Potential Bicycle Facility on Bayou Street Mobile, Alabama

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Prepared For

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Introduction

Review of the February 2018, City of Mobile engineering drawings for configuration of the Broad Street TIGER Project has highlighted a conflict between provision of on-street parking vs. provision of separate Cycle Tracks on each side of the street. Without severe reduction of several design elements, such as lane width or sidewalk width, these two important elements will not fit within the existing100 feet of ROW with 4 travel lanes and requisite auxiliary turn lanes.

This led to a focused evaluation of separate bike lanes on Streets east of Broad Street. This report discusses Bayou and Washington Streets as two alternatives to the Broad Street Cycle Tracks.

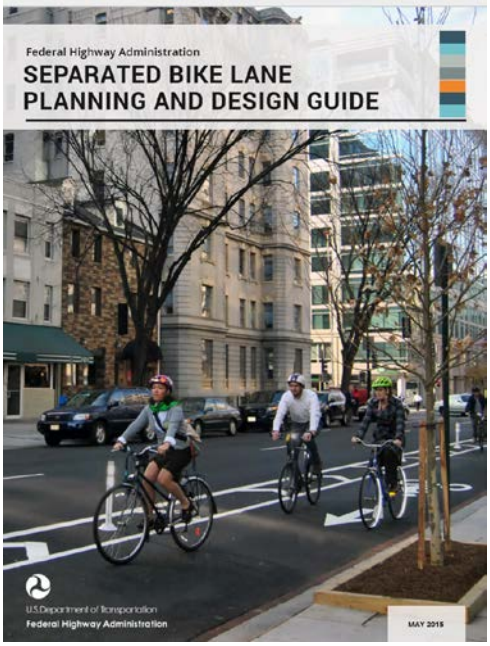
Recommendation

Based on analysis described below, I recommend Option 2, the **Bayou Street** conversion to a high grade, Two-Way, Separate Cycle Lane, with the following:

- Priority right-of-way for north/south direction via the **"Saintly Conversion"** [described in Option 2 below].
- The eastern side of Bayou would include the 11 foot, two-way Separated Bicycle Lane
- A 3 foot separation would be painted between the Bike and Vehicular lane
- An 11 foot travel lane, one-way north would accommodate motor vehicles
- The posted speed should be 15 mph to manage motor vehicle speeds in this bicycle priority street.

National Guidance

The Federal Highway Administration [FHWA] publication *Separated Bike Lane Planning and Design Guide* is referenced here.



Several examples of Separated Bicycle facilities are summarized below from the *Guide*.

1. One-Way Separated Bike Lane on a One-Way Street
2. Two-Way Separated Bike Lane on Side of One-Way Street (2 Lanes)
3. Two-Way Separated Bike Lane on Right-Side of Two-Way Street
4. Center Orientation Alternative Two-Way Street

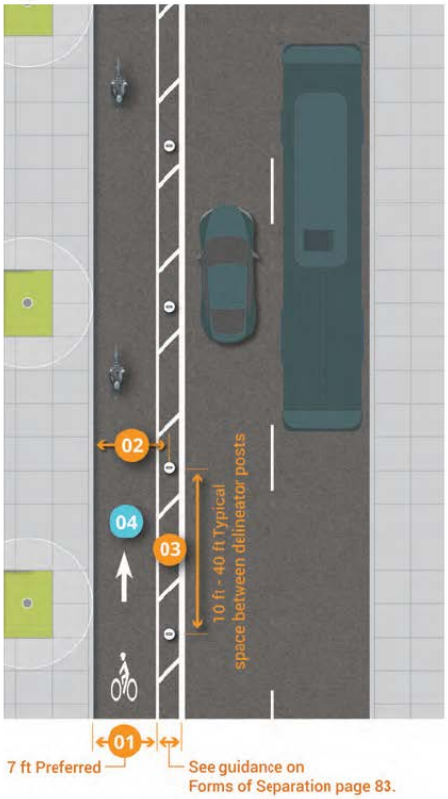
Option 1

DIRECTION AND WIDTH

One-Way Separated Bike Lane on a One-Way Street

A one-way separated bike lane on a one-way street is the least complicated design. This type of design can most easily be implemented on existing streets through the conversion of a motor vehicle lane or removal of on-street parking. Another advantage of this type of facility is the ability to provide a reasonable signal progression for cyclists, improving travel time and signal compliance. One potential complication of this design may be wrong-way riding by bicyclists. This can occur if there are no suitable and attractive bicycle routes (such as a parallel facility) near this separated bike lane.

Figure 8



01 One-way separated bike lanes should have a minimum width of 5 ft. Wider separated bike lanes provide additional comfort and space for bicyclists and should be considered where a high volume of bicyclists is expected. Widths of 7 ft and greater are preferred as they allow for passing or side-by-side riding. Additional care should be taken with wider lanes such that the separated bike lane is not mistaken for an additional motor vehicle lane.

02 Total clear width between the curb face and vertical element should be at least the fleet maintenance (sweeping or snowplow) vehicle width. Widths (inclusive of the gutter pan and to the vertical buffer element) narrower than 7 ft will often require specialized equipment. Consultation with a Public Works department is recommended during the planning process.

03 A minimum 3 ft buffer should be used adjacent to parking. For further guidance on buffer selection and installation, see page 83.

04 For further guidance on typical signs and markings for separated bike lanes, see page 127.

Option 1 – one-way bikes on one-way street, applies to the Bayou/Scott Street pair. Although Scott St. ends at the cemetery just south of Government St. the pair extends from Government to Congress. End point street connections to reach Broad street can be accomplished with some effort.

The primary benefit of one way, separated bike lanes on the one way street is simpler intersection operation and easier accommodation within the 25 foot curb to curb width. A One-way bike lane needs 7 feet for the lane and 2 feet for the separation. This configuration leaves a 9 foot street lane and one 7 foot parking lane, or a wide 16 foot northbound lane.

Negative impacts of Option1 include removal of some parking for two streets for the ½ mile duration of the facilities. Any re-orientation of STOP condition to favor the one-way pair would cause multiple stops for the many cross streets. The other challenge is connecting to the Broad network south of Government Street.

Option 2

DIRECTION AND WIDTH

Two-Way Separated Bike Lane on Right-Side of One-Way Street (2 Lanes)

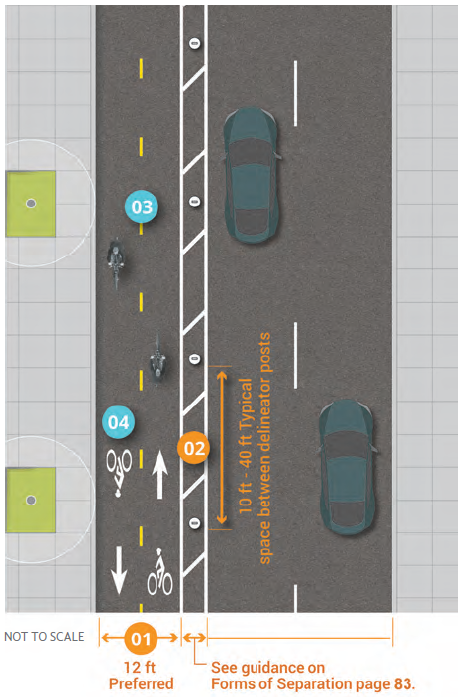
Providing a two-way separated bike lane on a one-way street may be desirable under certain circumstances. This design couples a separated bike lane with a contraflow bike lane in order to route bicyclists in the most direct or desirable way given the street network and destinations. However, this design can create some challenges for roadway user expectancy at intersections and driveways, which could be mitigated by signage suggesting to look both ways for pedestrians. Additionally, certain intersection designs are not possible.

Left-Side Running Alternative

Consider a left-side running separated bike lane under the following conditions:

- The corridor includes a high frequency transit route resulting in potential conflicts with transit vehicles, stops, and transit riders.
- There are fewer driveways, intersections, or other conflicts on the left-side of the street.
- The most likely destinations for bicyclists are on the left side of the street.
- On-street parking is located on the right side of the street.

Figure 11



01 Two-way separated bike lanes should have a preferred combined width of at least 12 ft. Given this total width, clear signs and markings should be provided such that the separated bike lane is not mistaken for an additional motor vehicle travel lane.

02 For further guidance on buffer selection and installation, see page 83.

03 A centerline to separate the two-way bicycle traffic marked in accordance with the MUTCD (2009).

04 For further guidance on typical signs and markings for separated bike lanes, see page 127.

Option 2 works for Bayou Street, which is well connected to Broad at its north and south ends. This alignmet for the separated bike lane would be located close to Broad Street, with its increasing commercial activity.

Within the 25 foot ROW, an 11 foot bicycle path, one 11 foot lane of traffic plus a 3 foot separator can all be accomodated. At a minimum, a 2 foot separator would allow an 12 foot Separate Bicycle Facility. The speed limit should be posted at 15 mph to further balance the relative speed of cyclists and motor vehicle drivers. The two way cycle travel on the one way street would work as an excellent compromise within the slow driving, urban setting for the ½ mile stretch.

Regarding traffic operations, the signal at the Government/Scott intersection might be moved to Bayou to facilitate the new Bike lanes. If the Conti Street/Bayou intersection could be re-signed to provide right-of-way to Bayou and stop sign condition to Conti, the cyclists could avoid one more stop and restart event. As stated in the *FHWA Design Guide*:

> *Bicyclists exert the most energy when starting from a stopped position. Decreasing the number of stops at traffic signals [and signs] in a corridor will increase the comfort for people on bikes and improve bicyclist compliance with the signals.*

This provision of right-of way to the Separated Bicycle Lanes moving north and south on Bayou is being called the **"Saintly Conversion"** given the number of streets named for saints. The conversion of right-of way from east/west to north/south should occur at all the Bayou Street intersections. In other words, stop signs would appear on the east/west legs of all Bayou Street intersections with Dauphin, St. Francis, St. Michael, St. Louis and St. Anthony Streets.

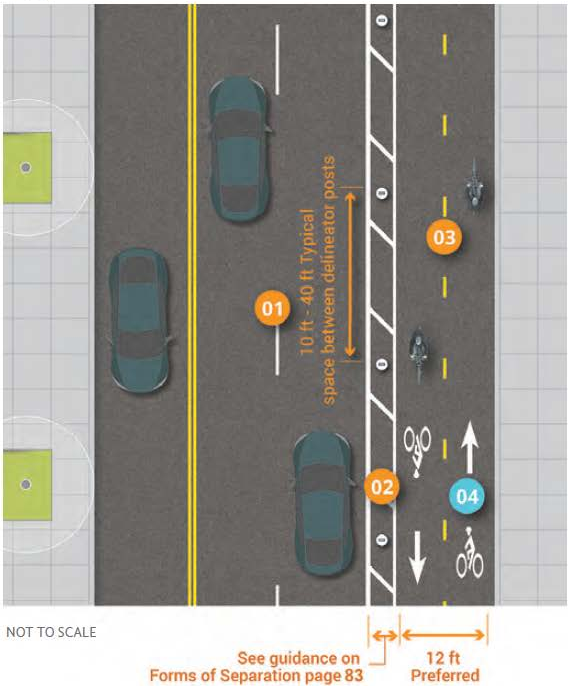
At Spring Hill Avenue, a signal or flashing beacon [with bike activation] would further enhance the cycling experience. The **"Saintly Conversion"** would be a great enhancement to cycling in the corridor because stop and restart events are minimized for cyclists. This north/south priority may entice greater support for shifting the bicycle facility from the proposed cycle track on the much busier Broad Street corridor, to Bayou Street, where cyclists encounter much lower through trips and turning vehicle movements.

Option 3

Two-Way Separated Bike Lane on Right-Side of Two-Way Street

Providing a two-way separated bike lane on a two-way street may be desirable under certain circumstances such as minimizing conflicts on high frequency transit corridors or along corridors with a higher number of intersections or driveways on one side of the street (such as along a waterfront). This design does, however, create some challenges for roadway user expectancy at intersections and driveways. Additionally, the design limits intersection design options.

Figure 12



01 Due to operational and user expectations, this design is best used when there is no room for separated bike lanes on both sides of the street.

02 For further guidance on buffer selection and installation, see page 83.

03 A centerline to separate the two-way bicycle traffic marked in accordance with the MUTCD (2009).

04 For further guidance on typical signs and markings for separated bike lanes, see page 127

Option 3 centers on Washington Street for the ½ mile Separated Bike lanes. although the drawing from the *Manual* shows three total lanes, with two adjacent to the Bike Lanes, Washington Street would have just two lanes for motor vehicle flow. Parking would be removed from the ½ mile length of the conversion. Orientation of the stop condition, the “Saintly Conversion” of operational priority, would also occur along Washington.

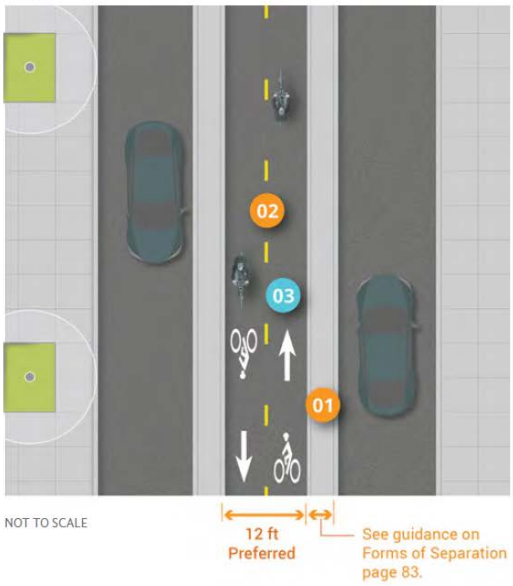
Special attention is required for the activity center at the Washington Street intersections with Daufin and Spring Hill Avenue. Parking loss would impact that center’s commercial activity.

Option 4

Center Orientation Alternative

An alternative design places a two-way separated bike lane in the center of the street. This design is uncommon and can be considered when there are significant conflicts due to turning movements, transit activity, or other conflicting curbside uses. Depending on the width of the roadway and the amount of space that can be allocated to the separated bike lane and buffer, this design may result in intersection design challenges, particularly on how bicyclist right- and left-turns are made.

Figure 13



01 A continuously raised buffer is preferred to reduce the chance of U-turns across the separated bike lane.

For further guidance on buffer selection and installation, see page 83.

02 A centerline to separate the two-way bicycle traffic marked in accordance with the MUTCD (2009).

03 For further guidance on typical signs and markings for separated bike lanes, see page 127.

The Washington Street alignment would only work with minimal widths applied. The separated cycle lanes at 10 feet wide located between the two 9 foot vehicular travel lanes and 1 foot of separation. The “Saintly Conversion” reorientation of the STOP condition to favor Washington would be needed. Central positioning for cyclists would make them much more visible to drivers, a very important factor in intersection cycling safety. Parking would be lost for the ½ mile of the conversion.

Analysis

A general sketch of the Option 2 conversion of Bayou Street is shown below. It includes an 11 foot Separated Bike Lane, a 3 foot separation and an 11 foot travel lane in the 25 foot curb to curb width typical of Bayou Street. Parking could be accommodated in select locations where the grass edge is converted to parking.

The use of Separated Bicycle Lanes east of Broad Street should be designed with sufficient improvement, as viewed by the cycling community, to potentially garner support for the switch from cycle tracks on Broad Street.

Benefits include lower volumes and lower speeds of motor vehicles adjacent to Separated Bike Lanes. Lower overall cost to the Broad Street project would also be important. Finally, the Broad Street Signals would have more Green Time to serve motor vehicle and pedestrian movements if the cyclists could enjoy a better path along Washington or Bayou Streets.

The key policy change, and show of support for cycling, would be the **"Saintly Conversion."** With many fewer requirements to stop the cyclists, their energy would go further, fewer sign and signal violations would occur, and a much more pleasant ride would be assured.