

APPENDIXES

APPENDIX A: GLOSSARY OF TERMS

This glossary of terms is provided by the 2012 American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities.

Bicycle Boulevard A street segment, or series of contiguous street segments, that has been modified to accommodate through bicycle traffic and minimize through motor traffic.

Bicycles Facilities A general term denoting improvements and provisions to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.

Bicycle/Bike Lane A portion of roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs. It is intended for one-way travel, usually in the same direction as the adjacent traffic lane, unless designed as a contra-flow lane.

Bicycle Level of Service (BLOS) A model used to estimate bicyclists' average perception of the quality of service of a section of roadway between two intersections.

Bicycle Locker or Bike Locker A secure, lockable container used for individual bicycle storage.

Bicycle Network A system of bikeways designated by the jurisdiction having authority. This system may include bike lanes, bicycle routes, shared use paths, and other identifiable bicycle facilities.

Bicycle Rack or Bike Rack A stationary fixture to which a bicycle can be securely attached.

Bicycle Route or Bike Route 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. Signs that provide directional, distance, and destination information for bicyclists do not necessarily establish a bicycle route.

Bikeway A generic term for any road, street, path, or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

Complete Streets Roadways that are planned, designed, constructed, maintained and operated to enable the safety and convenience of all users, including pedestrians, cyclists, motorists, freight vehicles, of all ages and abilities

Cycle Track An exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk.

Greenway A type of shared-use path that follows a linear corridor, such as the levee paths. Greenways allow for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users

Highway A general term denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.

Independent Right-of-way A general term denoting right-of-way outside the boundaries of a conventional highway.

Rail-Trail A shared use path, either paved or unpaved, built within the right-of-way of a former railroad.

Rail-with-Trail A shared use path, either paved or unpaved, built within the right-of-way of an active railroad.

Right-of-way A general term denoting land, property or interest therein, usually in a strip, acquired for or devoted to transportation purposes.

Roadway The portion of the highway, including shoulders, intended for vehicular use.

Shared Lane A lane of a traveled way that is open to both bicycle and motor vehicle travel.

Shared-Lane Marking A pavement marking symbol that indicates an appropriate bicycle positioning in a shared lane, sometimes referred to as a "sharrow."

Shared Roadway A roadway that is open to both bicycle and motor vehicle travel.

Shared Use Trail/Path A bikeway physically separated from motor vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Most shared use paths are designed for two-way travel.

Sharrow See "Shared-Lane Marking"

Shoulder The portion of the roadway contiguous with the traveled way that accommodates stopped vehicles, emergency use, and lateral support of sub-base, base, and surface courses. Shoulders, where paved, are often used by bicyclists.

Sidewalk That portion of a street or highway right-of-way, beyond the curb or edge of roadway pavement, which is intended for use by pedestrians.

Sidepath A shared use trail/path that is located immediately adjacent and parallel to a roadway.

Subdivision The division of a lot, tract, or parcel of land into two or more lots, plats, sites, or other divisions of land for the purpose, whether immediate or future, of sale or of building development

Traveled Way The portion of the roadway intended for the movement of vehicles, exclusive of shoulders and any bike lane immediately inside of the shoulder.

Unified Development Code A document that contains regulations governing planning, subdivision, and building.

Unpaved Path Path not surfaced with a hard, durable surface such as asphalt or Portland cement concrete.

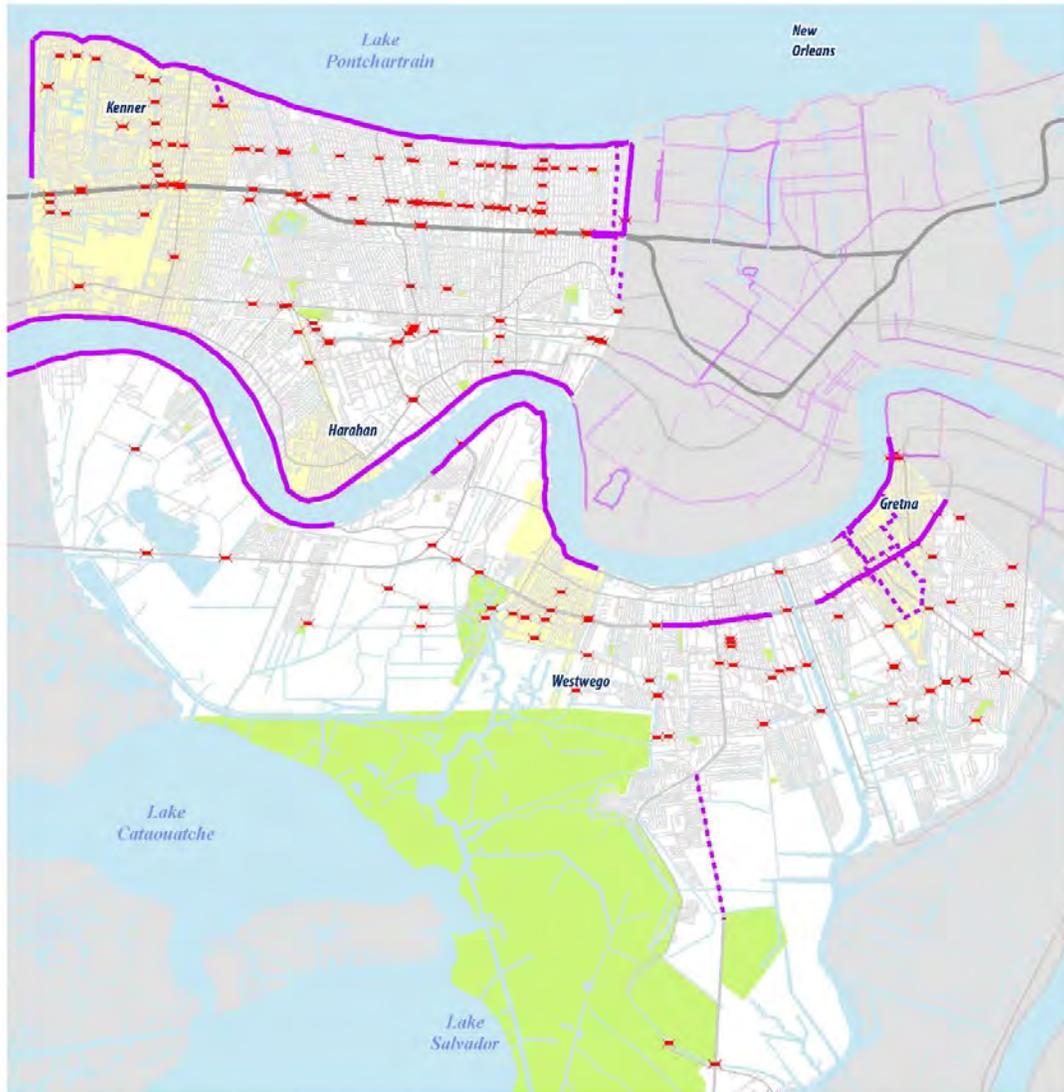
Zoning A land use planning tool that deems permissible uses, forms and densities on land

APPENDIX B: EXISTING CONDITIONS

THREAT ANALYSIS

The following maps illustrate the factors considered for developing the threat index described in **Chapter 3**.

Figure 14: Bridge Locations



Base layers source: Regional Planning Commission 2012

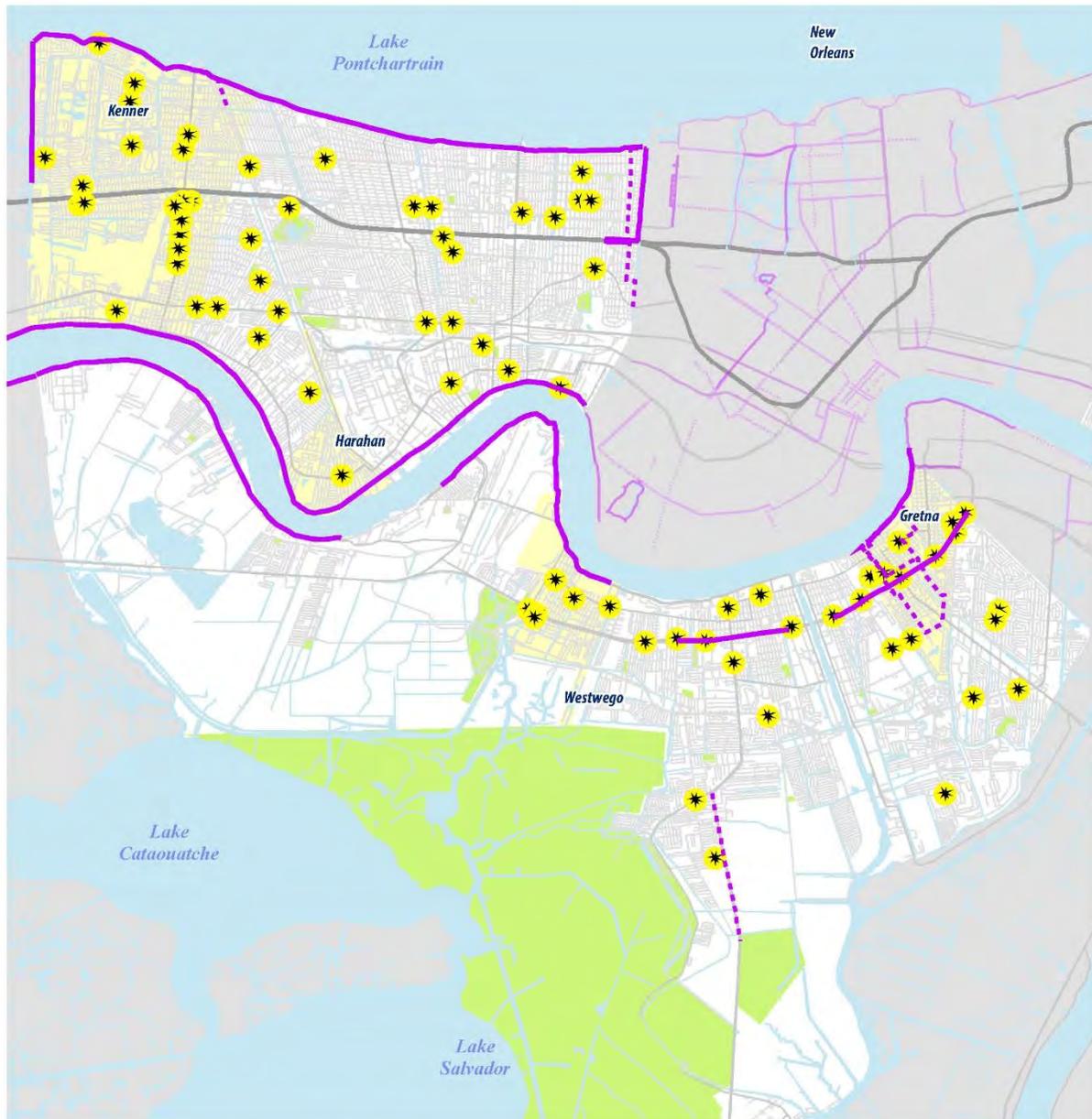
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- LEGEND**
- Existing Bikeways
 - Planned
 - Bridges
 - Parks & Playgrounds
 - Incorporated Areas



December 26, 2013





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Base layers source: Regional Planning Commission 2012

December 26, 2013

- LEGEND**
-  Existing Bikeways
 -  Planned
 -  Bicycle Crashes
 -  Parks & Playgrounds
 -  Incorporated Areas



Figure 16: Posted Speed Limit



Base layers source: Regional Planning Commission 2012

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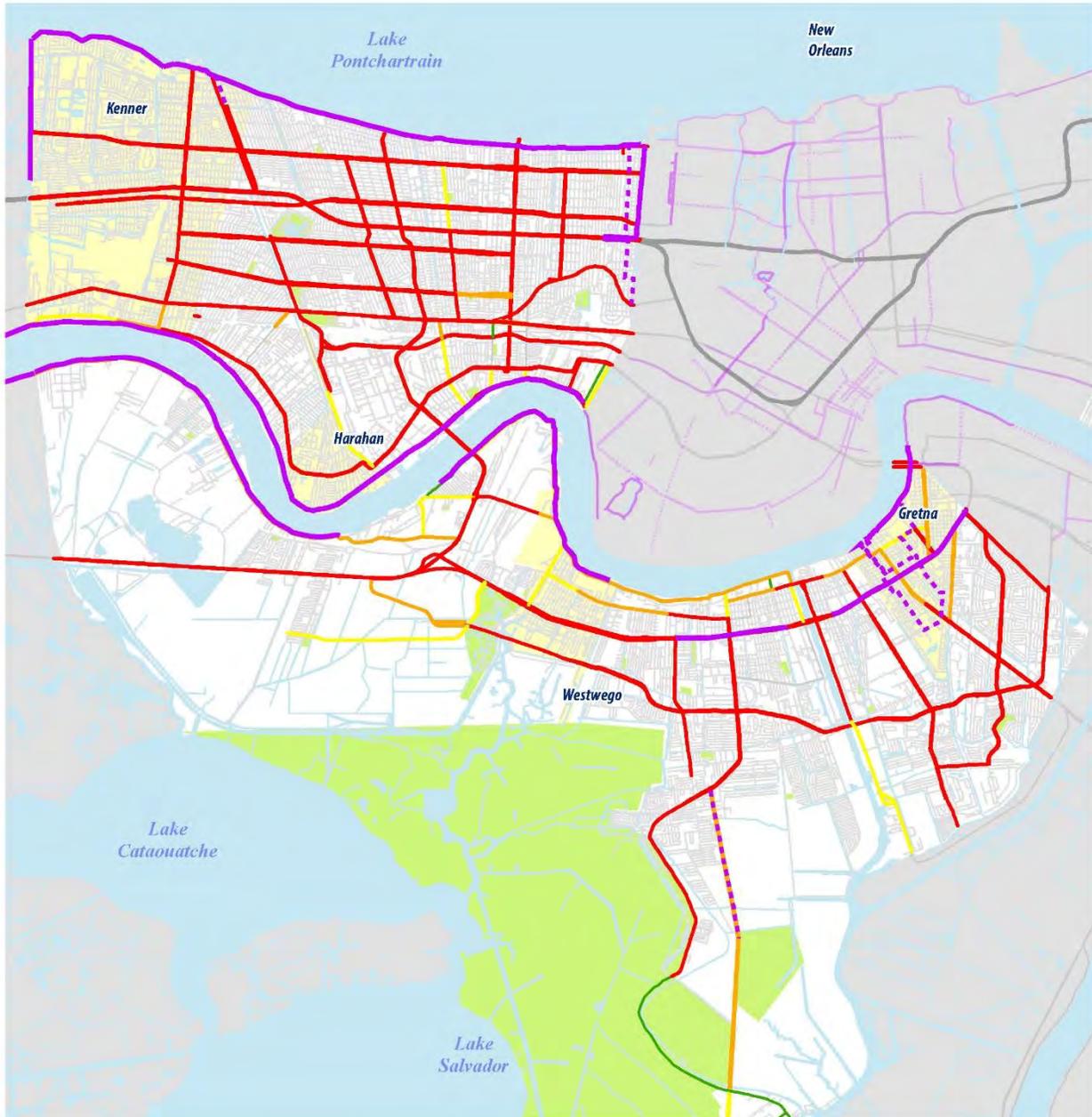
LEGEND

- Existing Bikeways
- - - Planned
- Streets**
- Speed Limit (MPH)**
- < 20
- 20 - 30
- 31 - 40
- > 40
- Parks & Playgrounds
- Incorporated Areas



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LEGEND

- Existing Bikeways
- - - Planned

Traffic Counts

JPNLADOTD_TrafficT

- < 3,000
- 3,000 - 7,999
- 8,000 - 12,000
- >12,000

- Parks & Playgrounds
- Incorporated Areas

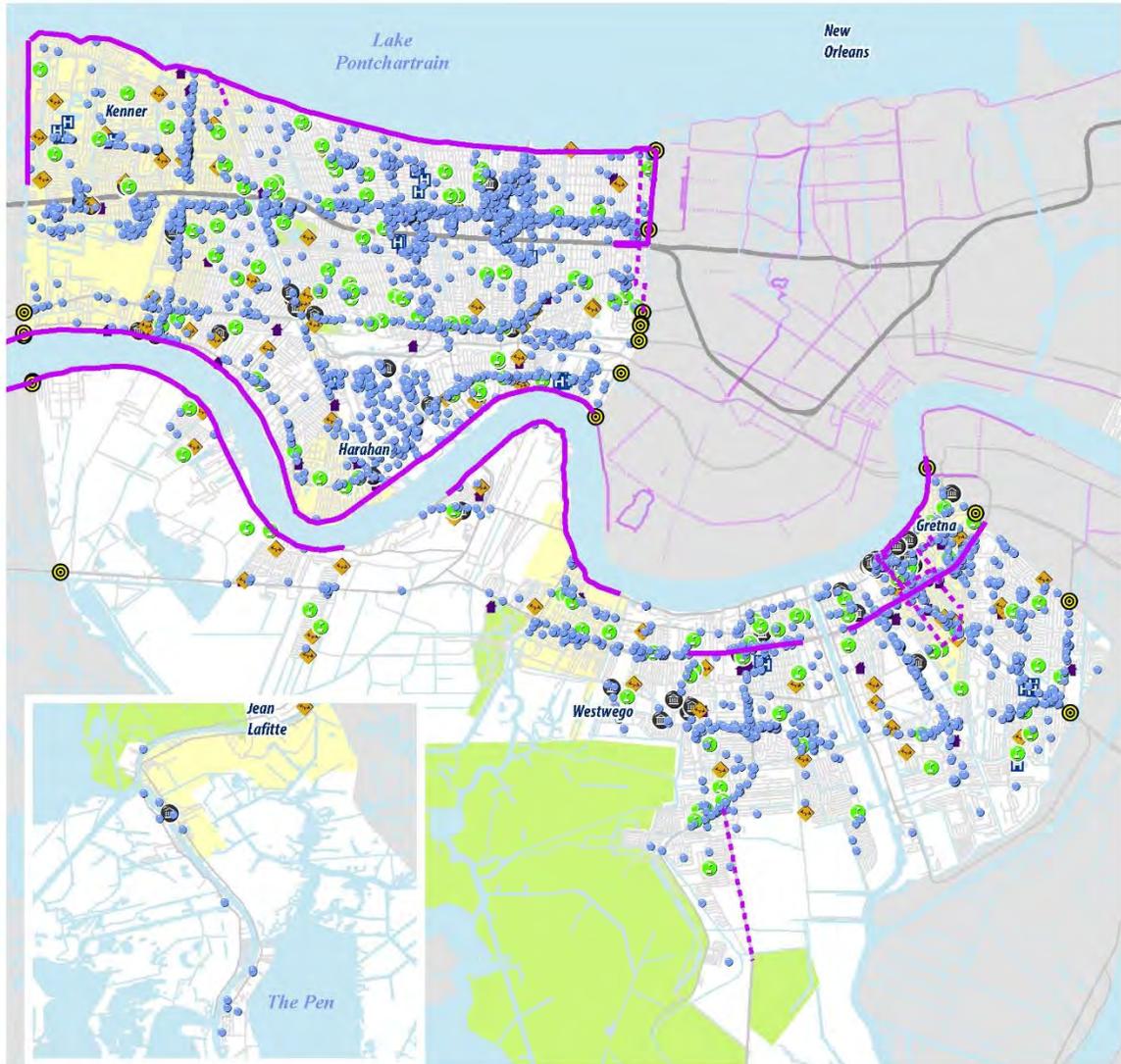
Base layers source: Regional Planning Commission 2012
 ADT source: Jefferson Parish 2012; LADOTD 2012
 December 26, 2013



DEMAND ANALYSIS

The following maps illustrate the factors considered for developing the demand index described in Chapter 3.

Figure 18: Destinations



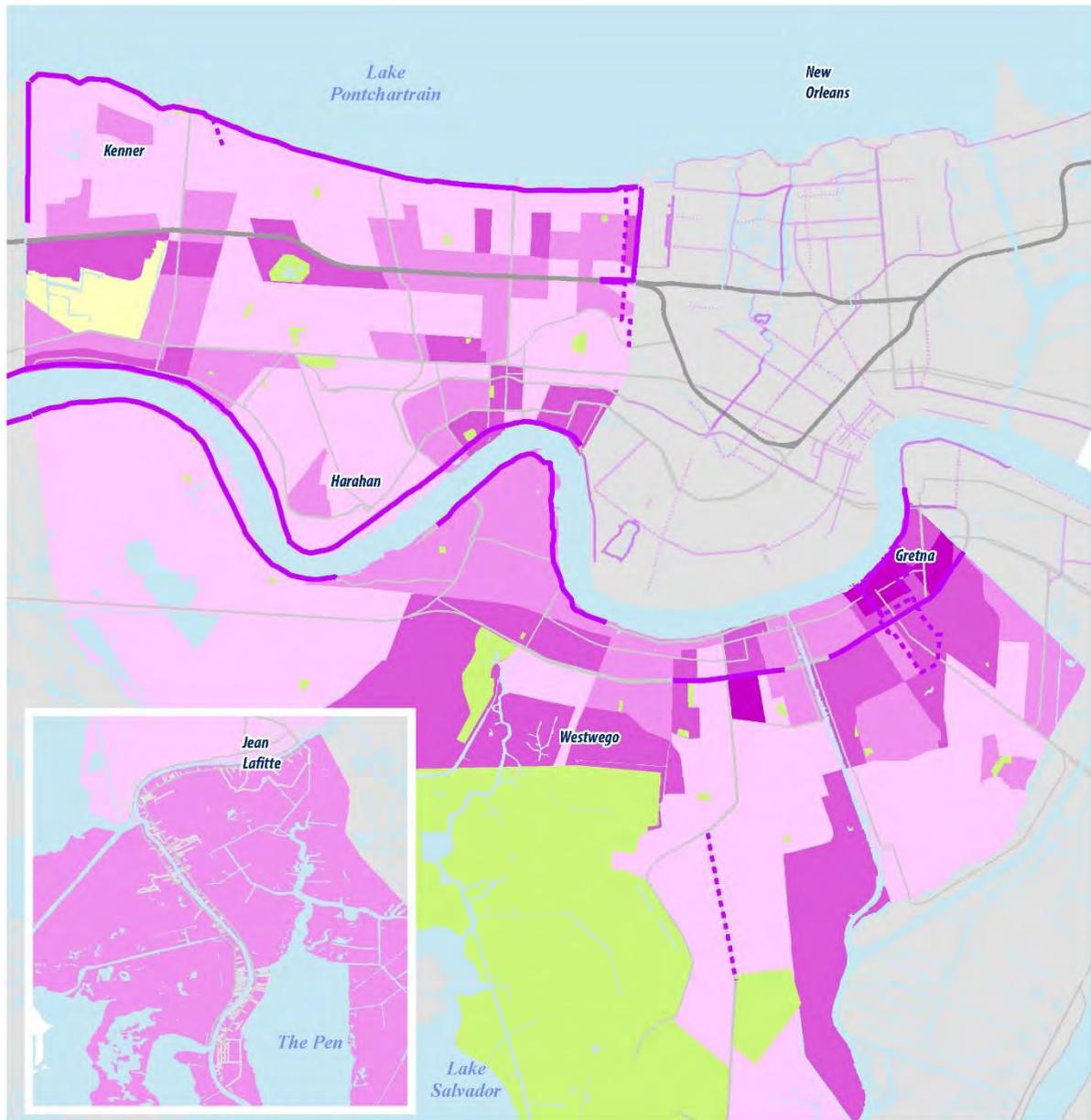
LEGEND

- Existing Bikeways
 - - - Planned
- Destinations**
- Parish Connections
 - Community
 - Government
 - Parks and Playgrounds
 - Schools
 - Hospital
 - Large Shopping Centers
 - Small Shopping Centers
 - Parks & Playgrounds
 - Incorporated Areas

Base layers source: Regional Planning Commission 2012

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Base layers source: Regional Planning Commission 2012

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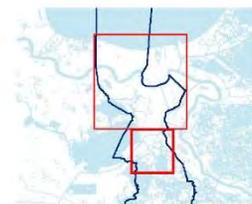
LEGEND

- Existing Bikeways
- Planned
- Parks & Playgrounds

No-vehicle households

Percent

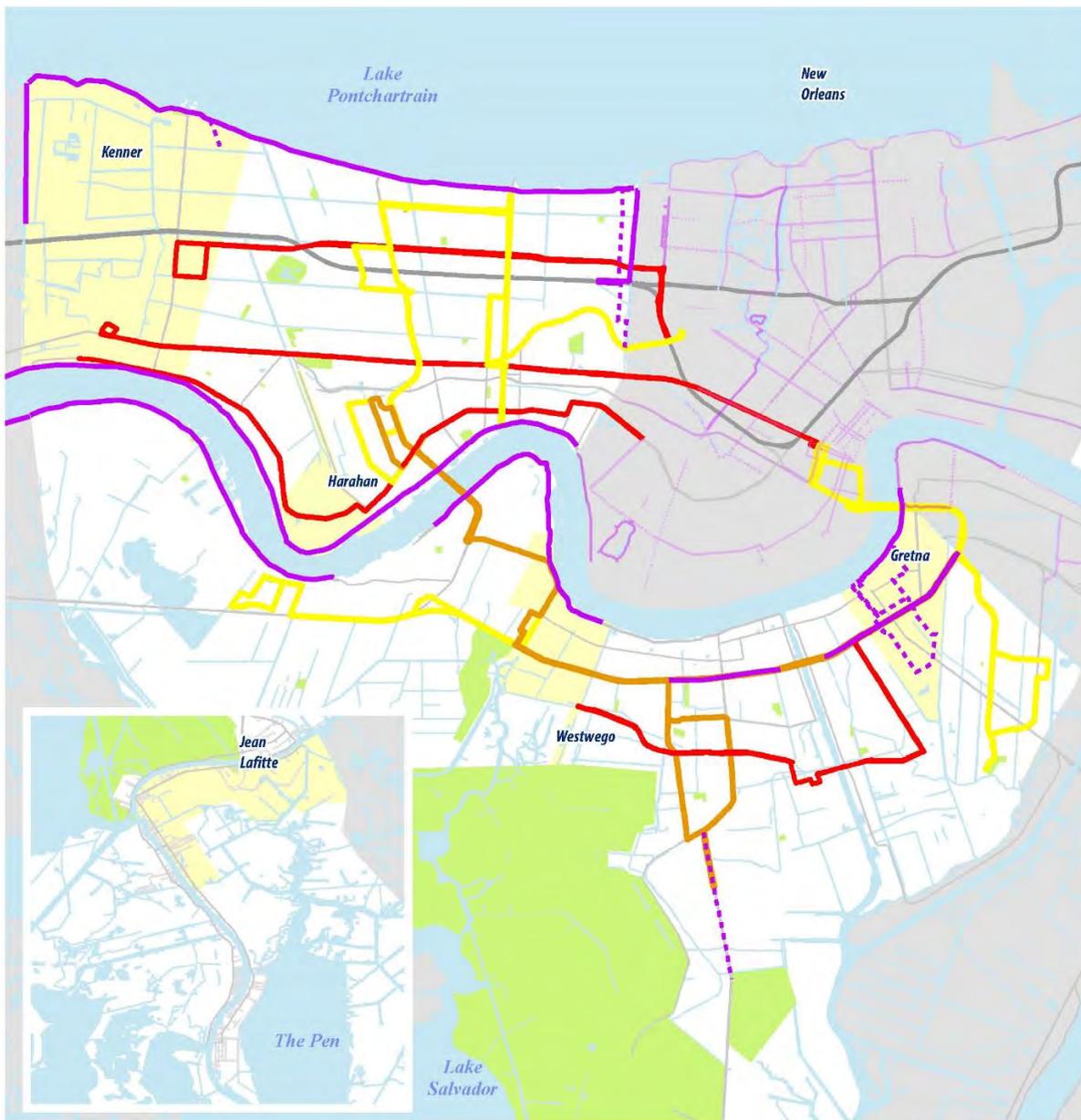
- 0.0 - 5.4
- 5.5 - 12.1
- 12.2 - 24.9
- 25.0 - 40.9
- Incorporated Areas



December 26, 2013



Figure 20: JeT Bike Rack Usage



Base layers source: Regional Planning Commission 2012

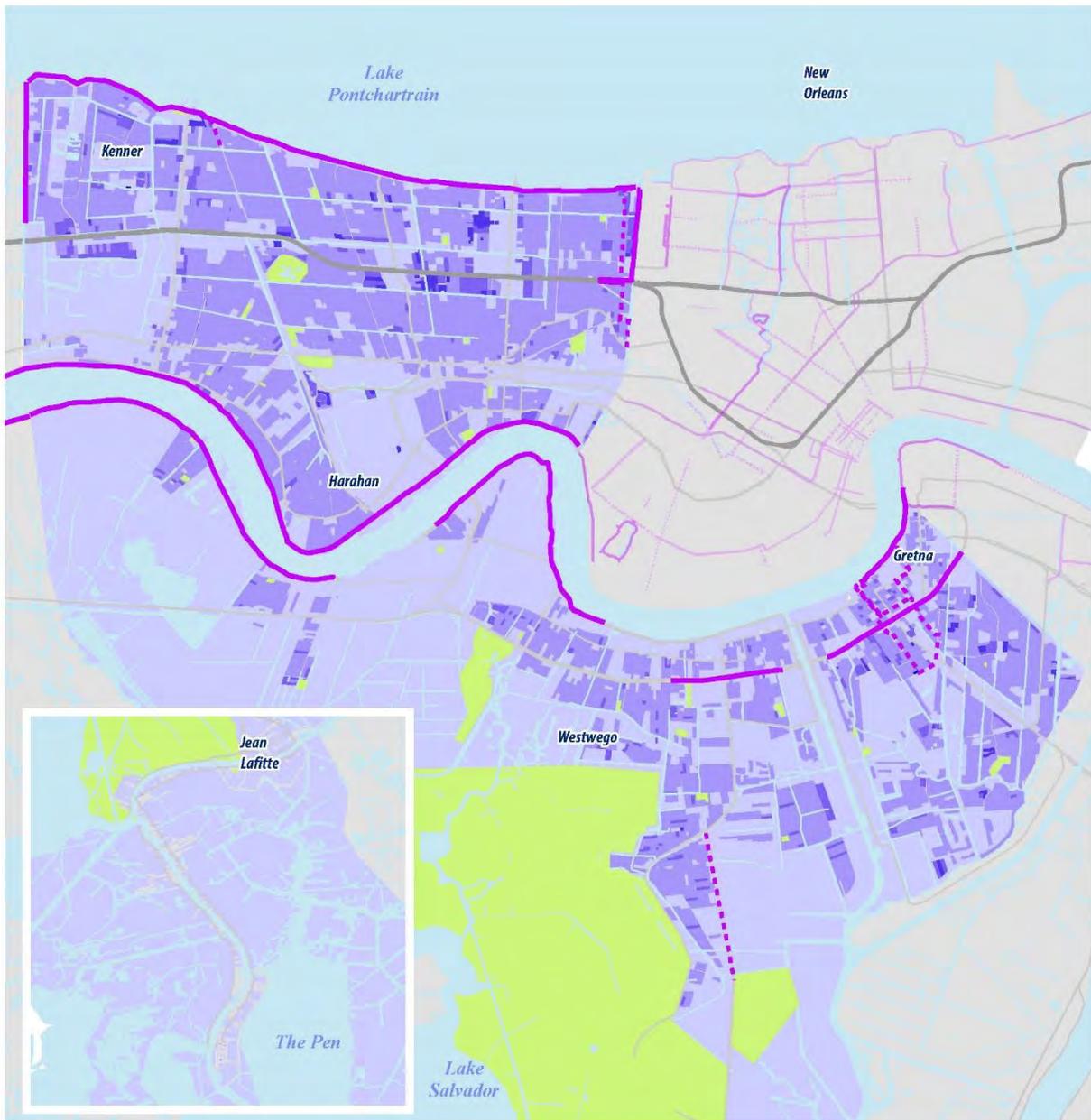
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- LEGEND**
- Existing Bikeways
 - - - Planned
 - JeT Rack Usage (Total bikes Jan12-Sept12)**
 - 90 - 600
 - 601 - 3300
 - >3300
 - Parks & Playgrounds
 - Incorporated Areas



December 26, 2013





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Base layers source: Regional Planning Commission 2012

LEGEND

- Existing Bikeways
- - - Planned
- Parks & Playgrounds

Population

People per acre

- 0.0 - 6.0
- 6.0 - 20.0
- 20.0 - 45.0
- 45.2 - 160.0
- 161.5 - 400.0
- Incorporated Areas

December 26, 2013

APPENDIX C: COMMUNITY ENGAGEMENT RESULTS

SUMMARY

The project team has set up many avenues of feedback for Jefferson Parish residents to communicate their opinions, desires, and experiences with bicycling in Jefferson Parish. These are:

- ❖ Project website with comment submittal form
- ❖ Citizen Survey – available online and distributed at public meetings
- ❖ Facebook page: 96 likes
- ❖ Twitter account: 19 tweets, 14 followers
- ❖ Flickr photo group
- ❖ Mapping exercise and surveys at Tour de Jefferson, November 4, 2012
- ❖ Two public meetings, held January 28th and 30th, 2013
- ❖ Four community workshops, March 18, 21, 25 and 28
- ❖ Four Citizens Advisory Committee Meetings

The public meetings included visual preference surveys for bikeways and bike facilities, a mapping exercise to determine barriers and desired routes, a brief presentation on the purpose of the plan, and educational materials. Attendees filled out comment cards and offered verbal comments to the consulting team.

CITIZEN ADVISORY COMMITTEE

In October 2012, the Parish Council adopted a resolution that:

“That the Jefferson Parish Bicycle Master Plan Citizens Advisory Committee be established for a period of one (1) year from November 7, 2012 through November 7, 2013 for the purpose of advising the Regional Planning Commission on the identification of a system of potential routes, recreational trails and bicycle boulevards with the inclusion of linkages that will provide for connectivity throughout Jefferson Parish and informing prioritization or a hierarchical approach to project and program implementation.”

Meetings were held December 19, 2012, March 13, June 7 and October 24, 2013, and were consulted individually for feedback on the final plan document.

CITIZEN SURVEY RESULTS

As of December 26, 2013 the citizen survey received 169 responses. The vast majority of people answering the survey had access to both a bike (98%) and a motor vehicle (94%). Most ride their bike daily (17%) or weekly (43%), but 17% rarely or never ride a bike.

The most popular reason for riding a bike is recreation or exercise (91%). Others ride their bike to commute (31%), for social reasons (51%), to run errands (38%), or to save money (33%). When asked what the most important reason they ride a bike, most respondents selected recreation/exercise (64%).

Respondents said they “highly prefer” off street paths (56%) and “prefer” on-street bike lanes or shoulders (43%); they “do not prefer” roadways without bicycle accommodations (48%). The most important factors that prevent respondents from bicycling are:

- ❖ bad physical roadway conditions (51% said very or most important)
- ❖ not enough on-street bike lanes or shoulders (79% said very or most important)
- ❖ not enough off-street bike paths (75% said very or most important)
- ❖ too much motorist traffic (71% said very or most important)
- ❖ motorists are too fast (69% said very or most important)
- ❖ motorists are disrespectful of bicyclists (74% said very or most important)
- ❖ traffic laws are not well enforced (60% said very or most important)

The average respondent was male (77%), middle-aged (66% between ages 30 and 59), and white (88%). Respondents are also highly educated (76% with a bachelor’s degree or more) and earn above-average incomes (52% with household income above \$75,000).

THEMES

Residents are generally supportive of the efforts to better link Jefferson Parish and improve the bicycle route network.

Overarching themes from the comments include:

- ❖ Connect the levee paths
 - ◇ Jefferson Parish’s levee paths should be continuous, easy to access, and well-marked multi-use trails
- ❖ Create a network
 - ◇ Jefferson Parish needs better north-south and east-west routes, especially across busy routes like Interstate 10 and Veterans Boulevard
- ❖ Connect areas divided by water
 - ◇ Jefferson Parish needs better infrastructure for bicyclists to cross waterways like the Mississippi River and the Harvey Canal
- ❖ Connect Jefferson Parish to New Orleans
 - ◇ Jefferson Parish and Orleans Parish should be connected by bicycle infrastructure
- ❖ Improve awareness and safety
 - ◇ More education for cyclists, drivers, and police is needed to improve safety

CONNECT THE LEVEE PATHS

Jefferson Parish residents enjoy recreational cycling along the existing levee paths in the parish. The levee paths are the main recreational cycling amenity in Jefferson Parish. Nearly all (90%) of survey respondents said they ride a bike for recreation or exercise, and nearly two thirds (64%) said it was the most important reason they ride a bike. Many of the comments received at the public meetings reflect frustrations with the gaps in the levee path network.

- ❖ Connect the Lake Path at each of the pump stations and Causeway Boulevard
- ❖ Fill the gaps in the West Bank Levee Trail from 11th Street to Avondale Gardens
- ❖ Open the lakefront for access to Orleans Parish
- ❖ Connect the West Bank River Trail east of Klein
- ❖ Make it easier to get on the River Levee Trail at the Parish line
- ❖ Need a connection to the levee trail near the Crescent City Connection
- ❖ It would be excellent for a bike path along the lake that would connect Kenner and Metairie to the Lakefront of New Orleans.
- ❖ I do not know what the plans are for crossing over/under Causeway Blvd while on the Lake Bike Path.
- ❖ One of the best paths that we used to ride often years ago, the one along the lake, is now hard to access and is chopped up.

Residents also commented on specific places where the levee paths should connect to the adjacent street grid. General access to the path was cited as a concern.

- ❖ East Bank River Trail connection to Brookhollow Esplanade (Elmwood area)
- ❖ East Bank River Trail connection at Hibiscus Place
- ❖ Easier access to the levee path from within Jefferson Parish on designated streets with bike lanes

In the visual preference survey at the public meetings, the picture of the levee path was the most liked picture. Residents from both sides of the river identified this photo as their preferred bikeway type.

Other off-street paths and trails, such as the Wisner Path in New Orleans, were positively identified by residents in the visual preference survey.

The survey question “which specific Jefferson Parish streets or paths are BEST for bicycling, and why?” was overwhelmingly answered with comments about the levee paths. Respondents included reasons why they said the levee paths, mostly referring to a lack of car traffic, scenic views, and the ability to bike long distances without stopping. Others noted that the levee paths are falling into disrepair and need improvement, particularly in the areas of access points, signage, and surface maintenance.

CREATE A NETWORK

Currently, bicyclists in Jefferson do not have an adequate network of bicycle friendly infrastructure to navigate the Parish. In addition to the Mississippi River and other waterways that divide the parish, major roadways such as Interstate 10, US-90, and Veterans Boulevard constitute significant obstacles to bicyclists trying to reach specific destinations. As one survey respondent wrote, “A viable transportation network must be just that – a network. There must be numerous north-south and east-west routes traversing the parish.”

General comments on this lack of an interconnected network included concerns about using road reconstruction funds to accommodate bicyclists, fear of fast-moving motorists, being forced onto back streets because of motorists and lack of infrastructure, having to drive in order to bike, and providing safe places for children to bicycle.

One survey comment summarizing this concern reads, “There are numerous existing residential streets that provide safe and comfortable bicycling throughout the parish. However, one can only ride so far before he/she runs into a drainage canal, expressway, or major roadway with few accessible crossings (ie, Causeway Blvd). Restoring some of this connectivity can be done with minimal cost and will have the biggest impact on getting people to ride their bike for transportation. Major barriers that prevent connectivity but can easily be improved: Houma Blvd and Canal, N Causeway Blvd, Bonabel Canal, W Napoleon, W Metairie, Wilson Canal, David Drive Canal, and all the grade level I-10 crossings.” Another added, “With the existing side streets, these larger roads can be mostly avoided except when a cyclist encounters a drainage canal with no bridge, or attempting to cross Veterans or Interstate 10. Cycling east-west is much easier than cycling north-south.”

The major roadways, in addition to being barriers for traveling along side streets, are not suitable for bicycling because of their heavy traffic loads. The major roadways are often the only way to get around water-based barriers like drainage canals, and side streets are often disjointed, leaving few options. These roadways were cited in survey comments as **the most unsafe places to bicycle** in Jefferson:

- ❖ All arterials because of traffic
- ❖ Central Avenue between Airline and Jefferson Highway – narrow lanes, no shoulder, and rude drivers. This is the only road that gives bikes access from northern Metairie to the levee bike path.
- ❖ Getting from the levee path to Airline is dangerous – bikes cannot take Clearview or Causeway over the train tracks, the only option is Central Avenue which is fast and busy with no shoulder at the train track intersections.
- ❖ Clearview Parkway – high speed traffic and poor shoulder.
- ❖ Airline, Clearview, Causeway, Veterans, Severn, W Esplanade, W Napoleon, W Metairie
- ❖ Airline where it turns into Tulane – the interstate on-ramp makes this too dangerous
- ❖ Williams Boulevard and West Esplanade
- ❖ Clearview – too much traffic with no safe way to get across I-10 and Earhart, though it is ideally situated and connects to the Clearview Mall, Elmwood, and the Huey Long Bridge.
- ❖ Lapalco, Manhattan, Barataria, Belle Chasse Highway, and Terry Parkway contain too much speeding traffic and motorists that don't follow the 3 foot rule.
- ❖ Terry Parkway. There is no shoulder or bike lane and it is a busy street. I often get off my bicycle and walk on the sidewalk since it is so unsafe to ride a bicycle on Terry Parkway.
- ❖ Veterans, because the traffic is wild and there is no bicycle infrastructure. The same with Manhattan Boulevard on the West Bank.
- ❖ Any street with four or more lanes is a deathtrap with aggressive drivers who act like cyclists are their mortal enemies. Heavily used two-lane streets aren't much better. If it's not a cul-de-sac or a dead-end, it's not usually safe to bike on it in Jefferson Parish.
- ❖ Airline Highway – no access for bicycles. Very busy at times, with traffic often passing at more than 40 mph speed limit. No shoulder, and far right portions, where bikes must travel often have gravel and other debris. There was a death involving a bicyclist at Airline and Arnoult last spring. (in a.m. rush hour, this bicyclist probably should have crossed at Severn red light)
- ❖ West Esplanade is tough because it lacks shoulders. It is also impossible to ride Clearview to the river due to heavy traffic and lack of a shoulder.
- ❖ From Jean Lafitte Park to Ames Boulevard - no shoulder and not bike friendly people.
- ❖ Behrman Highway, Belle Chasse Highway, Terry Parkway

As in the survey comments referenced earlier, the **lack of north-south routes on the East Bank** was called out many times in the public meeting mapping exercise and the citizen survey. Residents suggested places for north-south connectivity in need of further improvement or that are immediate safety concerns.

- ❖ Create a north-south connection near Clearview Parkway or Transcontinental
- ❖ Create a north-south connection near the Jefferson-Orleans Parish Line
- ❖ Create a north-south route parallel to Central Avenue or Clearview Parkway
- ❖ Create a lake to river connection along the Parish Line Canal (in Kenner)
- ❖ Improve the Cleary overpass
- ❖ Earhart Expressway is a barrier; need to improve the underpass at Central Avenue
- ❖ Not enough safe ways to cross over or under Interstate 10 or Veterans Boulevard

- ❖ It would be nice to have a few safe ways to get from the river to the lake. There's no safe north-south route. Clearview, Causeway, Dickory/David all have bridges that aren't usable by cyclists. It's tough to find any place to cross (a) RR tracks, (b) Interstate, (c) Veterans.
- ❖ Something from the Mississippi Levee path to the lake.
- ❖ Add or improve any suitable crossing over or under Interstate 10. Hang a bike lane on the Cleary Overpass. Same for David Drive. Look at Jefferson Davis bridge in New Orleans for example of one way to do it. Transcontinental crosses under I-10 with no provisions for cyclists. Between David Drive and Williams Blvd there is no way to cross I-10. Williams is a challenge, Loyola less so, but pretty far away from Williams and I-10. Causeway and Clearview are probably lost causes for cycling possibilities. Oaklawn at I-10 Service Road North is the only good way to get under I-10 with existing bike path to parish line.
- ❖ Most Jefferson Parish streets are not good because there are no bike lanes or even a shoulder to ride on. Also it is almost impossible to go North-South because of I-10.

Other specific routes in the mapping exercise were identified as needing bicycle infrastructure:

- ❖ Palmetto – West Esplanade – Esplanade Mall – Duncan – Williams Boulevard – Airline Highway
- ❖ Airport Access Road – parallel path to I-10 – Canal Boulevard – Academy Drive
- ❖ West Napoleon – Power Boulevard – lakefront
- ❖ Taylor – 6th Street – Roosevelt/Filmore – 23rd – Lake Pontchartrain
- ❖ Central – Airline – Transcontinental – Avron – Clearview
- ❖ West 3rd St – Jefferson Highway
- ❖ Evans – Edwards (Elmwood area)
- ❖ St. George – Clearview Parkway
- ❖ Cleary Avenue between Airline Highway and Lake Pontchartrain
- ❖ Acadia – Kawanee
- ❖ Transcontinental (all of it)
- ❖ Continue the planned route that ends at Metairie Road further south to the river via Monticello
- ❖ Metairie Road – Metairie Lawn – Napoleon
- ❖ Jefferson Highway & Labarre
- ❖ Bonnabel (all of it)

CONNECT AREAS DIVIDED BY WATER

The Mississippi River notably divides Jefferson Parish into two distinct areas, East Bank and West Bank. A network of drainage canals also function as barriers to cycling in the parish. These water barriers are regulated by multiple government agencies, but have adjacent right-of-way that could be used for innovative bicycle infrastructure. Jefferson Parish has a great opportunity to use new techniques and bike facility design to simultaneously preserve the canal system and improve intermodal connectivity.

The drainage canals and the Mississippi River are cited frequently in comments as barriers to cycling in Jefferson Parish:

- ❖ The drainage canals present a grid-like structure of blockades for cyclists
- ❖ Bicycle infrastructure requested on 4th Street (West Bank) from Huey P. Long Avenue across the canal to 1st Street
- ❖ Off street bike path requested from Manhattan Blvd and 9th Street to Peters Road and Lapalco Blvd along the canal/bayou
- ❖ Access to the Gretna/Jackson Avenue ferry is needed
- ❖ Bicycle access to the Crescent City Connection Bridge is needed
- ❖ Bicycle access to the Huey P. Long Bridge and improvements to the connections on either side of the bridge are needed
- ❖ Bicycle infrastructure requested over the canal on Metairie Heights Road
- ❖ More river crossings needed
- ❖ Access from Westwego/Marrero to Harvey Canal

- ❖ This plan should address the importance of ferries, and advocate for more crossings. Ferries are the most convenient, and practically the only way to cross the river.
- ❖ The canal network on the East Bank is ideal for off-street facilities using existing right of way
- ❖ Most neighborhood streets are fine except for drainage canals and major highways which can act as blockades to an otherwise good experience. Northern Jefferson Parish is a series of grids for the most part with plenty of relatively quiet backstreets to enjoy of commuting or pleasure. Until the rider encounters a huge drainage canal with no way to cross except a huge detour to a major arterial road where a bridge may be found.
- ❖ Bike path network along the canals.
- ❖ Harvey Canal Bridge on Lapalco Blvd
- ❖ Some type of river crossing (bridge, shoulder, or ferry at Sala Avenue to Audubon Park).
- ❖ When and where new roads were built or planned along canals or new canal work is done, why not build a bike path along those canals? For example, canal right of way from CN railroad to I-10 just west of David Drive. A working grid of bicycle routes could be designed in East Jefferson by using existing canal banks and converting some 20 mph roads into one way streets, like Haring Road and Green Acres.
- ❖ Bike path hung across the Huey P Long Bridge? Though maybe a little noisy and some vibrations, this would provide great views and would give some good uphill/downhill exercise. Safe access to the path would obviously be essential.

CONNECT JEFFERSON PARISH TO NEW ORLEANS

In the post-Katrina metro area, residents often cross parish lines to work, shop, and socialize. Geographic barriers between parishes necessitate that these trips occur in a private vehicle, taxicab, or on public transit, instead of by bicycle. On the East Bank, the 17th Street Canal serves as a major north-south barrier to connecting Jefferson and Orleans Parishes. On the West Bank, the Donner Canal similarly serves as barrier between Orleans and Jefferson.. Other areas along the parish line are similarly difficult to navigate by bicycle. Improving the connections between Jefferson and Orleans was a recurring request:

- ❖ I live at City Park and want to ride to Severn Avenue, how can this route be improved?
- ❖ Bicycle infrastructure needed on Jefferson Highway from Powerline Drive to the Orleans Parish line
- ❖ Create a connection to New Orleans on Whitney Avenue to LB Landry Avenue
- ❖ Create a connection from Orleans Parish to the East Bank River Levee Trail
- ❖ Create a complete north to south connection near the Jefferson – Orleans Parish line
- ❖ Open the lakefront for access to Orleans Parish
- ❖ Connect the [future] Lafitte Greenway [in New Orleans] to the potential railroad corridor in Old Metairie
- ❖ Better link between Orleans Parish and Jefferson Parish
- ❖ If the railway back belt in Metairie is rerouted, could the current tracks be turned into a bike trail?
- ❖ Once I biked from Mid City to Lakeside Mall along Metairie Road to Carrollton to Canal Boulevard to I-10 Service Road to Veterans. It was horrible. There should be better bicycle connectors and routes between the parishes.

IMPROVE AWARENESS AND SAFETY

Throughout this planning process, residents have continually emphasized the need for safety improvements and awareness of safe cycling techniques among drivers, other cyclists, and police. The existing levee paths are popular among cyclists because they are safe and separated from vehicular traffic, a fact noted in many comments. Others relayed specific situations where they felt unsafe or were injured while cycling in Jefferson Parish, such as along Bonnabel Boulevard. Residents have suggested signage improvements and education & marketing programs as ways to improve the safety of bicycling in Jefferson Parish.

- ❖ My biggest concern is lack of education on the part of drivers! Sadly, a lot of "casual" cyclists are totally uneducated - like riding on Veterans against traffic. So unsafe! And wrong.
- ❖ I don't ride now because of lack of safety for cyclists. People need to be educated regarding bicycle laws.

- ❖ Williams Boulevard bike lanes should be a priority based on the number of people riding sidewalks because of the amount of traffic. Was brushed by a car when returning from a grocery store on bike. I will not ride to store on Williams again.
- ❖ Need to have some one enforce or train bikers on the levee that they do not own the area and they do not have the right of way and they need to be considerate of walkers and joggers.
- ❖ For Jefferson Parish, it would safer to have wider sidewalks for biking than creating bike lanes in the street.
- ❖ Most of our streets are bad for bicycling because the lack bike lanes and shoulders.
- ❖ Most people/drivers are not educated in the laws of the road and do not know that cyclists have the same rights to the road as cars do, they think you belong on the sidewalks or not on a bike at all.
- ❖ It is not possible to travel down Airline where it turns into Tulane. If you are in the right hand lane cars trying to get to the interstate on-ramp make it too dangerous. I used to move to the middle of the road on Airline to avoid the on-ramp issue while going to Tulane, but then a police officer threatened to give me a citation for not being on the right side. He refused to listen to my explanation so I stopped traveling that route as well.
- ❖ I do not ride my bicycle on the sidewalks since I think that is illegal and it is also unsafe to ride your bicycle on sidewalks for the people that are walking.
- ❖ Williams Blvd needs a bike lane. I saw a priest on a bike get run over by an automobile because the driver cut him off at the intersection of West Napoleon and Williams. I have been driving my bike to the river levee after witnessing the accident. There are many workers riding on sidewalks and dangerous intersections down Williams. I got brushed by an automobile on Williams who shouted at me that bikes belong on the sidewalk. A sign indicating 3 ft clearance to bikes would help if there are no bike lanes.
- ❖ Regardless of routes, safety education/awareness is a nesscessity and should be a priority.
- ❖ I never bike to Jefferson Parish because of the lack of bike infrastructure. There is also a fear of fast moving motorists. More mixed-use development would be very welcome.
- ❖ Why not have PSAs about bicycle safety on TV/Cable. Signs and street stops for bicycle use on Veterans Blvd. No grid pattern to connect lakefront and river levee. Easy conection between existing parish bike transportation and proposed routes.
- ❖ Currently having to use the back streets. Would be great to feel safe riding on main roads.
- ❖ I live in Orleans Parish and would love to be able to bike into Jefferson Parish with safely designed streets. Currently it is very intimidating to bike in Jefferson. Consider bicycle boulevards and networks that encourage all types of cyclists, not just the hardcore cyclists. Design networks for the "willing but weary" cyclist.
- ❖ My biggest concern is impaired drivers who use cell phones and hand held devices. I would like to travel between the lake and river levee. Now I have to put my bikes in the car and park at Jefferson Playground or Williams Blvd to use the river levee.
- ❖ I have a 3 year old niece and a 2 year old nephew, both have bicycles and I would like to take them places to ride their bicycles and not have worry about cars.
- ❖ Riding down Bonnabel on the Old Metairie side, we were fussed at by about 10 people! We were hugging the right side of the road, staying very close to the parking lane, was there something we did wrong?? We had bright clothes, and it was daytime. I'm thinking signage would be a welcome thing in Metairie, similar to what they did recently in Orleans, about the 3 foot rule just to inform people of the law.

APPENDIX D: LAND USE RECOMMENDATIONS

BICYCLE PARKING DEFINITIONS

Based on the American Association of State and Highway Transportation Officials (AASHTO) 2012 and Association of Pedestrian and Bicycle Professionals 2010 standards for bicycle facility design, the following definitions are recommended to clarify and guide future parking requirements:

Bicycle Cage An area of long-term bicycle parking for residents who live in apartment buildings, employees who work in large buildings, or students. Bicycle cages are often installed in a large indoor space with key or code access, in parking lots for employees, or on school playgrounds.

Bicycle Corral On-street bicycle parking areas generally achieved by replacing a single car parking space with 8 to 12 bicycle parking spaces. These are generally located in commercial areas where bicycle parking on the sidewalk interferes with pedestrian traffic.

Bicycle Locker A bicycle storage space used for long-term bicycle parking and large enough to house a single bicycle that may be secured and accessed by a single user.

Bicycle Parking Space A parking space in an accessible area within which one bicycle can be stored and secured in an upright position with both wheels on a stable surface.

Bicycle Rack A bicycle storage system that comes in a variety of shapes and styles and are primarily used for short-term bicycle parking in public places.

Bicycle Room An area of long-term bicycle parking for residents who live in apartment buildings, employees who work in large buildings, or students. Bicycle rooms are often installed in a large indoor space with key or code access and are primarily used for residents in multi-family residential buildings.

Long-term Bicycle Parking An area of bicycle parking spaces located within a facility that is enclosed, limited-access, and protected from the elements. Examples include bicycle rooms within a building or garage, bicycle sheds, bicycle cages, and bicycle lockers. It is intended for use by building occupants such as residents or employees and must be conveniently accessible to those users, although authorized visitors may also use it. It should primarily serve trips of more than two hours.

Short-term Bicycle Parking An area of bicycle parking spaces located in publicly-accessible areas, near the entrances to buildings or on public sidewalks. These areas generally consist of either covered or uncovered outdoor, secured bicycle racks. It is intended for use by visitors, building occupants and the general public. It should primarily serve trips of about two hours or less, as the key goal is convenience and proximity to the building entrance, although it may be used for longer periods of time.

LOCATIONS

After availability, convenience is one of the most important factors for cyclists. Fifty feet is generally considered the maximum distance bicyclists are willing to walk to lock their bikes up to a rack before looking for another object to lock to. Many jurisdictions, including Fort Worth and New Orleans, require that the furthest bicycle parking space be no further away from the entrance than the nearest vehicle parking space. The following provides proposed language for the location of both short-term and long-term bicycle parking to be included in the Jefferson Parish Comprehensive Zoning Ordinance.

Recommended Language:*Location standards for Short-term Bicycle Parking*

- Short-term bicycle parking areas shall be located within fifty feet of pedestrian-accessible entrances, or no further than the nearest motor vehicle parking space, but not in the way of pedestrian traffic. Buildings with multiple entrances should have parking spaces at each entrance when possible.
- If more than ten spaces are required, the additional spaces may be distributed at a greater distance for convenience, so long as at least ten spaces are located within fifty feet of the entrance. All spaces should be no more than a 30 second walk (120 feet) from an entrance.
- Short-term bicycle parking areas near the building entrance should be located in a highly visible and sheltered area and should not impede the travel of customers to access the storefront.
- Short-term bicycle parking shall be accessed by a clear, convenient path of at least four feet in width between the public way and parking.
- Required short-term parking spaces may be satisfied by bicycle racks installed in the public way (i.e. sidewalk) at the owner's expense, subject to approval by the Parish.

Location standards for Long-term Bicycle Parking

- Long-term bicycle parking must be located within the same building as the use being served, or within a separate structure that is within fifty feet of a pedestrian entrance to any use being served.
- Long-term bicycle parking shall be accessed by a clear, convenient path of at least five feet in width between the public way and parking.
- Access to long-term spaces within a building, but not on the ground floor, shall be provided by elevator or via a stairway of no more than nine steps.

STANDARDS

Providing bicycle parking benefits business by attracting bicycle-riding customers, controlling where bikes are parked to present an orderly appearance, and preventing bikes from blocking walkways and streets. Carefully planned racks announce to customers that this business is environmentally aware and supports multiple forms of transportation. Bicycle parking areas should have sufficient parking spaces on sturdy bicycle racks, in a volume adequate to serve the building. The provision of inadequate or insufficient bicycle parking is also a concern for the Parish, as it increases pressure to accommodate bicycles on the public right-of-way, where space is already limited. The following provides general guidelines and a checklist for placement of bicycle parking facilities, which should be incorporated into the Jefferson Parish Comprehensive Zoning Ordinance:

Accessibility: Racks should be placed close to the entrance – a maximum distance of fifty feet – and buildings with multiple entrances should have racks at each entrance.

Visibility: Racks should be easily spotted by cyclists as they arrive from the street. When bicycle parking areas are placed in areas less visible, signage should be used to direct cyclists.

Security: Racks should be well-lit and in view of passers-by, retail activity, and when practical, in front of building windows to deter thieves and vandals. Where feasible, racks should be covered by roof overhangs for protection from sun and rain.

Avoid Conflict with Pedestrians: Locate racks so bicycles do not block walkways, ADA facilities, storefronts or roadways. Bicycles occupy about twelve square feet, and a space is generally 2'x6'.

Optimization of Racks: Bicycle parking areas should be kept clear of obstructions in order to provide optimal safety and desired use of the parking areas.

Long-term Bicycle Security: Long-term bicycle parking (i.e. bike rooms or cages) can be achieved in at least one of the following situations: 1) in a locked room or area enclosed by a fence with a locked gate; 2) within view of an attendant or security guard; 3) in an area that is monitored by a security camera; or 4) in a location that is visible from employee work areas.

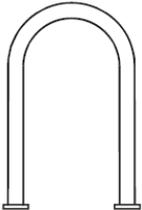
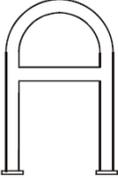
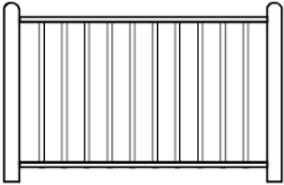
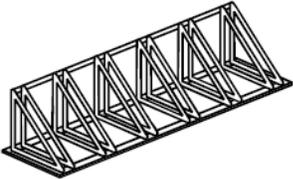
Bicycle Parking Checklist

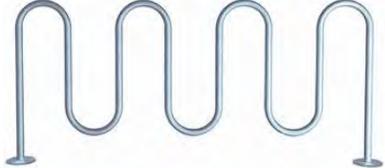
1. Is there at least three feet of clearance between the bike rack and structures or other racks – enough room to properly place bicycles in the rack?
2. Does the bike rack support the bicycle frame in at least one place (support at two places is preferable)
3. Are pedestrian walkways clear when bicycles are in the rack?
4. Is the bike rack accessible from the street?
5. Is the bike rack conveniently located to the building entrance and visible from the building?
6. Are the parked bikes protected from pedestrian and vehicular traffic?
7. Is there capacity to park the number of bicycles expected at any given time?
8. Is the rack anchored so that it cannot be moved?
9. Is long-term, secure bicycle parking available for employees?

RACK DESIGN

Bike racks will be used only when they provide stability and security. Racks should support the bike frame in at least one place (two places is best) so bikes don't fall over. Racks that hold only the front tire are not recommended because bikes easily fall over, damaging the wheels or other parts of the bike. When only the front wheel can be locked to the rack, it is also easy to release the wheel and steal the bike. Racks should always be anchored so that they don't move. The Table 13 provides a visual representation and explanation of the best racks for bicycle parking, which may be included in the Jefferson Parish CZO.

Table 13 Bicycle Rack Design Recommendations

RECOMMENDATION	STYLE	CONSIDERATION
HIGHLY RECOMMENDED		Inverted U racks allow users to secure 2 bicycles with standard locks. Simple and functional, the racks have no edges, seams or hardware to pose a hazard or become unsightly. A properly finished rack will not mar the bicycle frame. The rack provides parking without interfering with sidewalk or storefront space.
RECOMMENDED		Post and loop racks allow users to secure 2 bicycles with standard locks. These are simple and functional, and a properly finished rack will not mar the bicycle frame. These are often the rack of choice for decorative embellishment. The rack provides parking without interfering with sidewalk or storefront space.
RECOMMENDED		"A" racks allow users to secure 2 bicycles with standard locks. Like the Inverted U rack, these are simple and functional and a properly finished rack will not mar the bicycle frame. The rack provides parking without interfering with sidewalk or storefront space.
NOT RECOMMENDED		Comb racks are not recommended because there are few places to secure the lock to the frame to store it. Further, these types of racks do not offer much support for the bicycle. A domino effect is likely to knock over all the bikes when one falls.
NOT RECOMMENDED		Toast and wheel-secured racks provide no support for the bicycle frame, making it more likely the bicycle will fall over. Securing only the wheel increases the likelihood of bending the wheel. The advertised capacity of these racks is often higher than the practical capacity.

<p>NOT RECOMMENDED</p>		<p>The wave-style rack can accommodate several bikes and support the frame at one place. However, cyclists commonly use the rack as a single inverted “U” (i.e. placing the bikes alongside the rack) that often limits the capacity of the rack to 2 bikes.</p>
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SIGNAGE

Recommended Language: Unless Bicycle parking spaces are clearly visible from an entrance, a sign indicating their location shall be prominently displayed from outside the main entrance to the building or facility, and additional signs shall be provided as necessary to ensure easy way finding. Bicycle parking signs shall also be displayed on or adjacent to any indoor room or designated for long-term bicycle parking.



When bicycle parking is located in areas that are not immediately noticeable upon the approach to the development, signage should be installed to inform bicyclists how to access the facilities. Outdoor signs denoting bicycling parking areas need to be large enough to be easily seen and understood by cyclists. The Manual on Uniform Traffic Control Devices (2009 ed.), published by the U.S. Department of Transportation, recommends a minimum size of 12”x18” for outdoor bicycle parking signs. Standard letter visibility charts indicate that every one-inch of letter height provides ten feet of readability with the best impact. For example, two-inch tall letters make the best impact within twenty feet, though they are readable from a further distance.

INCENTIVES

Some cities studied offer incentives for developers to help cover the costs of installing bicycling parking. Incentives most often allow developers to replace car parking with bicycle parking. The most noticeable example of this is Portland, OR, which allows new developments to replace up to twenty-five percent of the required automobile parking with bicycle parking. Table 14 Possible Incentive Language for Bicycle Parking provides some examples of incentive language.

Table 14 Possible Incentive Language for Bicycle Parking

COMMUNITY	INCENTIVE
Chicago	“A nonresidential use may use up to two vehicle parking spaces required under this Chapter as space provided for bicycling parking”
Portland	“Bicycle parking may substitute for up to 25 percent of required parking. For every five non-required bicycle parking spaces that meet the short- or long-term bicycle parking standards, the motor vehicle parking requirement is reduced by one space. Existing parking may be converted to take advantage of this provision.”

Seattle

"For every four covered bicycle parking spaces provided, the total parking requirement shall be reduced by one space, up to a maximum of five percent of the parking."

APPENDIX E: FUNDING SOURCES

A variety of local, state and federal funding sources are available to support both bicycling infrastructure and non-infrastructure in Jefferson Parish. This section summarizes these sources and offers details on availability and the types of projects eligible for them.

- Table 15: Summary of Federal Funding Authorization: MAP-21
- Table 16: Federal Funding Programs under MAP-21
 - Transportation Alternatives
 - National Highway Performance Program
 - Surface Transportation Program
 - Recreational Trails Program
 - Safe Routes to School
- Table 17: State and Local Funding Sources
 - Jefferson Parish Capital Budget
 - State Capital Outlay Budget
- Table 18: Past Funding Sources
 - Transportation Enhancements
 - High Priority Projects (also referred to as DEMO)
- Table 19: Parish Funding for Bicycle/Pedestrian Projects
 - Transportation Enhancements Funding up to MAP-21
 - Recreational Trails
 - Jefferson Parish DEMO Funding

Table 15: Summary of Federal Funding Authorization: MAP-21

Federal Funding Source	Description	Applicability for Bicycle Facilities	Funding Availability
<p>MAP-21 - Moving Ahead for Progress in the 21st Century http://www.fhwa.dot.gov/map21/ http://www.fhwa.dot.gov/map21/summaryinfo.cfm</p>	<p>Funds surface transportation programs at over \$105 billion for fiscal years 2013 and 2014.</p> <p>Contains eight core formula programs:</p> <ul style="list-style-type: none"> • National Highway Performance Program (NHPP) • Surface Transportation Program (STP) • Transportation Alternatives (TAP) • Highway Safety Improvement Program (HSIP) • Congestion Mitigation and Air Quality Improvement Program (CMAQ) • Railway-Highway Crossings (set-aside from HSIP) • Metropolitan Planning Construction of Ferry Boats and Ferry Terminal Facilities <p>Table 16 describes the first three programs, the Recreational Trails Program (RTP) and Safe Routes to School (SRTS).</p>	<ul style="list-style-type: none"> • TAP is the primary program for funding bicycle and pedestrian projects • TAP funding is derived from the NHPP, STP, HSIP, CMAQ and Metropolitan Planning programs. 	<p>TAP Distribution Criteria: <i>50% of Funding by Population</i></p> <ul style="list-style-type: none"> • State DOTs must distribute funds according to the share of population within the state: • For areas with a population over 200,000, funds will be sub-allocated to MPOs. The MPOs must then run a grant competition within its area. • For areas with a population between 5,000 and 200,000, the state will distribute through a competitive grant program. • For areas with a population under 5,000, the state will distribute through a competitive grant program. • None of these funds may be transferred by the DOT. <p><i>50% of Funding by Grant Program</i></p> <ul style="list-style-type: none"> • The DOTs are required to run a grant program to distribute the other 50%. Only eligible entities may apply. State DOTs are not eligible. • State DOTs may transfer all of this pot to other highway uses. If they do, there will be no grant program. <p>Local Match Criteria:</p> <ul style="list-style-type: none"> • 80% federal funding with 20% local match (unless otherwise noted)

Table 16: Federal Funding Programs under MAP-21

MAP-21 Program	Description	Applicability for Bicycle Facilities	Funding Availability	Jefferson Parish Bike/Pedestrian Projects
<p>Transportation Alternatives (TAP) (Formally Transportation Enhancements) http://www.fhwa.dot.gov/map21/tap.cfm</p>	<p>Provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for the planning, design or construction of boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.</p>	<p>TAP encompasses most activities previously funded under the Transportation Enhancements, Recreational Trails, and Safe Routes to School programs under SAFETEA-LU, specifically:</p> <ul style="list-style-type: none"> • Construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other non-motorized 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. • Construction, planning, and design 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. • Conversion and use of abandoned railroad corridors for trails for pedestrians, bicyclists, or other non-motorized transportation users. 	<p>State of Louisiana Share:</p> <ul style="list-style-type: none"> • Fiscal Year 2013: \$11.8 million • Fiscal Year 2014: To be determined 	<ul style="list-style-type: none"> • To Be Determined by LADOTD and RPC

MAP-21 Program	Description	Applicability for Bicycle Facilities	Funding Availability	Jefferson Parish Bike/Pedestrian Projects
<p>National Highway Performance Program (NHPP) http://www.fhwa.dot.gov/map21/guidance/guidenhpp.cfm</p>	<p>The purposes of the National Highway Performance Program (NHPP) are (1) to provide support for the condition and performance of the National Highway System (NHS); (2) to provide support for the construction of new facilities on the NHS; and (3) to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in a State's asset management plan for the NHS.</p>	<ul style="list-style-type: none"> • Bicycle transportation and pedestrian walkways including new or improved lanes, paths, or shoulders for use by bicyclists, traffic control devices, shelters, or bicycle parking. The project or activity must be associated with an NHS (National Highway System) facility. • NHPP funds may be obligated only for a project on an "eligible facility" that is a project, part of a program of projects, or an eligible activity supporting progress toward the achievement of national performance goals for improving infrastructure condition, safety, mobility, or freight movement on the NHS. • Projects must be identified in the RPC's Transportation Improvement Program and be consistent with its Metropolitan Transportation Plan. 	<p>State of Louisiana Share:</p> <ul style="list-style-type: none"> • Fiscal Year 2013: \$363.3 million • Fiscal Year 2014: To be determined 	<ul style="list-style-type: none"> • To Be Determined by LADOTD and RPC
<p>Surface Transportation Program (STP) http://www.fhwa.dot.gov/map21/guidance/guidestp.cfm</p>	<p>The Surface Transportation Program (STP) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.</p>	<ul style="list-style-type: none"> • Carpool projects, fringe and corridor parking facilities and programs, including electric and natural gas vehicle charging infrastructure, bicycle transportation and pedestrian walkways, and ADA sidewalk modification. 	<p>State of Louisiana Share:</p> <ul style="list-style-type: none"> • Fiscal Year 2013: \$186.9 million • Fiscal Year 2014: To be determined 	<ul style="list-style-type: none"> • To Be Determined by LADOTD and RPC

MAP-21 Program	Description	Applicability for Bicycle Facilities	Funding Availability	Jefferson Parish Bike/Pedestrian Projects
<p>Recreational Trails Program (RTP) https://www.fhwa.dot.gov/environment/recreational_trails/ http://www.fhwa.dot.gov/environment/recreational_trails/overview/map21.cfm</p>	<ul style="list-style-type: none"> The Recreational Trails program provides funds to the States to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. MAP-21 authorized funding for the Recreational Trails Program (RTP) as a set-aside of the TAP (23 U.S.C. 213). The RTP funding is the same as the FY 2009 amount (unless the State opts out; see Funding Availability-Eligibility). 	<ul style="list-style-type: none"> Maintenance and restoration of existing recreational trails; Development and rehabilitation of trailside and trailhead facilities and trail linkages for recreational trails; Purchase and lease of recreational trail construction and maintenance equipment; Construction of new recreational trails, Acquisition of easements and fee simple title to property for recreational trails or recreational trail corridors; Assessment of trail conditions for accessibility and maintenance; Development and dissemination of publications and operation of educational programs to promote safety and environmental protection, (as those objectives relate to one or more of the use of recreational trails, supporting non-law enforcement trail safety and trail use monitoring patrol programs, and providing trail-related training), but in an amount not to exceed 5 percent of the apportionment made to the State for the fiscal year; and Payment of costs to the State incurred in administering the program, but in an amount not to exceed 7 percent of the apportionment made to the State for the fiscal year. 	<p>State of Louisiana Share:</p> <ul style="list-style-type: none"> Fiscal Year 2013: \$1,502,467 <p>Eligibility</p> <ul style="list-style-type: none"> No dedicated funding source; funding for RTP is a set-aside of TAP funding for the same amount as the FY 2009 amount Governors can opt out each year if they contact the Secretary of the US DOT 30 days prior to apportionments. Louisiana has preserved funding for this program for 2013. 	<ul style="list-style-type: none"> To Be Determined by LADOTD and RPC For previous RTP Projects see Table 19

MAP-21 Program	Description	Applicability for Bicycle Facilities	Funding Availability	Jefferson Parish Bike/Pedestrian Projects
<p>Safe Routes to School (SRTS) http://www.dotd.louisiana.gov/planning/highway_safety/safe_routes/</p>	<p>The purpose of this program is to enable and encourage children, including those with disabilities, to walk and bicycle to school; to make walking and bicycling to school safe and more appealing. Up to \$250,000 is available for infrastructure and \$50,000 in non-infrastructure costs per project.</p>	<p>- Pedestrian and bicycle safety and educational activities- Projects include both infrastructure (sidewalk improvements, traffic calming, pedestrian and bicycle facilities, etc.) and non- infrastructure (training and education materials, encouragement incentives, data gathering, law enforcement, equipment, etc.) projects.</p>	<p>Louisiana has dedicated nearly \$17 million in SRTS funds since 2005. There is no dedicated federal funding source specifically for SRTS, but the state may set aside TAP funds for this program. Louisiana has chosen to do so for 2013.</p>	<p>McDonoghville and Johnson neighborhood projects in Gretna include funding bicycle racks and cycling education programs at several participating schools, including William Hart Elementary, McDonogh 26 Elementary, St. Anthony, Shirley T. Johnson/Gretna Park, and Gretna Middle School.</p>
<p>Highway Safety Improvement Program (HSIP)</p>	<p>The Highway Safety Improvement Program (HSIP) aims to reduce traffic fatalities and injuries on all public roads, regardless of whether they are on the Federal-aid network. It is a flexible source that allows</p>	<p>- Any project or activity that addresses a demonstrated safety problem that is included in the State Strategic Highway Safety Plan</p>	<p>State of Louisiana Share:</p> <ul style="list-style-type: none"> • Fiscal Year 2013: \$42.2 million • Fiscal Year 2014: \$42.6 million 	<ul style="list-style-type: none"> • To Be Determined by LADOTD and RPC

Table 17: State and Local Funding Sources

Funding Source	Description	Applicability for Bicycle Facilities	Funding Availability	Jefferson Parish Use
Jefferson Parish Capital Budget http://www.jeffparish.net/index.aspx?page=130	Capital Improvements to Jefferson Parish facilities, infrastructure and streets based on 5 year capital plan, supported by sales taxes and operating budget transfers	May fund local bicycling facility projects or provide matching funds for state and federal projects	The 2013 Capital budget has allocated \$7.4 million for streets	The 2013 budget does not fund bicycling facilities
State Capital Outlay Budget http://www.doa.louisiana.gov/FPC/fpcSiteIndex.htm#CapitalOutlay	Each year the State Legislature passes a capital outlay budget, which the Office of Facility Planning and Control in the Division of Administration manages to fund infrastructure and facility projects across the state.	Bicycle facility projects on state roadways are eligible.	Varies	Jefferson Parish has requested \$65,000 in state capital outlay funds to support a shoulder bicycle lane on Leo Kerner Parkway.

Table 18: Past Funding Sources

Funding Source (No Longer Active)	Description	Applicability for Bicycle Facilities	Funding Availability	Jefferson Parish Bike/Ped Projects
Transportation Enhancements	Offer opportunities to help expand transportation choices and enhance the transportation experience through activities related to surface transportation, including pedestrian and bicycle infrastructure and safety programs.	<p>Pedestrian and bicycle facilities – Sidewalks, walkways, or curb ramps; bike lane striping, wide paved shoulders, bike parking and bus racks; off-road trails; bike and pedestrian bridges and underpasses</p> <p>Pedestrian and bicycle safety and educational activities – Campaigns promoting safety awareness; safety training activities & classes; training materials</p>	Funded through SAFETEA-LU	See Table 19
<p>High Priority Projects (HPP); also referred to as DEMO</p> <p>http://www.fhwa.dot.gov/safetealu/factsheets/highproj.htm</p>	This program designates funding for specific projects identified by the U. S. Congress in SAFETEA-LU. These projects can also be referred to as DEMO or Earmarked projects.	General High Priority Bicycle/Pedestrian Improvements- This program has many eligible types of projects. These projects include both infrastructure (roads, bridges, landscaping, pedestrian projects, etc.) and non-infrastructure (planning documents and engineering plans.) projects	The projects are identified by a Congressional law that sends the money to the FHWA for specific projects.	See Table 19

Table 19: Parish Funding for Bicycle/Pedestrian Projects

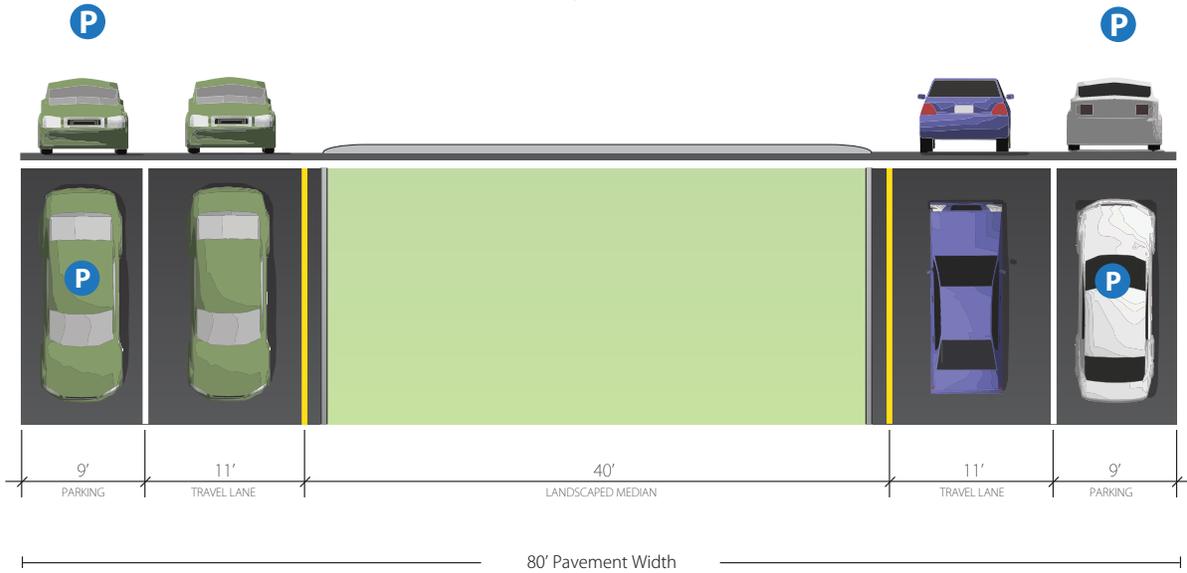
	Year	LA DOTD ID	Location	Federal Funds
TE Funding up to MAP-21				
Jefferson Linear Park & Bike	1995	H007460	Metairie	\$ 450,000
Jefferson Parish Levee Bikeway, Ph. II	1995	742-26-0024	Metairie	\$ 672,701
Jefferson Linear Park Bike Path, Phase II	1997	H007462	Kenner	\$ 778,877
Jeff Parish Linear Park Bike Path (Causeway-Suburban Canal)	1999	H007557	Metairie	\$ 710,b
Jeff Parish Linear Park Bike Path (Duncan-Rhine)	1999	H006515	Kenner	\$ 375,000
West Bank Mississippi River Levee Bike Path, Segment 1	2000	H07464		\$ 1,010,271
Jefferson Parish West Bank Levee Bike Path, Segment 2	2001	H007467		\$ 938,987
Gretna Shared Use Path	2001	H007466	Gretna	\$ 475,000
Jean Lafitte Downtown Sidewalk and Beautification Project*	2004	H002263	Jean Lafitte	\$ 179,000
Kenner Pedestrian/Bike Path Extension	2005	H007422	Kenner	\$ 233,300
Jefferson Lakefront Linear Park Bike/Ped Path, Phase VI-A	2006	H007473		\$ 373,000
Jefferson Lakefront Linear Park Bike/Ped Path, Phase VI-B	2007	H007474		\$ 280,000
Jefferson-West Bank Miss River Levee Multi-Use Path, Segment 3A (Klein Street to Douglas Lane)	2007	H007475		\$ 352,000
Fat City Streetscape Enhancements	2009	H007476	Metairie	\$ 1,045,000
Metairie Road Enhancement Project*	2009	H007477	Metairie	\$ 250,000
Jean Lafitte: Downtown Sidewalk, Phase 2*	2011	H009753	Jean Lafitte	\$ 319,600
Kenner: S Williams Blvd Streetscaping	2011	H009753	Kenner	\$ 423,400
Gretna Bicycle Access Improvements	2011	H009794	Gretna	\$ 303,700
Total				\$ 9,170,436
Recreational Trails Program				
Bucktown Connector Project Phase 2 (shared lanes)	2011	H009351	Metairie	\$ 112,000
North Kenner Bike Trail (Power Blvd. to lake)	2011	H009355	Kenner	\$ 112,000
Total				\$ 224,000
Jefferson Parish DEMO Funding				
Jefferson Linear Park – Duncan Canal to Huron Bike Path Reconstruction	2011	H006515	Kenner/Metairie	\$ 907,977
LA 1 Bike Path (Phase I) LM 1.42 - LM 4.610 (Grand Isle) Construction	2011	H009183	Grand Isle	\$ 1,171,998
Total				\$ 2,079,975

APPENDIX F: BIKEWAY RECOMMENDATIONS

PRIORITY BIKEWAY SECTIONS AND PLANS

The following sections illustrate the existing lane configurations (“before”) on priority roadway segments described in Goal 1, Objective 1, and proposed treatments. Concept diagrams for key intersections within these segments are also included.

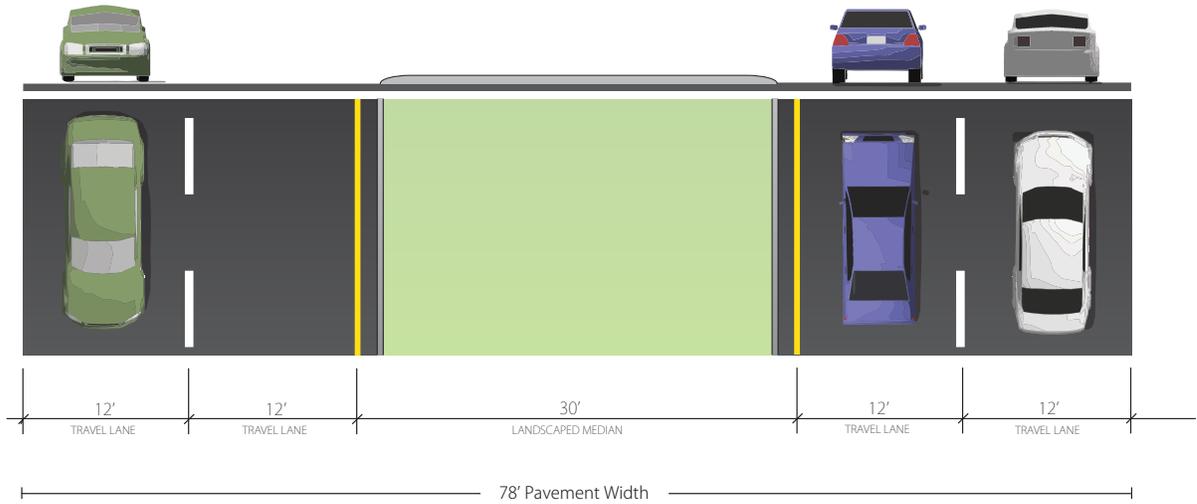
Gretna Boulevard Existing Conditions From Stumpf to Belle Chasse



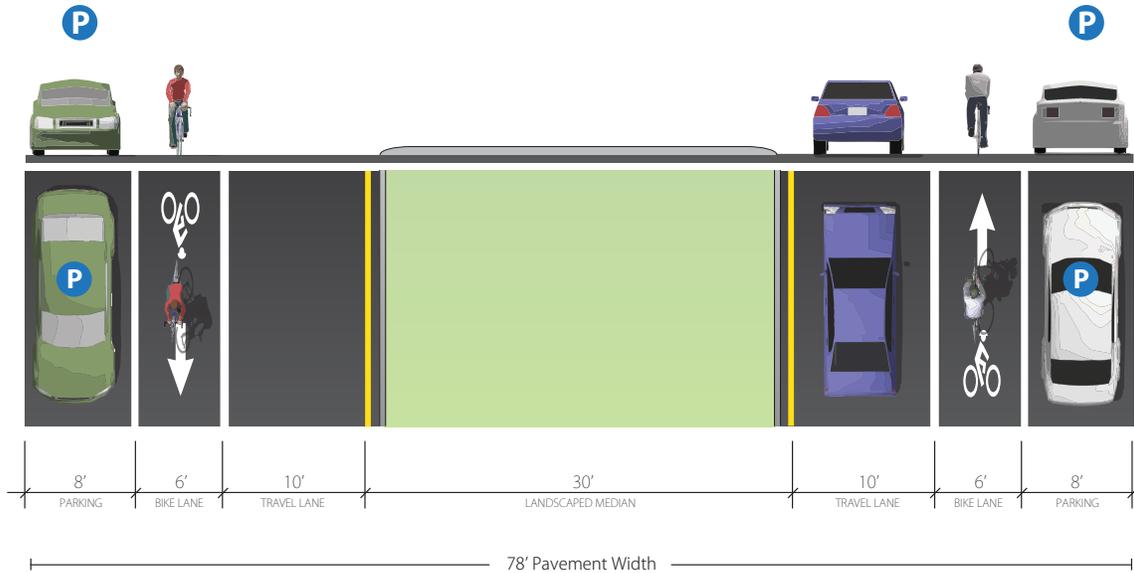
Gretna Boulevard Buffered Bike Lanes From Stumpf to Belle Chasse



Gretna Boulevard Existing Conditions From Belle Chasse to Manhattan

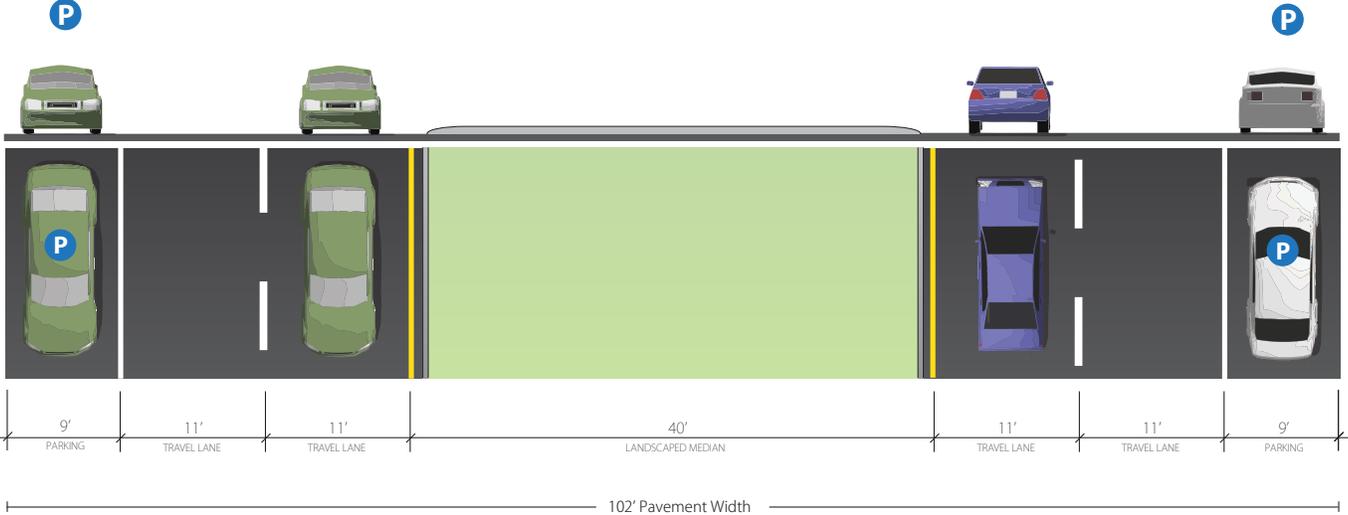


Gretna Boulevard Bike Lanes From Belle Chasse to Manhattan



Bonnabel Boulevard Existing Conditions

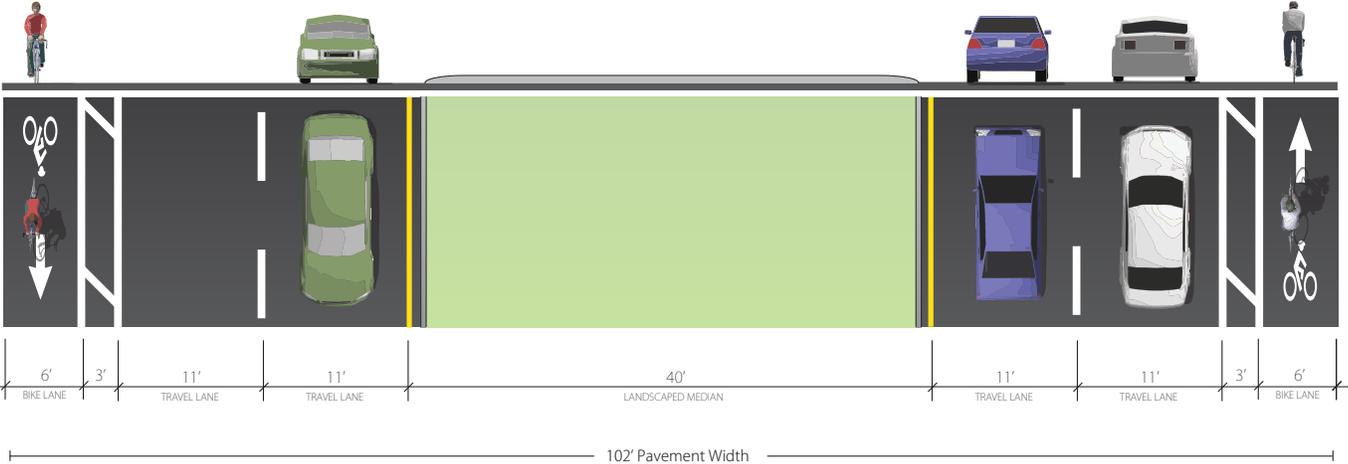
From Lakefront Trail to Metarie Rd



Bonnabel Boulevard Buffered Bike Lanes

From Lakefront Trail to Metarie Rd

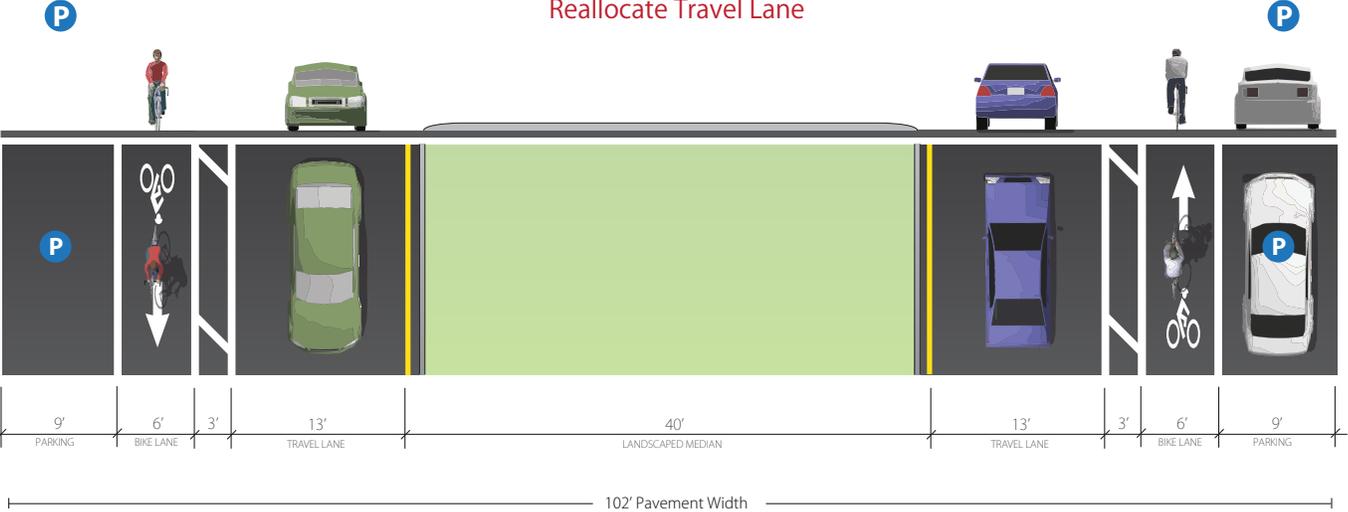
Reallocate Parking Lane



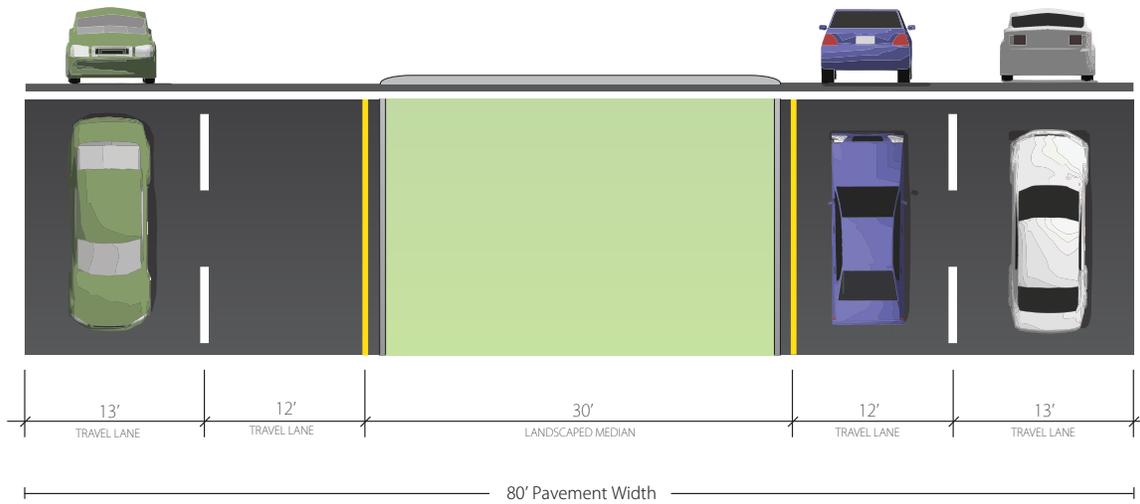
Bonnabel Boulevard Buffered Bike Lanes

From Lakefront Trail to Metarie Rd

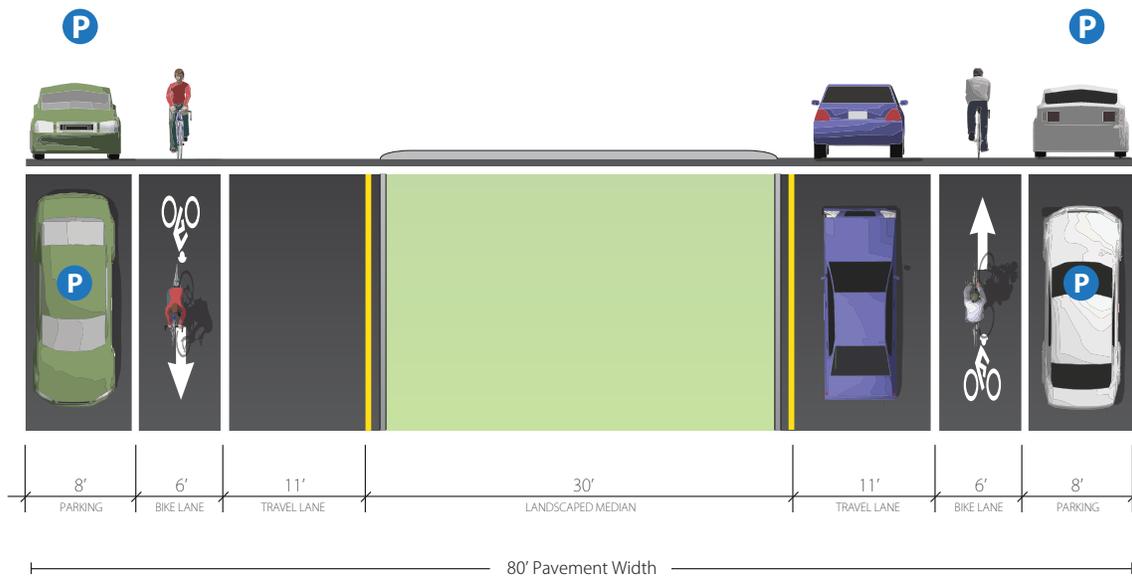
Reallocate Travel Lane



Transcontinental Boulevard Existing Conditions From Avron to Airline

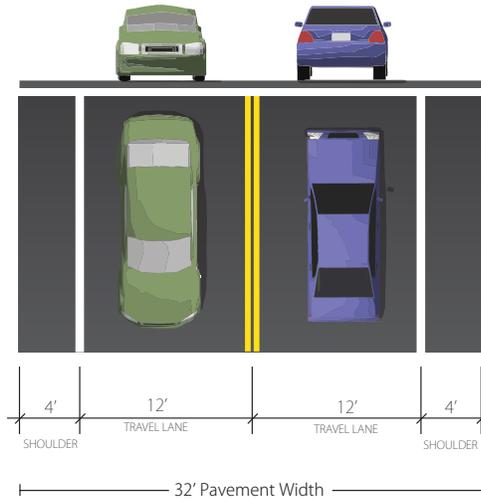


Transcontinental Boulevard Bike Lanes From Avron to Airline



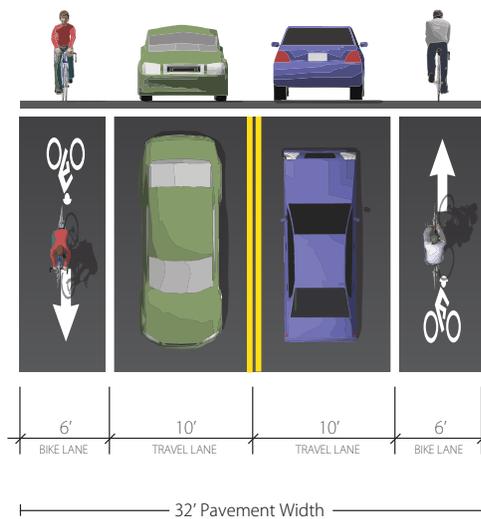
Destrehan Avenue Existing Conditions

From 4th to Westbank Expwy



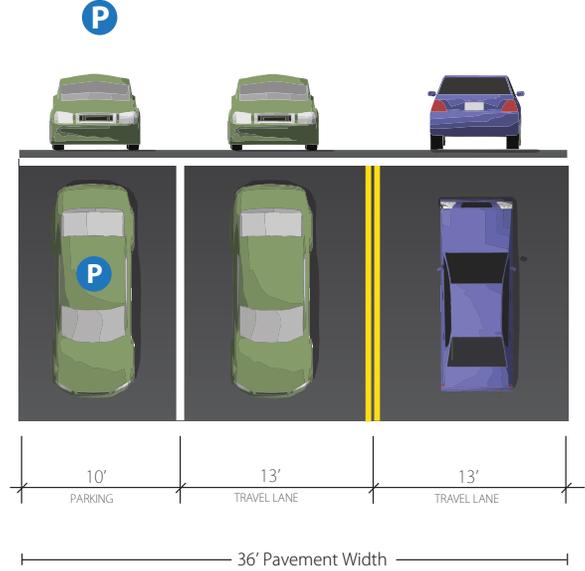
Destrehan Avenue Bike Lanes

From 4th to Westbank Expwy



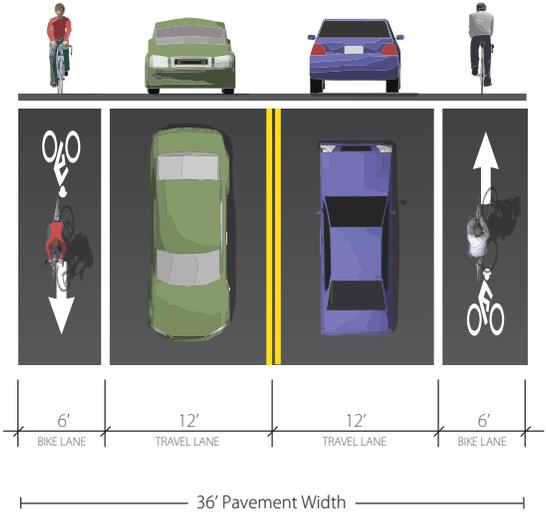
Destrehan Avenue Existing Conditions

From Max Dr to Leo Kerner Pkwy



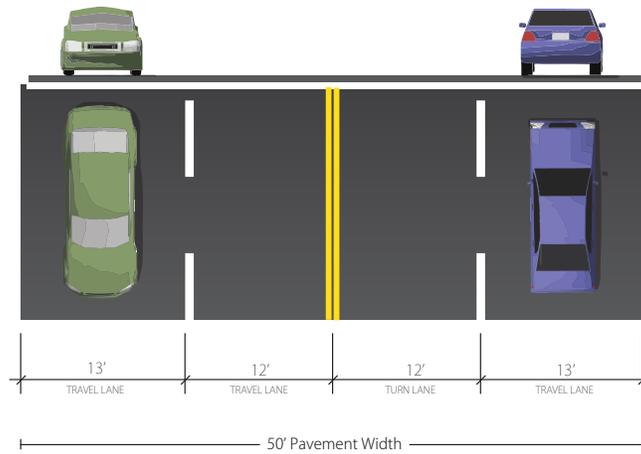
Destrehan Avenue Bike Lanes

From Max Dr to Leo Kerner Pkwy



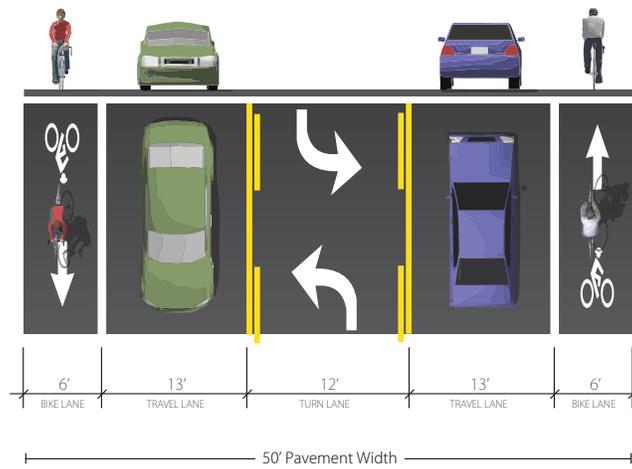
Destrehan Avenue Existing Conditions

From Westbank Expwy to Max Dr



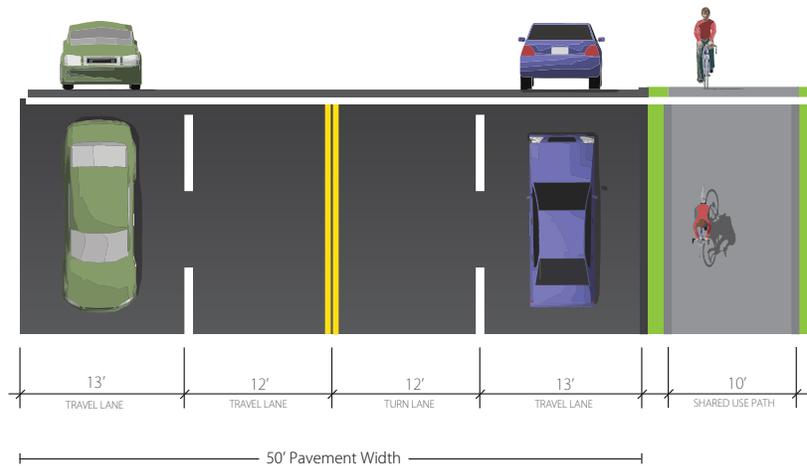
Destrehan Avenue Bike Lanes

From Westbank Expwy to Max Dr



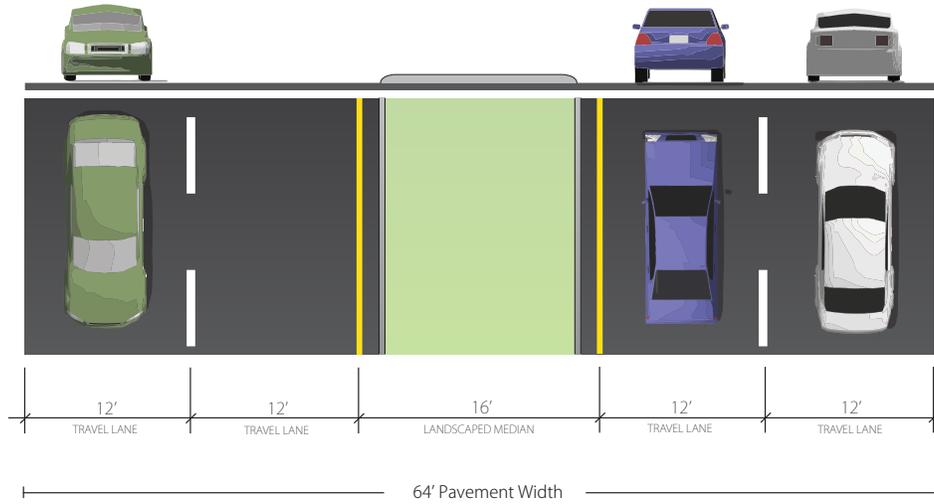
Alternate - Destrehan Avenue Off-street Facility (east)

From Westbank Expwy to Max Dr



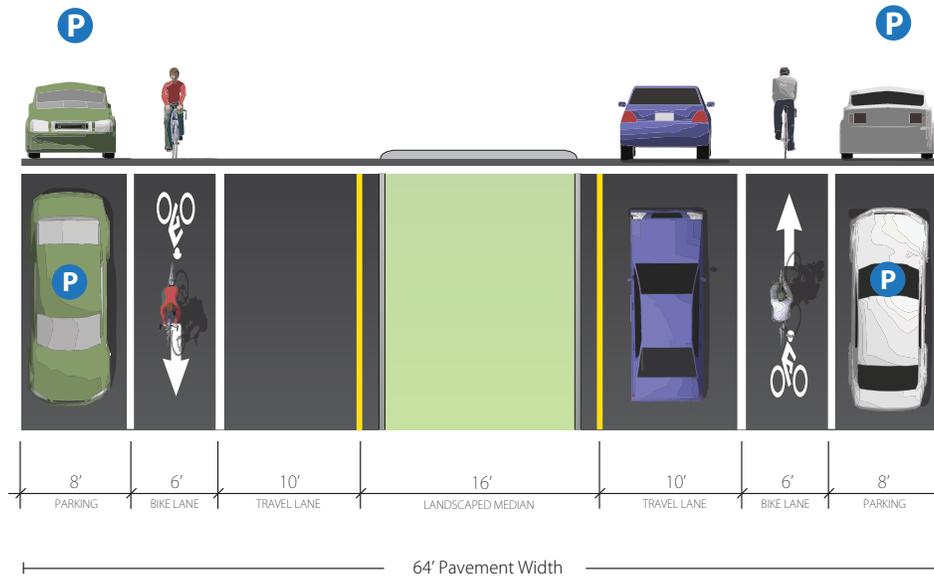
Westwood Dr Existing Conditions

From Westbank Expy to Lapalco



Westwood Dr Bike Lanes

From Westbank Expy to Lapalco



A new pathway on existing Parish ROW will provide access to 15th St for pedestrians and bicyclists.

A new shared use path provides a connection between proposed east/west bikeway.

High visibility crosswalks improve motorist awareness of marked crossing.

New signalized intersection. The addition of pedestrian countdown signals is preferred.

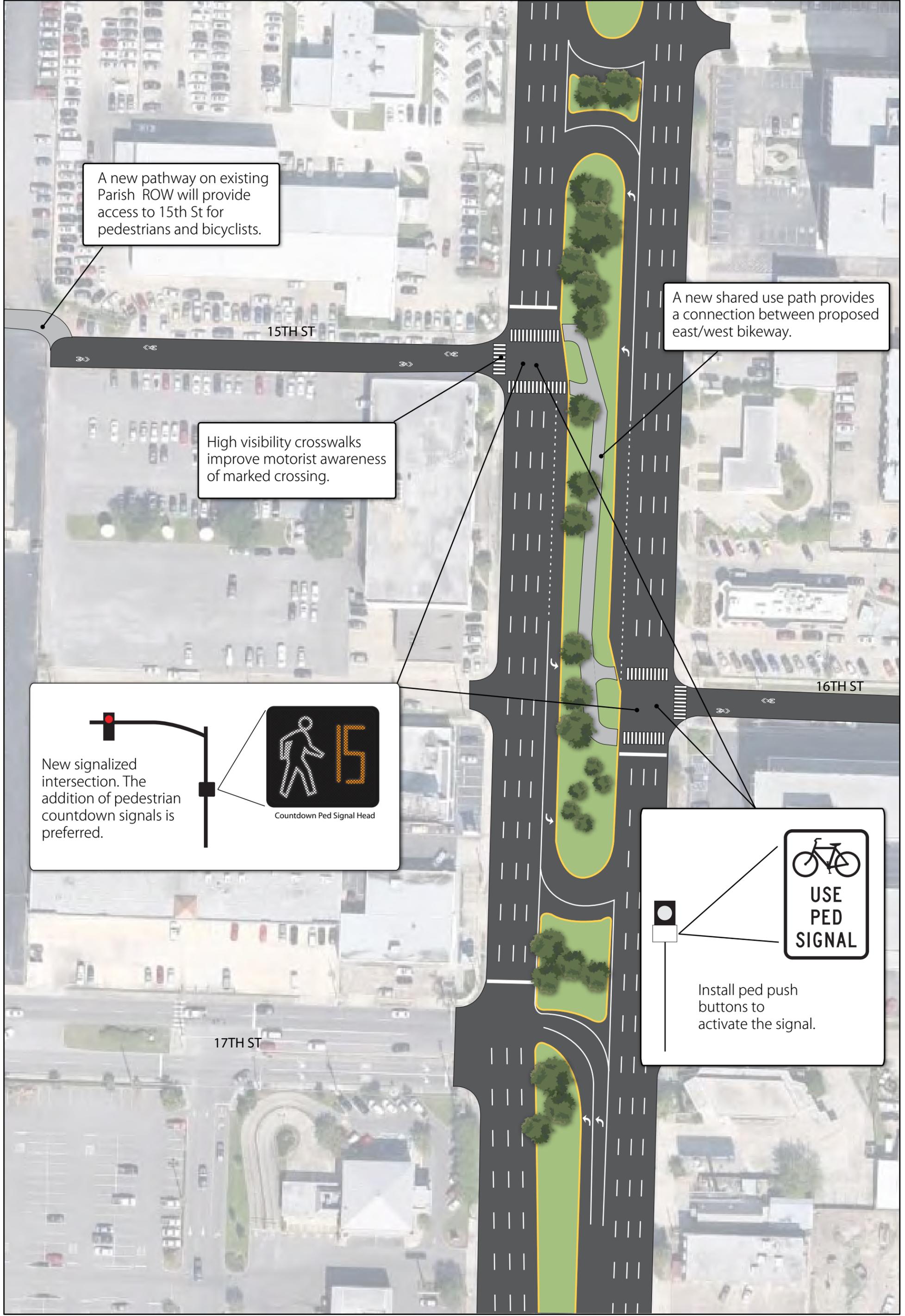


Countdown Ped Signal Head

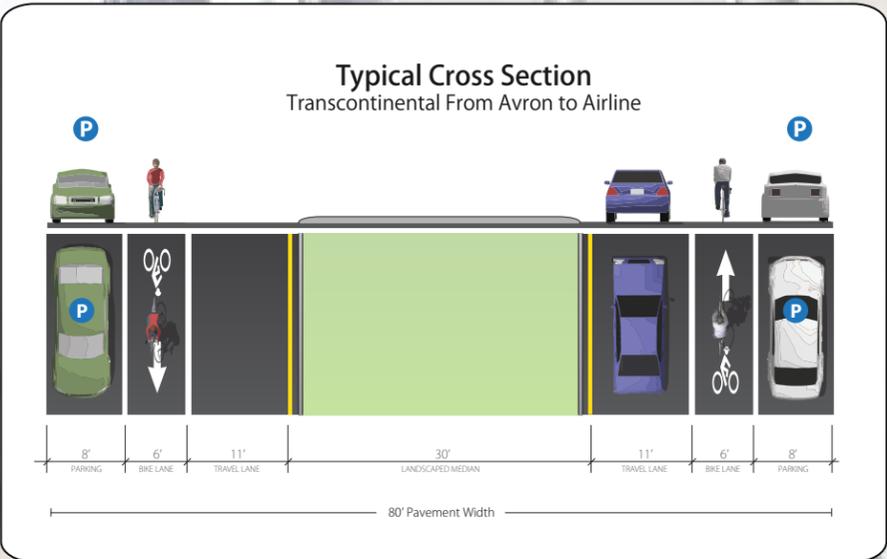
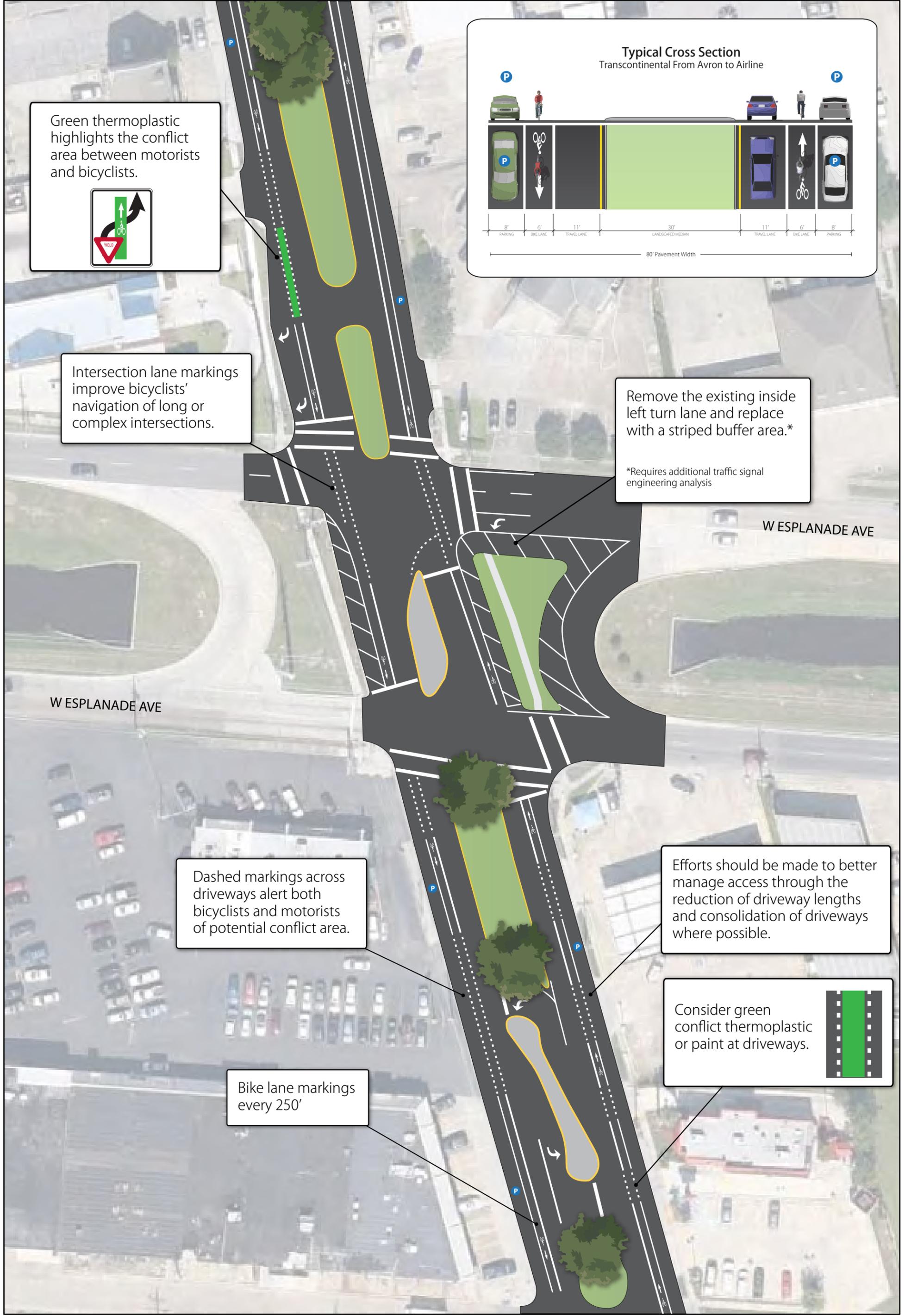


USE PED SIGNAL

Install ped push buttons to activate the signal.



15TH ST AND CAUSEWAY BLVD



Green thermoplastic highlights the conflict area between motorists and bicyclists.

Intersection lane markings improve bicyclists' navigation of long or complex intersections.

Remove the existing inside left turn lane and replace with a striped buffer area.*

*Requires additional traffic signal engineering analysis

W ESPLANADE AVE

W ESPLANADE AVE

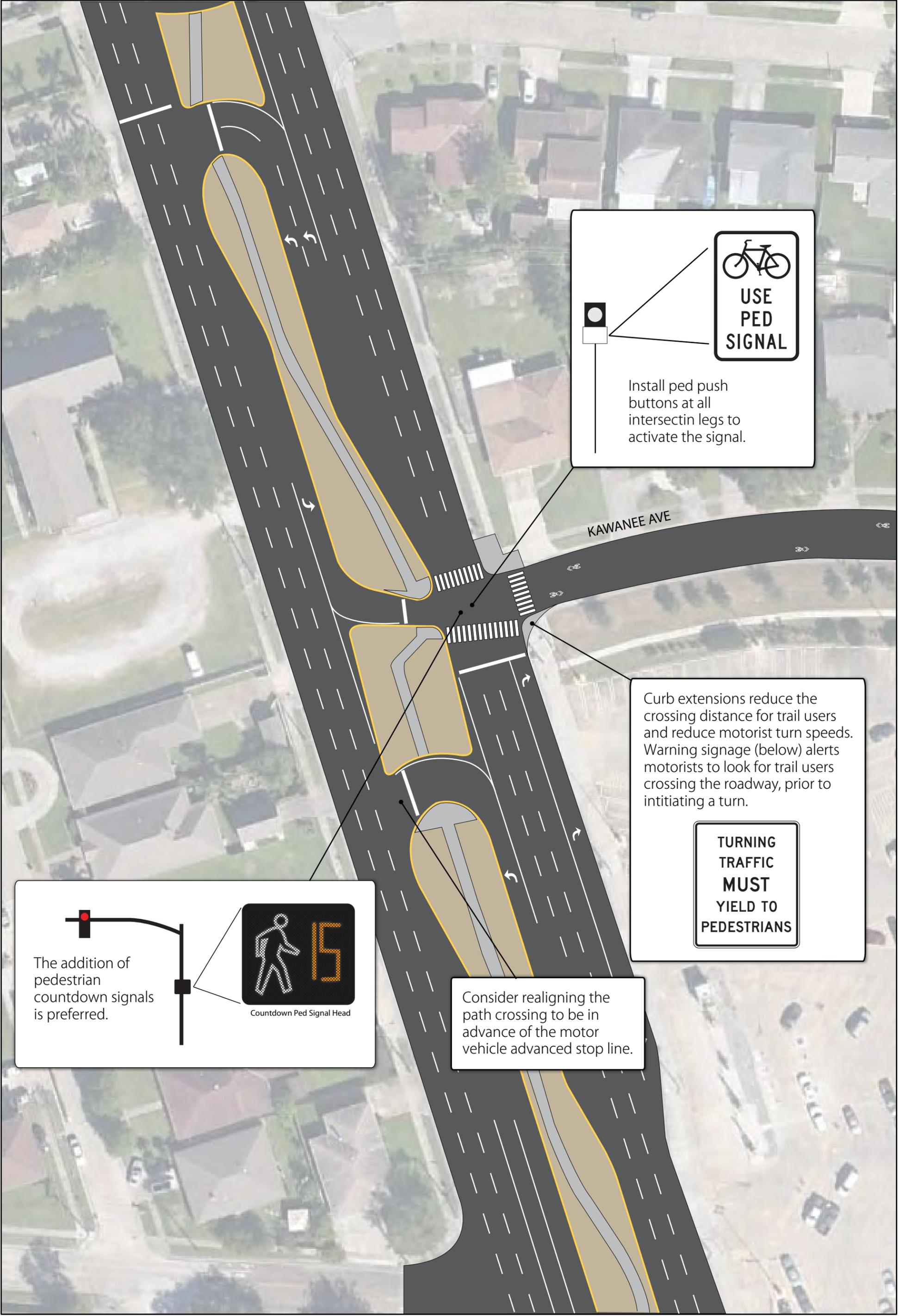
Dashed markings across driveways alert both bicyclists and motorists of potential conflict area.

Efforts should be made to better manage access through the reduction of driveway lengths and consolidation of driveways where possible.

Consider green conflict thermoplastic or paint at driveways.

Bike lane markings every 250'

TRANSCONTINENTAL AND W ESPLANADE




USE PED SIGNAL
 Install ped push buttons at all intersectin legs to activate the signal.

Curb extensions reduce the crossing distance for trail users and reduce motorist turn speeds. Warning signage (below) alerts motorists to look for trail users crossing the roadway, prior to intitiating a turn.

TURNING TRAFFIC MUST YIELD TO PEDESTRIANS

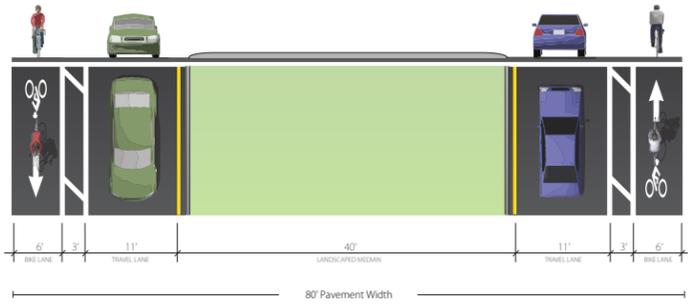
The addition of pedestrian countdown signals is preferred.


 Countdown Ped Signal Head

Consider realigning the path crossing to be in advance of the motor vehicle advanced stop line.

KAWANEE AVE AND POWER BLVD (Connection to Existing Trail)

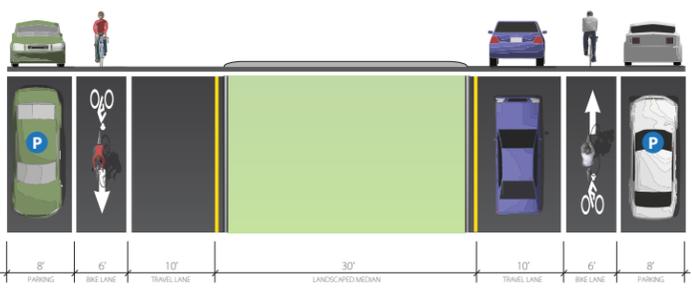
Typical Cross Section
Gretna Boulevard from Stumpf to Belle Chasse



Intersection lane markings improve bicyclists' navigation of long or complex intersections.

Bike lane markings every 250'

Typical Cross Section
Gretna Boulevard from Belle Chasse to Manhattan



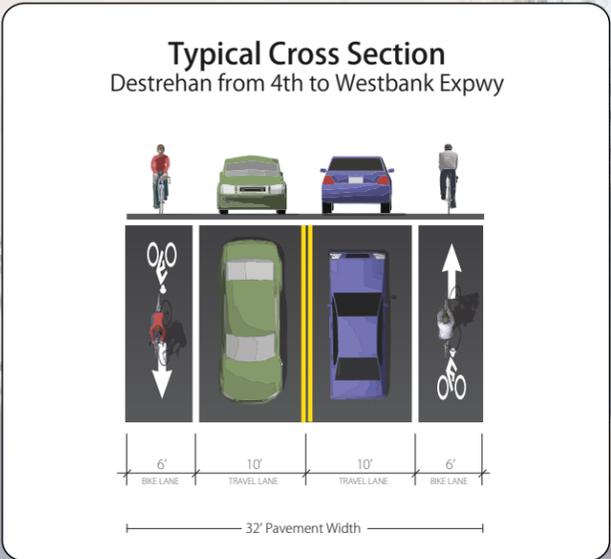
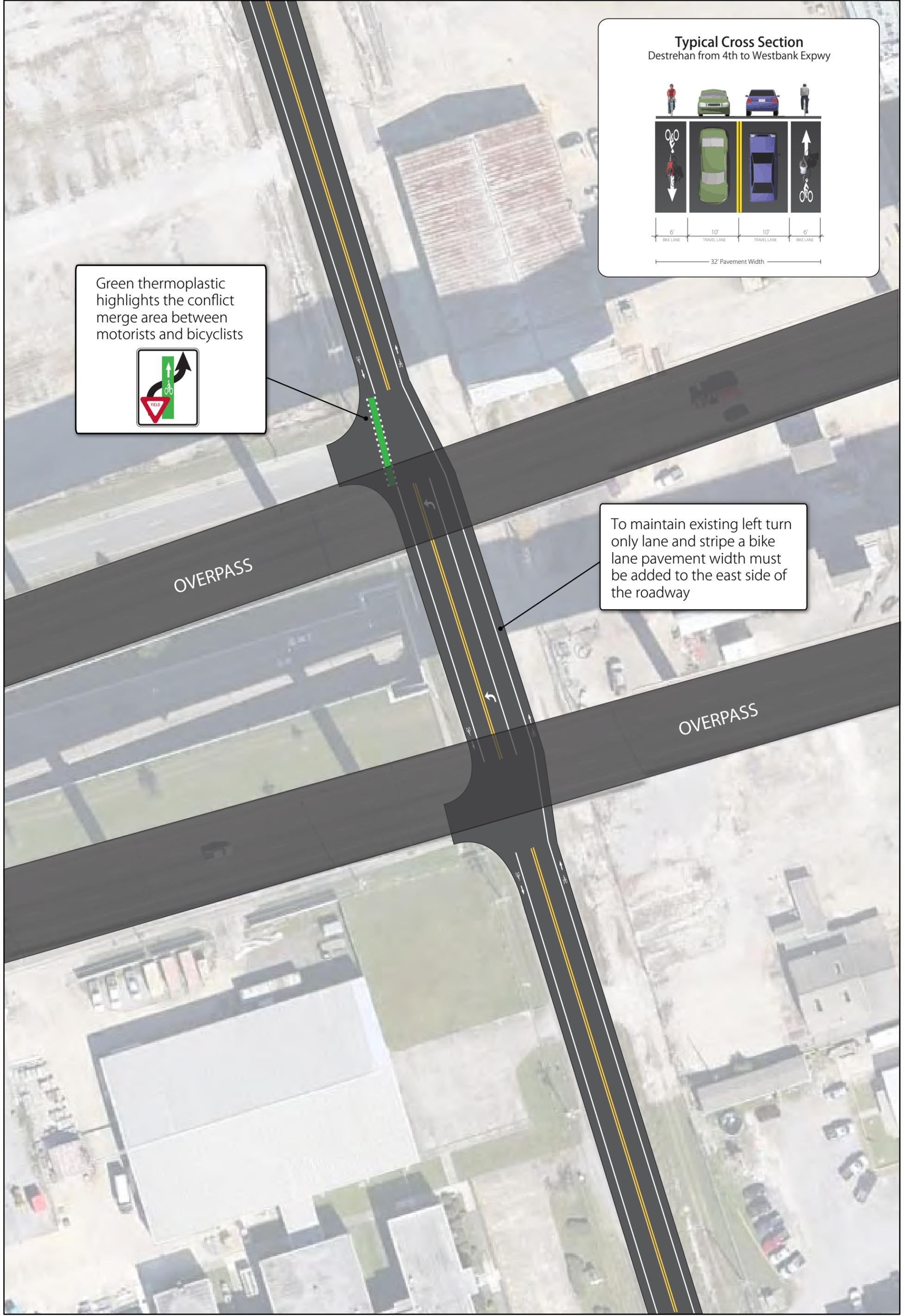
Efforts should be made to better manage access through the reduction of driveway lengths and consolidation of driveways where possible.

Dashed markings across driveways alert both bicyclists and motorists of potential conflict area.

Green thermoplastic highlights the conflict merge area between motorists and bicyclists.



GRETNA BLVD AND BELLE CHASSE



Green thermoplastic highlights the conflict merge area between motorists and bicyclists

To maintain existing left turn only lane and stripe a bike lane pavement width must be added to the east side of the roadway

OVERPASS

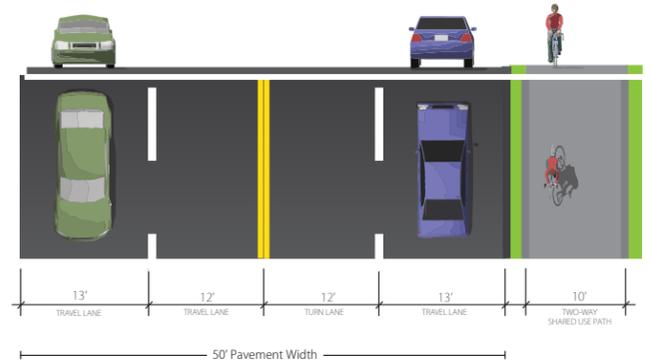
OVERPASS

DESTREHAN AVE AND WESTBANK EXPY

Manage conflicts at driveway access points to industrial sites by requiring trucks exiting and entering site to yield to bicyclists.

A two-way shared use path on the east side of Destrehan is preferred to avoid the difficult transition point southbound bicyclist would face at the triangular median.

Typical Cross Section
Destrehan from Westbank Expwy to Max Dr



East of the drainage ditch adjacent to the roadway is a 12' - 15' wide area suitable for the development of a shared use path.

A bike lane is recommended for Destrehan Ave. However, developing a shared use path where Destrehan Ave meets the Westbank Expwy access road (as shown here) will create a safe route for navigating this difficult intersection. North and south of this intersection, transitions from the path, across Destrehan Ave to the proposed bike lane facilities, should be provided. Transition points should utilize high visibility crosswalks and rectangular rapid flash beacons to safely and seamlessly move bicyclists along the corridor.



ALTERNATE - DESTREHAN AVE FROM WESTBANK EXPWY TO MAX DR



Table 20: Bicycle Boulevards

Bikeway Segment	Length (miles)
11th Street	0.85
33rd Street	1.47
33rd/Georgetown Dr	0.82
37th Street	1.35
37th Street	1.02
39th Street	0.17
7th Street	1.12
Academy Dr	0.90
Alabama Ave	0.74
Amanda St	0.24
Avenue A	0.52
Avenue G	0.34
Avron Blvd	2.57
Belle Chasse Hwy/Lafayette St	0.72
Bishop Dr. Ext	0.09
Bishop Drive	1.08
Breaux Ave	0.51
Bridge Connection	0.08
California Ave	1.29
Camphor St	1.62
Carrie Lane Bike Route	1.06
Carthage St	0.70
Caryota Dr	0.12
Catherine Ave	0.79
Chenevert Rd	0.42
Citrus Rd	0.95
Colonial Club Dr	1.88
Craig Ave	1.18
Crestmont St	0.67
Division St	0.83
Division St	0.18
Dolores Ave	0.44
Dolores/Azalea/Primrose	0.91
E Livingston Pl	0.47
Eisenhower Ave	0.90
Ellis Pkwy	0.47
Gardenia Lane	0.30
Generes Dr	1.47
Glenn Della Dr	1.41
Gordon Ave	1.79
Gretna Blvd	0.61
Harvard Ave	1.39
Helis Dr	1.37
Hester Ave	0.80
Houma Blvd	0.57
Houma Blvd	0.86
Houma Blvd	0.09

Industrial Blvd	0.57
Jeffer Dr	1.01
Jefferson St	0.68
Judith St	0.46
Lake Villa Dr	0.04
Little Farms Ave	1.62
Loyola Dr	2.25
Lynnette Dr	1.46
Michelle St	0.27
Morris Place	2.02
Mt Rushmore Drive Bike Route	0.69
Oglethorpe Pl	0.12
Orchard Blvd	0.38
Page Dr	1.53
Perry St	0.57
Poplar St	1.96
Queens Blvd	0.31
Redwood Dr	0.80
Rhine Dr	0.34
Riverdale Dr	1.04
Rosa Ave	1.89
S Jamie Blvd	1.29
Taylor St	0.08
Utica St	1.70
Vintage Dr	0.78
Vintage Dr - Connection to Greenway	0.28
Vintage Dr - Connection to Greenway	0.27
Virgil St	0.94
Ware Ave	0.66
Waverly Pl	0.22
Wilson Dr	0.94
Wright Ave	0.94
Wright Ave	1.28
Yates St	0.26
York St	1.53

Table 21: Shared lanes (sharrows)

Shared lane segments (sharrows and signage)	Length (miles)
11th Ave/Magnolia Dr	1.34
13th St	0.99
17th Street	0.65
18th Street	0.58
31st Street	1.44
3rd Street	2.11
4th St	0.74
5th Street	0.74
6th St	0.66
7th Street	1.17
8th Street	0.18
8th Street	0.85
Acre Rd	0.54
Airline Park Blvd	0.61
Ames Blvd	2.41
Apollo Ave	0.42
Arcadia St	0.23
Arnoult Rd	0.43
Ave D	1.71
Ave K	0.10
Avenue A	1.71
Belle Terre Rd	1.17
Bloomfield St	0.60
Bonnie Ann Dr	0.83
Candlelight Dr	0.38
Carol Sue Ave	2.09
Carrie Ln	0.52
Carrollton Ave	0.36
Central Ave	0.91
Central Ave	1.84
Chadwood Dr	0.34
Chateau Blvd - bridge required	0.87
Christiana Dr	0.33
Citrus Blvd	1.00
Cleary Ave	0.37
Cleary Ave	1.01
Cleary Ave - Remove Parking Lane	1.76
Codifer Blvd	0.73
Cousins Blvd	0.73
Cypress St	0.65
Dale Ave	0.50
Dandelion Dr	1.55
David Dr	0.94
David Dr	0.76
Division St	0.87
Dolhonde St	0.28
Drange St	0.13
Driftwood Blvd	0.69
E Ames Blvd	1.41
Ehret Rd	0.86
Eighty Arpent Rd	0.59
Elizabeth Dr	0.14

Feronia St	0.25
Filmore St	0.63
Glenwood Dr to Collin St	0.34
Hamilton St	0.56
Harrison-Pine St	0.73
Harvey Blvd	0.77
Hickory Ave	1.73
Holmes Blvd	1.76
Homestead Ave	1.89
Houma Blvd	0.06
I-10 Service Rd	2.12
I-10 Service Rd	1.99
Iris Ave	0.65
Joe Yenni Blvd	1.55
Julie St	0.20
Jupiter St	0.75
Kawanee Ave Sharrow - no parking removal	2.90
Kawanee St	0.18
Keith Way Dr	1.12
Klein	0.42
Lafayette St	0.94
Linda St	0.25
Little Flower Ln	0.23
Loyola Dr	2.26
Manhattan Blvd	0.47
Maplewood Dr	1.46
Metarie Ct	0.80
Mt Laurel Dr	0.69
Nathan Kornman Dr	0.57
Oak Forest Blvd	0.44
Oakmere Dr	0.38
Oakmere Dr	0.99
Oakwood Dr	1.47
Patriot St	2.69
Plantation Rd	0.45
Randolph St	0.92
Ridgeview - 17th St	1.27
River Rd	0.51
Rue Louis Phillippe	0.80
Severn Ave	3.05
Shrewsbury Rd	0.22
Spruce St	0.45
St George Ave - Boyce St	0.73
Stumpf Blvd	1.01
Teuton St	0.14
Untitled Path	0.28
Veterans Blvd Extension	0.90
Victory Dr	0.90
W Napoleon Ave Ext	0.29
W William David Pkwy	1.32
Westwood Dr	0.58
Westwood Dr	0.63
Whippletree Dr	0.55
Williams Blvd - Redevelopment	0.21
Woodmere Blvd	1.26

APPENDIX G: BICYCLE FRIENDLY COMMUNITIES FEEDBACK REPORT

In response to a submission in early 2013, the League of American Bicyclists provided the feedback report included in the following pages.



BICYCLE FRIENDLY
COMMUNITY

BICYCLE FRIENDLY COMMUNITY DRAFT FEEDBACK REPORT

Spring 2013



Photo: Trek

Jefferson Parish, LA

Below, reviewers provided key recommendations to further promote bicycling in Jefferson Parish and a menu of additional pro-cycling measures that can be implemented in the short and long term. We strongly encourage you to use this feedback to build on your momentum and improve your community for bicyclists. There may also be initiatives, programs, and facilities that are not mentioned here that would benefit your bicycling culture, so please continue to try new things to increase your ridership, safety, and awareness!

To learn more about what funds are available for bicycle projects, please visit http://www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/bp-broch.cfm and <http://www.advocacyadvance.org/>.

The key measures Jefferson Parish should take to improve cycling:

- Appoint a staff member Bicycle & Pedestrian Coordinator or create a new position. A Bicycle & Pedestrian Coordinator works with advocates, state and local elected officials, business leaders, media, law enforcement, public health officials, transit providers and the general public to build partnerships providing leadership and vision so these groups may embrace and implement facilities and programs that increase the number of residents that are safely bicycling and walking. This staff person should also work closely with the Bicycle Advisory Committee, review development

proposals to ensure that local bicycle/pedestrian requirements are incorporated and to assess bicycling and walking impacts, develop and implement educational and promotional programs, write grant proposals, serve as the public contact for bicycling/walking inquiries and complaints, educate other staff about state and federal facilities standards and guidelines, and coordinate with neighboring cities, transit agencies and other departments to implement policies and projects. See [this report](#) on the importance of Bicycle & Pedestrian program staff.

- Have the official Bicycle Advisory Committee (BAC) meet more frequently to facilitate the implementation of the bicycle master plan and to ensure that the bicycle program is held accountable by citizens.
- Adopt a [Complete Streets](#) policy at the Parish level and offer implementation guidance such as a design manual. By adopting a Complete Streets policy, the Parish directs its transportation planners and engineers to routinely design and operate the entire right-of-way to enable safe access for all users, regardless of age, ability, or mode of transportation. This means that every transportation project will make the street network better and safer for drivers, transit users, pedestrians, and bicyclists – making your community a better place to live.
- Expand your bike network using different types of [bike lanes](#), [cycle tracks](#) and [shared lane arrows](#). Particularly Veterans Memorial Blvd is in need of safe bicycle and

pedestrian infrastructure such as crosswalks and pedestrian heads at intersections. On-street improvements coupled with the expansion of the off-street system [will encourage more people to cycle](#) and will improve safety. Ensure smooth transitions for bicyclists between the trail network and the street network. These improvements will also increase the effectiveness of encouragement efforts by providing a broader range of facility choices for users of various abilities and comfort levels.

- It is essential to make both motorists and cyclists aware of their rights and responsibilities on the road. Expand your public education campaign promoting the share the road message. Take advantage of your local bicycle groups for content development and manpower. See the excellent [“Look”](#) campaign in New York City or the [“Don’t be a Road Hog”](#) campaign in Colorado.
- Expand encouragement efforts during Bike Month in partnership with local bicycle advocacy groups. Proclaim May (or a month with mild and dry weather) as Bike Month. Host, sponsor and encourage bicycle-themed community events, campaigns and programs. Increase your efforts on Bike to Work Day and Bike to School Day. Ensure to widely advertise all bicycle-themed community events and programs. For ideas and more information, visit <http://www.bikeleague.org/programs/bikemonth/> or refer to question #47 of the BFC application.

- Ensure that bicyclists and pedestrians are re-routed on clearly marked routes when trails are closed for construction. Currently, the lakefront trail and the river trail near the Orleans Parish line need temporary re-routing.

Choose from these additional recommendations to further promote bicycling:

Engineering

Low hanging fruit and fast results

- Develop and implement streetscape design guidelines that foster a pleasant and comfortable environment for pedestrians and cyclists. Beautiful streetscaping has also shown to increase community livability and pride, reduce crime and increase property values.
- Consider passing an ordinance or policy that would require larger employers to provide [bicycle parking](#), shower facilities, and other end-of-trip amenities.
- Increase the amount of [high quality bicycle parking](#) at popular destinations such as major transit stops, schools, universities, recreational and entertainment facilities, retail stores, office buildings, and churches throughout the community. Residents of multi-family dwellings and public housing should have access to high

Benefits of Further Improving Jefferson Parish for Cycling

quality bike parking as well. Regulations that require bike parking, e.g. for new developments, can secure private funding. See the bicycle parking ordinances of [Madison, Wisconsin](#) and [Santa Cruz, California](#). Also consider adding some [artistic bike racks](#) to enhance the sense of place of your community.

- Allow access to suitable public lands for mountain bicyclists. Since you lack mountainous topography, singletracks in flat or slightly hilly areas are great for beginners and children, and ramps can be built for more experienced users. Ensure to connect any off-road trails and facilities to your bicycle network.
- Consider [road diets](#) in appropriate locations to make streets more efficient and safe. Use the newly created space for bicycle and pedestrian facilities.
- Install a [bicycle wayfinding system](#) at strategic locations around the community. Click [here](#) for some best practices from the Washington, DC area Council of Governments.
- Implement broader transportation policies and programs that encourage alternative transportation choices, such as maximum/no minimum car parking standards or shared-parking allowances to complement **your community's infrastructure investments and programs.**

Further increasing bicycle use can [improve the environment](#) by reducing the impact on residents of pollution and noise, limiting greenhouse gases, and improving the quality of public spaces; [Reduce congestion](#) by shifting short trips (the majority of trips in cities) out of cars. This will also make cities more accessible for public transport, walking, essential car travel, emergency services, and deliveries; **Save lives** by creating safer conditions for bicyclists and as a direct consequence improve the safety of all other road users. [Research shows](#) that increasing the number of bicyclists on the street improves bicycle safety; **Increase opportunities** for residents of all ages to participate socially and economically in the community, regardless of income or ability.

Greater choice of travel modes also increases independence, especially among [seniors](#) and [children](#); [Boost the economy](#) by creating a community that is an attractive destination for new residents, tourists and businesses; **Enhance recreational opportunities**, especially for children, and further contribute to the quality of life in the community; [Save city funds](#) by increasing the efficient use of public space, reducing the need for costly new road infrastructure, preventing crashes, improving the health of the community, and increasing the use of public transport; **Enhance public safety and security** by increasing **the number of “eyes on the street”** and **providing more options for movement** in the event of emergencies, natural disasters, and major public events; [Improve the health and well being](#) of the population by promoting routine physical activity.

- Adequately maintain your on and off road bicycle infrastructure to ensure usability and safety. Increase the frequency of sweepings and address potholes and other hazards faster.
- Develop a mechanism that will allow cyclists to report hazards to traffic engineers and planners, such as a hotline or an online reporting tool.
- Consider [a raised crossing](#), a grade separated crossing or a high-visibility treatment where a shared use path crosses a medium or high traffic road. Ensure that both path and road users are clearly informed about who has the right-of-way.

Long Term Goals

- Implement land use policies that minimize large lot/low density and single-use development to better facilitate bicycling, pedestrian and transit trips. Consider a form-based code to allow for flexible land uses and to provide a comfortable and convenient built environment for pedestrians and cyclists.
- Develop solutions to physical barriers in order to provide convenient bicycle access to all parts of the community. Many open canals block passage for bikes and pedestrians because there is only passage for automobiles. Canal crossings could be connected to new trails along the water. The I-10 blocks most North-South

connections on the East Bank. By building high-quality infrastructure at these interchanges, it would encourage many more Parish residents to ride.

- Develop a system of bicycle boulevards, utilizing quiet neighborhood streets, that creates an attractive, convenient, and comfortable cycling environment welcoming to cyclists of all ages and skill levels. Learn how to do it at <http://www.ibpi.usp.pdx.edu/guidebook.php>. Use the [Bicycle Boulevards section](#) of the NACTO Urban Bikeway Design Guide for design guidelines.
- Since arterial and collector roads are the backbone of every transportation network, it is essential to provide designated bicycle facilities along these roads and calm traffic speeds to allow bicyclists of all skill levels to reach their destinations quickly and safely. On roads with posted speed limits of more than 35 mph, it is recommended to provide protected bicycle infrastructure, such as [cycle tracks](#), [buffered bike lanes](#) or parallel shared-use paths.
- Make intersections safer and more comfortable for cyclists. Include elements such as color, signage, medians, signal detection, and pavement markings. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, the adjacent street function and land use. See the [NACTO design guidelines](#) and the 2012 [AASHTO Guide for the](#)

[Development of Bicycle Facilities](#) for recommended intersection treatments.

Education

Low hanging fruit and fast results

- Consider offering bicycle education for children and youth outside of school through bike rodeos, youth recreation programs, helmet fit seminars or a [Safety Town](#) program.
- Consider creating a Bicycle Ambassador program. Have Ambassadors attend community and private events year-round to talk to residents and visitors of all ages about bicycling and to give bicycle safety demonstrations. They can also offer bike commuting presentations for area businesses.
- Offer Cycling Skills classes and Traffic Skills 101 classes or encourage a local bicycle advocacy group or shop to do so. Ideally, the instruction should incorporate a classroom portion as well as on-road training. The classroom portion of Traffic Skills 101 is now available [online](#) as well. For more information visit: www.bikeleague.org/programs/education/
- Team with a local bicycle group or shop to offer more frequent bike maintenance workshops at parks, libraries, community centers or at events. A short

tutorial on how to change a flat tire can empower a person to ride their bike more often.

- Regularly host Traffic Skills 101 or bike commuter courses for engineers and planners to better understand **cyclists' needs**. For more information visit: www.bikeleague.org/programs/education/
- Continue hosting League Cycling Instructor (LCI) seminars to increase the number of certified LCIs in your community. Having more local instructors will enable your community to expand cycling education, recruit knowledgeable cycling ambassadors, deliver education to motorists, provide cycling education to adults and kids, and have experts available to assist in encouragement programs. Visit <http://www.bikeleague.org/programs/education/> for more information.

Long Term Goals

- Bicycle-safety education should be a routine part of public education, and schools and the surrounding neighborhoods should be particularly safe and convenient for biking. Work with your Bicycle Advisory Committee, local bicycle groups or interested parents to expand the Safe Routes to School or equivalent program that emphasize bicycling for all elementary schools, middle schools and high schools. For more information, see the [National Highway Traffic Safety Administration's Safe Routes To School Toolkit](#),

www.bikeleague.org/programs/saferoutes/index.php or visit www.saferoutesinfo.org.

- Start a bicyclist ticket diversion program. Cyclists given a citation are offered an opportunity to waive fees for violations by attending a bicycling education course. This course should include a classroom and on-road component. See what [Pima County](#) and [San Diego County](#) have done.
- Expand the motorist education program for professional drivers. See San Francisco's [Frequent Driver Education](#).
- Increase your efforts to ensure your bicycle education programs reach traditionally underserved populations, particularly seniors, women, minorities, non-English speakers and the disabled.

Encouragement

Low hanging fruit and fast results

- Host, sponsor and/or encourage a variety of social and family-friendly bicycle-themed community events year-round, such as a bike movie festival, a 4th of July bike parade, an “increase-your-appetite” Thanksgiving community ride, a dress-like-Santa community ride before Christmas, a bicycle fashion show (stylish alternatives to spandex), a Halloween bike decoration competition, a bike to the arts event, etc. Work closely with local bicycle groups, bike shops and schools.

Provide appropriate safety measures such as road closures or police escorts.

- **Consider offering a ‘Ciclovía’ or ‘Summer Streets’ type event**, closing off a major corridor to auto traffic and offering the space to cyclists, pedestrians and group exercise events. Check out LA's [CicLAvia!](#)
- Set up and promote a bicycle-themed community celebration or social ride each time a new bicycle related project is completed. This is a great way to show off the **community’s good efforts and introduces new users to the improvement.**
- Encourage local public agencies, businesses and organizations to promote cycling to the workplace and to seek recognition through the free [Bicycle Friendly Business program](#). Businesses will profit from a [healthier, happier and more productive workforce](#) while the community would profit from less congestion, better air quality, public bike parking in prime locations provided by businesses, new and powerful partners in advocating for bike infrastructure and programs on the local, state and federal level, and business-sponsored **public bike events or classes.** Your community’s government should be the model employer for the rest of the community. See what the Colorado-based New Belgium Brewing Company is doing [here](#).
- Encourage local institutions of higher education to promote cycling and to seek recognition through the

[Bicycle Friendly University program](#). Many colleges and universities have embraced the growing enthusiasm for more bicycle-friendly campuses by incorporating bike share programs, bike co-ops, bicycling education classes and policies to promote bicycling as a preferred means of transportation. The community could potentially profit as well: Communities near a BFU such as Stanford or University of California at Davis have a very high number of regular bicyclists (as many students bike to campus, shops and restaurants), less congestion around campus, safer streets and university-hosted public bicycle events, programs and classes. Learn about what Stanford University is doing for cyclists [here](#).

- Establish a youth recreation or intervention program centered on bicycling, such as an Earn a Bike or Recycle a Bike program. See what the Community Cycling Center in Portland, OR does: <http://www.communitycyclingcenter.org/>
- Design and publish several printed local bike maps, addressing diverse needs and skill levels (commuter, recreational cyclist, sport cyclist, mountain biker etc). Each map should outline the existing on and off-road bicycle network by infrastructure type and skill level (if applicable). In addition, these maps could identify the locations of landmarks, greenways, low-traffic streets, public restrooms, water fountains, bike routes, designated scenic routes, bike stations, bike repair stations, bike parking and transit stations. Take a look at **Pittsburgh's award-winning [bike map](#)**.

Long Term Goals

- Recreational bicycling can be promoted through bicycle amenities such as a mountain bike park, a cyclocross course or a pump track. Ensure that the facilities are accessible by bicycle, so that there is no need to drive to ride.
- Develop a series of short (2-5 mi.) (themed) loop rides around the community and provide appropriate way-finding signage. Integrate these rides into local bike maps.

Enforcement

Low hanging fruit and fast results

- Invite a police officer to become an active member of the Bicycle Advisory Committee and appoint a law-enforcement point person to interact with the cyclists. This will actively facilitate stronger connections between bicycle advocates, the wider bicycling community and law enforcement, which will improve road safety for all users, and improve fair enforcement of motorist and cyclist infractions.
- Have police officers distribute helmets, bike lights and bike locks (or coupons to the local bike shop for each item) to encourage all types of cyclists to ride more safely, discourage bike theft and remove the barriers to

attaining these essential bike accessories. See the helmet and light promotions [at Stanford](#).

- Ask police officers to target both motorist and cyclist infractions to ensure that laws are being followed by all road users. Ensure that bicycle/car crashes are investigated thoroughly and that citations are given fairly.
- Enforcement practices could also include positive enforcement ticketing. Police officers could team up with local stores to reward safe cycling practices by handing out gift **certificates to cyclists who are “caught”** following the law.
- Increase the number of officers that patrol streets on bikes, as it gives officers a better understanding of the conditions for cyclists. Also ensure that secluded off road paths are regularly patrolled to improve personal safety and encourage more people to take advantage of this amenity.
- Provide safety amenities such as emergency call boxes along secluded trails, and offer services such as non-mandatory bike registration and missing bike recovery assistance.
- Pass more laws that protect cyclists, e.g. implement specific penalties for motorists for failing to yield to a cyclist when turning, ban cell phone use while driving, and specifically protect all vulnerable road users.

Evaluation/Planning

Low hanging fruit and fast results

- Adopt the Jefferson Parish Bicycle Master Plan that is currently being prepared. Ensure that there will be dedicated funding for the implementation of the plan.
- Work with your mountain bike community to develop a plan for off-road access to increase opportunities for [singletrack](#) riding within the community
- Expand your research on bicycle usage to more efficiently distribute resources according to demand. Conduct yearly counts at multiple locations across the Parish using automated and manual counters in partnership with advocacy organizations.
- Routinely conduct pre/post evaluations of bicycle-related projects in order to study the change in use, car speed and crash numbers. This data will be valuable to build public and political support for future bicycle-related projects.
- Adopt a target level of bicycle use (e.g. percent of trips) to be achieved within a specific timeframe, and ensure data collection necessary to monitor progress.
- Consider measuring the Bicycle Level of Service (BLOS) on community roads and at intersections, to be able to

identify the most appropriate routes for inclusion in the community bicycle network, determine weak links and hazards, prioritize sites needing improvement, and evaluate alternate treatments for improving bike-friendliness of a roadway or intersection:

<http://www.bikelib.org/bike-planning/bicycle-level-of-service/> (roads) and <http://www.bicyclinginfo.org/library/details.cfm?id=4425> (intersections).

- Implement a community-wide trip reduction program or ordinance. See good examples [here](#).
- Consider individualized marketing to identify and support current and potential bike commuters in your

community. See what Bellingham, WA is doing: <https://www.whatcomsmarttrips.org/login.aspx>

- Consider conducting an economic impact study on bicycling in your community. [Read about](#) what Portland, OR has done.
- Establish a mechanism that ensures that bicycle facilities and programs are implemented in traditionally underserved neighborhoods.

For more ideas and best practices please visit the [Bicycle Friendly Community Resource Page](#).

APPENDIX H: BICYCLE FACILITY DESIGN GUIDELINES

The following attachment contains the bicycle facility design guidelines described in Goal 3 Objective 2.

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INTRODUCTION



JEFFERSON PARISH BICYCLE MASTER PLAN

DESIGN GUIDELINES (DRAFT)

STATE PROJECT

INTRODUCTION

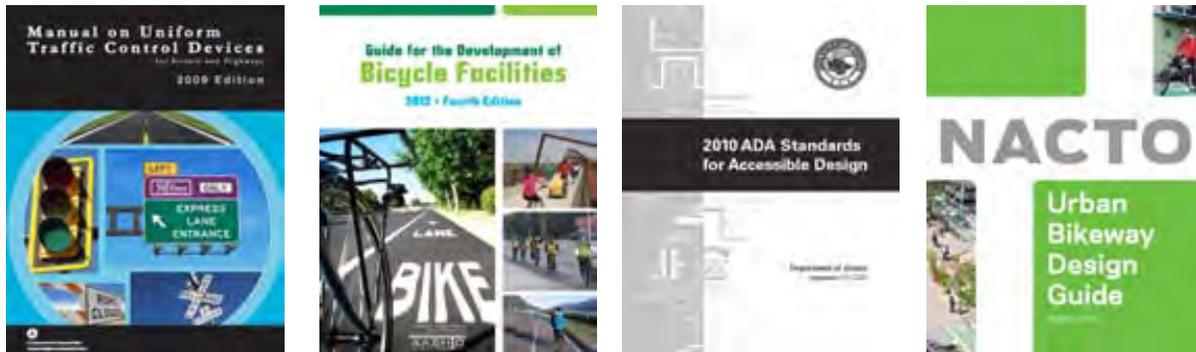
This technical handbook is intended to assist Jefferson Parish, in the selection and design of bicycle facilities. The following chapters pull together best practices by facility type from public agencies and municipalities nationwide, and reflect existing standards of Jefferson Parish and the Louisiana Department of Transportation and Development (DOTD). Within the design chapters, treatments are covered within a single sheet tabular format relaying important design information and discussion, example photos, schematics (if applicable), and existing summary guidance from current or upcoming draft standards. Existing, state, local, and national standards are referenced throughout and should be the first source of information when seeking to implement any of the treatments featured here.

GUIDING PRINCIPLES

The following guiding principles are consistent with the vision and goals of the Jefferson Parish Bicycle Master Plan:

- **The bicycling environment should be safe.** All bicycling routes should be physically safe and perceived as safe by all users. Safe means minimal conflicts with external factors, such as noise, motor-vehicular traffic and protruding physical elements. Safe also means routes are clear and well marked with appropriate pavement markings and directional signage.
- **The bicycle network should be accessible.** Shared-use paths, bike routes on-street bikeways, and crosswalks should permit the mobility of cyclists of all ages and abilities. The bicycle network should employ principles of universal design. Bicyclists have a range of skill levels, and facilities should be designed with a goal of providing for inexperienced/recreational bicyclists (especially children and seniors) to the greatest extent possible.
- **Bicycle network improvements should be economical.** Bicycle improvements should achieve the maximum benefit for their cost, including initial cost and maintenance cost, as well as a reduced reliance on more expensive modes of transportation. Where possible, improvements in the right-of-way should stimulate economic development, and reinforce and connect with adjacent private improvements.
- **The bicycle network should connect to places people want to go.** The bicycle network should provide continuous direct routes and convenient connections between destinations such as homes, schools, shopping areas, public services, recreational opportunities and transit. A complete network of on-street bicycling facilities should connect seamlessly to existing and proposed multi-use trails to complete recreational and commuting routes.
- **The bicycling environment should be clear and easy to use.** Shared-use paths, bikeways, and crossings should allow all people to easily find a relatively direct route to a destination with minimal delays. All public roads are legal for the use of pedestrians and bicyclists (except freeways, from which each is prohibited unless a separate facility on that right of way is provided). This means that most streets are bicycle facilities and should be designed, marked and maintained accordingly.
- **The bicycling environment should be attractive and enhance community livability.** Good design should integrate with and support the development of complementary uses and should encourage preservation and construction of art, landscaping and other items that add value to communities. These components might include open spaces such as plazas, courtyards and squares, and amenities like street furniture, banners, art, plantings and special paving. These along with historical elements and cultural references, should promote a sense of place.
- **Design guidelines are flexible and should be applied using professional judgment.** This document references specific local, state and national guidelines for bicycle facility design, as well as a number of design treatments not specifically covered under current guidelines. Statutory and regulatory guidance may change. For this reason, the guidance and recommendations in this document function to complement other resources considered during a design process, and in all cases sound engineering judgment should be used.

NATIONAL STANDARDS



The Federal Highway Administration's *Manual on Uniform Traffic Control Devices* (MUTCD) defines the standards used by road managers nationwide to install and maintain traffic control devices on all streets, highways, bikeways, and private roads open to public traffic. The MUTCD is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.

To further clarify the MUTCD, the FHWA created a table of contemporary bicycle facilities that lists various bicycle-related signs, markings, signals, and other treatments and identifies their official status (e.g., can be implemented, currently experimental). See *Bicycle Facilities and the Manual on Uniform Traffic Control Devices*.¹

Bikeway treatments not explicitly covered by the MUTCD are often subject to experiments, interpretations and official rulings by the FHWA. The *MUTCD Official Rulings* is a resource that allows website visitors to obtain information about these supplementary materials. Copies of various documents (such as incoming request letters, response letters from the FHWA, progress reports, and final reports) are available on this website.²

American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*, updated in June 2012 provides guidance on dimensions, use, and layout of specific bicycle facilities. The standards and guidelines presented by AASHTO provide basic information, such as minimum sidewalk widths, bicycle lane dimensions, detailed striping requirements and recommended signage and pavement markings.

The National Association of City Transportation Officials' (NACTO) 2012 *Urban Bikeway Design Guide*³ is the newest publication of nationally recognized bikeway design standards, and offers guidance on the current state of the practice designs. The NACTO *Urban Bikeway Design Guide* is based on current practices in the best cycling cities in the world. The intent of the guide is to offer substantive guidance for cities seeking to improve bicycle transportation in places where competing demands for the use of the right of way present unique challenges. All of the NACTO *Urban Bikeway Design Guide* treatments are in use internationally and in many cities around the US.

Meeting the requirements of the Americans with Disabilities Act (ADA) is an important part of any bicycle and pedestrian facility project. The United States Access Board's proposed *Public Rights-of-Way Accessibility Guidelines*⁴ (PROWAG) and the *2010 ADA Standards for Accessible Design*⁵ (2010 Standards) contain standards and guidance for the construction of accessible facilities. This includes requirements for development of accessible shared use pathways.

Some of the treatments that follow are not directly referenced in the current versions of the AASHTO Guide or the MUTCD, although many of the elements of these treatments are found within these documents. In all cases, engineering judgment is recommended to ensure that the application makes sense for the context of each treatment, given the many complexities of urban streets.

1 FHWA, *Bicycle Facilities and the Manual on Uniform Traffic Control Devices*. 2011
http://www.fhwa.dot.gov/environment/bikeped/mutcd_bike.htm

2 FHWA, *MUTCD Official Rulings*. <http://mutcd.fhwa.dot.gov/orsearch.asp>

3 NACTO, *Urban Bikeway Design Guide*. 2012

4 United States Access Board, *Public Rights-of-Way Accessibility Guidelines*. 1999

5 United States Department of Justice, *2010 ADA Standards for Accessible Design*. 2010

LOCAL STANDARDS

The Louisiana Department of Transportation and Development (DOTD) considers pedestrian and bicycle facilities valuable components of the transportation network. To ensure the highest standard of care for all users the department follows the guidelines for bicycle and pedestrian facilities design from the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and local standards listed below:

- The main document for roadway design is the **DOTD Roadway Design Manual**. This manual presents the policies and procedures for development of roadway construction plans, and it is intended to complement other more detailed local resources listed therein. www.dotd.la.gov/highways/project_devel/design/road_design/documents.aspx
- The **DOTD Engineering Directives And Standards Manual (EDSM)**, provides DOTD policy guidance in the decision aspects of planning and engineering design. <http://webmail.dotd.la.gov/ppmemos.nsf>. The following standards are relevant for bicycle facilities design:
 - EDSM II.2.1.10 - Requirements for Construction of Bicycle and Pedestrian Facilities
 - EDSM II.2.1.14 - Bicycle and Pedestrian Facilities
- The **DOTD Traffic Engineering Manual** is intended to complement the *MUTCD* by clarifying the DOTD policy about the study and installation of traffic control devices. <http://www.dotd.la.gov/highways/traffic/>

DOTD Complete Streets Document

Seeks to advance the improvement of bicycle and pedestrian accommodations that do not require right-of-way acquisition, utility relocation, or major construction by retrofitting existing roadways through narrowing lanes, restriping and other means of providing improved bicycle and pedestrian access.

- The **Jefferson Parish Code of Ordinances Section 29, titles 89 through 91**, restrict pedestrian and bicycle access to the following facilities: the Lapalco Bridge on Lapalco Boulevard crossing the Harvey Canal and Bayou Segnette, the Causeway Boulevard Overpass crossing over Veterans Boulevard, and the Causeway Boulevard overpass crossing over I-10.

ADDITIONAL REFERENCES

In addition to the previously described national standards, the basic bicycle and pedestrian design principals outlined in this chapter are derived from the documents listed below. Many of these documents are available online and provide a wealth of public information and resources.

Additional US Federal Guidelines

- AASHTO, *AASHTO Policy on Geometric Design of Streets and Highways*. 2001 www.transportation.org
- United States Access Board, *Public Rights-of-Way Accessibility Guidelines (PROWAG)*. 2007 <http://www.access-board.gov/PROWAC/alterations/guide.htm>
- United States Department of Justice, *2010 ADA Standards for Accessible Design*. 2010 http://www.ada.gov/2010ADASTandards_index.htm

Best Practice Documents

- Alta Planning + Design and the Initiative for Bicycle & Pedestrian Innovation (IBPI), *Fundamentals of Bicycle Boulevard Planning & Design*. 2009 <http://www.ibpi.usp.pdx.edu/media/BicycleBoulevardGuidebook.pdf>
- Alta Planning + Design, *Cycle Tracks: Lessons Learned*. 2009 http://www.altaplanning.com/App_Content/files/pres_stud_docs/Cycle%20Track%20lessons%20learned.pdf
- Association of Pedestrian and Bicycle Professionals (APBP), *Bicycle Parking Design Guidelines, 2nd Edition*. 2010

- City of Portland Bureau of Transportation, *Portland Bicycle Master Plan for 2030*. 2010 <http://www.portlandonline.com/transportation/index.cfm?c=44597>
- FHWA, *BIKESAFE: Bicycle Countermeasure Selection System*. 2005 <http://www.bicyclinginfo.org/bikesafe/index.cfm>
- FHWA, *Report HRT-04-100, Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations*. 2005 <http://www.fhwa.dot.gov/publications/research/safety/04100/>
- FHWA, *Designing Sidewalks and Trails for Access*. 2001 <http://www.fhwa.dot.gov/environment/sidewalk2/contents.htm>
- King, Michael, for the Pedestrian and Bicycle Information Center, *Bicycle Facility Selection: A Comparison of Approaches*. 2002 <http://www.hsrc.unc.edu/pdf/2002/BicycleFacilitySelectionMKingetal2002.pdf>
- Oregon Department of Transportation, *Oregon Bicycle and Pedestrian Design Guide*. 2012 <http://www.oregon.gov/ODOT/HWY/BIKEPED/planproc.shtml>
- Rosales, Jennifer, *Road Diet Handbook: Setting Trends for Livable Streets*. 2006



SPECIAL CONSIDERATIONS

TYPES OF BICYCLISTS

It is important to consider bicyclists of all skill levels when creating a bicycle plan or project. Bicyclist skill level greatly influences expected speeds and behavior, both in separated bikeways and on shared roadways. Bicycle infrastructure should accommodate as many user types as possible, with decisions for separate or parallel facilities based on providing a comfortable experience for the greatest number of people.

The bicycle planning and engineering professions currently use several systems to classify the population, which can assist in understanding the characteristics and infrastructure preferences of different bicyclists. The most conventional framework classifies the "design cyclist" as *Advanced, Basic, or Child*¹. A more detailed understanding of the US population as a whole is illustrated in the figure below. Developed by planners in Portland, OR² and supported by data collected nationally since 2005, this classification provides the following alternative categories to address varying attitudes towards bicycling in the US. Although a scientific poll has not been conducted to categorize comfort levels of in Jefferson Parish, the demographic profile of the community and anecdotal evidence suggests that this categorization is also applicable to Jefferson Parish.

- **Strong and Fearless** (approximately 1% of population) – Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections — even if shared with vehicles — over separate bicycle facilities such as shared use paths.
- **Enthusied and Confident** (5-10% of population) - This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or shared use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.
- **Interested but Concerned** (approximately 60% of population) – This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or multi-use trails under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become "Enthusied & Confident" with encouragement, education and experience.
- **No Way, No How** (approximately 30% of population) – Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will not ride a bicycle under any circumstances.



¹ FHWA, *Selecting Roadway Design Treatments to Accommodate Bicycles*, Publication No. FHWA-RD-92-073. 1994

² Roger Geller, City of Portland Bureau of Transportation, *Four Types of Cyclists*. 2009
<http://www.portlandonline.com/transportation/index.cfm?a=237507>

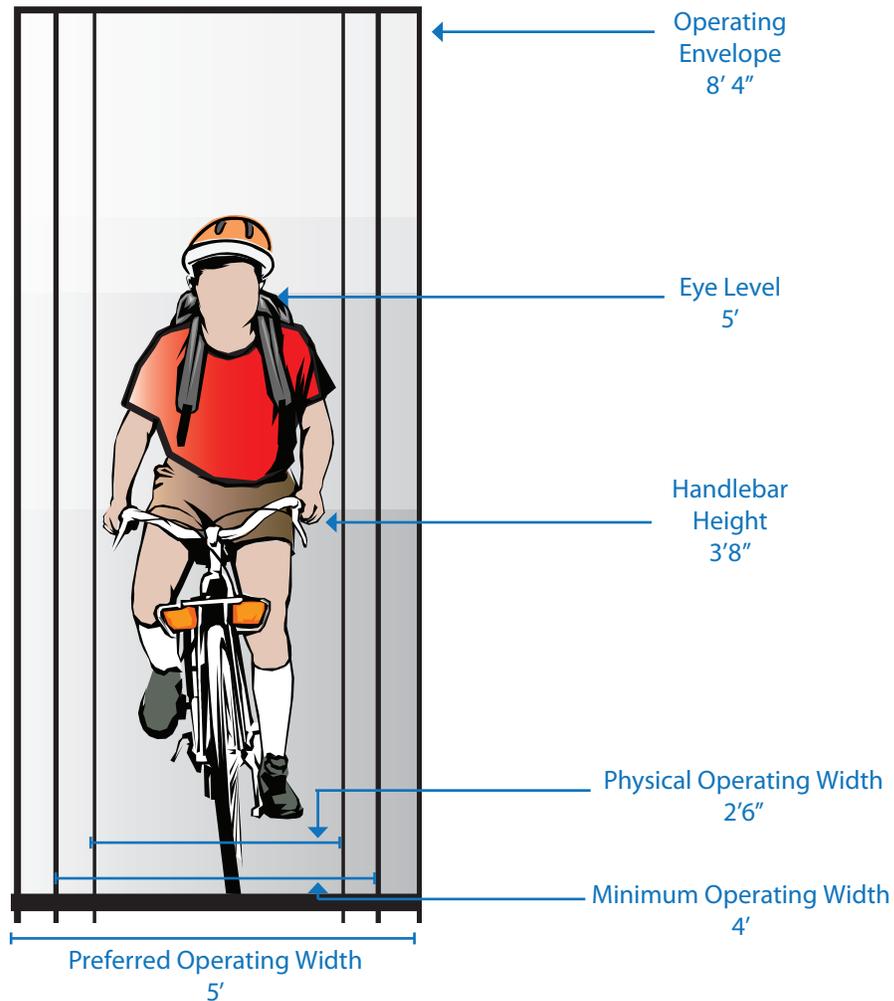
DESIGN NEEDS OF BICYCLISTS

The purpose of this section is to provide the facility designer with an understanding of how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction and maintenance practices than motor vehicle drivers. Bicyclists lack the protection from the elements and roadway hazards provided by an automobile's structure and safety features. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk.

Bicycle as a Design Vehicle

Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

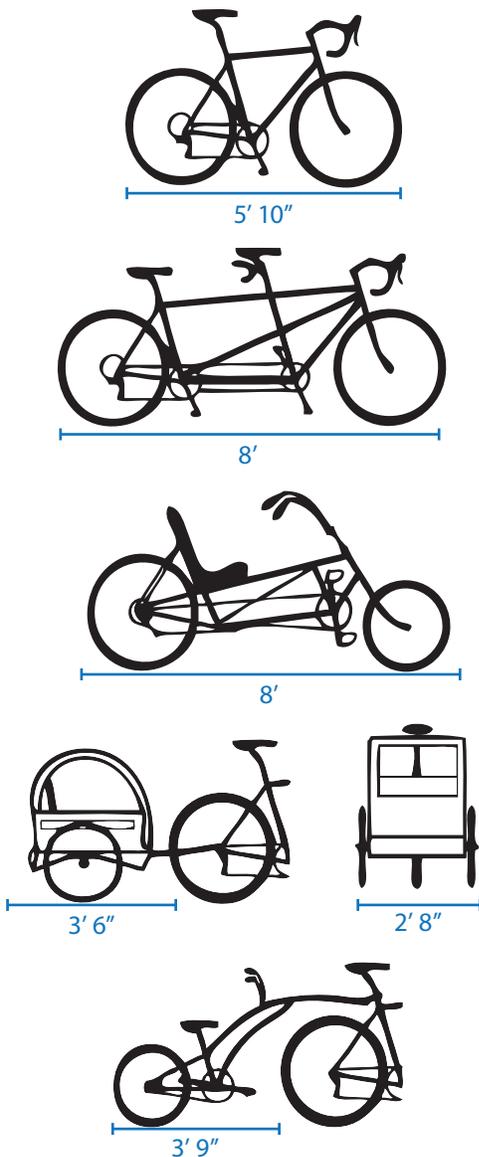
The figure below illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.



Standard Bicycle Rider Dimensions

Source: AASHTO, *Guide for the Development of Bicycle Facilities*, 3rd Edition. 2012

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure and table below summarize the typical dimensions for bicycle types.



Bicycle as Design Vehicle - Typical Dimensions

Source: AASHTO, *Guide for the Development of Bicycle Facilities, 3rd Edition*. 2012 *AASHTO does not provide typical dimensions for tricycles.

Bicycle as Design Vehicle - Typical Dimensions

Bicycle Type	Feature	Typical Dimensions
Upright Adult Bicyclist	Physical width	2 ft 6 in
	Operating width (Minimum)	4 ft
	Operating width (Preferred)	5 ft
	Physical length	5 ft 10 in
	Physical height of handlebars	3 ft 8 in
	Operating height	8 ft 4 in
	Eye height	5 ft
	Vertical clearance to obstructions (tunnel height, lighting, etc)	10 ft
Approximate center of gravity	2 ft 9 in - 3 ft 4 in	
Recumbent Bicyclist	Physical length	8 ft
	Eye height	3 ft 10 in
Tandem Bicyclist	Physical length	8 ft
Bicyclist with child trailer	Physical length	10 ft
	Physical width	2 ft 8 in

Bicycle as Design Vehicle - Design Speed Expectations

Bicycle Type	Feature	Typical Speed
Upright Adult Bicyclist	Paved level surfacing	15 mph
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5-12 mph
Recumbent Bicyclist	Paved level surfacing	18 mph

*Tandem bicycles and bicyclists with trailers have typical speeds equal to or less than upright adult bicyclists.

Design Speed Expectations

The expected speed that different types of bicyclists can maintain under various conditions also influences the design of facilities such as shared use paths. The table to the right provides typical bicyclist speeds for a variety of conditions.

FACILITY SELECTION

This section includes:

- Bicycle Facility Selection Guidelines



JEFFERSON PARISH BICYCLE MASTER PLAN

DESIGN GUIDELINES (DRAFT)

STATE PROJECT #: 12-34567899

BICYCLE FACILITY SELECTION GUIDELINES

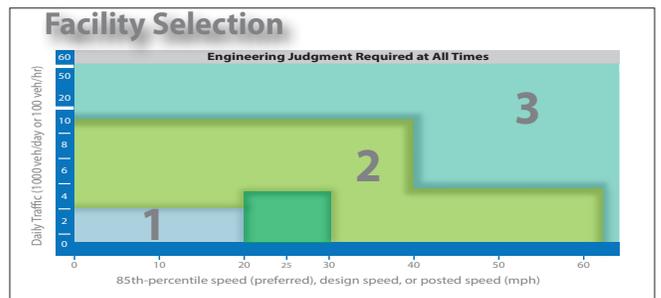
This section summarizes the bicycle facility selection typology developed for Jefferson Parish. The specific facility type that should be provided depends on the surrounding environment (e.g. auto speed and volume, topography, and adjacent land use) and expected bicyclist needs (e.g. bicyclists commuting on a highway versus students riding to school on residential streets).

FACILITY SELECTION GUIDELINES

There are no 'hard and fast' rules for determining the most appropriate type of bicycle facility for a particular location — roadway speeds, volumes, right-of-way width, presence of parking, adjacent land uses, and expected bicycle user types are all critical elements of this decision. Additionally, most bicyclists prefer facilities separated from motor vehicle traffic or located on local roads with low motor vehicle traffic speeds and volumes. Because off-street pathways are physically separated from the roadway, they are perceived as safe and attractive routes for bicyclists who prefer to avoid motor vehicle traffic. Consistent use of treatments and application of bikeway facilities allow users to anticipate whether they would feel comfortable riding on a particular facility, and plan their trips accordingly. This section provides guidance on various factors that affect the type of facilities that should be provided.

Facility Continua illustrates the range of on-street bikeway facilities from least protected to most protected. The design details for each of the facilities found in the continua can be found in the 'Facilities' section of this guide.

The Facility Selection chart illustrates the appropriate facilities that may be considered at various speed/volumes thresholds

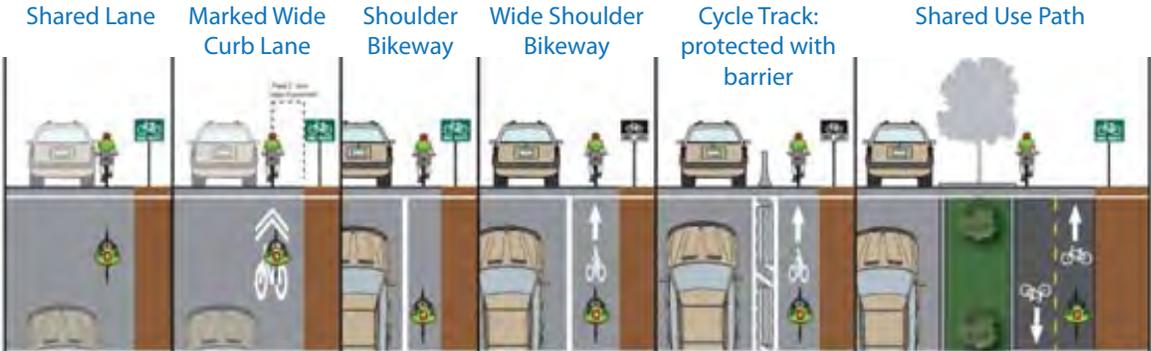


Facility Continua

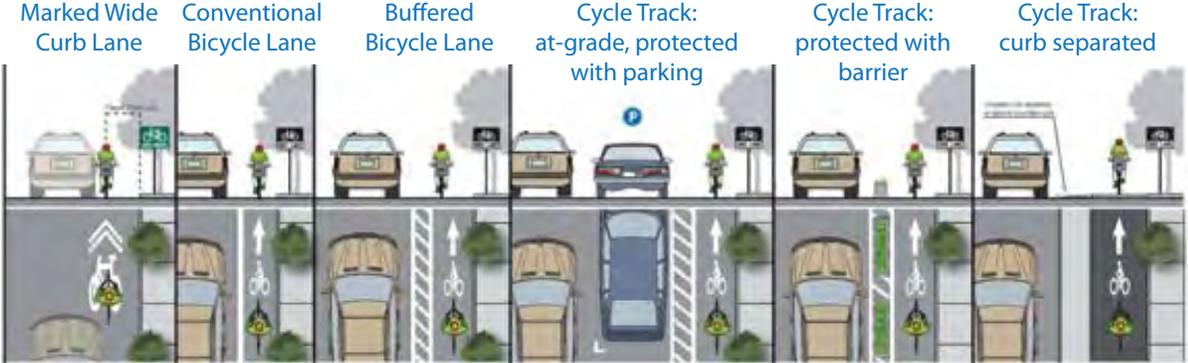
The following continua illustrate the range of bicycle facilities applicable to various roadway environments, based on the roadway type and desired degree of separation. **Engineering judgment, traffic studies, previous municipal planning efforts, community input and local context should be used to refine criteria when developing bicycle facility recommendations for a particular street.** In some corridors, it may be desirable to construct facilities to a higher level of treatment than those recommended in relevant planning documents in order to enhance user safety and comfort. In other cases, existing and/or future motor vehicle speeds and volumes may not justify the recommended level of separation, and a less intensive treatment may be acceptable.



Arterial/Highway Bikeway Continuum (without curb and gutter)



Arterial/Highway Bikeway Continuum (with curb and gutter)



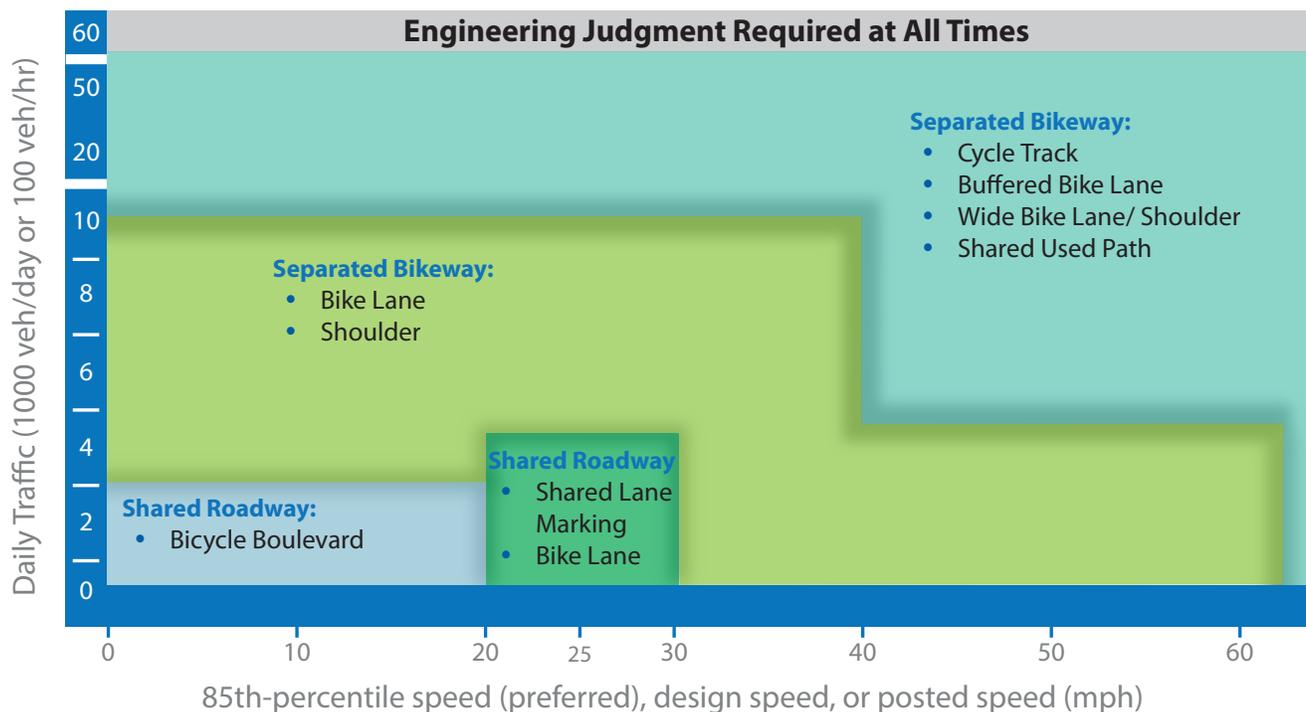
Collector Bikeway Continuum



Facility Selection Chart

Selecting the best bikeway facility type for a given roadway can be challenging, due to the range of factors that influence bicycle users' comfort and safety. There is a significant impact on cycling comfort when the speed differential between bicyclists and motor vehicle traffic is high and motor vehicle traffic volumes are high. As a starting point to identify a preferred facility, the chart below can be used to determine the recommended type of bikeway to be provided in particular roadway speed and volume situations. To use this chart, identify the daily traffic volume on the y-axis and travel speed on the x-axis for the existing or proposed roadway, and locate the facility types indicated by those key variables.

This chart by itself cannot fully represent the range of roadway complexities that can contribute to the optimal bikeway facility selection. Rather, this chart should be used as a starting point for the selection of bicycle facilities. Some of the other factors (beyond speed and volume) that could affect facility selection include the percentage of heavy vehicles, transit service and frequency, the presence of on-street parking, intersection density, surrounding land use, and roadway sight distance. **The transportation planner or designer's judgment should be applied to select the facility that will provide the greatest amount of protection within the existing roadway context for the expected user group.**



Discussion

The **Types of Bicyclists** framework describes how bicyclists with different comfort and skill levels will prefer certain facility types. The Facility Selection Chart above identifies a range of acceptable facilities with varying levels of protection. If your target bicycle type is the "Interested but Concerned" the facility offering the highest level of protection should be selected.

Additional References and Guidelines

The Facility Selection Chart was adopted from the following sources:

NACTO, *Urban Bikeway Design Guide*. 2012

Oregon Department of Transportation, *Bicycle and Pedestrian Design Guide*. 2011

Transport for London, *London Cycling Design Standards, Chapter 4*. 2005

FACILITIES

This section includes:

- Shared Roadways
- Separated Bikeways
- Cycle Tracks
- Greenways
- Bicycle Support Facilities



JEFFERSON PARISH BICYCLE MASTER PLAN

DESIGN GUIDELINES (DRAFT)

STATE PROJECT #: 12-34567899

SHARED ROADWAYS

On shared roadways, bicyclists and motor vehicles use the same roadway space. These facilities are typically used on roads with low speeds and traffic volumes, however they can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided.

Shared roadways employ a large variety of treatments from simple signage and shared lane markings to more complex treatments including directional signage, traffic diverters, chicanes, chokers, and/or other traffic calming devices to reduce vehicle speeds or volumes.

BICYCLE BOULEVARDS

Bicycle boulevards are a special class of shared roadways designed for a broad spectrum of bicyclists. They are low-volume local streets where motorists and bicyclists share the same travel lane. Treatments for bicycle boulevards are selected as necessary to create appropriate automobile volumes and speeds, and to provide safe crossing opportunities of busy streets.



Marked Shared Roadway



Shared Roadways with Diagonal Parking



Bicycle Boulevards

Marked Shared Roadway

Description

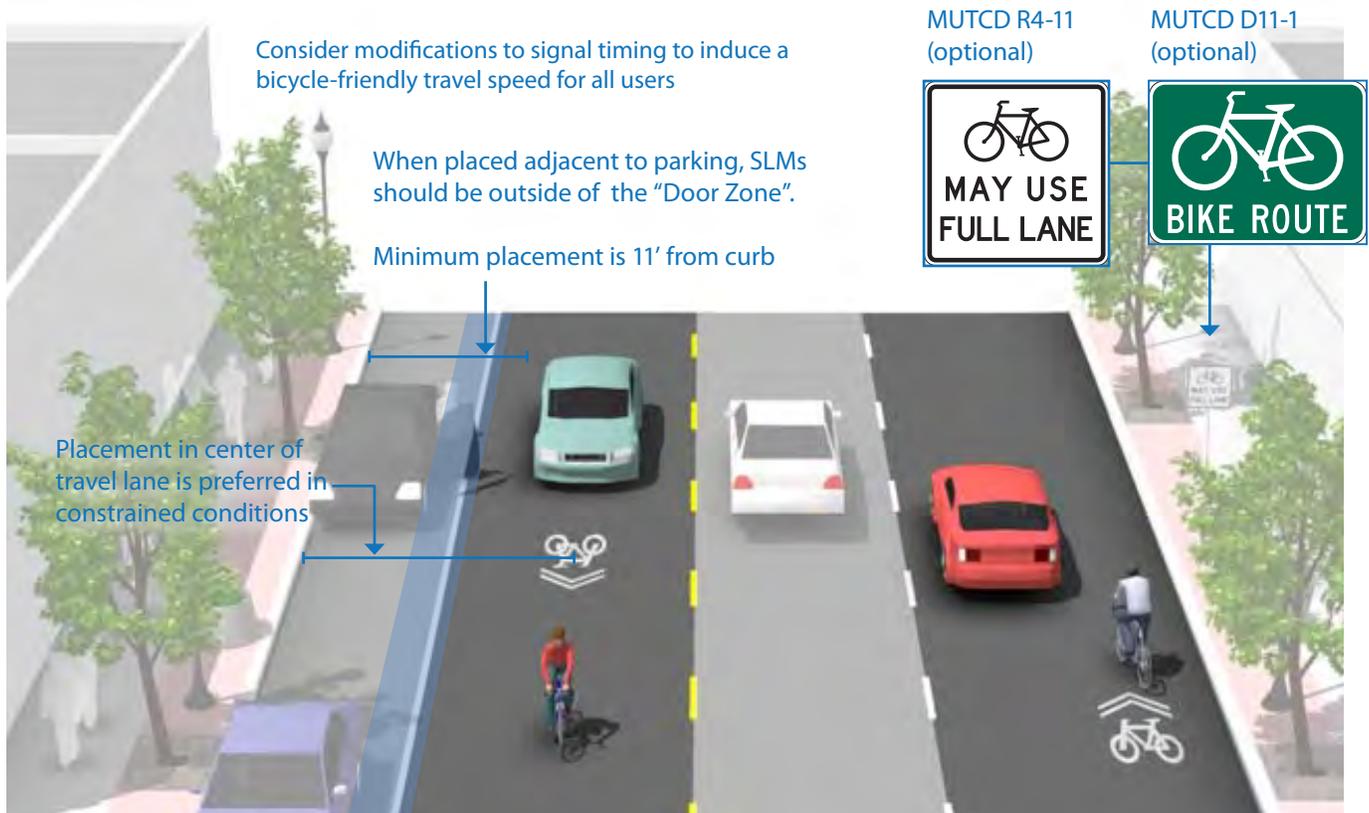
A marked shared roadway is a general purpose travel lane marked with shared lane markings (SLM) used to encourage bicycle travel and proper positioning within the lane.

In constrained conditions, the SLMs are placed in the middle of the lane to discourage unsafe passing by motor vehicles. On a wide outside lane, the SLMs can be used to promote bicycle travel to the right of motor vehicles.

In all conditions, SLMs should be placed outside of the door zone of parked cars.

Guidance

- In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.



Discussion

Bike Lanes should be considered on roadways with outside travel lanes wider than 15 feet, or where other lane narrowing or removal strategies may provide adequate road space. SLMs shall not be used on **shoulders**, in designated **Bike Lanes**, or to designate **Bicycle Detection** at signalized intersections. (MUTCD 9C.07)

This configuration differs from a **Bicycle boulevard** due to a lack of traffic calming, wayfinding, and other enhancements designed to provide a higher level of comfort for a broad spectrum of users.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Placing SLMs between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.

Shared Roadway Adjacent to Diagonal Parking

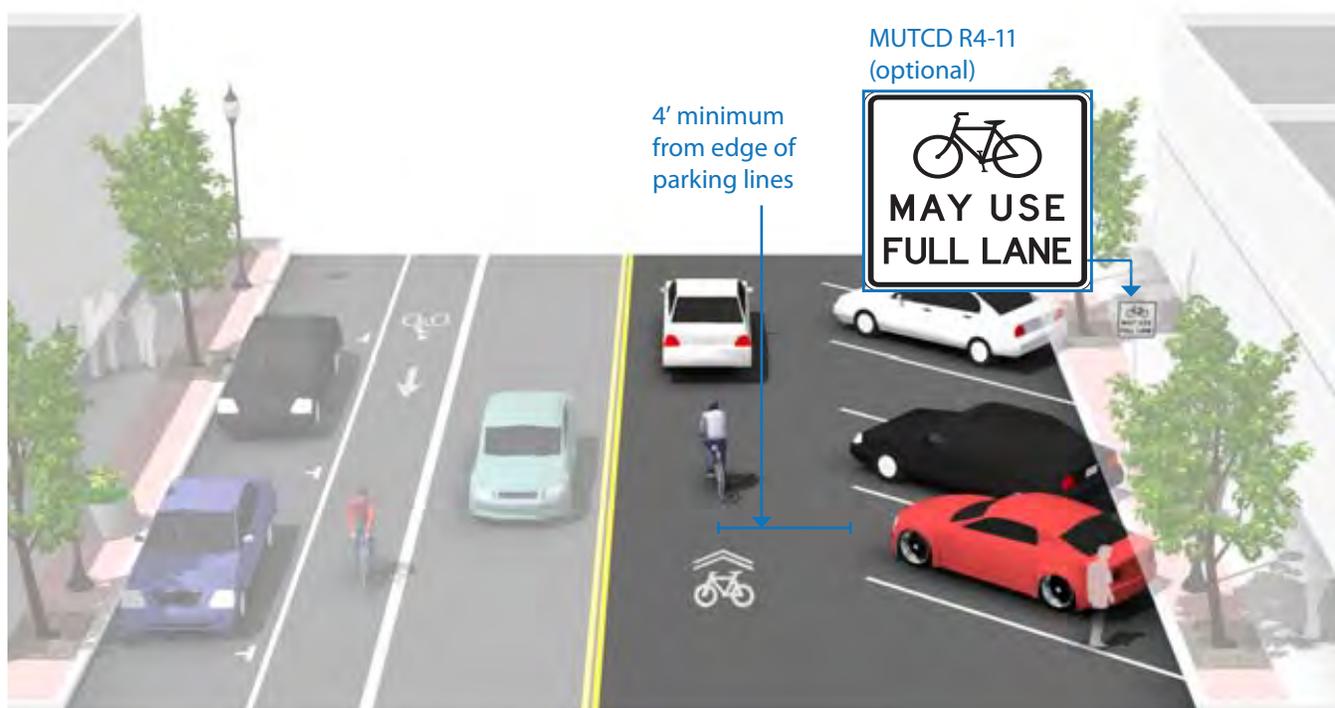
Description

In certain areas with high parking demand such as urban commercial areas, diagonal parking can be used to increase parking supply.

Back-in diagonal parking improves sight distance between drivers and bicyclists when compared to conventional head-in diagonal parking. Back-in diagonal parking provides additional benefits to vehicles including loading and unloading of the trunk at the curb rather than in the street, passengers (including children) are directed by open doors towards the curb; there is also no door conflict with bicyclists.

Guidance

- In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- Minimum placement of SLM marking centerline is 4 feet from the edge of parking lines.



Discussion

Conventional front-in diagonal parking is not compatible or recommended in conjunction with high levels of bicycle traffic as drivers backing out of conventional diagonal parking have poor visibility of approaching bicyclists.

While there may be a learning curve for some drivers, using back-in diagonal parking is typically an easier maneuver than conventional parallel parking.

Additional References and Guidelines

There is no currently adopted Federal or State guidance for this treatment.

Materials and Maintenance

Placing SLMs between vehicle tire tracks will increase the life of the markings and minimize the long-term cost of the treatment.

Bicycle Boulevards

Description

Bicycle Boulevards are low-volume, low-speed streets modified to enhance bicyclist comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction, and intersection modifications. These treatments allow through movements of bicyclists while discouraging similar through-trips by non-local motorized traffic.

Guidance

- Signs and pavement markings are the minimum treatments necessary to designate a street as a bicycle boulevard.
- Bicycle boulevards should have a maximum posted speed of 25 mph. Use traffic calming to maintain an 85th percentile speed below 22 mph.
- Implement volume control treatments based on the context of the bicycle boulevard, using engineering judgment. Target motor vehicle volumes range from 1,000 to 3,000 vehicles per day.
- Intersection crossings should be designed to enhance safety and minimize delay for bicyclists.

Signs and Pavement Markings identify the street as a bicycle priority route.

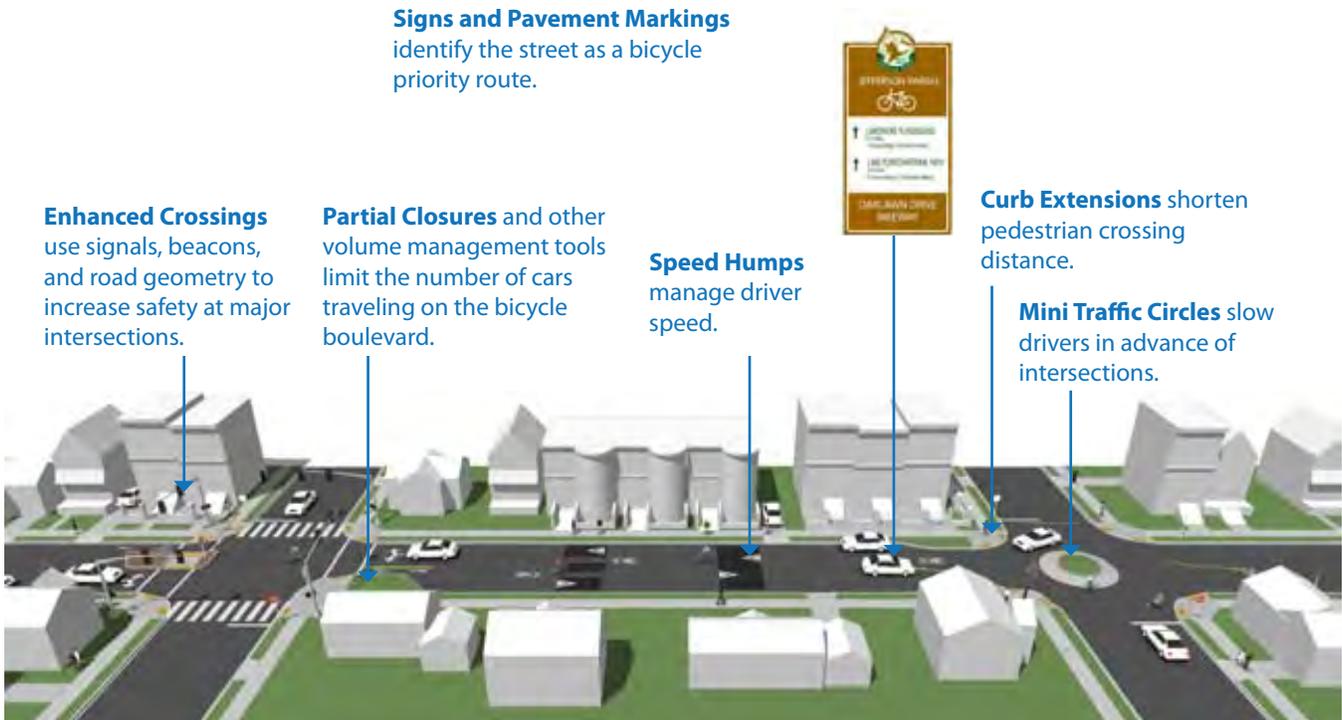
Enhanced Crossings use signals, beacons, and road geometry to increase safety at major intersections.

Partial Closures and other volume management tools limit the number of cars traveling on the bicycle boulevard.

Speed Humps manage driver speed.

Curb Extensions shorten pedestrian crossing distance.

Mini Traffic Circles slow drivers in advance of intersections.



Discussion

Bicycle boulevard retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the bicycle boulevard and compromise safety.

Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

Additional References and Guidelines

Alta Planning + Design and IBPI, *Bicycle Boulevard Planning and Design Handbook*. 2009
FHWA. *BikeSafe, Bicycle Countermeasure Selection System*. 2005
Ewing, Reid, *Traffic Calming: State of the Practice*. 1999
Ewing, Reid and Brown, Steven, *U.S. Traffic Calming Manual*. 2009

Materials and Maintenance

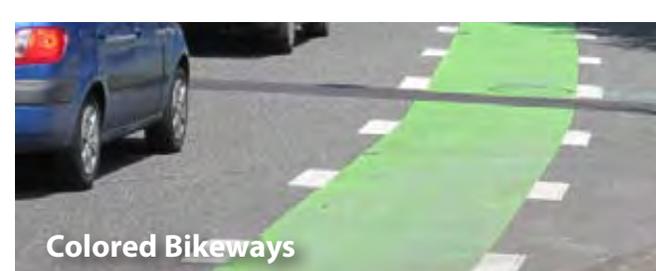
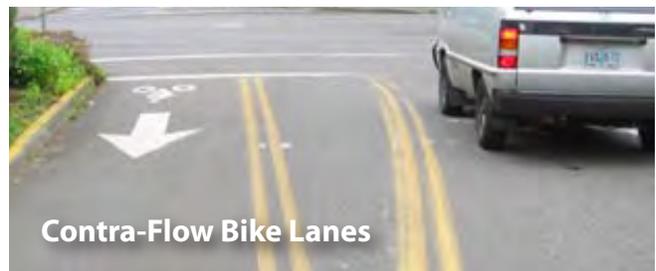
Vegetation should be regularly trimmed to maintain visibility and attractiveness.

SEPARATED BIKEWAYS

Designated exclusively for bicycle travel, separated bikeways are segregated from vehicle travel lanes by striping, and can include pavement stencils and other treatments. Separated bikeways are most appropriate on arterial and collector streets where higher traffic volumes and speeds warrant greater separation.

Separated bikeways can increase safety and promote proper riding by:

- Defining road space for bicyclists and motorists, reducing the possibility that motorists will stray into the bicyclists' path
- Discouraging bicyclists from riding on the sidewalk
- Reducing the incidence of wrong way riding
- Reminding motorists that bicyclists have a right to the road



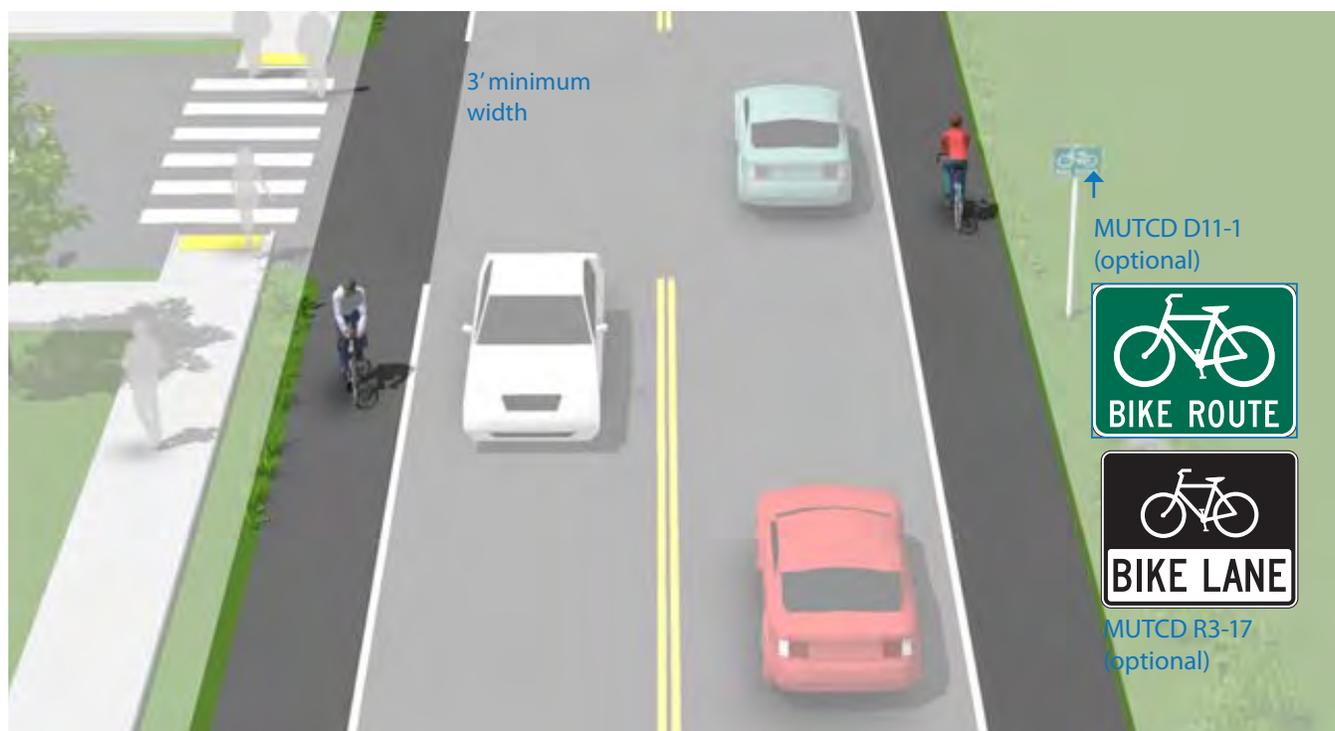
Shoulder Bikeways

Description

Typically found in less-dense areas, shoulder bikeways are paved roadways with striped shoulders (4'+) wide enough for bicycle travel. Shoulder bikeways often, but not always, include signage alerting motorists to expect bicycle travel along the roadway. Shoulder bikeways should be considered a temporary treatment, with full bike lanes planned for construction when the roadway is widened or completed with curb and gutter. This type of treatment is not typical in urban areas and should only be used where constraints exist.

Guidance

- Per *EDSM No: II.2.1.14*, the minimum desirable paved shoulder width for a bicycle friendly highway is 4 feet.
- If 4 feet or more is available for bicycle travel, the full bike lane treatment of signs, legends, and an 8" bike lane line would be provided.
- If it is not possible to meet minimum bicycle lane dimensions, a reduced width paved shoulder can still improve conditions for bicyclists on constrained roadways. In these situations, a minimum of 3 feet of operating space should be provided.



Discussion

A wide outside lane may be sufficient accommodation for bicyclists on streets with insufficient width for bike lanes but which do have space available to provide a wider (14'-16') outside travel lane. Consider configuring as a **marked shared roadway** in these locations. Where feasible, **roadway widening** should be performed with pavement resurfacing jobs, but not exceeding desirable bike lane widths.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
DOTD, *Engineering Directives And Standards Manual (EDSM)*, No: II.2.1.14. 2009

Materials and Maintenance

Shoulder bikeways should be clear of trash and debris through routine maintenance operations.

Bike Lane

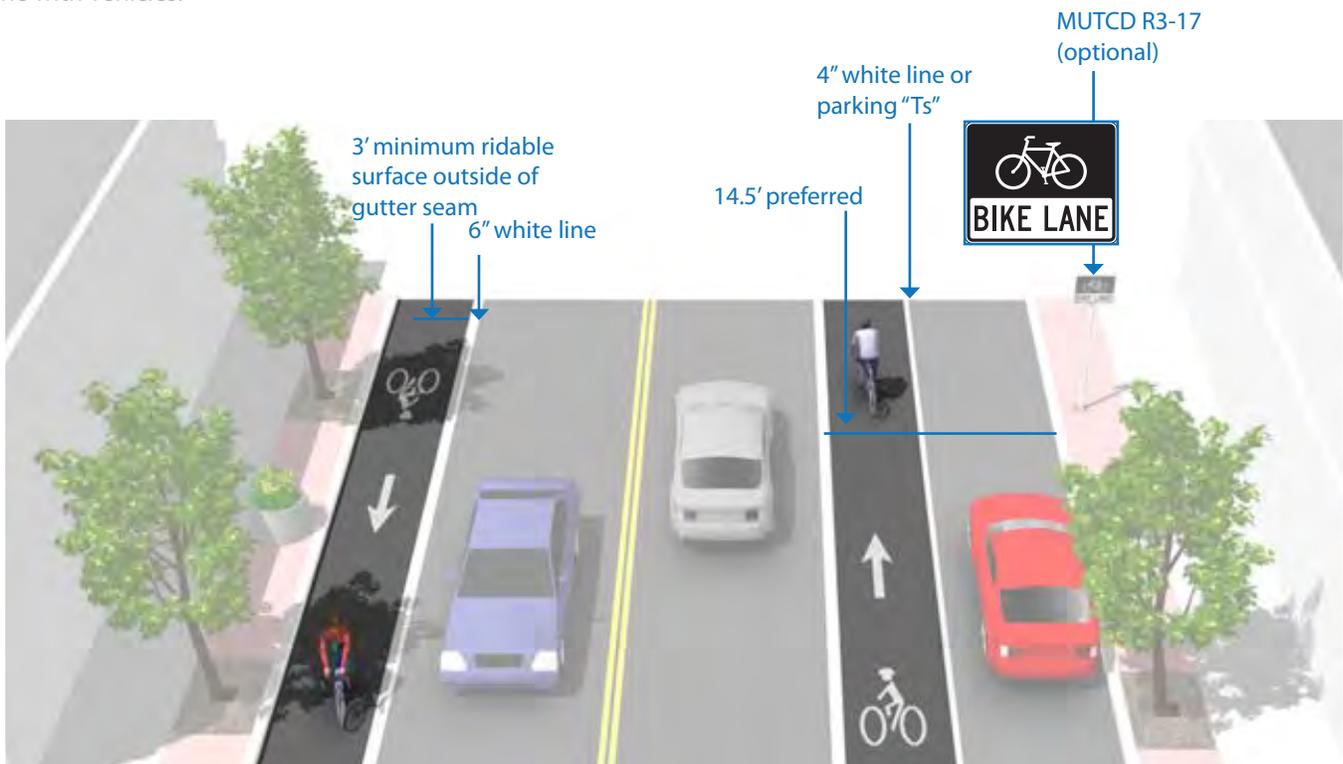
Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.

Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

Guidance

- 4 foot minimum when no curb and gutter is present.
- 5 foot minimum when adjacent to curb and gutter or 3 feet more than the gutter pan width if the gutter pan is wider than 2 feet.
- 14.5 foot preferred from curb face to edge of bike lane. (12 foot minimum).
- 7 foot maximum width for use adjacent to arterials with high travel speeds. Greater widths may encourage motor vehicle use of bike lane.



Discussion

Wider bicycle lanes are desirable in certain situations such as on higher speed arterials (45 mph+) where use of a wider bicycle lane would increase separation between passing vehicles and bicyclists. Appropriate signing and stenciling is important with wide bicycle lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane. Consider **Buffered Bicycle Lanes** when further separation is desired.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

Bike Lane Adjacent to On-Street Parallel Parking

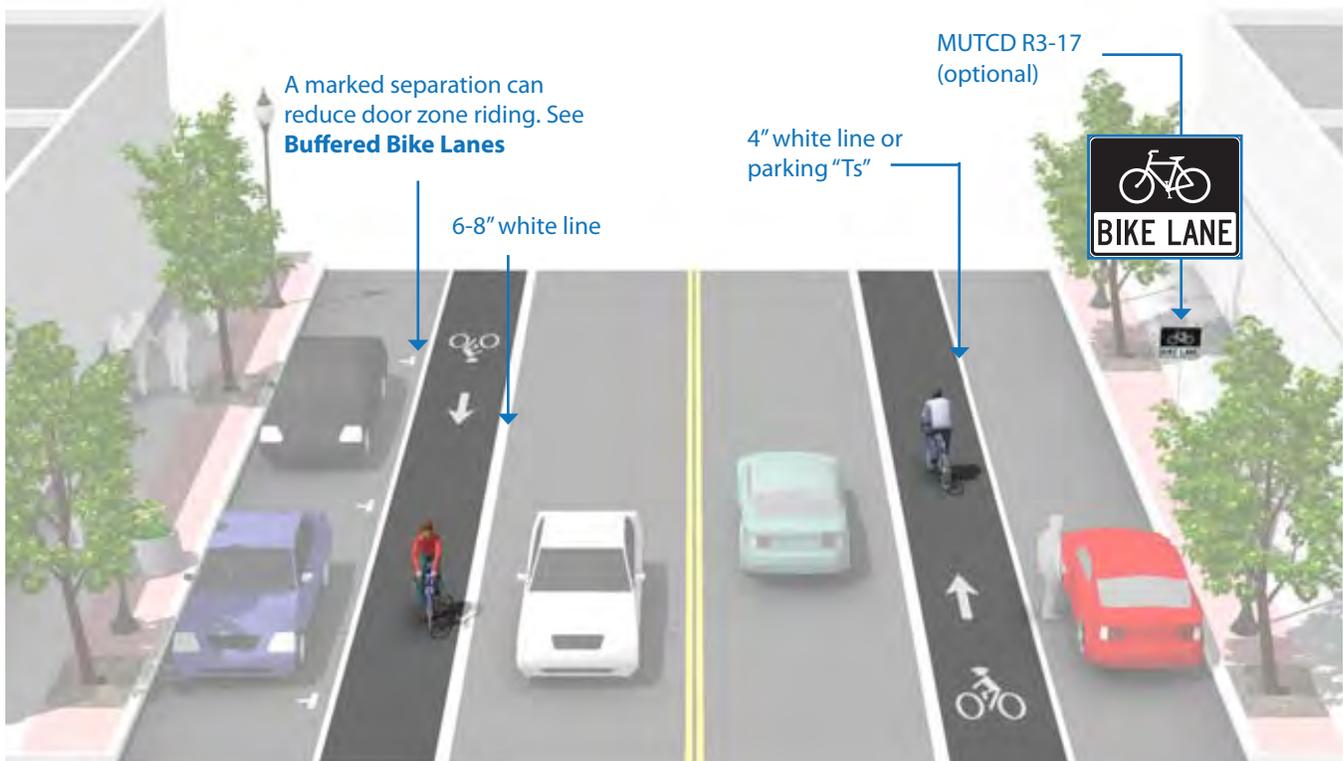
Description

Bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage. The bike lane is located adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.

Many bicyclists, particularly less experienced riders, are more comfortable riding on a busy street if it has a striped and signed bikeway than if they are expected to share a lane with vehicles.

Guidance

- 12 foot minimum from curb face to edge of bike lane.
- 14.5 foot preferred from curb face to edge of bike lane.
- 7 foot maximum for marked width of bike lane. Greater widths may encourage vehicle loading in bike lane. See **buffered bike lanes** when a wider facility is desired.



Discussion

Bike lanes adjacent to on-street parallel parking require special treatment in order to avoid crashes caused by an open vehicle door. The bike lane should have sufficient width to allow bicyclists to stay out of the door zone while not encroaching into the adjacent vehicular lane. Parking stall markings, such as parking "Ts" and double white lines create a parking side buffer that encourages bicyclists to ride farther away from the door zone.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining marking should be a high priority.

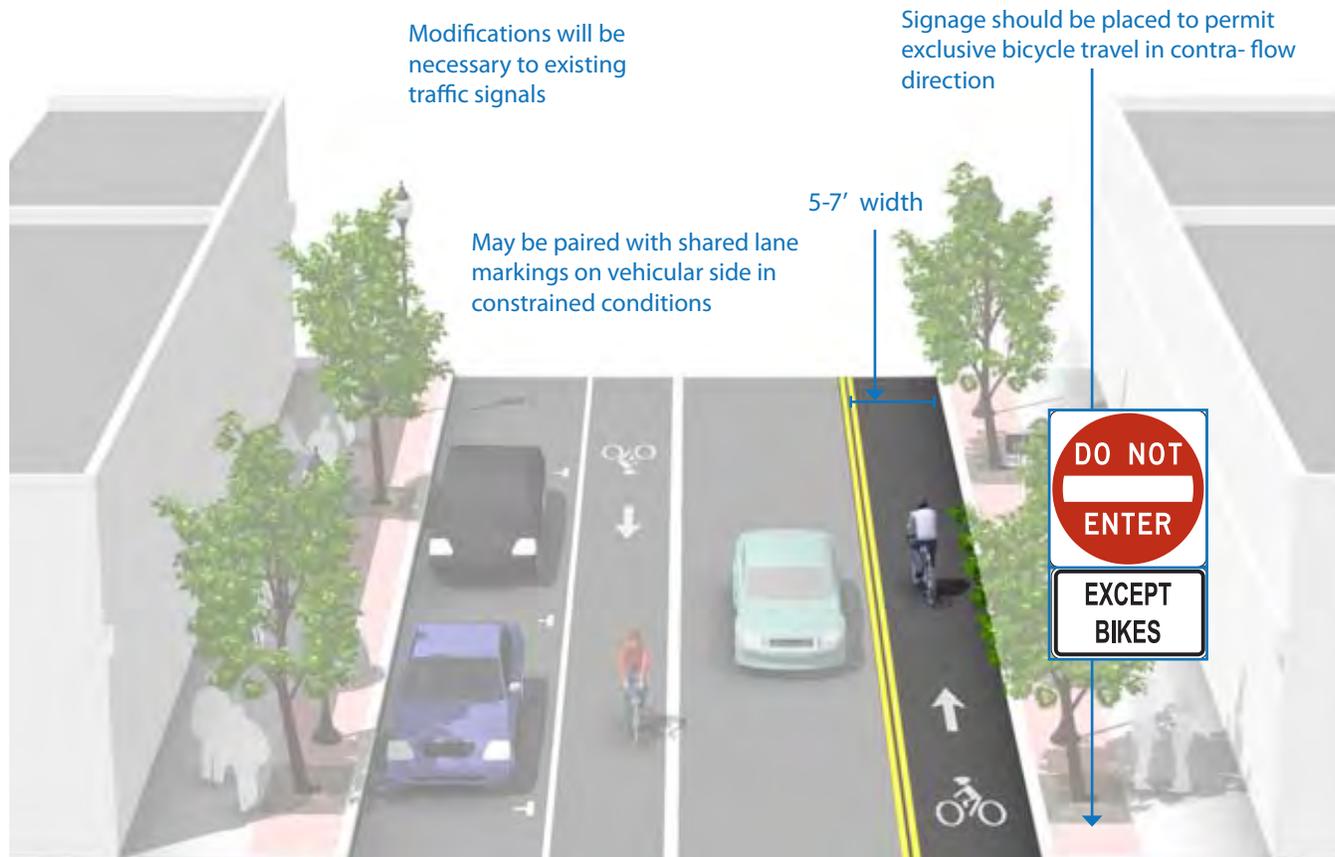
Contra-flow Bike Lane on One-way Street

Description

Contra-flow bike lanes provide bidirectional bicycle access on a roadway that is one-way for motor vehicle traffic. This treatment can provide direct access and connectivity for bicyclists and reducing travel distances. Contra-flow bike lanes can also be used to convert two-way motor vehicle traffic to one-way to reduce traffic volumes where desired.

Guidance

- The contra-flow bike lane should be 5-7 feet wide and marked with a solid double yellow line and appropriate signage. Bike lane markings should be clearly visible to ensure that the contra-flow lane is exclusively for bicycles. Coloration should be considered in the bike lane.
- Signage specifically allowing bicycles at the entrance of the contra flow lane is recommended.



Discussion

Because of the opposing direction of travel, contra-flow bike lanes increase the speed differential between bicyclists and motor vehicles in the adjacent travel lane. If space permits consider a **buffered bike lane** or **cycle track** configuration to provide additional separation.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining marking should be a high priority.

Buffered Bike Lane

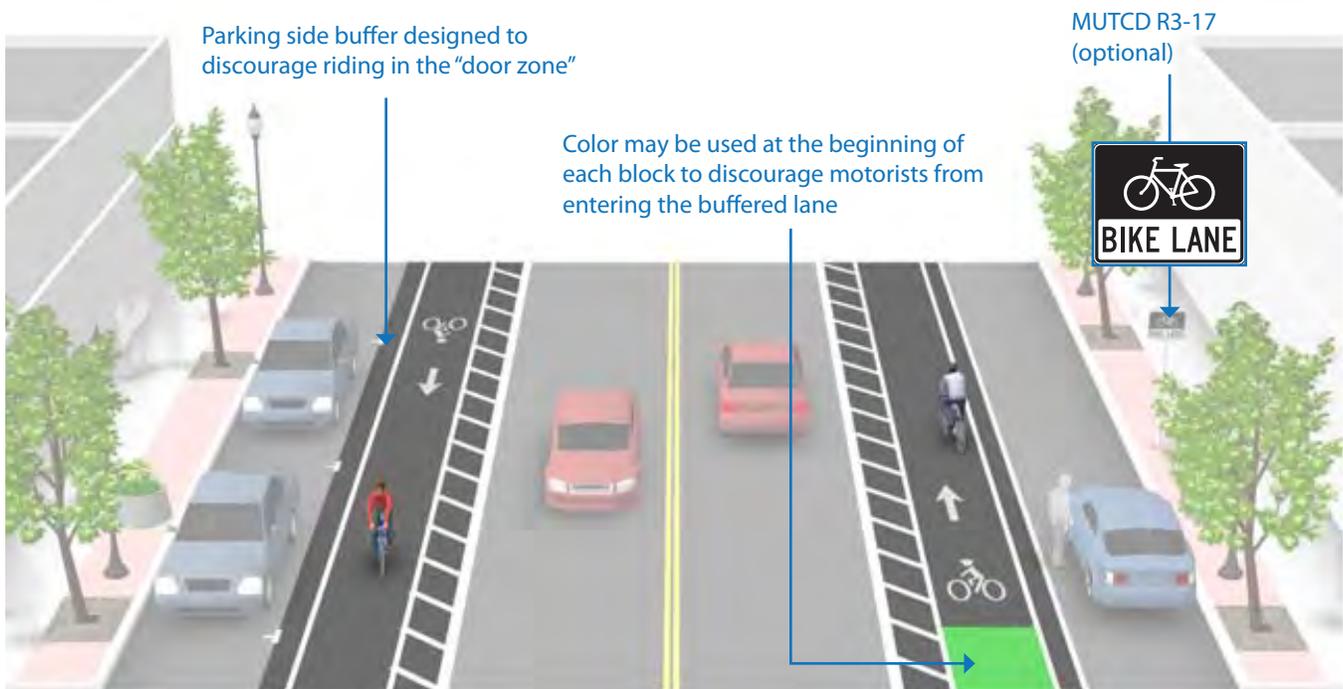
Description

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane. Buffered bike lanes are allowed as per MUTCD guidelines for buffered preferential lanes (section 3D-01).

Buffered bike lanes are designed to increase the space between the bike lane and the travel lane or parked cars. This treatment is appropriate for bike lanes on roadways with high motor vehicle traffic volumes and speed, adjacent to parking lanes, or a high volume of truck or oversized vehicle traffic.

Guidance

- Where bicyclist volumes are high or where bicyclist speed differentials are significant, the desired bicycle travel area width is 7 feet.
- Buffers should be at least 2 feet wide. If 3 feet or wider, mark with diagonal or chevron hatching. For clarity at driveways or minor street crossings, consider a dotted line for the inside buffer boundary where cars are expected to cross.



Discussion

Frequency of right turns by motor vehicles at major intersections should determine whether continuous or truncated buffer striping should be used approaching the intersection. Commonly configured as a buffer between the bicycle lane and motor vehicle travel lane, a parking side buffer may also be provided to help bicyclists avoid the 'door zone' of parked cars.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices (3D-01)*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining marking should be a high priority.

Colored Bikeways

Description

Colored pavement within a bicycle lane increases the visibility of the bicycle facility. Use of color is appropriate for use in areas with pressure for illegal parking, frequent encroachment of motor vehicles, clarify conflict areas, and along enhanced facilities such as **contra-flow bicycle lanes** and **cycle tracks**.

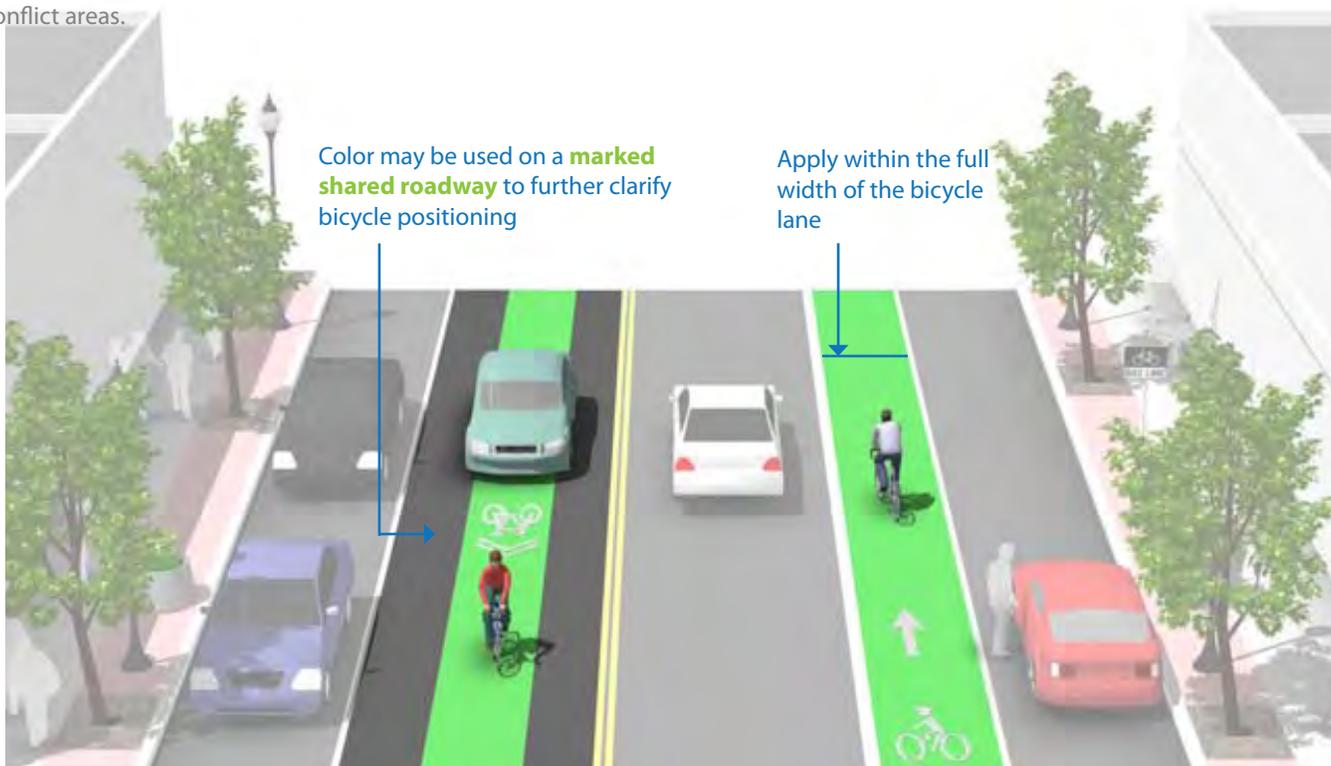
Color has also been used in conjunction with shared lane markings to create a "lane within a lane" to further clarify proper bicyclist positioning on shared roadway streets.

When applied along full corridors, driveway and intersection areas should be identified through the absence of color, or the use of an alternate marking pattern to identify potential conflict areas.

Guidance

The color green has been given interim approval by the Federal Highway Administration in March of 2011. See interim approval IA-14 for specific color standards.

The colored surface should be skid resistant and retro-reflective.



Discussion

Colored pavement is also used to identify potential areas of conflict, and reinforces priority to bicyclists in these conflict areas. See **Colored Bike Lanes in Conflict Areas** on page 45 of this report for more guidance.

Additional References and Guidelines

FHWA, Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10. 2011
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining marking should be a high priority.

CYCLE TRACKS AND SHARED USE PATHS

A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—they provide space that is intended to be exclusively or primarily used by bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks. In situations where on-street parking is allowed, cycle tracks are located to the curb-side of the parking (in contrast to bike lanes).

Cycle tracks may be one-way or two-way, and may be at street level, 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.

A two-way cycle track is desirable when more destinations are on one side of a street (therefore preventing additional crossings), if the facility connects to a path or other bicycle facility on one side of the street, or if there is not enough room for a cycle track on both sides of the road.

By separating bicyclists from motor traffic, cycle tracks can offer a higher level of comfort than bike lanes and are attractive to a wider spectrum of the public.

Shared Use Paths are facilities separated from roadways for use by bicyclists and pedestrians.

Intersections and approaches must be carefully designed to promote safety and facilitate left-turns from the right side of the street. See **separated bikeways at intersections** on page 43 of this report for more information.



One Way Cycle Tracks



Two-Way Cycle Tracks



Shared Use Paths along Roadways



Major Street Crossings

Cycle Track Separation and Placement

Description

Protection is provided through physical barriers and can include bollards, parking, a planter strip, an extruded curb, or on-street parking. Cycle tracks using these protection elements typically share the same elevation as adjacent travel lanes.

Raised cycle tracks may be at the level of the adjacent sidewalk or set at an intermediate level between the roadway and sidewalk to separate the cycle track from the pedestrian area.

Guidance

- Cycle tracks should ideally be placed along streets with long blocks and few driveways or mid-block access points for motor vehicles. Cycle tracks located on one-way streets have fewer potential conflict areas than those on two-way streets.
- In situations where on-street parking is allowed, cycle tracks shall be located between the parking lane and the sidewalk (in contrast to bike lanes).



Discussion

Sidewalks or other pedestrian facilities should not be narrowed to accommodate the cycle track as pedestrians will likely walk on the cycle track if sidewalk capacity is reduced. Visual and physical cues (e.g., pavement markings & signage) should be used to make it clear where bicyclists and pedestrians should be travelling. If possible, separate the cycle track and pedestrian zone with a furnishing zone.

Additional References and Guidelines

NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Barrier separated and raised cycle tracks may require special equipment for street cleaning operations.

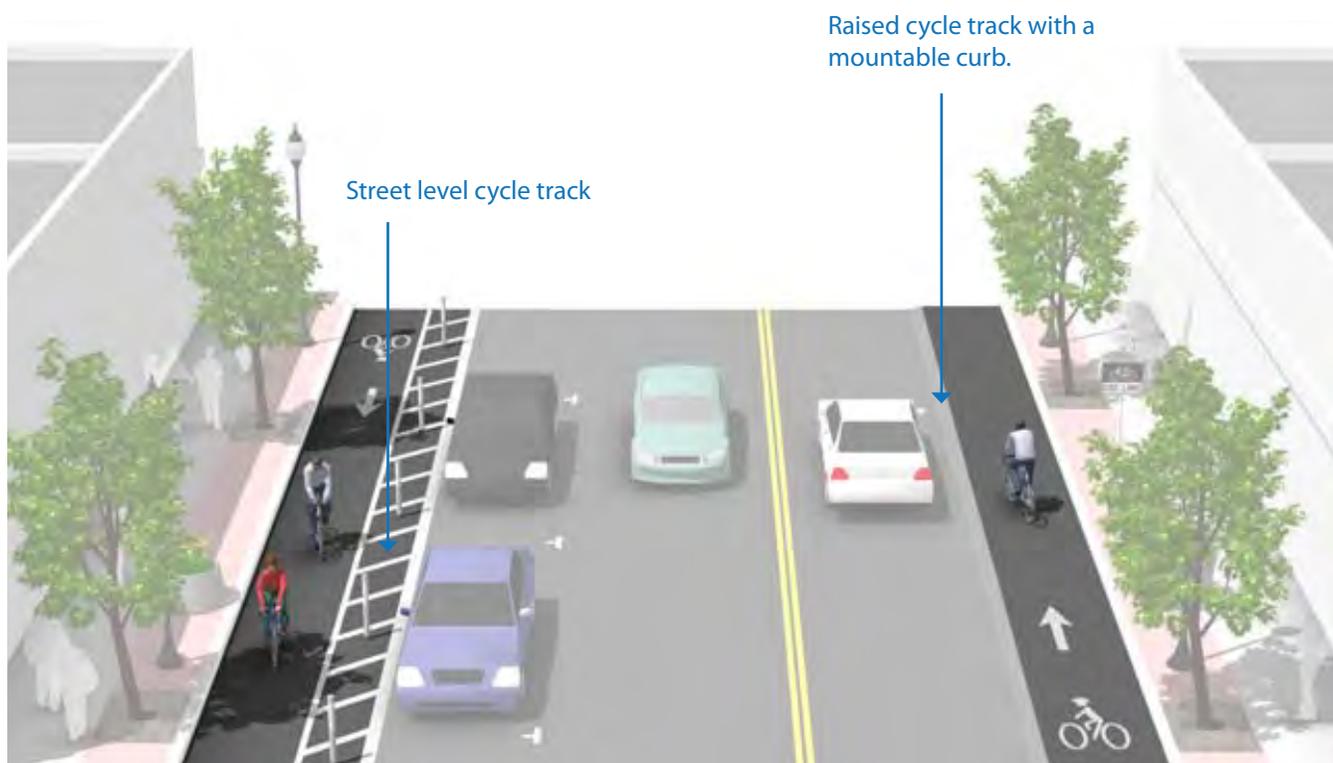
One-Way Cycle Tracks

Description

One-way cycle tracks are physically separated from motor traffic and distinct from the sidewalk. Cycle tracks are either raised or at street level and use a variety of elements for physical protection from passing traffic.

Guidance

- 7 foot recommended minimum to allow passing.
- 5 foot minimum width in constrained locations.
- When placed adjacent to parking, the parking buffer should be three feet wide to allow for passenger loading and to prevent door collisions.
- When placed adjacent to a travel lane, one-way raised cycle tracks may be configured with a mountable curb to allow entry and exit from the bicycle lane for passing other bicyclists or to access vehicular turn lanes.



Discussion

Special consideration should be given at transit stops to manage bicycle and pedestrian interactions. Driveways and minor street crossings are unique challenges to cycle track design. Parking should be prohibited within 30 feet of the intersection to improve visibility. Color, yield markings and "Yield to Bikes" signage should be used to identify the conflict area and make it clear that the cycle track has priority over entering and exiting traffic. If configured as a raised cycle track, the crossing should be raised so that the sidewalk and cycle track maintain their elevation through the crossing.

Additional References and Guidelines

NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Barrier separated and raised cycle tracks may require special equipment for street cleaning operations.

Two-Way Cycle Tracks

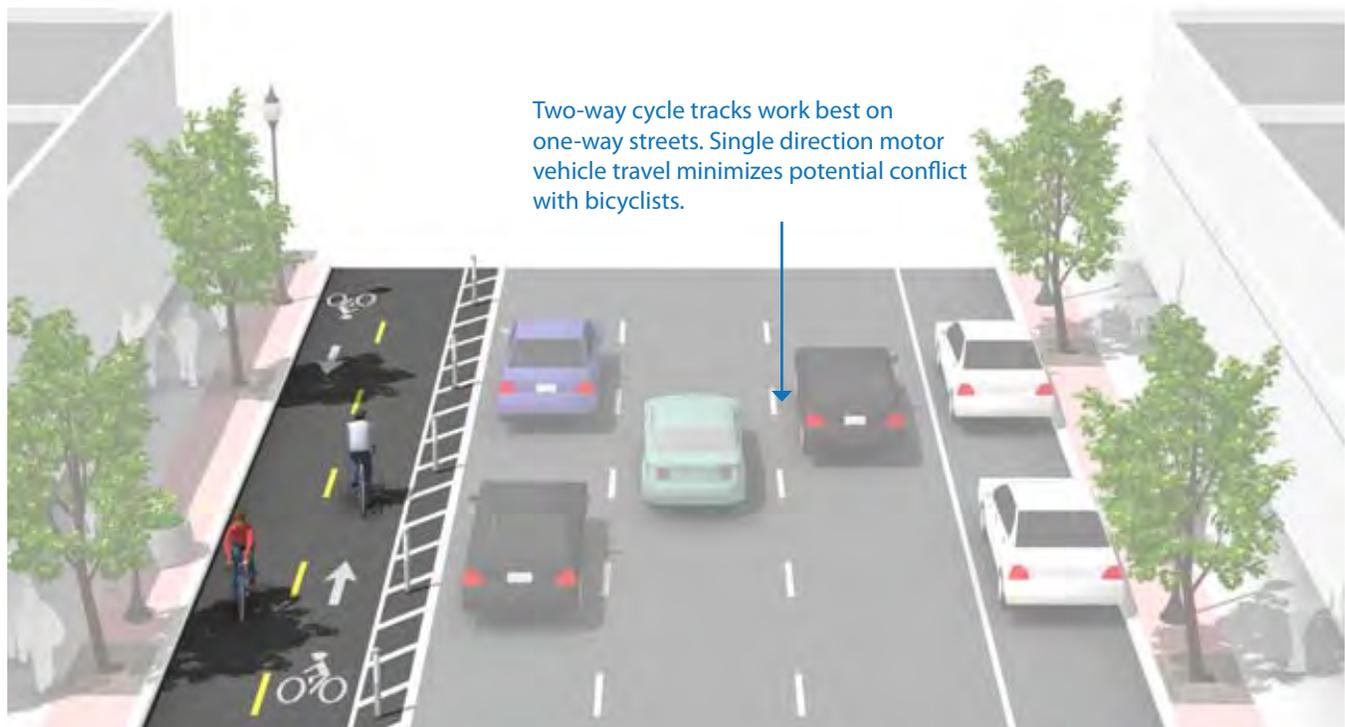
Description

Two-way cycle tracks are physically separated cycle tracks that allow bicycle movement in both directions on one side of the road. Two-way cycle tracks share some of the same design characteristics as **one-way cycle tracks**, but may require additional considerations at driveway and side-street crossings.

A two-way cycle track may be configured as a protected cycle track at street level with a parking lane or other barrier between the cycle track and the motor vehicle travel lane and/or as a raised cycle track to provide vertical separation from the adjacent motor vehicle lane.

Guidance

- 12 foot recommended minimum for two-way facility
- 8 foot minimum in constrained locations
- When placed adjacent to parking, the parking buffer should be three feet wide to allow for passenger loading and to prevent door collisions.



Discussion

Two-way cycle tracks require a higher level of control at intersections to allow for a variety of turning movements. These movements should be guided by separated signals for bicycles and motor vehicles. Transitions into and out of two-way cycle tracks should be simple and easy to use to deter bicyclists from continuing to ride against the flow of traffic.

At driveways and minor intersections, bicyclists riding against roadway traffic in two-way cycle tracks may surprise pedestrians and drivers not expecting bidirectional travel. Appropriate signage is recommended.

Additional References and Guidelines

NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Barrier separated and raised cycle tracks may require special equipment for street cleaning operations.

Major Street Crossings

Description

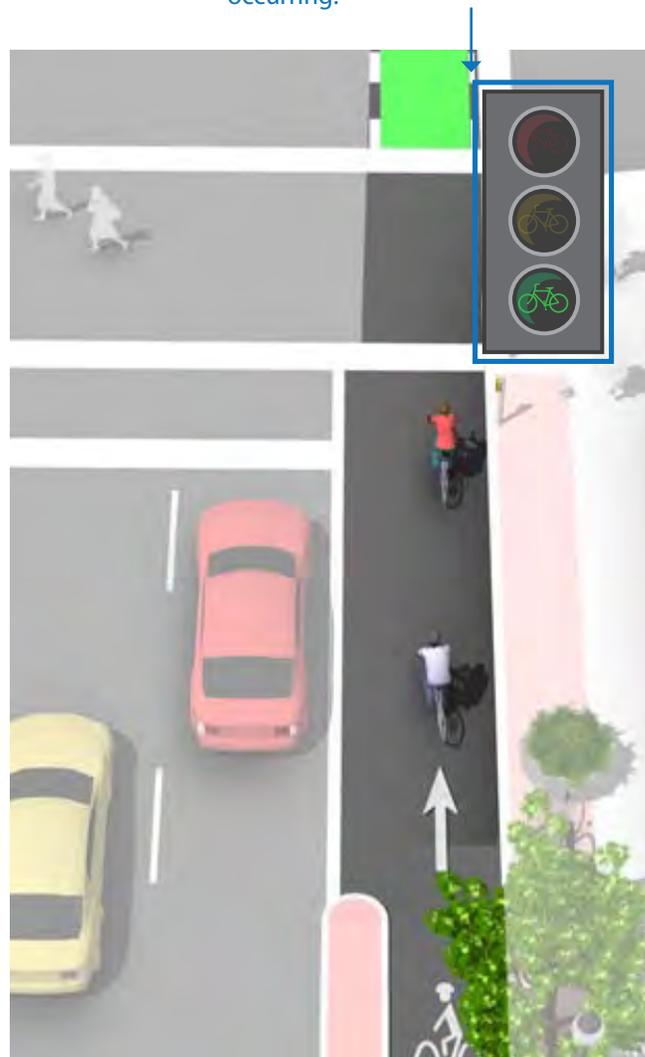
Cycle tracks approaching major intersections must minimize and mitigate potential conflicts and provide connections to intersecting facility types.

Cycle track crossings of signalized intersections can also be accomplished through the use of a bicycle signal phase which reduces conflicts with motor vehicles by separating bicycle movements from any conflicting motor vehicle movements.

Guidance

- Drop cycle track buffer and transition to bike lane 16' in advance of the intersection.
- Remove parking 16' -50' in advance of the buffer termination.
- Use a **bike box** or advanced stop line treatment to place bicyclists in front of traffic.
- Use **colored pavement** markings through the conflict area.
- Provide for left-turning movements with **two-stage turn** boxes.
- Consider using a protected phase **bicycle signal** to isolate conflicts between bicyclists and motor vehicle traffic.
- In constrained conditions with right turn only lanes, consider transitioning to a **shared bike lane/turn lane**.

Demand-only bicycle signals can be implemented to reduce vehicle delay and to prevent an empty signal phase from regularly occurring.



Discussion

Signalization utilizing a bicycle signal head can also be set to provide cycle track users a green phase in advance of vehicle phases. The length of the signal phase will depend on the width of the intersection.

The same conflicts exist at non-signalized intersections. Warning signs, special markings and the removal of on-street parking in advance of the intersection can raise visibility and awareness of bicyclists.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

Shared Use Paths Along Roadways

Description

A shared use path adjacent to a roadway provides for two way travel separated from motor vehicle traffic.

A shared use path allows for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, runners and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles.

Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path.

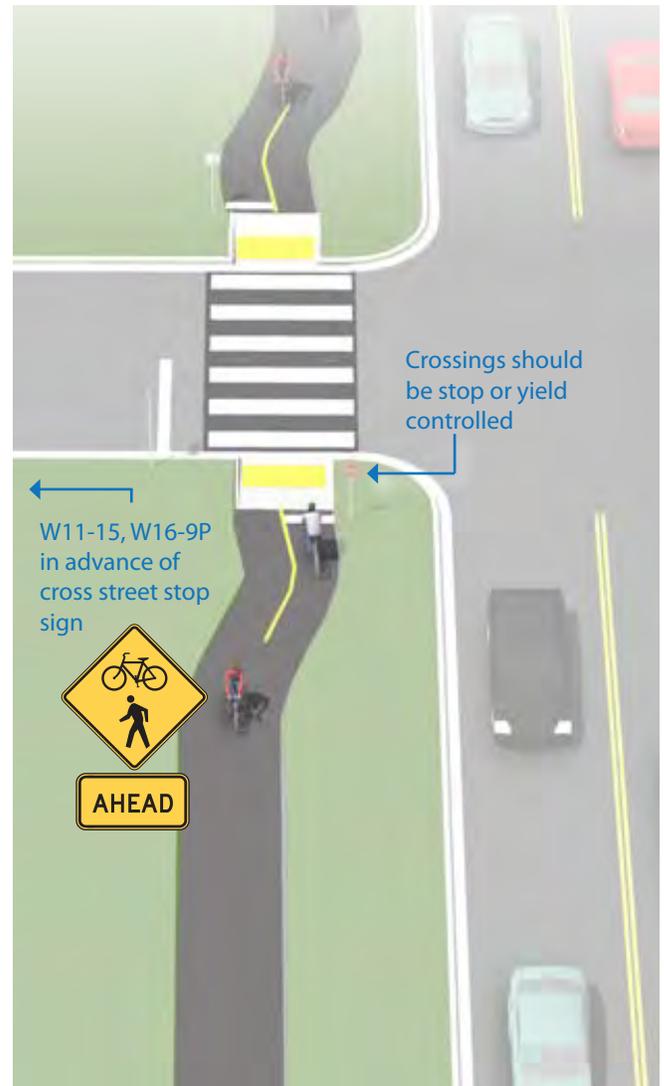
The *AASHTO Guide for the Development of Bicycle Facilities* provides guidance on the development of shared-use paths directly adjacent to roadways.

Guidance

- 8 feet is the minimum allowed for a two-way bicycle path and is only recommended in low traffic situations.
- 10 feet is recommended in most situations and is adequate for moderate to heavy use.
- 12 feet is recommended for heavy use situations with high concentrations of multiple users such as runners, bicyclists, rollerbladers and pedestrians. A separate track (5' minimum) can be provided for pedestrian use.

Bicycle lanes should be provided as an alternate facility whenever possible.

Pay special attention to the entrance/exit of the path as bicyclists may continue to travel on the wrong side of the street.



Discussion

When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bicycle lane width on the roadway, as the on-street bicycle facility is preferred over the "sidepath" by experienced bicyclists and those who are cycling for transportation purposes.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
NACTO, *Urban Bikeway Design Guide*. 2012 (See entry on Raised Cycle Tracks.)

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw-cut concrete joints (rather than troweled) improve the experience of path users.

GREENWAYS

A greenway is a type of shared-use path that follows a linear corridor, such as the levee paths in Jefferson Parish. Greenways allow for two-way, off-street bicycle use and also may be used by pedestrians, skaters, wheelchair users, joggers and other non-motorized users. These facilities are frequently found in parks, along rivers, beaches, and in greenbelts or utility corridors where there are few conflicts with motorized vehicles. Path facilities can also include amenities such as lighting, signage, and fencing (where appropriate).

Key features of greenways include:

- Frequent access points from the local road network.
- Directional signs to direct users to and from the path.
- A limited number of at-grade crossings with streets or driveways.
- Terminating the path where it is easily accessible to and from the street system.
- Separate treads for pedestrians and bicyclists when heavy use is expected.



General Design Practices

Description

Shared use paths can provide a desirable facility, particularly for recreation, and users of all skill levels preferring separation from traffic. Bicycle paths should generally provide directional travel opportunities not provided by existing roadways.

Guidance

Width

- 8 feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic situations.
- 10 feet is recommended in most situations and will be adequate for moderate to heavy use.
- 12 feet or more is recommended for heavy use situations with high concentrations of multiple users. A separate track (5' minimum) can be provided for pedestrian use.

Lateral Clearance

- A 2 foot or greater shoulder on both sides of the path should be provided. An additional foot of lateral clearance (total of 3') is required by the MUTCD for the installation of signage or other furnishings.
- If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night.

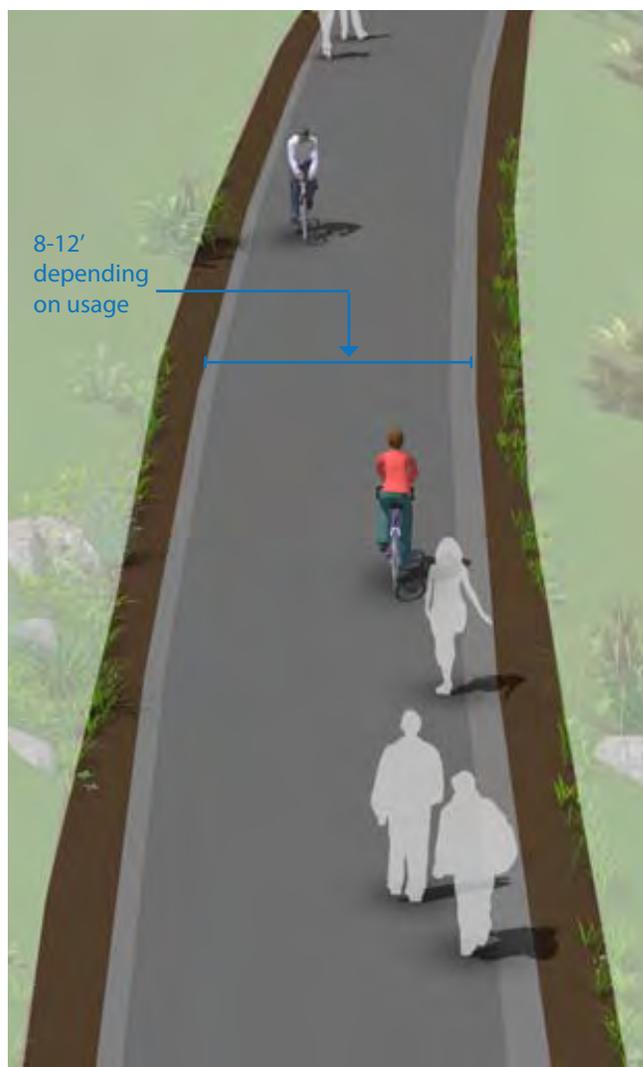
Overhead Clearance

- Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

Striping

- When striping is required, use a 4 inch dashed yellow centerline stripe with 4 inch solid white edge lines.
- Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.

Terminate the path where it is easily accessible to and from the street system, preferably at a controlled intersection or at the beginning of a dead-end street.



Discussion

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of **shared use paths along roadways**. Also known as “sidepaths”, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the path.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
Flink, Chuck, *Greenways: A Guide To Planning Design And Development*. 1993
Flink, Chuck, *Trails for the Twenty-First Century*. 2001

Materials and Maintenance

Asphalt is the most common surface for bicycle paths. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled improve the experience of path users.

Greenways along Waterway Corridors

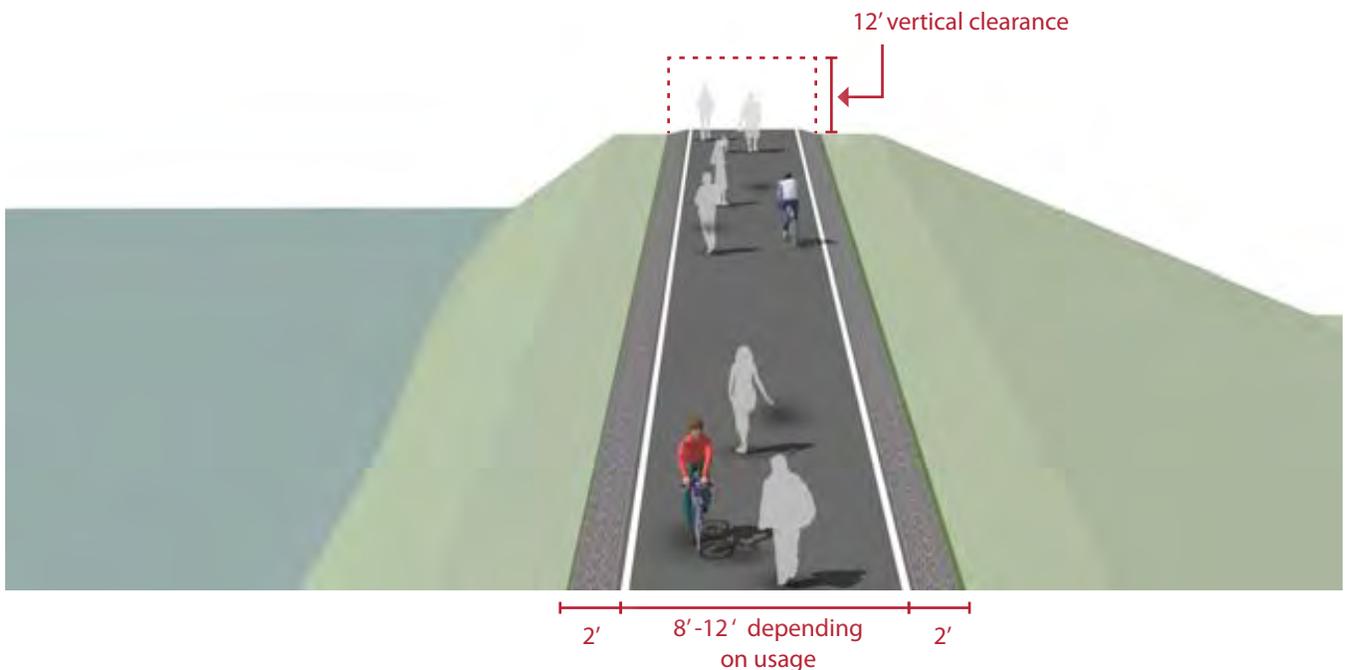
Description

Utility and waterway corridors often offer excellent opportunities for greenway development and bikeway gap closure. Utility corridors typically include powerline and sewer corridors, while waterway corridors may include canals, levees, drainage ditches, rivers, and beaches.

Waterway corridors are often ideally suited for greenways and bikeways. They are typically long and linear in nature and can generally offer a continuous bikeway with few

conflicts with other transportation modes. Waterway corridors often have the benefit of great views and are suitable for users of all ages and skill levels.

The relatively clear, level surface of the top of a levee provides an ideal location for a greenway. Access to a trail on top of a levee would likely require ramps or boardwalk to provide Americans with Disabilities Act (ADA) compliance. Barriers such as water crossings, existing bridges and flood control infrastructure may require modifications or additional structures to provide continuous access for the greenway.



Discussion

Similar to railroads, public access to flood control channels or canals often necessitate additional features to make a greenway compatible with flood control or canal operations. Hazardous materials, deep water or swift current, steep, slippery slopes, and debris all constitute considerations that must be addressed for public access.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
Flink, Chuck, *Greenways: A Guide To Planning Design And Development*. 1993

Materials and Maintenance

Asphalt is the most common surface for greenways. The use of concrete for paths has proven to be more durable over the long term. Saw cut concrete joints rather than troweled joints improve the experience of wheeled greenways users.

Greenways along Waterway Corridors (Continued)

Ownership

The Levee system in the New Orleans district is managed by the US Army Corps of Engineers. Corps offices work in partnership with the Regional Planning Commission and local parishes to allow greenways/shared use paths on top of the levees through a formal request process. Greenway projects are typically done in conjunction with restoration projects to ensure that the levees are in good repair prior to the addition of new facilities.

Guidance

Greenways in utility corridors should meet or exceed **current best design practices**, which are described on page 35 of this report. If space is available, wider paths and landscaping are desirable. However, landscaping could have a negative impact on the structural integrity of a levee and must be approved by managing agency.

Wayfinding and Signage

Any access point to the path should be well-defined with appropriate wayfinding signage designating the pathway as a greenway or bicycle facility and prohibiting motor vehicles. Regulatory signage may also be needed along the path alignment. For instance, there are many existing conflicts with commercial driveways along the levee paths that present a safety issue. Regulatory signs should be placed at these conflict areas to alert greenway users to exercise caution when approaching the driveways. A sign displaying a commercial truck could serve as an appropriate sign treatment. Removable bollards, or gate features could also be installed, which would allow non-motorized access and would prevent motorized public use while preserving maintenance access.

Path Closure

A gate that can prevent any access to the facility should also be present in case of path closure, to prevent public access during the following events:

- Maintenance activities
- Inclement weather or the prediction of storm conditions

Design Considerations

- Meet or exceed US Army Corps of Engineers standards
- Use permeable surfacing where possible; where impermeable surfaces are required, grade towards infiltration strips
- Meet ADA standards to the maximum extent feasible
- 12' minimum vertical clearance to permit passage of maintenance and emergency vehicles

BICYCLE SUPPORT FACILITIES

Bicycle Parking

Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of 2 hours or less, or long-term parking for employees, students, residents, and commuters.

Access to Transit

Safe and easy access to bicycle parking facilities is necessary to encourage commuters to access transit via bicycle. Providing bicycle access to transit and space for bicycles on buses and rail vehicles can increase the feasibility of transit in lower-density areas, where transit stops are beyond walking distance of many residences. People are often willing to walk only a quarter-to half-mile to a bus stop, while they might bike as much as two or more miles to reach a transit station.



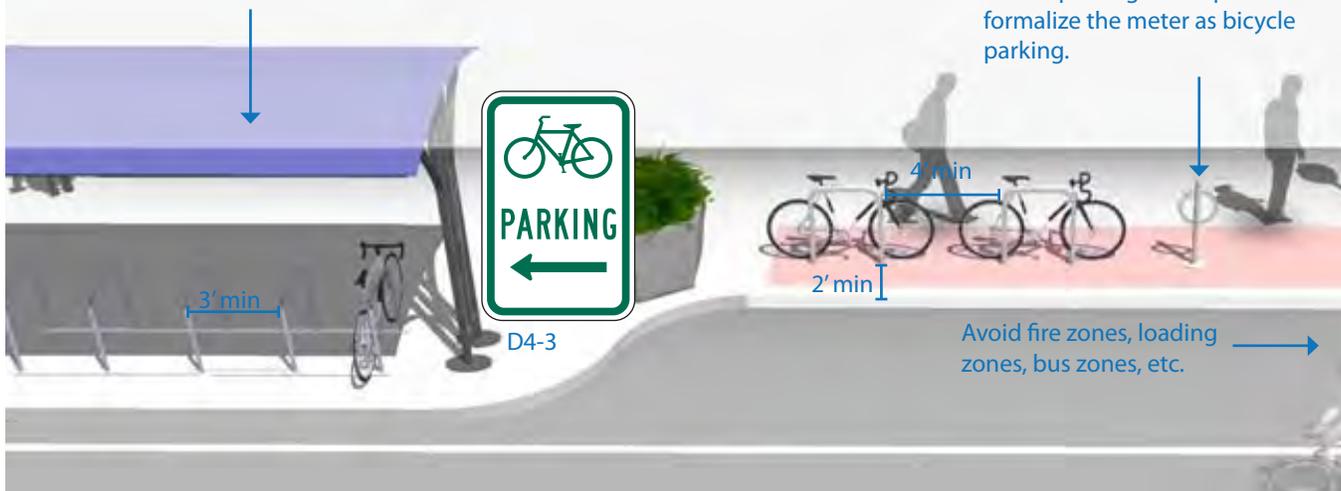
Bicycle Racks

Description

Short-term bicycle parking is meant to accommodate visitors, customers, and others expected to depart within two hours. It should have an approved standard rack, appropriate location and placement, and weather protection. The Association for Pedestrian and Bicycle Professionals (APBP) recommends selecting a bicycle rack that:

- Supports the bicycle in at least two places, preventing it from falling over.
- Allows locking of the frame and one or both wheels with a U-lock.
- Is securely anchored to ground.
- Resists cutting, rusting and bending or deformation.

Bicycle shelters consist of bicycle racks grouped together within structures with a roof that provides weather protection.



Guidance

- 2' minimum from the curb face to avoid 'dooring.'
- Close to destinations; 50' maximum distance from main building entrance.
- Minimum clear distance of 6' should be provided between the bicycle rack and the property line.
- Should be highly visible from adjacent bicycle routes and pedestrian traffic.
- Locate racks in areas that cyclists are most likely to travel.

Discussion

Where the placement of racks on sidewalks is not possible (due to narrow sidewalk width, sidewalk obstructions, street trees, etc.), **bicycle parking** can be provided in the street where on-street vehicle parking is allowed in the form of **on-street bicycle corrals**. Some types of bicycle racks may meet design criteria, but are discouraged except in limited situations. This includes undulating "wave" racks, schoolyard "wheel bender" racks, and spiral racks.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
APBP, *Bicycle Parking Guide, 2nd Edition*. 2010

Materials and Maintenance

Use of proper anchors will prevent vandalism and theft. Racks and anchors should be regularly inspected for damage.

On-Street Bicycle Corral

Description

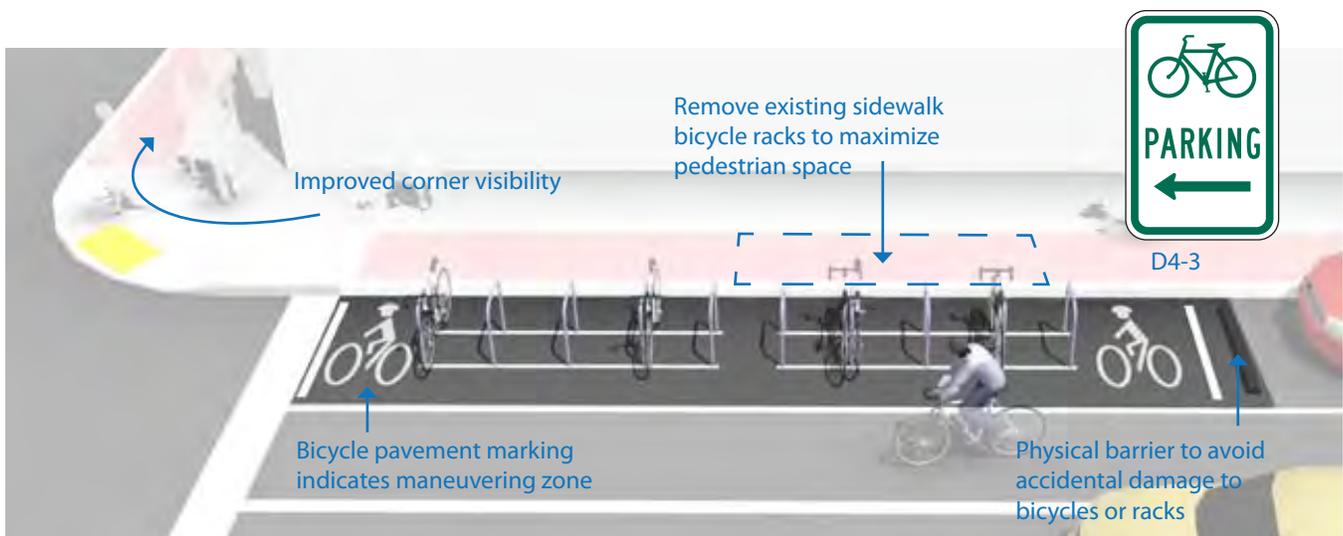
Bicycle corrals (also known as on-street bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for automobile parking. Bicycle corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking. Each motor vehicle parking space can be replaced with approximately 6-10 bicycle parking spaces.

Bicycle corrals move bicycles off the sidewalks, leaving more space for pedestrians, sidewalk café tables, etc. Because bicycle parking does not block sightlines (as large motor vehicles would do), it may be possible to locate bicycle parking in 'no-parking' zones near intersections and crosswalks.

Guidance

See guidelines for sidewalk **Bicycle Rack** placement and clear zones.

- Bicyclists should have an entrance width from the roadway of 5' – 6'.
- Can be used with parallel or angled parking.
- Parking stalls adjacent to curb extensions are good candidates for bicycle corrals since the concrete extension serves as delimitation on one side.



Discussion

In many communities, the installation of bicycle corrals is driven by requests from adjacent businesses, and is not a city-driven initiative. In such cases, the city does not remove motor vehicle parking unless it is explicitly requested. In other areas, the city provides the facility and business associations take responsibility for the maintenance of the facility. Communities can establish maintenance agreements with the requesting business. Bicycle corrals can be especially effective in areas with high bicycle parking demand or along street frontages with narrow sidewalks where parked bicycles would be detrimental to the pedestrian environment.

Additional References and Guidelines

APBP, *Bicycle Parking Guide*, 2nd Edition. 2010

Materials and Maintenance

Physical barriers may obstruct drainage and collect debris. Establish a maintenance agreement with neighboring businesses.

Bicycle Transit Amenities

Description

Safe and easy access to transit stations and secure bicycle parking facilities is necessary to encourage commuters to access transit via bicycle. Bicycling to transit reduces the need to provide expensive and space consuming car parking spaces.

Many people who ride to a transit stop will want to bring their bicycle with them on the transit portion of their trip, so buses and other transit vehicles should be equipped accordingly.

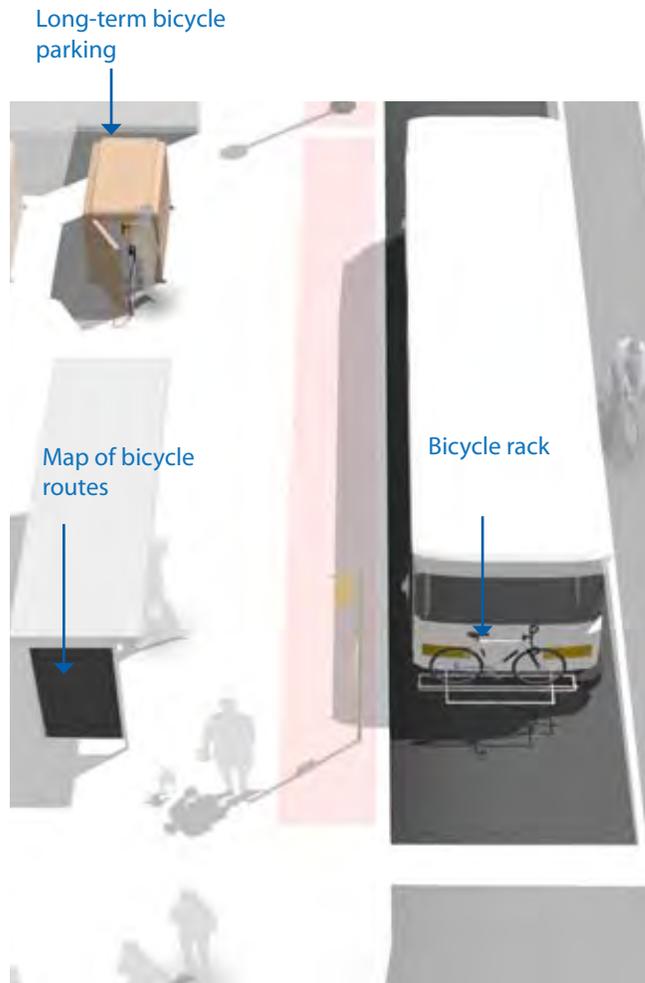
Guidance

Access

- Provide direct and convenient access to transit stations and stops from the bicycle and pedestrian networks.
- Provide maps at major stops and stations showing nearby bicycle routes.
- Provide wayfinding signage and pavement markings from the bicycle network to transit stations.
- Ensure that connecting bikeways offer proper bicycle actuation and detection.

Bicycle Parking

- The route from bicycle parking locations to station/stop platforms should be well-lit and visible.
- Signage should note the location of bicycle parking, rules for use, and instructions as needed.
- Provide safe and secure long-term parking such as bicycle lockers at transit hubs. Parking should be easy to use and well maintained.



Discussion

Providing bicycle routes to transit helps combine the long-distance coverage of bus and rail travel with the door-to-door service of bicycle riding. Transit use can overcome large obstacles to bicycling, including distance, hills, riding on busy streets, night riding, inclement weather, and breakdowns. High-visibility crosswalks and mid-block crossings are often appropriate treatments to provide safer bicycle and pedestrian access to bus stops, particularly at high-usage transit stops. If a bus stop is located mid-block, adequate crossing treatments should be provided, based on the level of traffic on the roadway. All transit riders will need to cross the street to access or leave the bus stop.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
APBP, *Bicycle Parking Guide, 2nd Edition*. 2010
FHWA, *University Course on Bicycle and Pedestrian Transportation, Lesson 18: Bicycle and Pedestrian Connections to Transit*. 2006

Materials and Maintenance

Regularly inspect the functioning of long-term parking moving parts and enclosures. Change keys and access codes periodically to prevent access to unapproved users.

TREATMENTS

This section includes:

- Separated Bikeways at Intersections
- Signalization
- Bikeway Signing



JEFFERSON PARISH BICYCLE MASTER PLAN

DESIGN GUIDELINES

STATE PROJECT #: 12-34567899

SEPARATED BIKEWAYS AT INTERSECTIONS

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians and other modes in order to advance traffic flow in a safe and efficient manner. Designs for intersections with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting clear right-of-way and facilitating eye contact and awareness with other modes. Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with timed or specialized signals.

The configuration of a safe intersection for bicyclists may include elements such as color, signage, medians, signal detection and pavement markings. Intersection design should take into consideration existing and anticipated bicyclist, pedestrian and motorist movements. In all cases, the degree of mixing or separation between bicyclists and other modes is intended to reduce the risk of crashes and increase bicyclist comfort. The level of treatment required for bicyclists at an intersection will depend on the bicycle facility type used, whether bicycle facilities are intersecting, and the adjacent street function and land use.



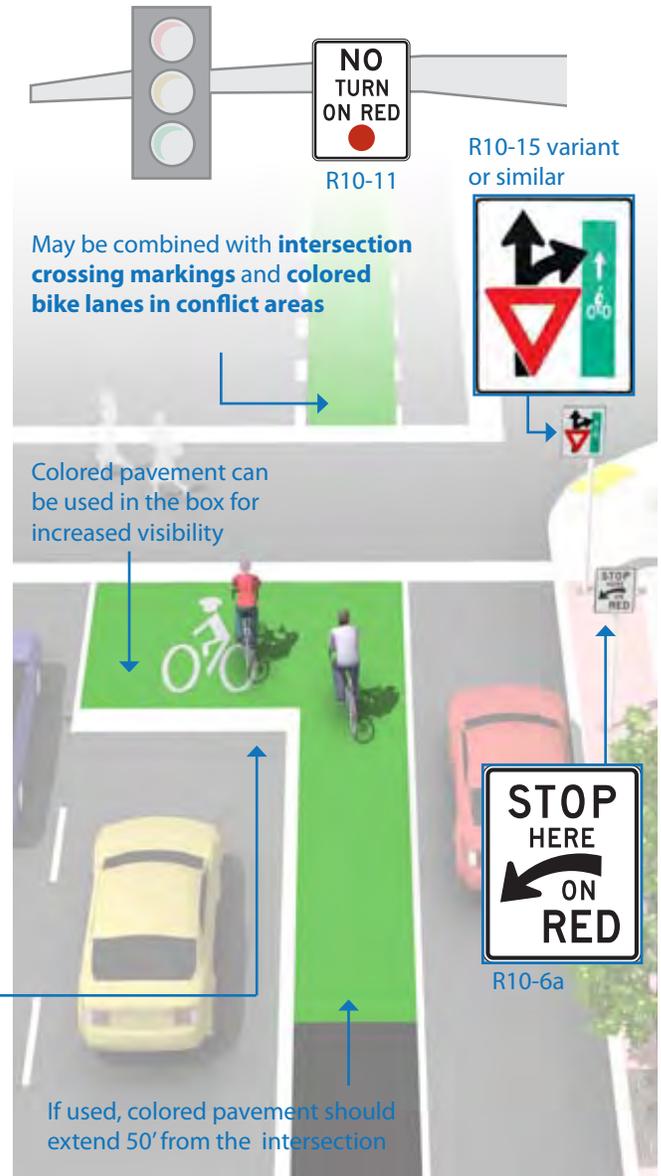
Bike Box

Description

A bike box is a designated area located at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible space to get in front of queuing motorized traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box.

Guidance

- 14' minimum depth
- A "No Turn on Red" (MUTCD R10-11) sign shall be installed overhead to prevent vehicles from entering the Bike Box.
- A "Stop Here on Red" sign should be post-mounted at the stop line to reinforce observance of the stop line.
- A "Yield to Bikes" sign should be post-mounted in advance of and in conjunction with an egress lane to reinforce that bicyclists have the right-of-way going through the intersection.
- An ingress lane should be used to provide access to the box.
- A supplemental "Wait Here" legend can be provided in advance of the stop bar to increase clarity to motorists.



Discussion

Bike boxes should be placed only at signalized intersections, and right turns on red shall be prohibited for motor vehicles. Bike boxes should be used in locations that have a large volume of bicyclists and are best utilized in central areas where traffic is usually moving more slowly. Prohibiting right turns on red improves safety for bicyclists yet does not significantly impede motor vehicle travel.

Additional References and Guidelines

NACTO, *Urban Bikeway Design Guide*. 2012
FHWA, Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10. 2011

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

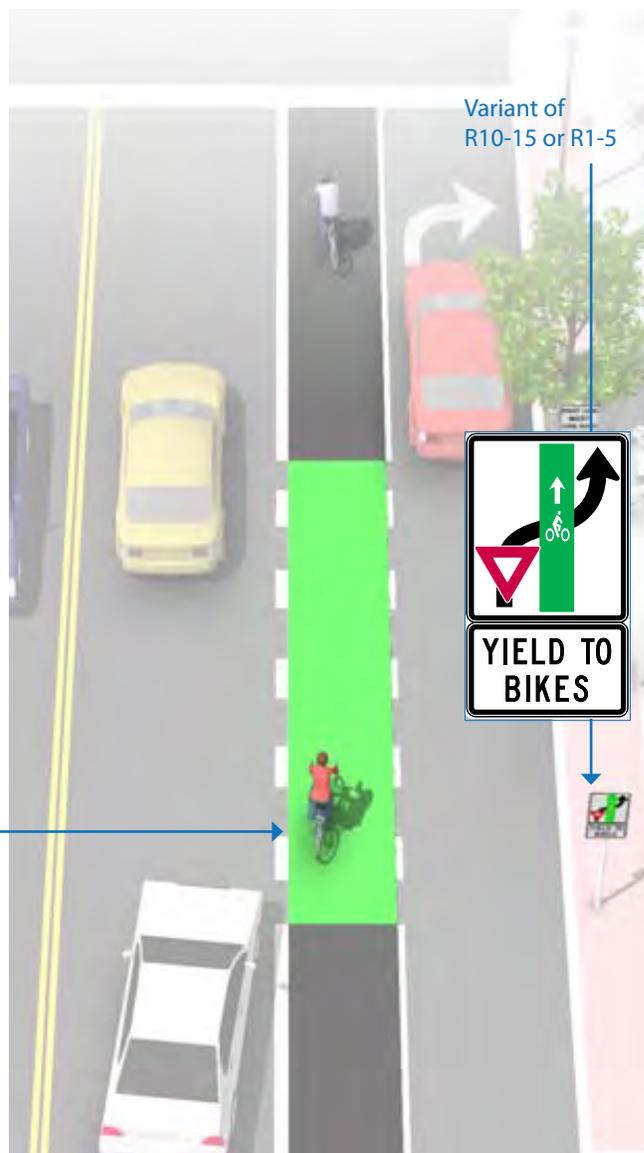
Colored Bike Lanes in Conflict Areas

Description

Colored pavement within a bicycle lane increases the visibility of the facility and reinforces priority of bicyclists in conflict areas.

Guidance

- Green colored pavement was given interim approval by the Federal Highways Administration in March 2011. See interim approval for specific color standards.
- The colored surface should be skid resistant and retro-reflective.
- A “Yield to Bikes” sign should be used at intersections or driveway crossings to reinforce that bicyclists have the right-of-way in colored bike lane areas.



Discussion

Evaluations performed in Portland, OR, St. Petersburg, FL and Austin, TX found that significantly more motorists yielded to bicyclists and slowed or stopped before entering the conflict area after the application of the colored pavement when compared with an uncolored treatment.

Additional References and Guidelines

FHWA, Interim Approval (IA-14) has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10. 2011
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining markings should be a high priority.

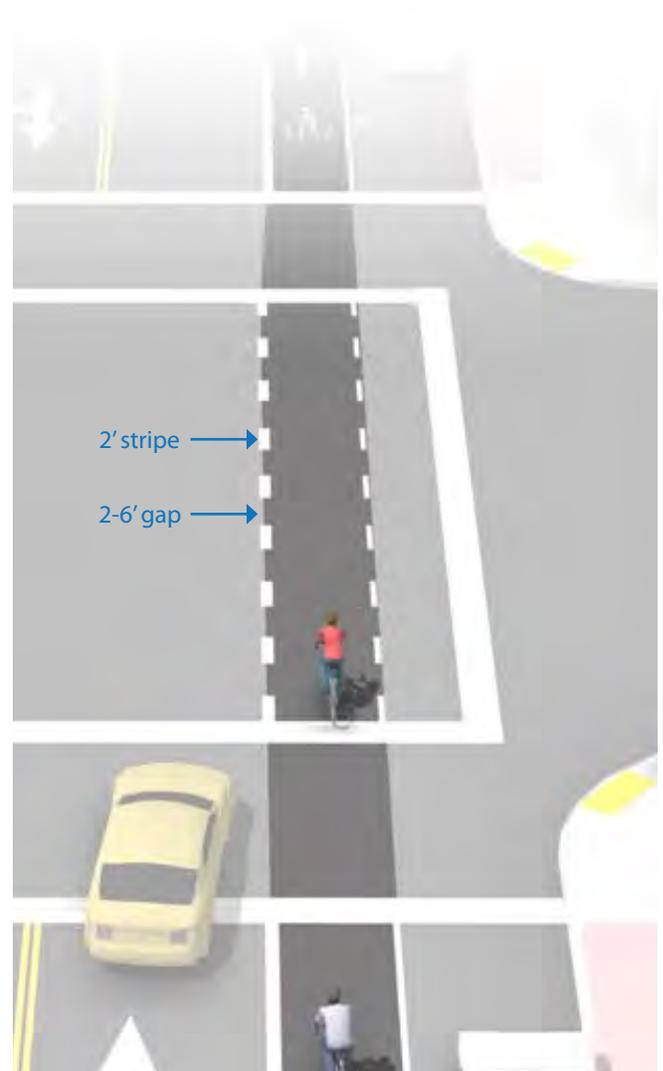
Intersection Crossing Markings

Description

Bicycle pavement markings through intersections indicate the intended path of bicyclists through an intersection or across a driveway or ramp. They guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and either through or crossing motor vehicles in the adjacent lane.

Guidance

- See MUTCD Section 3B.08: “dotted line extensions”
- Crossing striping shall be at least six inches wide when adjacent to motor vehicle travel lanes. Dotted lines should be two-foot lines spaced two to six feet apart.
- Chevrons, shared lane markings, or **colored bike lanes in conflict areas** may be used to increase visibility within conflict areas or across entire intersections. Elephant’s Feet markings are common in Europe and Canada.

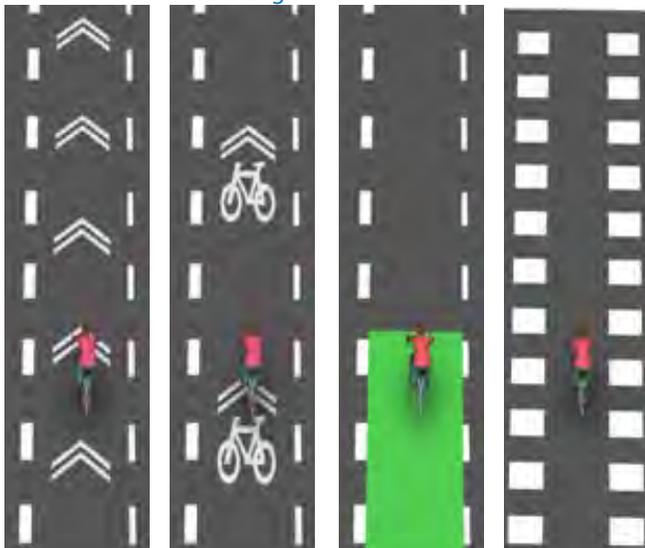


Chevrons

Shared Lane Markings

Colored Conflict Area

Elephant's Feet



Discussion

Additional markings such as chevrons, shared lane markings, or **colored bike lanes in conflict areas** are strategies currently in use in the United States and Canada. Cities considering the implementation of markings through intersections should standardize future designs to avoid confusion.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices, 3A.06*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.

Two-Stage Turn Boxes

Description

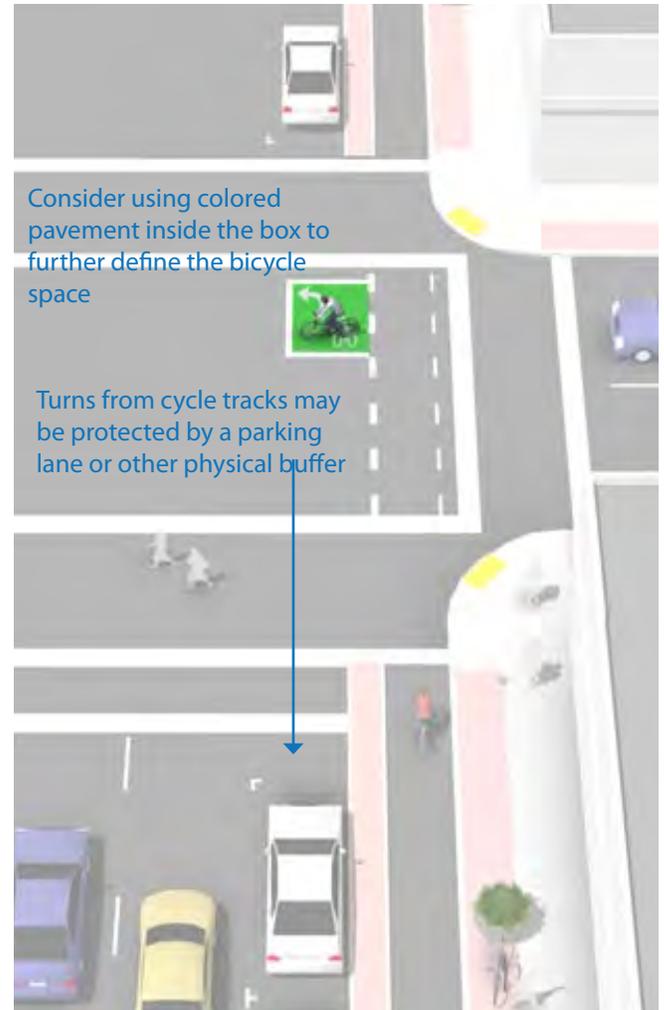
Two-stage turn queue boxes offer bicyclists a safe way to make left turns at multi-lane signalized intersections from a right side cycle track or bike lane.

On right side cycle tracks, bicyclists are often unable to merge into traffic to turn left due to physical separation, making the provision of two-stage left turn boxes critical. Design guidance for two-stage turns apply to both bike lanes and cycle tracks.

Guidance

- The queue box shall be placed in a protected area. Typically this is within an on-street parking lane or cycle track buffer area.
- 6' minimum depth of bicycle storage area
- Bicycle stencil and turn arrow pavement markings shall be used to indicate proper bicycle direction and positioning.
- A "No Turn on Red" (MUTCD R10-11) sign shall be installed on the cross street to prevent vehicles from entering the turn box.

Turns from a bicycle lane may be protected by an adjacent parking lane or crosswalk setback space



Cycle track turn box protected by physical buffer:

Bike lane turn box protected by parking lane:



Discussion

While two stage turns may increase bicyclist comfort in many locations, this configuration will typically result in higher average signal delay for bicyclists due to the need to receive two separate green signal indications (one for the through street, followed by one for the cross street) before proceeding.

Additional References and Guidelines

NACTO, *Urban Bikeway Design Guide*. 2012

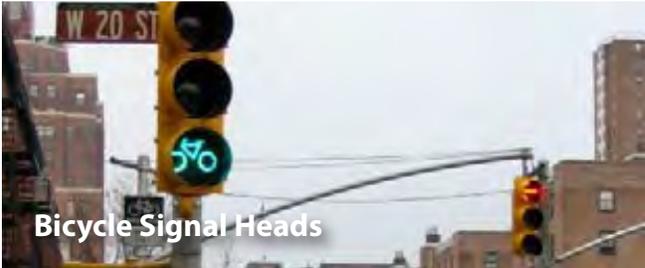
Materials and Maintenance

Because the effectiveness of markings depends entirely on their visibility, maintaining marking should be a high priority.

SIGNALIZATION

Bicycle signals and beacons facilitate bicyclist crossings of roadways. Bicycle signals make crossing intersections safer for bicyclists by clarifying when to enter an intersection and by restricting conflicting vehicle movements. Bicycle signals are traditional three lens signal heads with green, yellow and red bicycle stenciled lenses that can be employed at standard signalized intersections and hybrid beacon crossings. Flashing amber warning beacons can be utilized at unsignalized intersection crossings. Push buttons, signage, and pavement markings may be used to supplement these facilities for both bicyclists and motorists.

Determining which type of signal or beacon to use for a particular intersection depends on a variety of factors. These include speed limits, Average Daily Traffic (ADT), anticipated bicycle crossing traffic, and the configuration of planned or existing bicycle facilities. Signals may be necessary as part of the construction of a protected bicycle facility such as a cycle track with potential turning conflicts, or to decrease vehicle or pedestrian conflicts at major crossings. An intersection with bicycle signals may reduce stress and delays for a crossing bicyclist, and discourage illegal and unsafe crossing maneuvers.



Bicycle Detection and Actuation

Description

Push Button Actuation

User-activated button mounted on a pole facing the street.

Loop Detectors

Bicycle-activated loop detectors are installed within the roadway to allow the presence of a bicycle to trigger a change in the traffic signal. This allows the bicyclist to stay within the lane of travel without having to maneuver to the side of the road to trigger a push button.

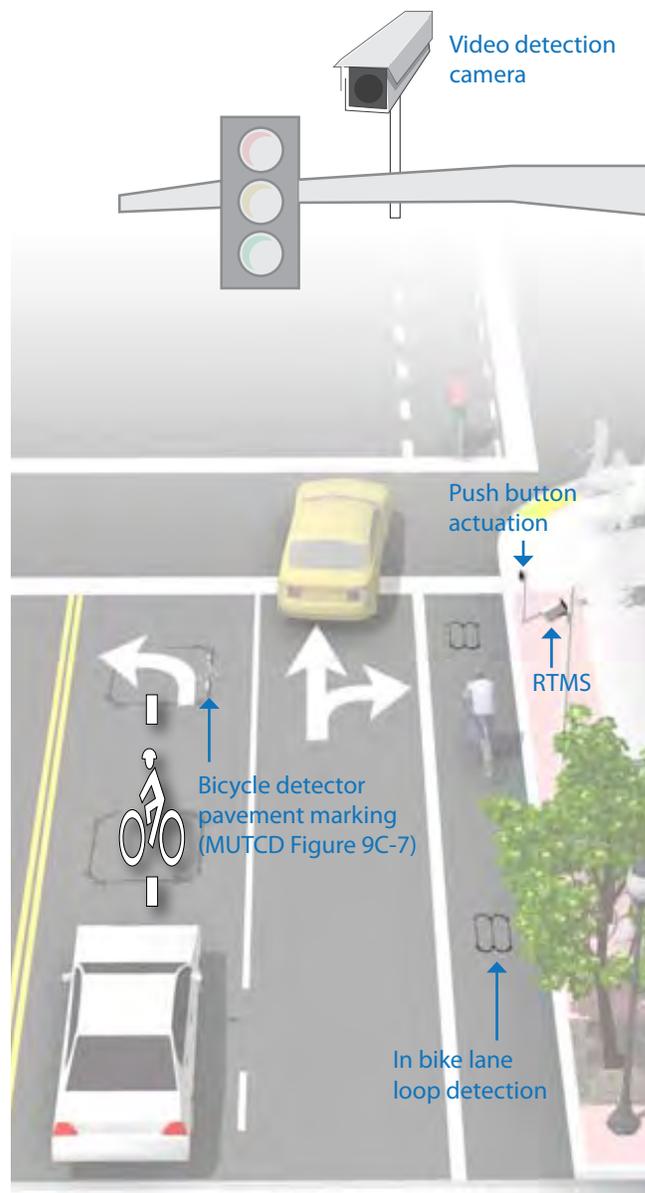
Loops that are sensitive enough to detect bicycles should be supplemented with pavement markings to instruct bicyclists how to trip them.

Video Detection Cameras

Video detection systems use digital image processing to detect a change in the image at a location. These systems can be calibrated to detect bicycles. Video camera system costs range from \$20,000 to \$25,000 per intersection.

Remote Traffic Microwave Sensor Detection (RTMS)

RTMS is a system which uses frequency modulated continuous wave radio signals to detect objects in the roadway. This method marks the detected object with a time code to determine its distance from the sensor. The RTMS system is unaffected by temperature and lighting, which can affect standard video detection.



Discussion

Proper bicycle detection should meet two primary criteria: 1) accurately detects bicyclists and 2) provides clear guidance to bicyclists on how to actuate detection (e.g., what button to push, where to stand).

Bicycle loops and other detection mechanisms can also provide bicyclists with an extended green time before the light turns yellow so that bicyclists of all abilities can reach the far side of the intersection.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Signal detection and actuation for bicyclists should be maintained with other traffic signal detection and roadway pavement markings.

Bicycle Signal Heads

Description

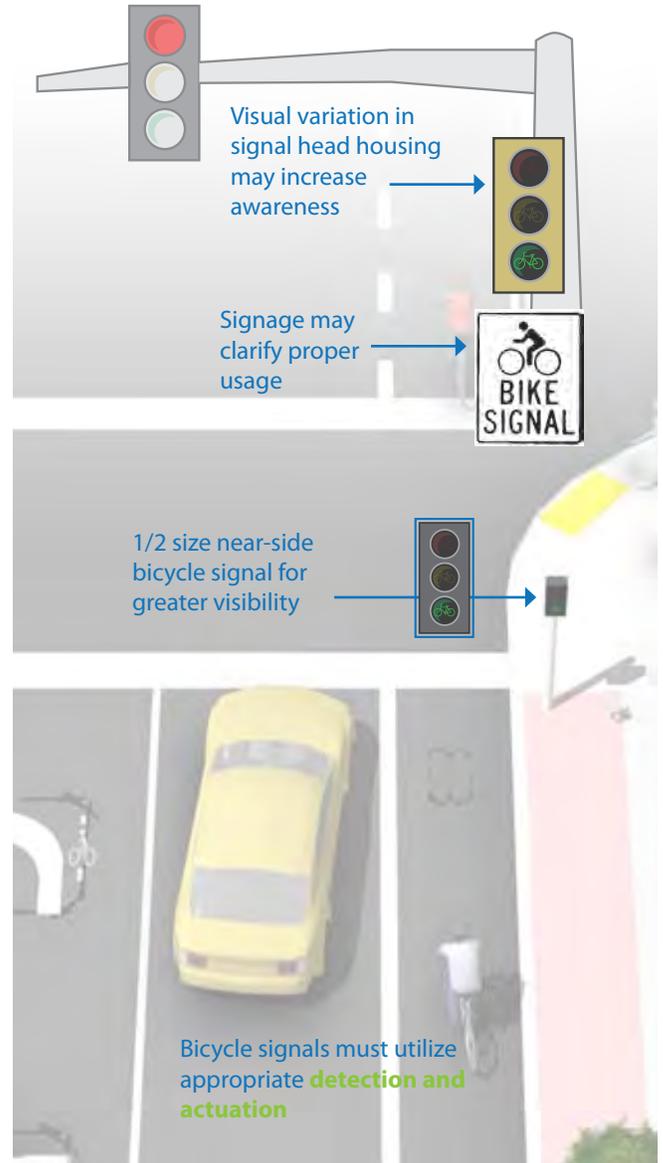
A bicycle signal is an electrically powered traffic control device that should only be used in combination with an existing conventional or hybrid signal. Bicycle signals are typically used to improve identified safety or operational problems involving bicycle facilities. Bicycle signal heads may be installed at signalized intersections to indicate bicycle signal phases and other bicycle-specific timing strategies. Bicycle signals can be actuated with bicycle sensitive loop detectors, video detection, or push buttons.

In the United States, bicycle signal heads typically use standard three-lens signal heads in green, yellow, and red. Bicycle signals are typically used to provide guidance for bicyclists at intersections where they may have different needs from other road users (e.g., bicycle-only movements, or leading bicycle intervals).

Guidance

Specific locations where bicycle signals have had a demonstrated positive effect include:

- Those with high volume of bicyclists at peak hours
- Those with high numbers of bicycle/motor vehicle crashes, especially those caused by turning vehicle movements
- At T-intersections with major bicycle movement along the top of the "T."
- At the confluence of an off-street bike path and a roadway intersection
- Where separated bike paths run parallel to arterial streets



Discussion

Per *EDSM No: IV.7.1.5*, new signal installations shall be performed by, or under the direction of traffic operations as requested from the District Traffic Operations Engineer and/or Traffic Engineering Management. Local municipal code should be checked or modified to clarify that at intersections with bicycle signals, bicyclists should only obey the bicycle signal heads. For improved visibility, smaller (4 inch lens) near-sided bicycle signals should be considered to supplement far-side signals.

Additional References and Guidelines

NACTO, *Urban Bikeway Design Guide*. 2012
The National Committee on Uniform Traffic Control Devices has formed a Task Force that is considering adding guidance to the MUTCD on the use of bicycle signals.
DOTD, *EDSM No: IV.7.1.5. Engineering Directives And Standards, DOTD Traffic Signal Manual*. 2012

Materials and Maintenance

Bicycle signal heads require the same maintenance as standard traffic signal heads, such as replacing bulbs and responding to power outages.

BIKEWAY SIGNING

The ability to navigate through a city is informed by landmarks, natural features and other visual cues. Signs throughout the city should indicate to bicyclists:

- Direction of travel
- Location of destinations
- Travel time/distance to those destinations

These signs will increase users' comfort and accessibility to the bicycle systems.

Signage can serve both wayfinding and safety purposes including:

- Helping to familiarize users with the bicycle network
- Helping users identify the best routes to destinations
- Helping to address misperceptions about time and distance
- Helping overcome a "barrier to entry" for people who are not frequent bicyclists (e.g., "interested but concerned" bicyclists)

A community-wide bicycle wayfinding signage plan would identify:

- Sign locations
- Sign type – what information should be included and design features
- Destinations to be highlighted on each sign – key destinations for bicyclists
- Approximate distance and travel time to each destination

Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes. Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.



Wayfinding Sign Types

Description

A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. There are three general types of wayfinding signs:

Confirmation Signs

Indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route.

Can include destinations and distance/time. Do not include arrows.



Turn Signs

Indicate where a bikeway turns from one street onto another street. Can be used with pavement markings.

Include destinations and arrows.



Decisions Signs

Mark the junction of two or more bikeways.

Inform bicyclists of the designated bike route to access key destinations.

Destinations and arrows, distances and travel times are optional but recommended.



Discussion

There is no standard color for bicycle wayfinding signage. Section 1A.12 of the MUTCD establishes the general meaning for signage colors. Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

Wayfinding Sign Placement

Description

Confirmation Signs

Every ¼ to ½ mile on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 ft of a turn or decision sign). Should be placed soon after turns to confirm destination(s). Pavement markings can also act as confirmation that a bicyclist is on a preferred route.

Turn Signs

Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through). Pavement markings can also indicate the need to turn to the bicyclist.

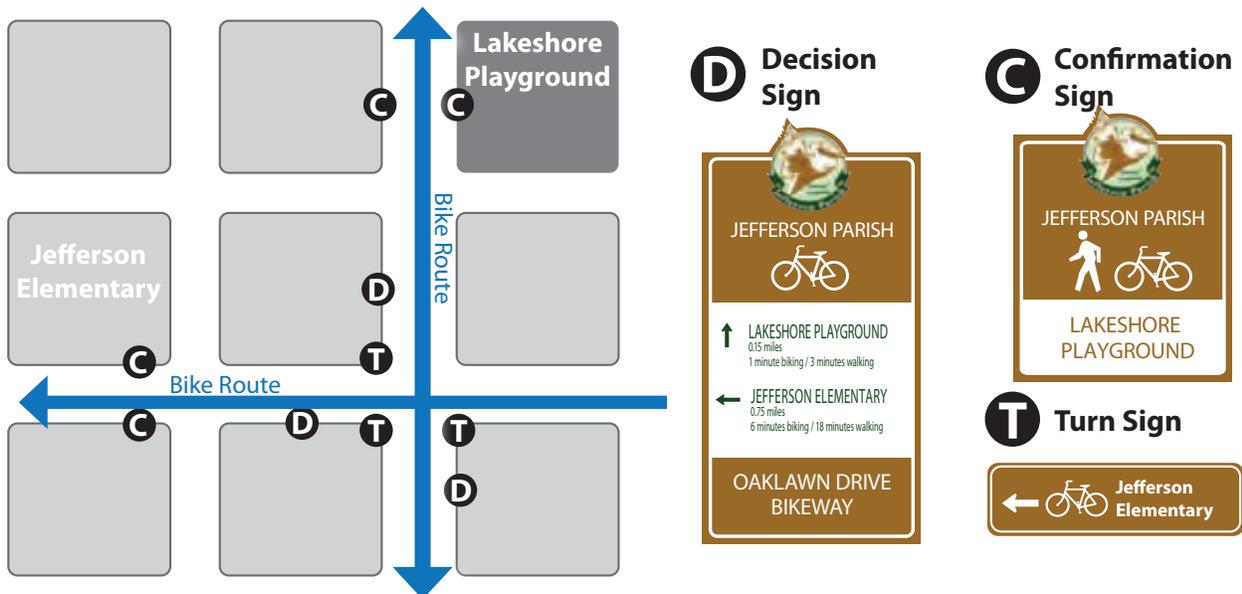
Decisions Signs

Near-side of intersections in advance of a junction with another bicycle route.

Along a route to indicate a nearby destination.

Guidance

Signs are typically placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.



Discussion

It can be useful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination's ranking in the hierarchy can be used to determine the physical distance from which the locations are signed. For example, primary destinations (such as the downtown area) may be included on signage up to five miles away. Secondary destinations (such as a transit station) may be included on signage up to two miles away. Tertiary destinations (such as a park) may be included on signage up to one mile away.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 2012
FHWA, *Manual on Uniform Traffic Control Devices*. 2009
NACTO, *Urban Bikeway Design Guide*. 2012

Materials and Maintenance

Maintenance needs for bicycle wayfinding signs are similar to other signs and will need periodic replacement due to wear.

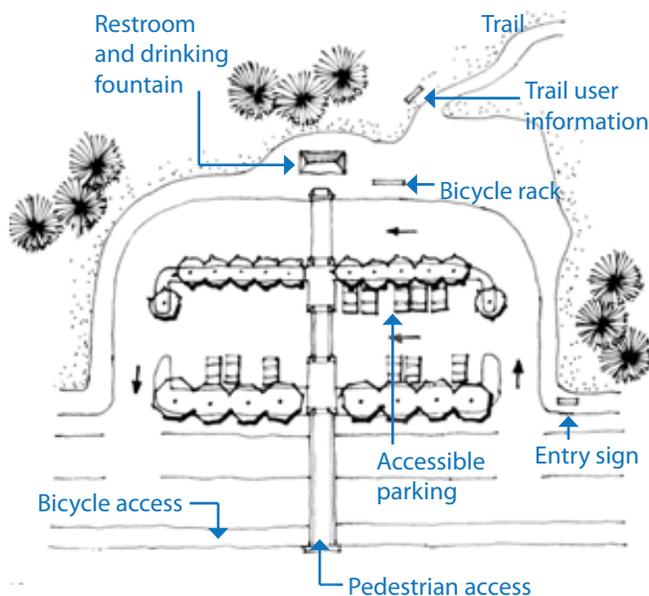
Trailheads

Description

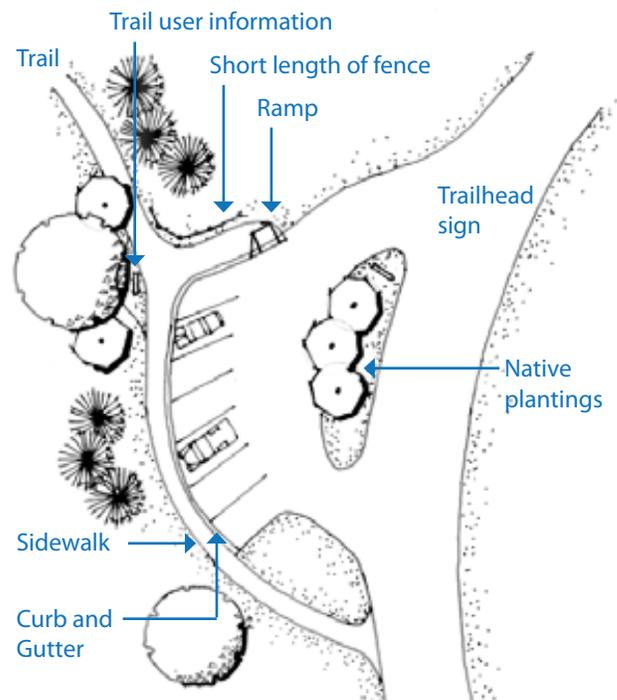
Good access to a path system is a key element for its success. Trailheads serve the local and regional population arriving to the path system by car, transit, bicycle or other modes. Trailheads provide essential access to the shared-use path system and include amenities like parking for vehicles and bicycles, restrooms, (at major trailheads), and posted maps.

Guidance

- Major trailheads should include automobile and bicycle parking, trail information (maps, user guidelines, wildlife information, etc.), garbage receptacles and restrooms.
- Minor trailheads can provide a subset of these amenities.



Major Trailhead



Minor Trailhead

Discussion

Trailheads with a small motor vehicle parking area should additionally include bicycle parking and accessible parking.

Neighborhood access should be achieved from all local streets crossing the path. No parking needs to be provided, and in some situations "No Parking" signs will be desirable to minimize impact on the neighborhood.

Additional References and Guidelines

AASHTO, *Guide for the Development of Bicycle Facilities*. 1999

Materials and Maintenance

Trailhead signage and lighting will require regular maintenance. Major trailheads will require regular servicing.