycle boulevard corridor.

##### Classification or Intended Use

Residential roadways.

##### Other Considerations

Bicycle Boulevards use signs, pavement markings, and speed and volume management measures to discourage through trips by motor vehicles and create safe, convenient bicycle crossings of busy arterial streets.



#### Private

##### Definition

Privately maintained shared use paths and sidewalks. Typically located on private property or within a subdivision and maintained by a Property Owners Association. Facilities may vary in width, length, and surface material. Occasionally these facilities connect to a larger public path (trail) system.



#### Wide Sidewalks

##### Definition

Wide sidewalks may have a greater width than standard sidewalks to accommodate higher volumes of users. However, the facility width does not comply with AASHTO guidelines for a shared use path that safely accommodates a range of non-motorized users.



**Item #7:**  
**Fitness Friendly Business**  
**Program**



**Bicycle/Pedestrian Advisory Committee  
November 8, 2016**

**Agenda Item No. 7**

**Fitness Friendly Business Program**

To create incentives for promoting bicycle and pedestrian friendly communities, KTMPO is in the process of developing the Fitness Friendly Business Initiative. This program recognizes area businesses that cater towards bicyclists and pedestrians. Businesses that qualify for this program must follow criteria to receive this recognition.

KTMPO is asking BPAC for input on the Fitness Friendly Business Program.

**Discussion and Possible Action Item:** Input on the Fitness Friendly Business Program.



## **Fitness Friendly Business Program**

### **Program Background**

The Fitness Friendly Business program recognizes local businesses as being bicycle and pedestrian friendly. This initiative can drive economic success, decrease congestion, promote healthy lifestyles, and increase quality of life. Businesses catering towards cyclists and pedestrians can provide several positive impacts not only the community but for the business. Non-motorized users can save on fuel and vehicle maintenance costs, allowing them to spend more on goods, hobbies and recreational activities. Bicyclists and pedestrians are more likely to notice a business when biking and walking than traveling in an automobile which can also drive economic success.

To be a member of the Fitness Friendly Business Program, businesses must follow certain criteria.

### **Recognizing a Fitness Friendly Business Program**

For businesses to be recognized as a fitness friendly business, they shall meet a **minimum of three criteria**.

The following list are criteria that businesses shall meet to be considered for the FFBP:

- Must allow cyclist and pedestrians to use the bathroom facilities;
- Designated bicycle parking;
  - Bike Rack
  - Covered Parking
  - Other appropriate bike parking options
- **15% discount for cyclists or pedestrians;**
- Refill Water Stations;
  - Allow Cyclists and Pedestrians to Refill Water
  - Free Bottle of Water for Cyclists/Pedestrians
- Bicycles Repair Kit.
  - Air Pressure Tank
  - Tire Repair Kit
  - Tools: Screwdrivers, ratchet set, hammer, etc.
- First Aid Kit
- Accessibility of businesses to cyclists and pedestrians.
  - Located on a designated bike lane, bike route, roadway with shoulder, trail, sidewalk or an appropriate bike/pedestrian facility not listed.
  - Near a Transit Stop.
- Other Amenities

Businesses will be acquired to fill out an application to be considered membership of their program. Their submitted application will be presented at a BPAC meeting. BPAC members will have the opportunity to recommend whether to approve or disapprove a business.



**Membership or Application Fee:**

The application fee will be \$25. The application fee will be used to purchase the business decals and other promotional items.

**Failure to Recognize:**

Business members that do not abide by the rules will have their membership revoked. Business may have the opportunity to reapply for membership after one year. If membership is revoked for a second time, businesses will not be given the opportunity to receive membership for a third time.

**KTMP O will recognize businesses by the following:**

Display the location of the business on the KTMP O Bicycle/Pedestrian Web Map.

Recognition in KTMP O newsletters and social media.

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## Commonly Used Transportation Related Acronyms and Terms

Organizations	Terms
<b>KTMPPO</b>	<b>TMA</b>
Killeen – Temple Metropolitan Planning Organization	Transportation Management Area
<b>TPPB (KTMPPO)</b>	<b>MAP - 21</b>
Transportation Planning Policy Board	Moving Ahead for Progress in the 21 <sup>st</sup> Century (legislation replaced SAFETEA-LU in July 2012)
<b>TAC (KTMPPO)</b>	<b>SAFETEA – LU</b>
Technical Advisory Committee	Safe, Accountable, Flexible, Efficient Transportation Equity Act
<b>FHWA</b>	<b>MPO</b>
U.S. Department of Transportation Federal Highway Administration	Metropolitan Planning Organization
<b>FTA</b>	<b>UPWP</b>
U.S. Department of Transportation Federal Transit Administration	Unified Planning Work Program
<b>TxDOT</b>	<b>MTP</b>
Texas Department of Transportation	Metropolitan Transportation Plan
<b>TCEQ</b>	<b>TIP</b>
Texas Commission on Environmental Quality	Transportation Improvement Program
<b>TTI</b>	<b>STIP</b>
Texas A&M Transportation Institute	Statewide Transportation Improvement Program
<b>CTCOG</b>	<b>STP-MM</b>
Central Texas Council of Governments	Surface Transportation Program – Metropolitan Mobility
<b>HCTD or “The HOP”</b>	<b>TAP</b>
Hill Country Transit District	Transportation Alternatives Program
<b>CTR TAG</b>	<b>UTP</b>
Central Texas Regional Transportation Advisory Group	Unified Transportation Program
<b>BPAC</b>	<b>CMAQ</b>
Bicycle and Pedestrian Advisory Committee	Congestion Mitigation and Air Quality Improvement Program
	<b>UA or UZA</b>
	Urbanized Area
	<b>EJ or “Title VI”</b>
	Environmental Justice
	<b>CMP</b>
	Congestion Management Process
	<b>ITS</b>
	Intelligent Transportation Systems
	<b>NAAQS</b>
	National Ambient Air Quality Standards

A comprehensive listing with definitions is available under Transportation Planning Resources at [www.ktmpo.org](http://www.ktmpo.org). Pages 61-65 of the publication “The Transportation Planning Process... is a great resource for commonly used Transportation terms.



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