



# Standard Drawing Report

**Date:** December 15, 2017

**Technical Owner:** Traffic - Lewis H. Wardrip, P.E.

**Standard Drawing No.** P-436      **Calculation Book No.** n/a

**Drawing Title:** Pavement Markings Standard Detail Blocks



Expires 06/30/18

## Background Information, Including Reference Material:

- 1) Manual on Uniform Traffic Control Devices, 2009 Edition (MUTCD), Chapter 3
- 2) Standard Highway Signs, 2004 Edition (SHS)
- 3) PBOT Traffic Manual

## Assumption Made:

Described in design narrative below.

## Design Narrative:

P-436 contains transverse pavement markings and pavement marking legends that are commonly used on City of Portland streets, off-street shared use paths, sidewalks, and bike facilities.

All markings used on City of Portland streets meet the MUTCD requirements for color, section 3A.04, "Markings shall be yellow, white, red, or blue," or the FHWA "Interim Approval for Optional Use of Green Colored Pavement for Bicycle Lanes," dated April 15, 2011. The off-street bike loop (white on green) marking does not meet the criteria for use of green specified by the FHWA interim approval; however, this marking is used as guidance only for people biking on off street paths, separated bikeways, or sidewalks. This marking is not installed in motor vehicle travel lanes or in-street bike lanes, and is not used to guide motor vehicles.

P-436 does not provide any information to the user of this standard drawing on the proper application of the detail blocks (how they should or can be used). The intent of P-436 is to allow the user to easily specify the details of a marking as shown on the striping plans. The information on proper application of each detail block can be found within the MUTCD, the Oregon Supplement to the MUTCD, the PBOT Traffic Manual, or the ODOT Traffic Line Manual, other standard drawings, and/or the Oregon Revised Statutes. Therefore, the user of the standard drawing must be knowledgeable of the above stated documents to ensure that the detail blocks are applied correctly.

Each detail block is discussed below in detail.

### **BXL, BXR**

- The Left Turn Bike Box pavement markings are used at intersections where bikes are encouraged or required to turn left from the far right side of the intersection in a two-stage maneuver.
- The Right Turn Bike Box pavement markings are used at intersections where bikes are encouraged or required to turn right from the far left side of the intersection in a two-stage maneuver.
- Meets the requirements of the FHWA "Interim Approval for Optional Use of Two-Stage Bicycle Turn Boxes" dated July 13, 2017 except for the following two elements:
  1. Condition of Approval 2a in the "Interim Approval for Optional Use of Two-Stage Bicycle Turn Boxes" states, "Two-stage bicycle turn boxes shall include an appropriately-sized bicycle symbol as shown in Figure 9C-3A of the MUTCD..." The MUTCD symbol shown in 9C-3A is 6 feet in height and the Portland Bureau of Transportation found that a symbol of this size was unnecessary for viewing by people riding bikes and was too big to fit within a typically sized bike turn box (8 feet by 10 feet). Alternatively, the Portland Bureau of Transportation worked with a pavement marking manufacturer to develop a smaller 4ft by 3ft-3in bicycle with rider symbol to better fit within a typically sized box with an arrow.
  2. Condition of Approval 2b in the "Interim Approval for Optional Use of Two-Stage Bicycle Turn Boxes" states, "Two-stage bicycle turn boxes shall be bounded by a solid white line on all sides. Details BXL and BXR include solid white lines on three sides of the box but the side that the bike enters the box does not include a solid white line. Portland Bureau of Transportation omitted the white solid line on the entrance side of the box to make it clear where bikes should enter the box. The BXL and BXR details also have a wide solid white line on the departure side of the box to act as a stop bar for bikes entering the box and turning while they wait for their signal phase.

### **BLE-G**

- This marking meets the requirements for use of green markings listed in the FHWA "Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes," dated April 15, 2011.

### **OPM**

- The Off-street Obstruction Pavement Marking is used on separated shared use paths or sidewalk-level bicycle facilities when a bollard is placed in the pathway to restrict access to non-motorized traffic only. These markings are not used on in-street bicycle facilities.

- The dimensions of OPM match MUTCD 2009 Edition Figure 9C-8 "Examples of Obstruction Pavement Markings" which illustrates the use of normal solid yellow lines in a 10 foot long diamond shaped marking around the obstruction.

### GRN

- This detail is used for the installation of green pavement markings in bike facilities as approved for use in the FHWA "Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes," dated April 15, 2011.

### BL

- The Bike Loop symbol is classified as a pavement marking symbol in the MUTCD. Used in the roadway to indicate the optimum position for a bicyclist to actuate a signal.
- Meets MUTCD 2009 Edition Section 3B.20, "Word, symbol, and arrow markings shall be white, except as otherwise provided in this Section."
- The BL symbol meets the size and proportions shown for the bicycle detector pavement marking in the MUTCD 2004 Standard Highway Signs page 10-17.

### BL-GREEN

- Used to indicate the optimum position for a bicyclist to actuate a signal.
- This marking is used as guidance only for people biking on off street paths, separated sidewalk level bikeways, or shared use path/sidewalk facilities. This marking is not installed in motor vehicle travel lanes or in-street bike lanes.
- The Off-street Bike Loop (White on Green) marking includes the addition of green contrast material to supplement the BL marking previously described. The only difference is the addition of a green contrast material to provide added conspicuity to the white markings when installed on a standard light-colored concrete separated bike facility or shared use sidewalk facility.

### BL-CON

The Off-street Bike Loop (White on Black) marking includes the addition of black contrast material to supplement the BL marking previously described. The only difference is the addition of a black contrast material to provide added conspicuity to the white markings when installed on a standard light-colored concrete roadway.