CHAPTER 3: BICYCLE LANE DESIGN

3.1 General Notes

Bicycle lanes have been shown to increase the comfort level of bicyclists. Various studies have found that bicycle lanes have some distinct advantages over paved shoulders and wide outside lanes as they:

- Provide exclusive space for the bicyclist;
- Reduce wrong way bicycle riding;
- Encourage increased bicycle use;
- Increase motorist awareness of bicyclists;
- Encourage bicyclist to ride further away from parked vehicles;
- Reduce motorist lane changes when passing bicyclists;
- Provide visual guidance to cyclist navigating intersections (Hunter et al, 2005).

Bicycle lanes have also been shown to have some of the following potentially negative operational characteristics:

- Require additional enforcement to prevent motorists from parking or stopping in the bicycle lane
- Create an impression that bicyclist must always operate in the bicycle lane (even if there is debris or an obstruction present)
- Can place bicyclist within the path of an opening parked vehicle door

Designated bicycle lanes shall be considered if any one of the following criteria is met:

- It will be a minimum length of one-half (0.5) mile;
- Bicycle lanes are included in the local Master Plan;
- Existing or proposed adjacent land use will support bicycling (residential, commercial, educational, recreational, transit); or
- The bicycle lane would serve to connect other bicycle facilities, including shared use paths and bicycle routes.

Bicycle lanes are usually not necessary for roadways with very low operating speeds (20 mph or less). In these locations, lane sharing between bicyclists and motor vehicles occurs naturally as there is little difference in speeds between them. Examples of such locations are in the new Rockville and Gaithersburg Town Centers.

Generally, roadway shoulders will not be converted to or designated as bicycle lanes, because by law all shoulders are available for bicycle travel unless specifically prohibited. The most common exception to this policy is to provide connectivity for an existing bicycle lane. When shoulders are converted to bicycle lanes with the appropriate signs and pavement markings, they shall be referred to as bicycle lanes and not shoulders. In addition, parking...
shall be prohibited on these facilities. However, it is important to note that the establishment of a bicycle lane on what was previously a shoulder does not prohibit its use by emergency vehicles or disabled motor vehicles for short periods.

3.2 Bicycle Lane Continuity
Bicycle lanes should be continuous along roadway segments (between intersections). It is preferable that bicycle lanes continue through the functional area of intersections, with the through bicycle lane striped to the left of all right-turn lanes (see discussion in section 3.5).

3.3 Bicycle Lane Pavement Markings and Signs

Bicycle Lane Pavement Markings
The Maryland MUTCD Part 9 establishes standards and guidance on the use of pavement markings (symbol and pavement marking arrow) to designate bicycle lanes, and should be referenced in addition to the guidance provided herein.

While SHA allows the use of either bicycle symbol described in the Maryland MUTCD, the use of the bicycle with rider symbol is preferred. The bicycle lane symbol shall be a white, thermoplastic preformed pavement marking. The symbol should generally be placed in the center of the bicycle lane and shall be accompanied by a pavement marking arrow.

Bicycle lane pavement markings shall only be used in conjunction with a solid and/or dashed white stripe that delineates the bicycle lane from the motor vehicle travel lane. The bicycle lane striping shall be a minimum of five inches in width to delineate the bicycle lane from the motor vehicle travel lane per the Maryland MUTCD. An optional five inch wide stripe may delineate the bicycle lane from a parking lane.

Symbol and Arrow Placement for Wide Shoulders Converted to Bicycle Lanes
When wide shoulders are converted to bicycle lanes, it is recommended that the symbol and arrow pavement marking be placed in the center of the lane. However, upon approaching an intersection or the end of the bicycle lane, the symbol and arrow should be shifted to align bicyclists into position to be seen by motorists before any necessary merging begins (on the left hand side of the right turn lane). Figure 3.4 depicts the symbol and arrow placement requirements when departing from a wide bicycle lane onto a narrower bicycle lane.
Bicycle Lane Signs
Part 9 of the Maryland MUTCD establishes standards and guidance on the use of signs to designate bicycle lanes, and should be referenced in addition to the guidance provided herein. The following discussion highlights the primary signs required in conjunction with bicycle lanes.

The use of the BIKE LANE SIGN (R3-17, as shown in Figure 3.5) shall be used only in conjunction with marked bicycle lanes, and should be placed at periodic intervals along the bicycle lanes. Bicycle lane signs need not be adjacent to every symbol to avoid overuse of the signs. Preference should be given to placing signs at locations where there are sight distance problems, where the bicycle lane is unexpected, where there is a history of motorists utilizing the bicycle lane for driving, and/or parking.

Sign Placement Guidance:

a. In rural areas, bicycle lane signs and pavement markings should be placed immediately after major intersections.

Along the length of rural roadways, bicycle lane pavement markings should be provided at 0.5 – 1.0 mile intervals. Bicycle lane signs should be provided every 1.0 – 3.0 miles, and shall be positioned adjacent to the pavement marking.

b. In suburban areas and urban areas without on-street parking, bicycle lane signs and pavement markings should be placed immediately after major intersections. Bicycle lane symbols and arrows may be placed at the entrance to major intersections and major driveways (not including alleys or minor driveways) to reinforce the correct direction of travel for bicyclists.

Along the length of suburban roadways, the bicycle lane symbols and arrows should be placed every 0.1 – 0.5 mile. Bicycle lane signs should be provided every 0.5 – 1.0 mile, and should be positioned adjacent to the symbol and arrow pavement marking.

c. In urban areas with on-street parking, the guidelines in item b. above apply, except that the use of bicycle lane signs should be kept to a minimum to reduce sign clutter. The use of the bicycle lane sign should be considered where there is a history of motorist encroachment on the bicycle lane.

The AHEAD and ENDS signs (R3-17a and R3-17b, as shown in Figures 3.6 and 3.7) are optional and may be helpful in locations where advanced notice of the beginning or end of a bicycle lane would be beneficial to either bicyclists or motorists.
In locations where it is necessary to end the bicycle lane in advance of an intersection, and then to regain the bicycle lane after the intersection and the resulting gap exceeds 200’ in length (not including the width of the intersection itself), the BIKE LANE ENDS sign (as shown in Figure 3.7) should be used.

In locations where motorists frequently weave across a bicycle lane to enter a dedicated right turn lane, the BEGIN RIGHT TURN YIELD TO BIKES (R4-4) sign should be used (as shown in Figure 3.8). This sign is not intended for use at low volume residential driveways.

The Maryland MUTCD provides an optional WRONG WAY sign (R5-1b) that can be used in locations with a high level of wrong way riding, i.e. one way streets near college campuses. This sign should be placed facing wrong-way bicycle traffic, such as on the left side of the roadway, and may be mounted back-to-back with other existing signs to minimize visibility to other traffic. The Maryland MUTCD also provides an optional RIDE WITH TRAFFIC subplate sign (R9-3c) which can be placed beneath the WRONG WAY sign (as shown in Figure 3.9).

### 3.4 Designated Bicycle Lanes at Midblock

**Open Section, No Parking**

Shoulders will have variable widths based upon their original design purpose. Only shoulders with a minimum width of four feet can be designated as bicycle lanes with pavement markings and signs, although five feet is preferred. Parking shall be prohibited in the bicycle lane.

Additional shoulder width is desirable if any one of the following conditions is present:
- motor vehicle speeds exceed 35 mph;
- percentage of trucks, buses, and recreational vehicles is greater than 8%;
- if static obstructions exist at the side of the roadway;
- if there is a steep grade (greater than 10%) at the roadway edge; or
- if rumble strips exist or are planned to be installed.

See discussion in Chapter 4 for other bicycle facilities such as wide curb lanes and striped shoulders.

See Figure 3.11 for signing and striping guidelines.
**OPTION: EDGE LINE**
5’ solid white line.

**DESIGNATED BICYCLE LANE**
4’ minimum width. See Facility Width Guidelines below.

**BICYCLE LANE LINE**
5’ solid white line. Wider lines may be installed at the discretion of the engineer.

**TRAVEL LANE**
The number and width of travel lanes will vary.

**BICYCLE LANE SYMBOL**
Place in center of bicycle lane. See Sign and Symbol Placement Table below for placement details.

**BICYCLE LANE SIGN**
Use MUTCD Sign R3-17. See Sign and Symbol Placement Table below for placement details.

**FACILITY WIDTH GUIDELINES**

<table>
<thead>
<tr>
<th>OPERATING SPEED</th>
<th>VOLUME RANGE</th>
<th>MIN. SHOULDER WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;35 MPH</td>
<td>&lt;10,000 ADT</td>
<td>4 FEET</td>
</tr>
<tr>
<td>36-45 MPH</td>
<td>10,000-20,000 ADT</td>
<td>5 FEET</td>
</tr>
<tr>
<td>&gt;45 MPH</td>
<td>&gt;20,000 ADT</td>
<td>6 FEET</td>
</tr>
</tbody>
</table>

**SIGN AND SYMBOL PLACEMENT**

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<thead>
<tr>
<th></th>
<th>SIGN SPACING</th>
<th>SYMBOL SPACING</th>
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<tbody>
<tr>
<td>RURAL</td>
<td>1-3 MILES</td>
<td>0.5-1 MILES</td>
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<tr>
<td>SUBURBAN</td>
<td>0.5-1 MILES</td>
<td>0.1-0.5 MILES</td>
</tr>
<tr>
<td>URBAN</td>
<td>VARIES*</td>
<td>2-4 PER BLOCK</td>
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</tbody>
</table>

* In urban areas, the use of bike lane signs should be kept to a minimum. Generally a sign may be utilized at the beginning and end of a bike lane.

**DESIGN OF BIKE LANES ON OPEN SECTION ROADWAYS WITH NO PARKING:**
- Bike lanes may be wider than the recommended widths.
- For roadway sections with guardrails, walls, or other obstructions adjacent to roadway, maintain a minimum of 2’ of shy space between face of object and edge of the bicycle lane.
- In areas where parking violations frequently occur, the use of the R7-9 NO PARKING/BIKE LANE sign may be used in place of the NO PARKING sign (R7-1) or similar. If desired, a sign with "EMERGENCY STOPPING OK" or similar message may be placed below the R7-9 or on a separate post.

**Figure 3.11- Designated Bike Lane: Open Section Midblock- No Parking**
Closed Section, No Parking
The striping of closed section roadways will be dependant upon a number of factors including vehicle speed, vehicular volumes, road width, lane width, and pavement condition. Parking shall be prohibited in the bicycle lane. Bike lanes on closed section roadways shall be a minimum of five feet in width.

See Figure 3.13 for signing and striping guidelines.

Closed Section, With Parallel Parking
The marking of bike lanes on closed section roadways with parallel parking should vary depending upon a number of factors including parking turnover, vehicular volumes, road width, lane width, and pavement condition. In general, it is recommended that parking lanes be a minimum width of 8 feet adjacent to a 5 foot bicycle lane. Parking shall be prohibited in the bicycle lane.

See Figure 3.15 for signing and striping guidelines.
CURB

GUTTER
Typical 1’ width.

DESIGNATED BICYCLE LANE
5’ minimum width. See Facility Width Guidelines below.

BICYCLE LANE LINE
5” solid white line. Wider lines may be installed at the discretion of the engineer.

TRAVEL LANE
The number and width of travel lanes will vary.

BICYCLE LANE SYMBOL
Place in center of bicycle lane. See Sign and Symbol Placement Table below for placement details.

BICYCLE LANE SIGN
Use MUTCD Sign R3-17. See Sign and Symbol Placement Table below for placement details.

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* In urban areas, the use of bike lane signs should be kept to a minimum. Generally a sign should be utilized at the beginning and end of a bike lane.

DESIGN OF BIKE Lanes ON CLOSED SECTION ROADWAYS WITH NO PARKING:
- Bike lanes may be wider than the recommended widths.
- In areas where parking violations frequently occur, the use of the R7-9 NO PARKING/BIKE LANE sign may be used in place of the NO PARKING sign (R7-1 or similar).

Figure 3.13 - Designated Bike Lane: Closed Section Midblock- No Parking
PARKING LANE
8' minimum width. 9' preferred width.

PARKING LANE LINE
5" solid white line.

BICYCLE LANE
5' Minimum width adjacent to parking.
See facility width guidelines below.

BICYCLE LANE LINE
5" solid white line. Wider lines may
be installed at the discretion of the
engineer.

TRAVEL LANE
The number and width of travel lanes
will vary.

BICYCLE LANE SYMBOL
Place in center of bicycle lane. See Sign and
Symbol Placement Table below for placement
details.

BICYCLE LANE SIGN
Use MUTCD Sign R3-17. See Sign and Symbol
Placement Table below for placement details.

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DESIGN OF BIKE Lanes ON CLOSED SECTION ROADWAYS WITH PARKING:
- In areas where parking violations frequently occur, the use of the R7-9 NO PARKING/BIKE LANE sign may be used in place of the NO PARKING sign (R7-1 or similar).

Figure 3.15 - Designated Bicycle Lane: Closed Section -With Parking
Bicycle Lanes in Areas with High Parking Turnover

In locations where bike lanes are adjacent to on-street parking, consideration should be given to the possibility that bicyclists may crash into car doors that are suddenly swung open. This type of crash is typically more likely in locations with higher parking turnover, such as main streets, streets near restaurants and retail, etc. This is not typically a concern on residential streets. Bicyclists encountering an opened door must either stop short of the door, swerve into an adjacent travel lane or risk riding into the open door or being struck by the opening door. This act is commonly referred to as “dooring” by bicyclists. Bicyclists have been injured and killed due to dooring events.

To mitigate or reduce the possibility of a dooring event a number of communities have experimented with various pavement markings, regulatory signs, and or warning signs to prevent dooring incidents. The following mitigation measures have been analyzed in locations with high parking turnover, and 7 or 8 foot parking lanes adjacent to bicycle lanes; or locations with a history of dooring accidents or complaints of dooring “close calls.” SHA may consider using these measures on urban streets with frequent on-street parking turnover, on an experimental basis.

Door Warning Sign

This sign can be located adjacent to existing parking regulation signs to increase their visibility to motorists. Please note, this is an experimental sign and is not included in the Maryland MUTCD. An example of a dooring warning sign is shown in Figure 3.16.

Modified Bicycle Lane Marking

Based upon a study performed in San Francisco, CA, marking the door zone with extension lines as shown in Figure 3.17 may encourage bicyclists to ride towards the left side of the bicycle lane outside of the door zone. Engineering judgment should be utilized to determine the frequency of placement of the door zone extension lines.

Consideration may also be given to utilizing a smaller bicycle lane symbol and arrow which would be placed on the extreme left side of bicycle lane. See further discussion on the reduced symbol and arrow size below.

Variations of this sign are proposed or in use in Washington, D.C., Seattle, Washington, San Francisco, California, and New York, New York.
Small Symbol and Arrow Bicycle Lane Marking
Based upon a study performed in Cambridge, MA, utilizing smaller symbols and arrows as shown in Figure 3.18 may encourage bicyclist to ride towards the left side of the bicycle lane outside of the door zone.

The smaller markings should be placed to the extreme left of the bicycle lane.

Shared Lane Pavement Marking
In some locations with high parking turnover, it may be preferable to use a wide outside lane with a shared lane marking placed a minimum of 11’ from the curb in lieu of a bicycle lane. See Section 4.3 for further discussion.

Bicycle Lanes Adjacent to Angled Parking
Angled parking can be used to increase parking capacity and to reduce the width of travel lanes. Bicycle lanes may be considered adjacent to angled parking for locations with back-in (or reverse) angled parking. Bicycle lanes are generally not appropriate adjacent to front-in angled parking, unless sufficient space exists to enable vehicles to back out of the space without intruding on the bicycle lane.

When designing bike lanes adjacent to back-in angled parking, the parking stall markings shall be of sufficient size to fully store the typical design vehicle for the jurisdiction. A bike lane stripe shall be used to delineate the bike lane from the travel lane, but a second line shall not be used to separate the parking lane from the bike lane. It is preferable to use a 6 foot bike lane to allow a vehicle to partially pull out of the travel lane before backing into the parking space, but the bicycle lane may be as narrow as four-feet.

There are numerous benefits to reverse angled parking. The benefits include:
- Improved sight distance between motorists and bicyclists compared to parallel parking or front-in angled parking;
- No danger of “dooring” for bicyclists;
- Allows for more parking spaces compared to parallel parking
- Allow easier loading/unloading of vehicles;
- Direct pedestrians toward the curb;

An example of reverse angled parking adjacent to a bicycle lane is shown in Figure 3.19.

In locations with front-in angled parking, sight distance between drivers and bicyclists is restricted. Therefore it is recommended that if a bicycle route passes through an area with
front-in angled parking, that the parking be changed to back-in angled parking. If the parking can not be reversed, bicyclists should be directed to ride towards the center of the travel lane, away from the parked vehicles.

3.5 Bicycle Lanes at Intersection Approaches
Research has found that over 70 percent of bicyclist crashes occur at roadway and driveway intersections (Hunter et al, 1996 79). The careful selection of signs and striping can raise awareness of necessary merging movements and the proper position at the stop line. The Maryland MUTCD gives general guidance on typical intersection configurations.

There are a variety of customized configurations for bicycle lanes at intersections, as shown in Figures 3.20 – 3.29. These figures provide more guidance for intersections that are typical on Maryland roadways. For complex intersections that are not depicted in the drawings in this manual, the designer should consult with SHA’s Bicycle and Pedestrian Coordinator and the Assistant District Engineer for Traffic.

SHA allows for a range of lane widths (between 10’ and 17’) to be used at intersections (SHA Access Manual, 15.6.4). Often a shoulder or parking lane is eliminated to create space for turning lanes or bypass lanes at intersections. This can be problematic, however, when it interrupts the continuity of a bicycle lane. For this reason, designers should make every attempt to maintain the continuity of the bicycle lane through the intersection approach, rather than eliminating the bicycle lane prior to the intersection. This may require alterations to turn lane configurations, reductions in turn lane widths, and reduced bicycle lane widths.

Dedicated Right Turn Only Lanes with Separate Through Bicycle Lane – “Pocket Lanes”
For locations that have a high volume of right turning vehicle movements the preferred design treatment is to provide a separate bicycle lane to the left of the right turning traffic. A cause of many bicyclist crashes is when a right turning vehicle overtakes a straight through moving bicyclist at an intersection. For this reason, through bicycle lanes shall not be located to the right of right-turn only lanes.

It is desirable to give the bicyclist enough space in the bicycle lane to feel comfortable being passed by motorists on the left and on the right. The lane may be as narrow as 4 feet, but it is preferable to provide a wider lane at locations where vehicle speeds are in excess of 30 mph and/or where there are high volumes or right turning vehicles.

Examples of pocket lane striping from the Maryland MUTCD are shown in Figures 3.21, 3.22, and 3.23.
Source: Maryland MUTCD 2006 Edition (Interim Edition), Section 9C.03
Note:
- Refer to pedestrian chapters of this manual for the design and configuration of all required pedestrian facilities.

**Figure 3.21** - Examples of Intersection Pavement Markings --
Designated Bicycle Lane with Left-Turn Area, Heavy Turn Volumes, Parking, One-Way Traffic, or Divided Highway
Figure 3.22 - Example of Bicycle Lane Treatment at Right Turn Only Lane or Deceleration Lane.
Figure 3.23 - Example of Bicycle Lane Treatment at Right Turn Only Lane.
Shared Right Turn Only Lanes with Through Moving Bicyclists
In locations where it is not possible to provide a separate through bicycle lane or at locations that have a low volume of right turning vehicle movements, a shared right turn only/bicycle through lane may be provided. For this treatment, a 3 foot pocket lane with dash lane markings is provided on the left side of the right turn only lane as shown in Figure 3.24. While a separate through bicycle lane (as described previously) is preferred, this design helps to reinforce proper bicyclist operating position when continuing straight through the intersection. It is preferable to provide a wide right turn lane to allow safe sharing of the lane.

Figure 3.24 - Example of Shared Right Turn Lane with Bicycle Pocket Lane

Bicycle Lane Treatments with Acceleration/Deceleration Lanes
The use of acceleration and deceleration lanes on State roadways at individual intersections can be beneficial to reducing motor vehicle crashes by providing a separate lane for motorists to change speeds to exit or enter the roadway. They are, however, generally incompatible with bicycle use and should be avoided wherever possible in locations with bicycle use.

The following sections provide guidance for locations where acceleration/deceleration lanes must be constructed in conjunction with bicycle lanes.

Bicycle Lane Placement Adjacent to Vehicular Deceleration Lanes
Generally the bicycle lane should be placed to the left of the deceleration lane as shown in Figure 3.22. In locations where the deceleration lane is longer than one/half mile and vehicular operating speeds are in excess of 35 mph, it may be acceptable to place the bicycle lane to the right of the deceleration lane. Bicycle lanes shall not be striped to the right of
deceleration lanes without approval and consultation with SHA’s Bicycle and Pedestrian Coordinator and the Assistant District Engineer for Traffic.

Bicycle Lane Placement Adjacent to Vehicular Acceleration Lanes

Generally the bicycle lane should be placed to the right of the acceleration lane as shown in Figure 3.25. In locations where the acceleration lane is shorter than 200 feet the bicycle lane should be placed to the left of the acceleration lane as shown in Figure 3.26.

Figure 3.25 - Example of Bicycle Lane Placed to Right of Acceleration Lane Greater than 200 Feet in Length
Bicycle Lane Treatments with Auxiliary Lanes or Continuous Right Turn Lanes
In locations where there are frequent driveways, auxiliary lanes or continuous right turn lanes are commonly used. Due to conflict points at each driveway intersection, these lanes can cause problems for both pedestrians and bicyclists.

It is recommended that the use of continuous right-turn lanes or auxiliary lanes be limited in length and that basic access management principals be employed during the design to limit driveways and to reduce conflict points. It is preferable to increase the spacing between driveways and to provide dedicated right turn lanes. Bicyclist merging should be limited to defined locations.

On roadways where auxiliary lanes are utilized, the need for high speed turns from the roadway onto adjoining driveways and roadways is greatly reduced as the auxiliary lane provides space for the deceleration and acceleration of vehicles. A design speed of 30 mph is recommended for auxiliary lanes to create an environment that is conducive to safe passing, merging, and yielding. To facilitate the desired operating speed in the auxiliary lane it is recommended that the curb radii utilized at intersections be the minimum required to accommodate the most common vehicle. This may require special design considerations for larger wheel based service vehicles.

To provide bicycle facilities on existing roadways with continuous right turn lanes or auxiliary lanes, the designer may consider the following bicycle accommodation options:
• For roadways with auxiliary lanes that extend over one half mile, the bicycle lane may be kept adjacent to the curb line as shown in Figure 3.27. At the last intersection where vehicular turning traffic must turn right, the bicycle lane should be placed to the left of the right turn only lane.

• For roadways with auxiliary lanes that extend less than one half mile, the bicycle lane should be placed to the left of the auxiliary lane as shown in Figure 3.28.

• For roadways where a separate bicycle lane cannot be achieved adjacent to an auxiliary lane of any length, a wide curb lane is preferred. See section 4.4 for further discussion.

• If motorists operating speeds can be reduced to below 35 mph and a separate bicycle lane is not possible, shared lane pavement markings may be considered with consultation with SHA’s Bicycle and Pedestrian Coordinator and the Assistant District Engineer for Traffic (ADE-T).

Bicycle Lane Treatments with Bypass Lanes
Where motorists frequently drive in the bicycle lane to bypass left turning vehicles, it is preferable to develop a bypass lane next to the bike lane. In order to develop a bypass lane, travel lanes may need to be narrowed or the roadway may need to be widened. When it is necessary to make a choice between providing a bicycle lane or providing a bypass lane, a bicycle lane is preferred in order to provide connectivity for bicyclists. An example of a bicycle lane striped with a bypass lane is shown on Figure 3.29.

At locations where it is not possible to widen the roadway and it is not possible to prevent motorists from driving in the bicycle lane to pass left-turning vehicles, proper warning shall be provided. The posted speed should be reduced to appropriate level based upon engineering judgment of the site conditions. It is recommended that the advisory speed be posted at 35 mph or less.
RIGHT TURN LANE
Refer to SHA MUTCD for Signing and Striping Requirements

BICYCLE LANE LINES
10" solid white
5' minimum bicycle lane width, 6' preferred

BICYCLE LANE Extension Line
10" dotted line, type 2 white
tapered to end of solid striping

BICYCLE LANE LINES
10" solid white, between intersections
5' minimum bicycle lane width, 6' preferred

BICYCLE LANE SYMBOL
Place after each intersection

AUXILIARY LANE
Refer to Maryland MUTCD for Signing and Striping Requirements

DESIGN OF BICYCLE LANE ADJACENT TO AUXILIARY LANE:
- This treatment is reserved for auxiliary lanes greater than \( \frac{1}{2} \) mile in length

Figure 3.27 - Curb Side Bicycle Lane Adjacent to Auxiliary Lane
RIGHT TURN LANE
Refer to Maryland MUTCD for Signing and Striping Requirements

BICYCLE LANE LINES
10" solid white
5' minimum bicycle lane width, 6' preferred

BICYCLE LANE SYMBOL
Place at start of solid striping

BICYCLE LANE EXTENSION LINES
10" dotted lines, type 2 white
5' minimum bicycle lane width, 6' preferred

BICYCLE LANE SYMBOL
Place after each intersection

AUXILIARY LANE
Refer to Maryland MUTCD for Signing and Striping Requirements

DESIGN OF BICYCLE LANE ADJACENT TO AUXILIARY LANE:
- This treatment is reserved for auxiliary lanes less than ½ mile in length where the posted speed limit is 40 mph or less

Note:
- Refer to pedestrian chapters of this manual for the design and configuration of all required pedestrian facilities.

Figure 3.28 - Bicycle Lane Adjacent to Auxiliary Lane
BIKE LANE SYMBOL
Place in center of bicycle lane at end of taper.

SOFT SHOULDER

BIKE LANE SYMBOL
Place in center of bicycle lane at start of departure lane.

WIDENED ROADWAY
Add 5' minimum width pavement to maintain bicycle lane (if bypass lane eliminates bicycle lane) and maintain 2' clear zone to right of bicycle lane.

BYPASS LANE
Refer to SHA’s Application and Design Guidelines for Shoulder Bypass Lanes to determine taper, approach, and departure lane lengths.

BIKE LANE SYMBOL
Place in center of bicycle lane.

BICYCLE LANE STRIPE
5" Solid White

Note:
- Refer to pedestrian chapters of this manual for the design and configuration of all required pedestrian facilities.

Figure 3.29 - Bicycle Lane Adjacent to Shoulder Bypass Lane