INTERSECTION IMPROVEMENTS

The proposed pedestrian and bicycle network map developed for St. Tammany Parish not only shows the routes and type of facilities recommended for improvement but also shows existing roadway intersections that are recommended for improvement where new bicycle and pedestrian infrastructure is proposed (or in some cases, where bicycle and pedestrian facilities already exist).

There are 168 roadway intersections (or roadway crossings by bicycle/pedestrian facilities) proposed for improvement on the network map. These include various type of intersections--some three-leg or 'T' intersections, some 4-leg or 'cross' intersections; some with stop sign control, some with signalization. There are also some roundabout intersections, and several existing and proposed non-intersection crossings (such as where the Tammany Trace crosses active roadways).

Full engineering design of these 168 intersections & crossings will come later, as each of the projects are funded, and each will consider things such as type of bicycle/pedestrian facility, traffic levels, speed limits and capacity of roadways. However, as there are very few existing roadway intersections in St. Tammany Parish that take bicycle or pedestrian movements into account, this section will present some examples of different types of intersection design upgrades that may be considered and used as the bicycle and pedestrian network comes to fruition.

SIDEWALKS AND SIDEPATHS AT INTERSECTIONS

"T" Intersections

Three-legged or "T" intersections are a common location for the intersection improvements that are being proposed. Some are as simple as a residential or local street meeting up with a two-lane roadway or highway, with stop conditions only on the local street. Other "T" intersections may be a two-lane highway or roadway coming to a terminus at another perpendicular two-lane highway and may include dedicated right turn lanes depending on traffic volumes. Some may even be heavily traveled intersections with signalization.

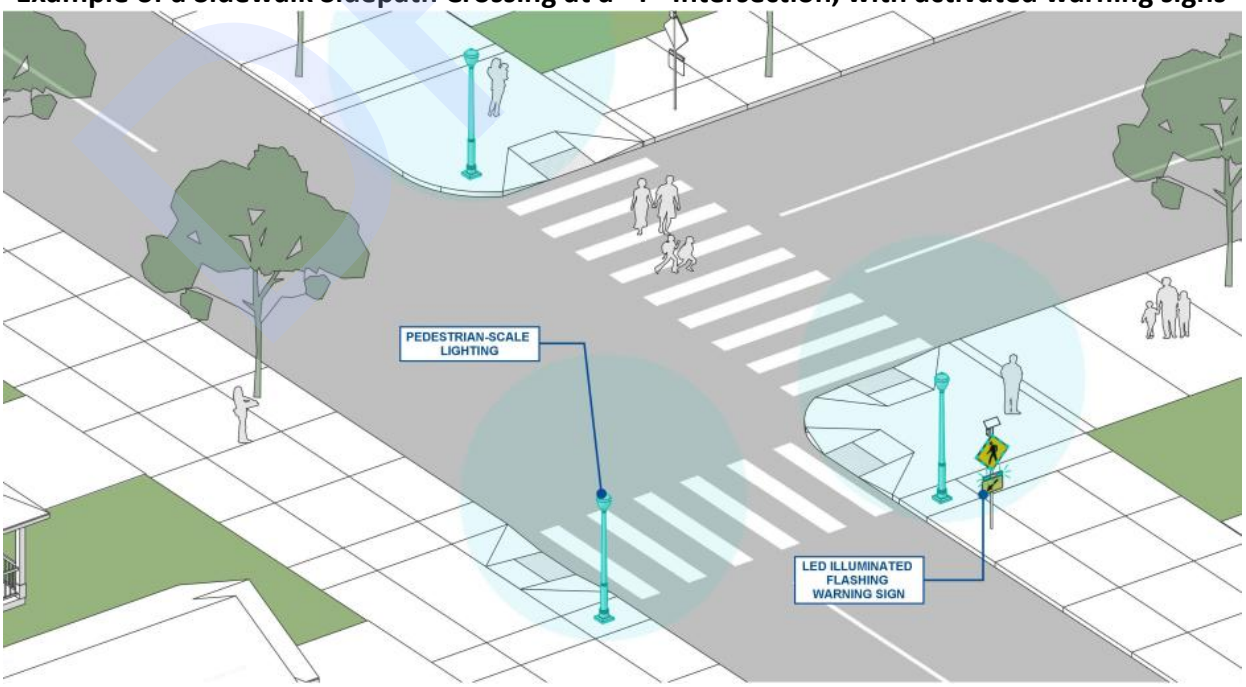
In the less heavily traveled, non-signalized intersections, crosswalks and signage may suffice, similar to the design shown on the following page:

Example of a Simple Sidewalk/Sidepath Crossing at a "T" Intersection

Source: https://www.tyndallifs.com/landscape_C05_sidewalks.php

If the "T" intersection operates on a stop condition but has higher traffic levels on one or more roadways, crosswalks may be limited to just two crossings, and actuated LED flashing warning signs may be added, as shown in the example below:

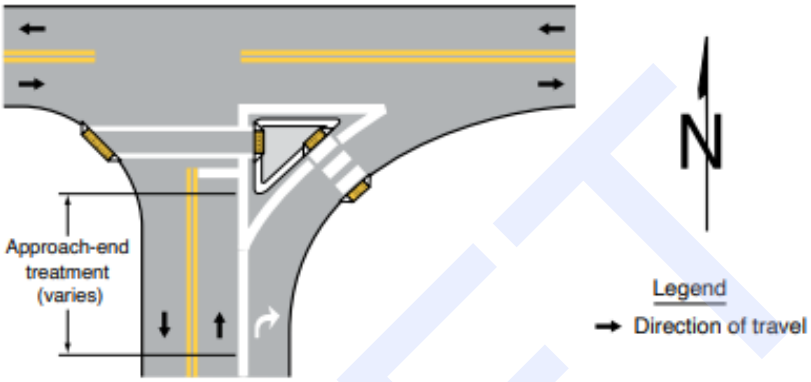
Example of a Sidewalk Sidepath Crossing at a "T" Intersection, with activated warning signs



Source: https://www.vta.org/cdt/street-design-home-page/intersections

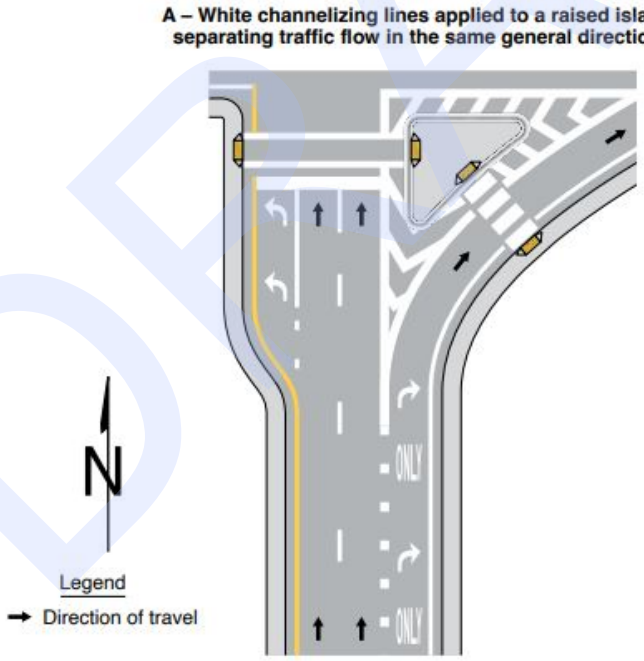
If dedicated right-turn lanes are present, then safety islands for pedestrians (and/or bicyclists) coming from sidewalks or shared use paths should be included, as shown on the following examples:

Example of Markings for an Approach-End Treatment to an Island



Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 636

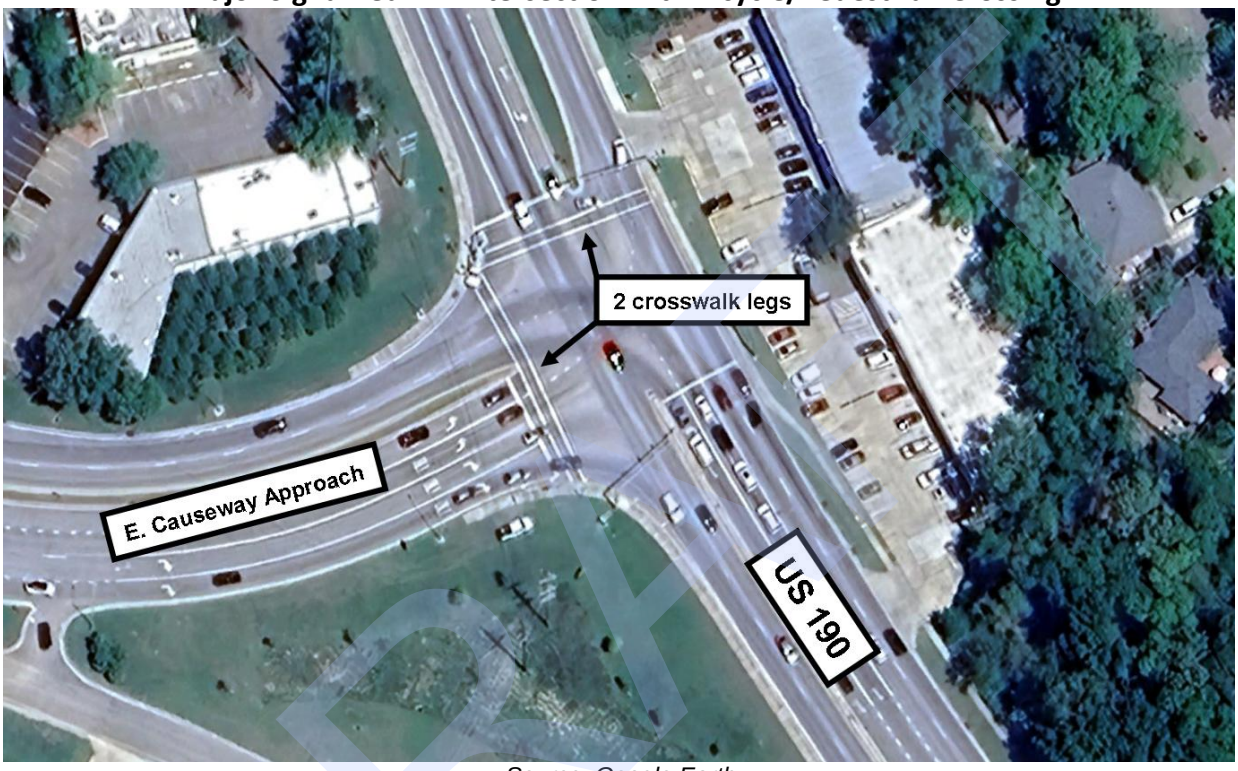
Example of Pavement Markings for Raised Islands



Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 637

The busiest "T" intersections, those with multiple lanes of traffic and full signalization, should also have their crossing points limited to two crossings, one for the main roadway and one of the intersecting roadway, but should also have in addition to striped crosswalks and signage, user-activated signal crossing 'request' buttons with 'walk/don't walk' indicators. "Countdown" timers may even be merited. An example of this type of intersection is currently in place at US 190 and the East Causeway Approach in the Mandeville area:

Major Signalized "T" Intersection with Bicycle/Pedestrian Crossing



Source: Google Earth

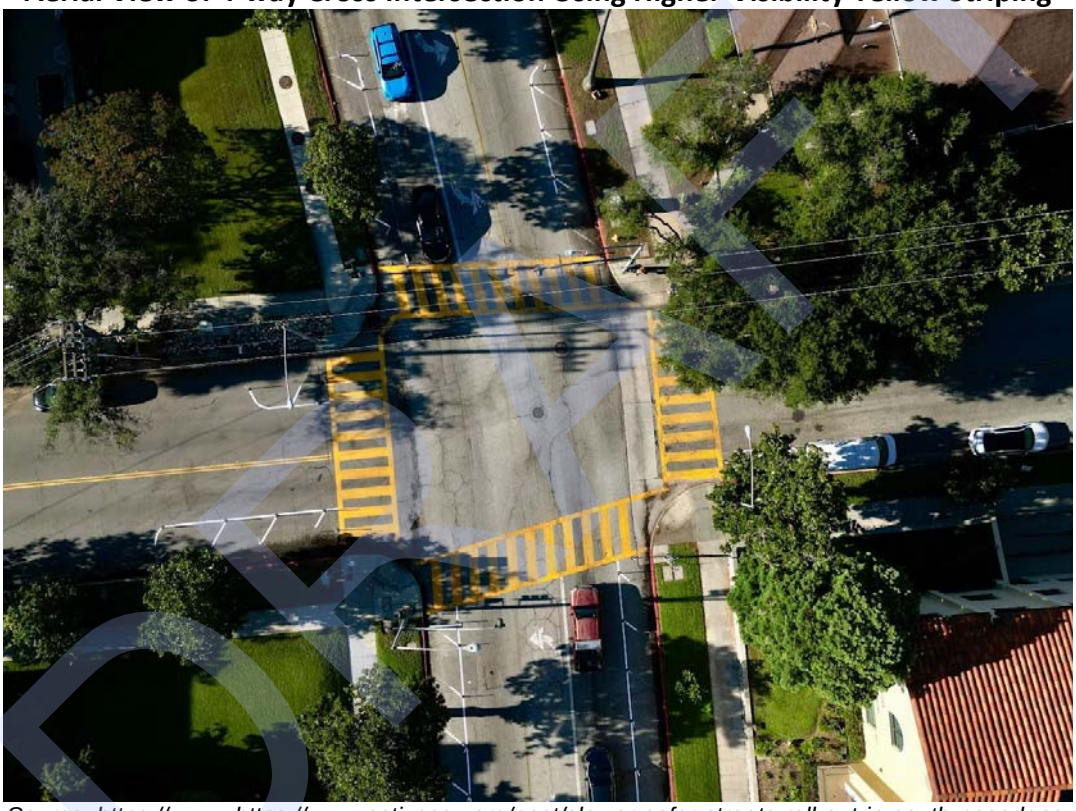
Another improvement at such a major "T" intersection (which could be a final recommended improvement at this very intersection) is to adjust or locate the crossing stripes, adjust or locate the vehicle stop lines, and/or extend the center medians toward the center of the intersection in order to provide a *safe haven* in the median when crossing multiple lanes of traffic. Not all persons using crosswalks have the ability to completely cross a wide roadway during one signal phase, and a median safe haven would allow them to use two (2) signal phases to completely cross the roadway.

4-Way "Cross" Intersections

4-way or “cross” intersections are also a common location where intersection improvements are being proposed. In general, these are usually more complex than 'T' intersections; some may only have stop signs on the lesser of the two crossing streets and some may have 4-way stops. There are also instances where cross intersections have basic signalization (two-phase signal) and some are heavily traveled intersections with dedicated turn lanes and multiphase signalization.

At less heavily traveled non-signalized intersections with stop conditions, crosswalks and signage may suffice.

Aerial View of 4-way Cross Intersection Using Higher-Visibility Yellow Striping



Source: https://www. https://www.activesgv.org/post/slower-safer-streets-roll-out-in-south-pasadena

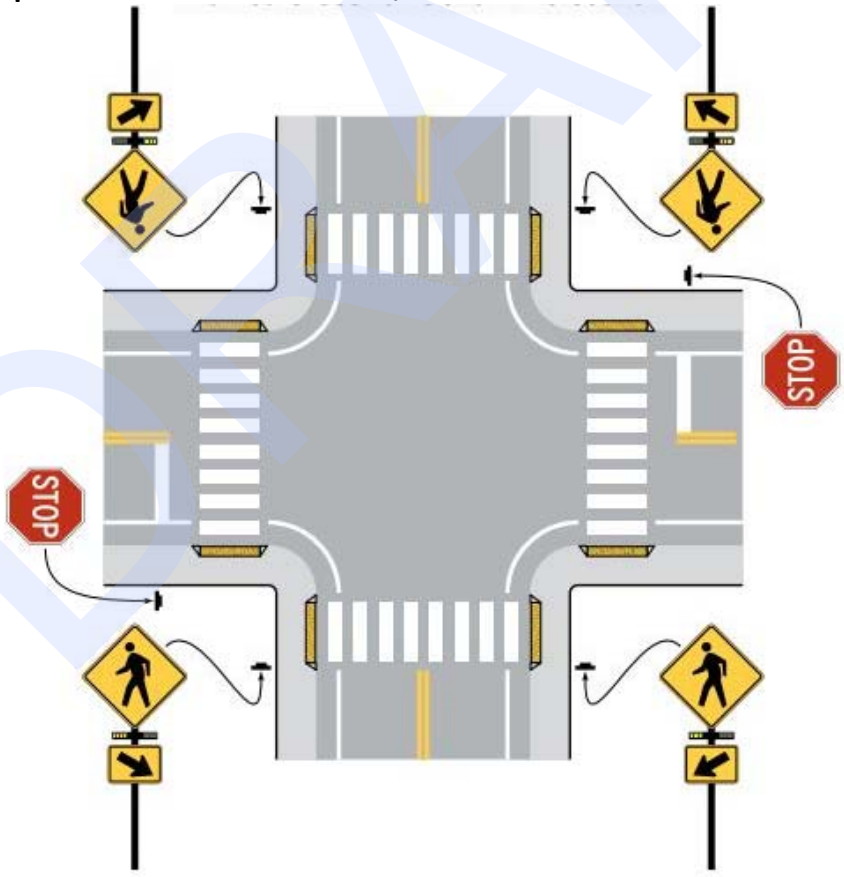
An additional option on busier intersections is to also include **rectangular rapid flashing beacons (RRFBs)** in addition to signage and painted crosswalks, to make drivers more aware of pedestrians and bicyclists crossing the roadway. RRFBs are flashing amber lights mounted to the mast arm of a signal pole at intersections or mid-block crossings. These highly-visible signals are typically activated by a push button to help ensure motorists yield to pedestrians and bicyclists crossing the intersection.

Example of RRFBs at an Intersection

Source: https://www.tssco.com/product/rectangular-rapid-flashing-beacon/

Below and on the following page are two figures showing how RRFBs are typically designed and placed.

Example of RRFBs at Uncontrolled, Marked Crosswalks at an Intersection

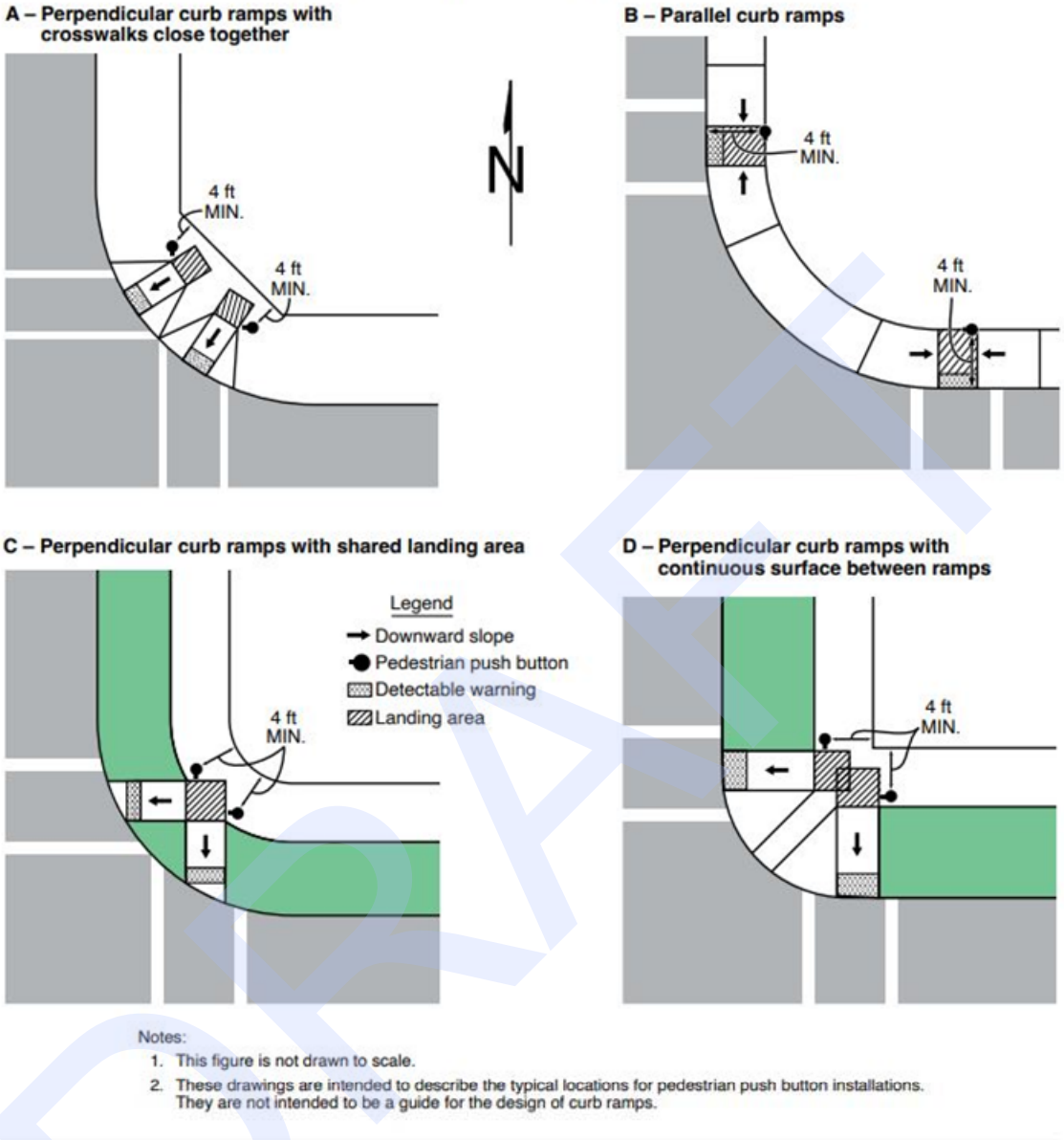


Notes:

1. When activated, the RRFBs on both approaches shall simultaneously commence operation of their rapid flashing indications and shall cease operation simultaneously.
2. If placed overhead, follow the requirements of Paragraph 8 of Section 4L.02, except that the signs may be placed approximately over the center of the intersection.

Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 737

Typical RRFB Push Button Locations



Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 723

RRFBS are one option to assist crossings for bicyclist/pedestrians crossings on sidepaths and sidewalks at busier intersections, but another option gives even more control to non-motorized travelers. That is the system know as a **HAWK signal**. The HAWK signal (*from High-Intensity Activated CrossWalK*) is designed to aid pedestrians when crossing at intersections (and also mid-block crossings). Like conventional traffic signals, the HAWK signal provides a pedestrian with an indication notifying them when to cross the street, and is only operational when activated by a pedestrian.

Operationally, the HAWK signal rests in a dark state, allowing normal traffic flow. In its resting state, the HAWK displays a constant "Don't Walk" indication for pedestrian crossing until activated by a pedestrian. When a pedestrian presses the button, approaching drivers will see a flashing yellow signal indicating that they should reduce speed and be prepared to stop for

pedestrians. The signal then changes to a solid yellow, then a solid red light indicating for drivers to stop. Once the dual red lights begin to alternately flash, **vehicles must stop for pedestrians** but are permitted to proceed if there are no pedestrians in the crosswalk.

The HAWK signal features equipment that provides pedestrians with information about when the walk signal is on. An audible tone and vibrating arrow button help visually impaired people locate the push button.

Example of a HAWK signal

Source: https://www.srcity.org/911/HAWK-Signals

On signalized intersections-- especially in more urbanized areas-- in addition to striped crosswalks and signage, signal crossing with walk/don't walk indicators or even countdown timers may be merited:

Example of Signalized Intersection with Indicators

Source: https://www.pedbikeimages.org/details.php?picid=2813

The busiest "cross" intersections, those with multiple lanes of traffic, sweeping left turns and multi-phase signalization, should of course have adequately striped crosswalks and signage, user-activated signal crossing 'request' buttons with 'walk/don't walk' indicators and countdown timers. As much as possible the use of existing (or creation of) center medians to provide a *safe haven* in the median should also be encouraged.

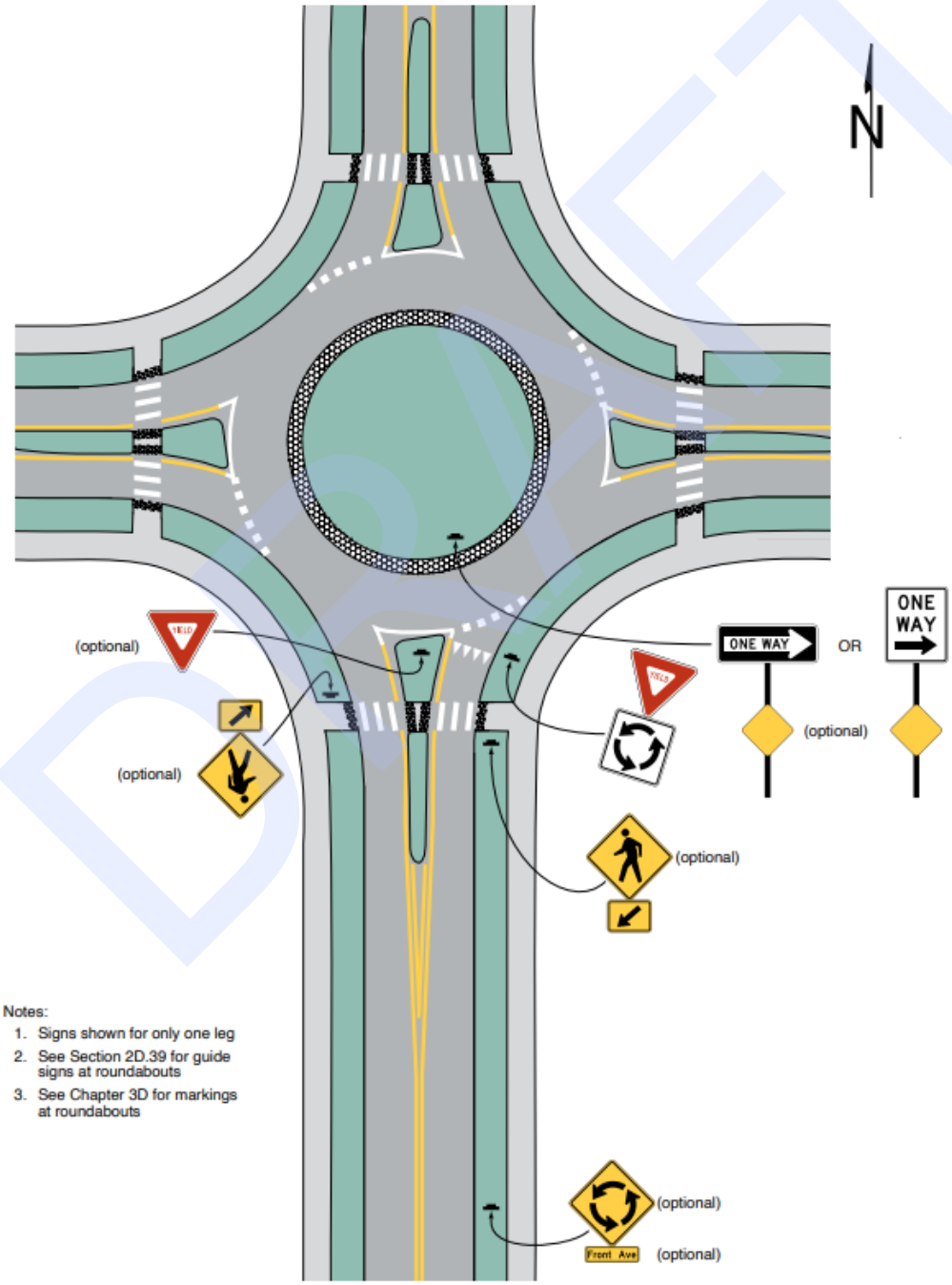
An example of this is type of bicycle/pedestrian crossing system at a busy 4 way intersection was put in place a few years ago at the intersection of Veterans Blvd and Bonnabel Blvd. in Metairie, which not only serves sidewalks but also a median shared use path along Bonnabel. An aerial view of the intersection is shown below:

Source: Google Earth

Roundabouts

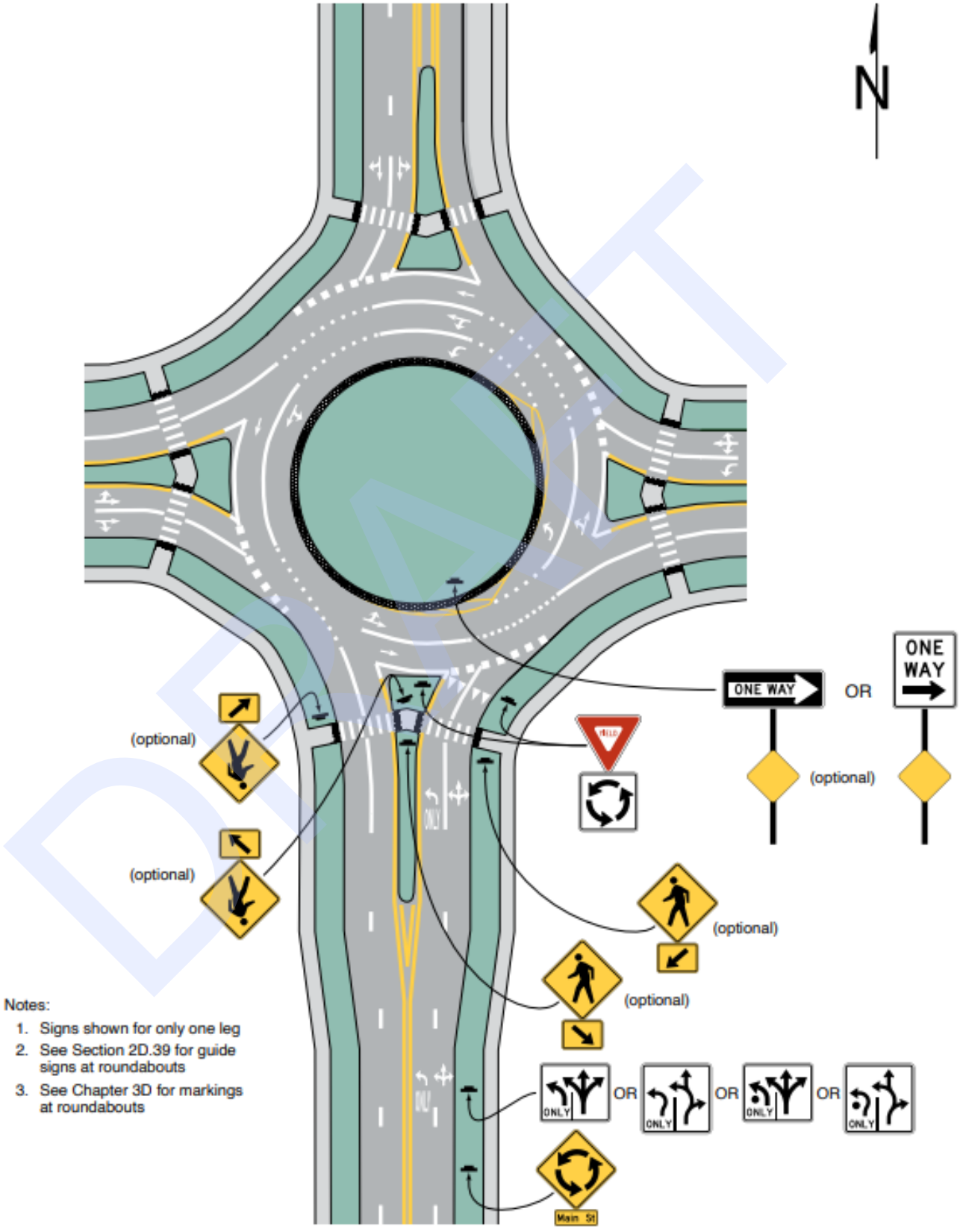
Roundabouts present a unique challenge for sidewalk and sidepath crossings, as they are essentially designed for free-flow vehicular traffic with yield conditions instead of stop conditions. Five (5) existing roundabout intersections are identified for future improvement due to proposed new bicycle/pedestrian facilities. Thankfully, standards for sidewalk/sidepath treatment at roundabouts have already been promulgated, and are shown on the following pages:

Example of Regulatory and Warning Signs for a One-Lane Roundabout



Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 120

Example of Regulatory and Warning Signs for a Two-Lane Roundabout with Consecutive Double Lefts



Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 121

Aerial view of a roundabout with bicycle/pedestrian accommodations

Source: https://www.urbanismspeakeasy.com/p/roundabouts-can-help-retrofit-suburbia

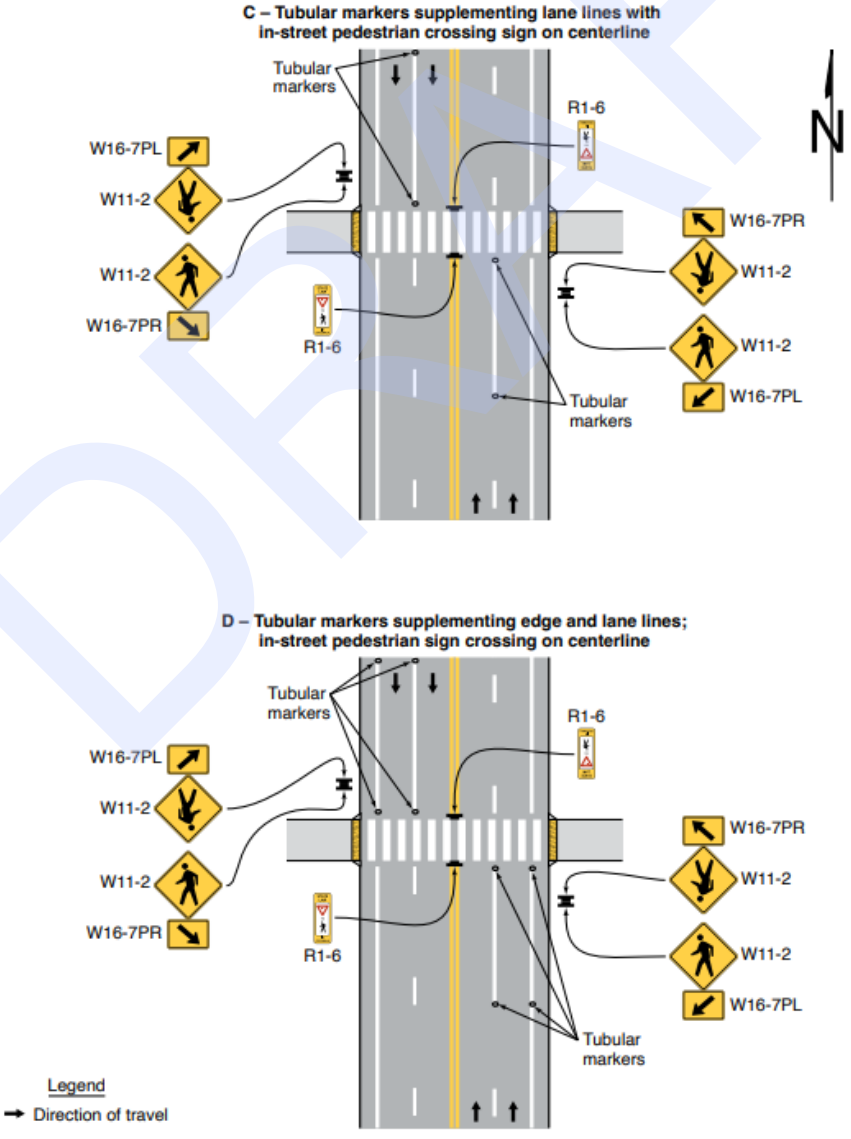
Ground level view of a roundabout with bicycle/pedestrian accommodations including RRFBs

Source: https://mntransportationresearch.org/2023/04/18/enhancing-pedestrian-experiences-at-roundabouts

SHARED USE PATH CROSSING OF ROADWAYS

The Tammany Trace, the Parish's premier pedestrian and bicyclist path, is rather unique in that it exists as a shared use path on its own right-of-way (an old railroad line) and does not run along or beside any active roadways. However, the Trace does have several locations where it crosses active roads. Different measures are in place at different crossings, depending on the type of street and traffic volumes. All Tammany Trace crossings of roadways are striped, and all have stop signs for trail travelers crossing streets. Most have some form of signage to alert vehicles, and some local street crossings have 4 way stops for both Trace users and vehicular traffic. At some busy crossings, there are actuated flashing signals to alert motorists of approaching bicyclists. Four (4) of these Tammany Trace street crossings have been identified for future improvement in the future bicycle and pedestrian network. One way to improve these intersections may be mid-street tubular markers (with signs) supplementing signage and pavement markings, as shown below:

Examples of Tubular Markers Supplementing Pavement Markings and Signage in Advance of an Unsignalized Crosswalk

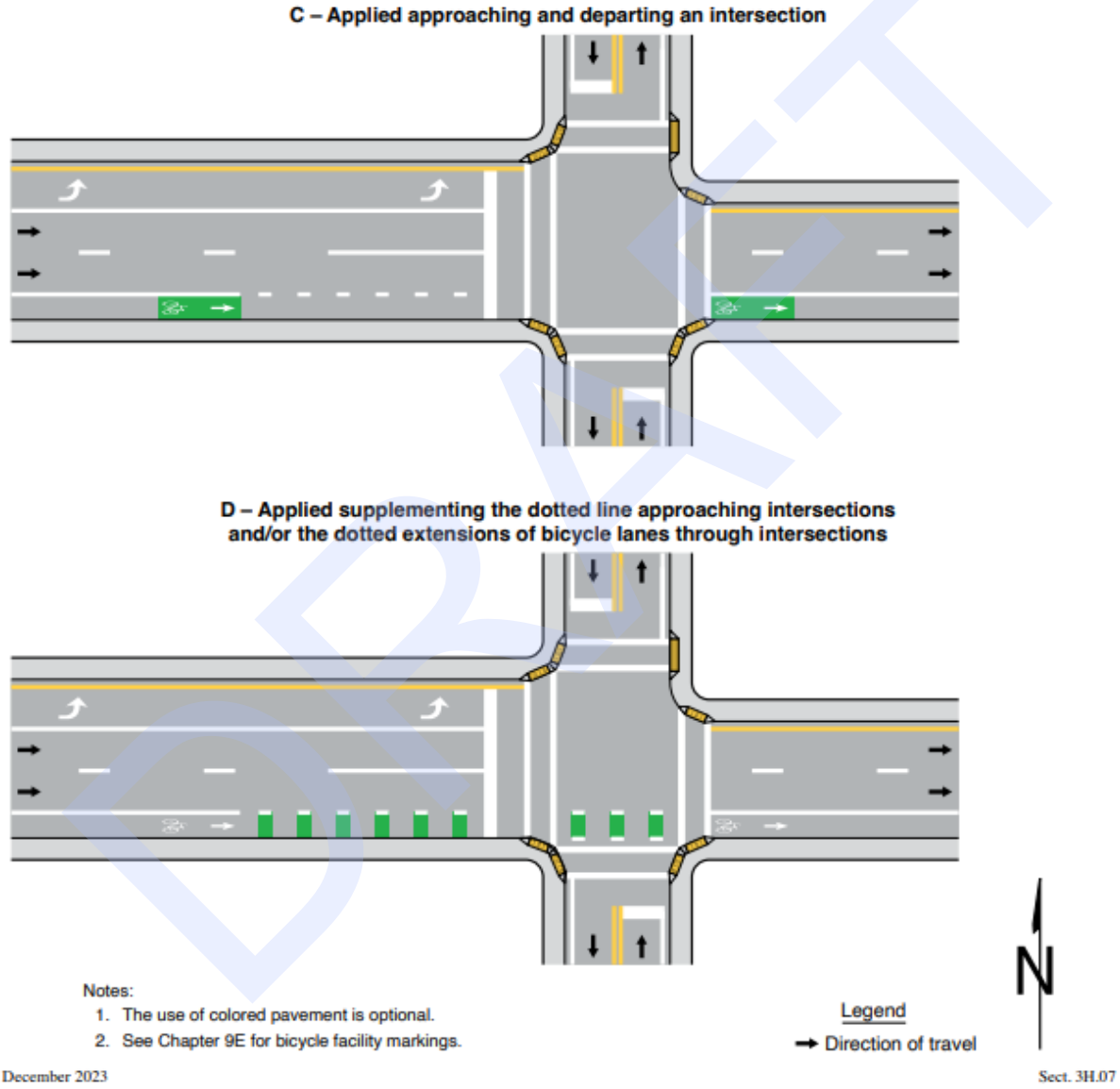


Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 634

BICYCLE LANES AT INTERSECTIONS

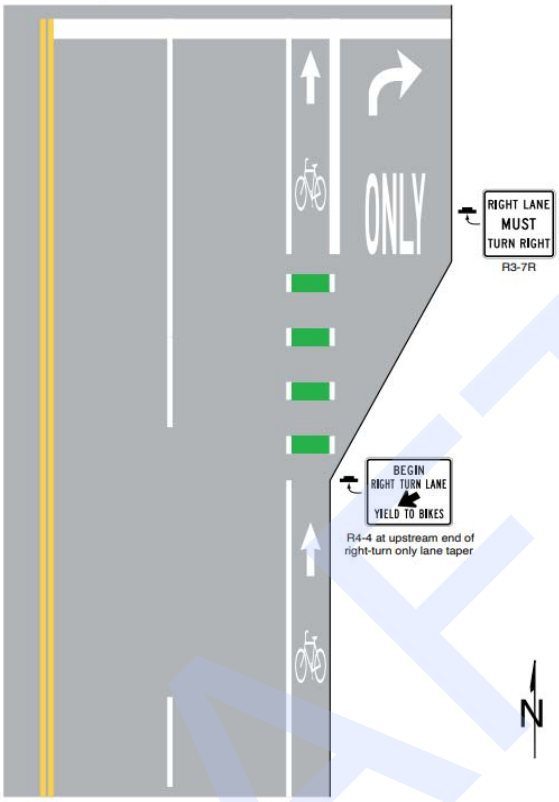
While most of the recommended improvements involve sidepaths and sidewalks, there are several existing bicycle lanes in the Parish and several proposed bicycle lanes in the network plan. Bicycle lanes also have their own unique issues at intersections, usually dealt with via striping, lane painting, and signage. Below are several different examples of intersection treatments to include bicycle lanes.

Examples of Green-Colored Pavement Applications at Bicycle Lane intersections

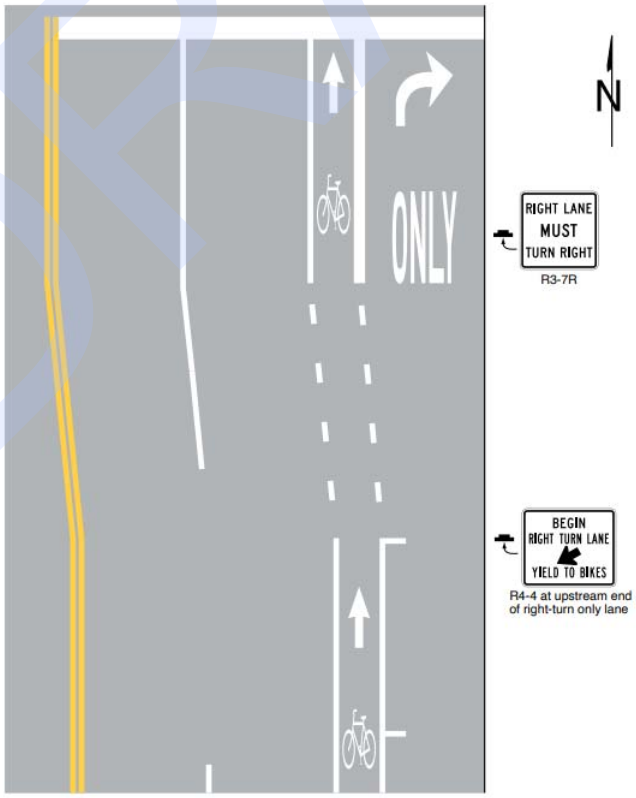


Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 627

Two Examples of Bicycle Lane Markings on an Approach to an Intersection

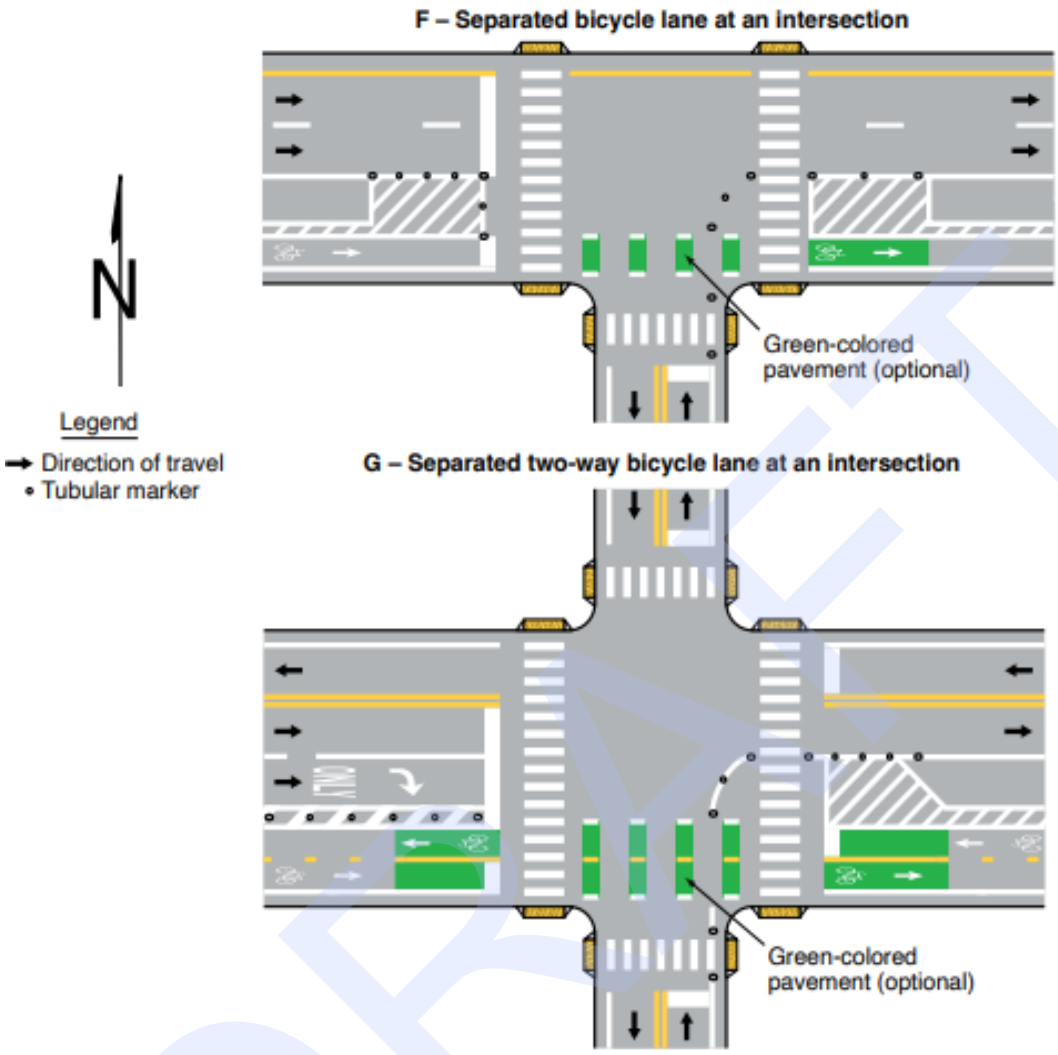


Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 1089



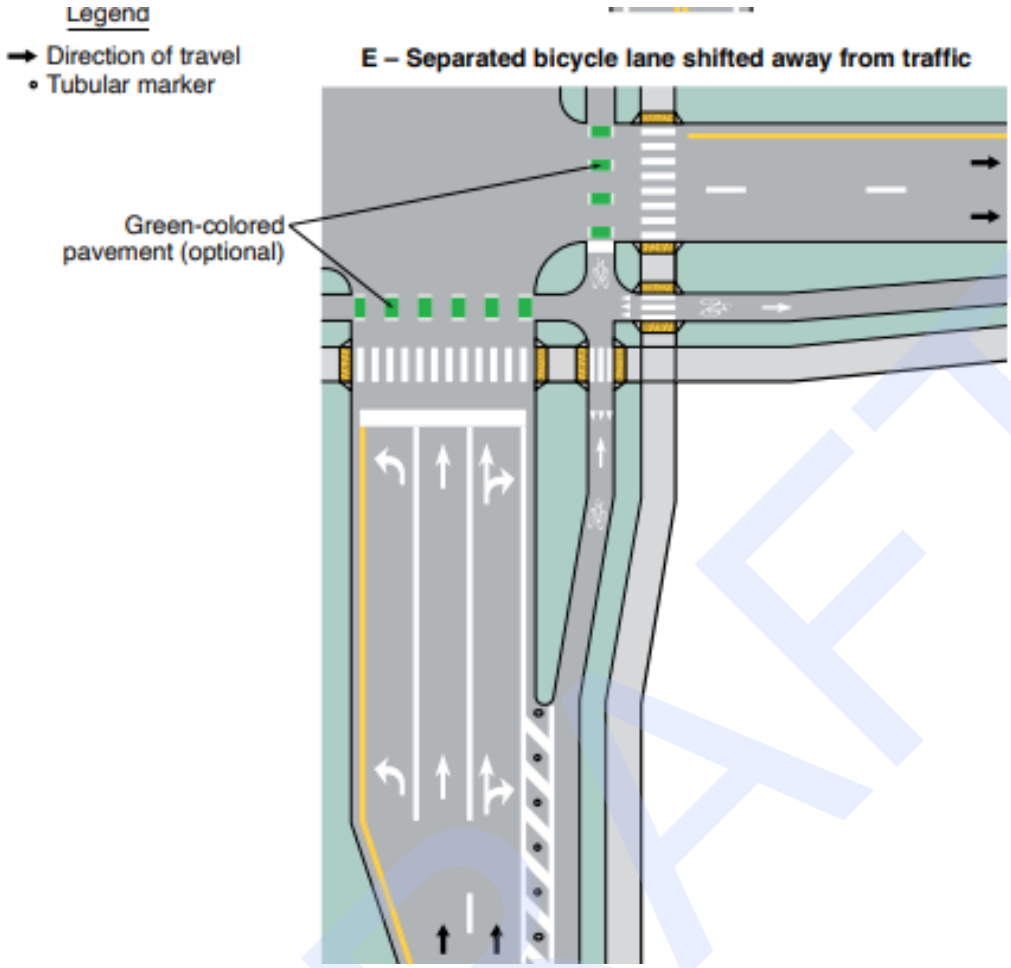
Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 1090

Examples of Lane Markings for Separated Bicycle Lanes at Intersections



Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 1100

Examples of Lane Markings for Separated Bicycle Lanes at Intersections



Source: Manual on Uniform Traffic Control Devices (MUTCD 2023) 11th Edition, page 1099