Traffic Engineering Striping & Stenciling Handbook

MaineDOT

MARCH 2018
Section 1 & 2
Striping Patterns/
Layouts & Passing
Zone Layouts
Section 3
Truck Lane Layouts
Section 4
Turning Lane Layouts
Section 5 & 6
Stencil Layout,
Square Footage

Points of Contacts
Region Traffic Engineers (RTE) List
Region 1 - Southern
Randy Illian - 885-7000
Bob VanLuling - 885-7000
Region 2 – Midcoast
David Allen - 624-8227
Region 3 - Western
Tim Soucie - 562-4228
Region 4 - Eastern
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Region 5 - Northern
Raymond Demerchant - 764-2200
Erick Bechtel - 764-2200
Additional Contact:
Noah French - 557-5429
Notes

1. Passing zones shall not be less than 430 feet or 10 skips long (with 11 gaps).
2. Traffic patterns are laid out using the basic “H” pattern. Use only the patterns on pages 8 & 9.
3. All travel lanes have an assumed width of 11 feet unless otherwise marked (center of line to center of line).
   • All travel lanes must be properly identified. At the beginning of each end of the new pavement, the number reflecting the lane width should be painted on the road. (Example 10’, 10’-6”, 11’, 11’-6”, etc.)
   • Any tapering or widening of a travel lane, from the original desired width, shall be properly laid out to show the appropriate new taper or new widening along with the new desired width.
4. All lanes, passing zones, intersections, islands, curve layouts, and truck lanes should follow the designs in this booklet.
5. The listed Regional Traffic Engineers are the only individuals authorized to make changes to road layouts, passing zones, intersections, edge lines, truck lanes, and lane widths within each region.
6. Any questions, concerns, or problems with the layouts need to be brought to the attention of the RTE in your region. The RTE contact information is on page 2.
Definitions

**Solid White Lines (SWL):** Solid line pavement markings delineating the separation of traffic lanes that have the same direction of travel & where crossing the lane line markings is discouraged. This is also used in conjunction with tick marks in aggressive curves for additional visibility. Tick marks are 2 foot dots, attached to the white line, that are 8 inches wide and gapped 6 feet between dots. Tick marks run from the PC to the PT through the curve. When tick marks run through an intersection the solid white line changes to a dotted white line forming a 12 inch wide (8 inch + 4 inch) x 2 foot long dot.

**Broken White Line (BWL):** Broken line pavement markings are used wherever crossing the lane line is permitted. This line is 4 inches in width, with 10 foot long painted lines separated by 30 foot long gaps. On the freeway they would be 6 inch lines, 15 feet long with 25 foot gaps.

**Dotted White Line (DWL):** A dotted lane line provides guidance or warning of a downstream change in lane function. A dotted line for lane extensions within an intersection should consist of 2 foot line segments and 6 foot gaps (1:3 ratio). A dotted line separating an auxiliary lane between two freeway interchange or exit ramps involving lane drops should consist of 3 foot line segments and 9 foot gaps. Dotted white lane lines that are used for lane drop markings and that are used as a lane line separating through lanes from auxiliary lanes should consist of line segments that are 3 feet in length separated by 9 foot gaps. A lane drop marking used in advance of lane drops at freeway/expressway exit ramps should begin at least 1/2 mile in advance of the theoretical gore. A dotted white line marking shall be used as the lane line to separate a through lane that continues beyond the interchange or intersection from an adjacent lane under the following conditions:
A) A deceleration or acceleration lane,
B) A through lane that becomes a mandatory exit or turn lane,
C) An auxiliary lane 2 miles or less in length between an entrance ramp and an exit ramp,
D) An auxiliary lane 1 mile or less in length between two adjacent intersections,
E) Dotted line on a curve through an intersection.

**Two Solid White Lines (2SWL):** A white, double line between travel lanes that strongly limits crossing. This is the most restrictive white lane lines. An exception to crossing this line would be to enter the roadway from a drive or entrance. This line consists of two parallel lines, 4 inches in width separated by a 4 inch gap.

**Stop Bar:** Stop lines/bars shall consist of solid white lines, 24” wide, extending across approach lanes to indicate the point at which the stop is intended or required to be made.
Two Solid Yellow Lines (2SYL): A yellow, double line on the farthest left acceptable travel lane that generally prohibits crossing. This is the most restrictive yellow lane line. An exception to crossing the line would be to enter a drive or entrance on the left side of the highway. This line consists of two parallel lines, 4 inches in width separated by a 4 inch gap.

Two Dotted Yellow Lines (2DYL): A dotted yellow line on the farthest left acceptable travel lane that provides guidance or warning of a downstream change in lane function, namely a transition to a solid double yellow line. This line consists of two parallel lines 4 inches in width, with 2 foot long painted lines separated by 6 foot long gaps, with 4 inches separating one line from the adjoining parallel line.

Solid Yellow Line (SYL): A yellow line to the left of the acceptable travel lane that generally prohibit crossing. Some examples of this line would be on the freeway between the left through lane & the center median, to the left of a right turn on an off-ramp splitter island, left side of an off-ramp after the gore, non-freeway would be around a splitter island. An exception to crossing this line would be to enter a drive or entrance on the left side of the highway. The line is 4 inches wide (6 inches on freeways), except in rare occasions 12”.

Broken Yellow Line (BYL): Part A) A yellow broken line on the farthest left acceptable normal travel lane and indicates a permissive condition allowing short term crossing of the line when conditions permit. This line is 4 inches in width, with 10 foot long painted dashes separated by 30 foot long gaps (15 foot dashes seperated by 25 foot long gaps on freeway applications).Part B) A yellow broken line that indicates a permissive condition allowing short term crossing of the line when conditions permit. Typically used in two-way left-turn lanes in conjunction with a solid yellow edge line.

Dotted Yellow Line (DYL): A yellow dotted line on the farthest left acceptable travel lane that provides guidance or warning of a downstream change in lane function or lane extensions within an intersection, namely a solid yellow line. This yellow line is 4 inches wide ( or 6 inch width for emphasis), 2 foot long painted dots separated by 6 foot long gaps (1:3 ratio).

Cross Hatching Yellow (YCH): Yellow lines 45° to centerline painted from left to right (perspective of starting near the opposing lane & coming at a 45° angle toward the direction of travel). Lines are 12” wide (25 - 40 MPH) & 24” wide (40 mph & greater) & spaced at 1 foot per mile per hour of the posted speed. (i.e.: 45 MPH speed limit translates to 45 foot spacing) being measured upstation (leading end to leading end or trailing end to trailing end).

Cross Hatching White (WCH): White lines 45° to a theoretical mid point line through the hatched area painted in chevron format (perspective of starting on the midpoint & coming at a 45° angle toward the directions of travel). Lines are 12” wide (25 - 40 MPH) & 24” wide (40 mph & greater) & spaced at 1 foot per mile per hour of the posted speed. (i.e.: 45 MPH speed limit 45 foot spacing) being measured upstation (leading end to leading end).
Drawings in this book are not to scale.
Section 1

Striping Patterns

1 2 3 4 5

6 7 8

9 10

11 12 13 14 15
Striping Patterns

Center Line Markings & 5 Dot Patterns (For Dotted Lines)

16 17 18 19

Edge Line Markings (white)

20 21 22

20" to 24"

23 24 25

8" to 12"

Final centerline markings are to be placed where the centerline will be striped. The striping truck may need to stripe from either direction, depending upon the direction of the sun. Marks must be placed on the high point ("center line joint") because marks under the tire of the striping truck cannot be seen by the operator. One foot off the centerline joint is not acceptable.
A 3 dot pattern represents a 10 ft dash with a 30 ft gap. A 5 dot pattern represents a 2 ft "dot" with a 6 ft gap.

Place 1 inch marks every 3 to 4 feet for layout of the dotted line.
12 inch dotted line (8" + 4")

4 inch line with 8 inch x 24 inch tick marks
Section 2

Spacing for 25 - 30 MPH

100 FT spacing when total length of center turn lane is less than 1,000 FT in length
Spacing for 35 - 40 MPH

16'
300'
16'
Spacing for 45 MPH & greater
Section 3

Truck Lane

*For best results start at the trailing end (where travel lane & shoulder are back to normal width).
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Lane reduction arrows are not required for speeds less than 45 MPH.

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**Notes:**

1. LRTM layout markings (LRTM) are required for alternate merge layouts.
2. LRTM spacing is often dictated by geometry; therefore, spacing may require adjustments.
3. 1/3 D can be used when 3 arrows per lane is desired.
ALTERNATING MERGE - LAYOUT
30 MPH

NOTES:
*1) LANE REDUCTION TRANSITION MARKINGS (LRTM) ARE REQUIRED FOR ALTERNATE MERGE LAYOUTS.
*2) LRTM SPACING IS OFTEN DICTATED BY GEOMETRY; THEREFORE SPACING MAY REQUIRE ADJUSTMENTS.
*3) 1/3 D CAN BE USED WHEN 3 ARROWS PER LANE IS DESIRED.
ALTERNATING MERGE - LAYOUT
35 MPH

NOTES:
*1) LANE REDUCTION TRANSITION MARKINGS (LRTM) ARE REQUIRED FOR ALTERNATE MERGE LAYOUTS.
*2) LRTM SPACING IS OFTEN DICTATED BY GEOMETRY; THEREFORE SPACING MAY REQUIRE ADJUSTMENTS.
*3) 1/3 D CAN BE USED WHEN 3 ARROWS PER LANE IS DESIRED.
ALTERNATING MERGE - LAYOUT

40 MPH

NOTES:

*1) LANE REDUCTION TRANSITION MARKINGS (LRTM) ARE REQUIRED FOR ALTERNATE MERGE LAYOUTS.
*2) LRTM SPACING IS OFTEN DICTATED BY GEOMETRY; THEREFORE SPACING MAY REQUIRE ADJUSTMENTS.
*3) 1/3 D CAN BE USED WHEN 3 ARROWS PER LANE IS DESIRED.
ALTERNATING MERGE - LAYOUT
45 MPH

NOTES:
*1) LANE REDUCTION TRANSITION MARKINGS (LRTM) ARE REQUIRED FOR ALTERNATE MERGE LAYOUTS.
*2) LRTM SPACING IS OFTEN DICTATED BY GEOMETRY; THEREFORE SPACING MAY REQUIRE ADJUSTMENTS.
*3) 1/3 D CAN BE USED WHEN 3 ARROWS PER LANE IS DESIRED.
ALTERNATING MERGE - LAYOUT
50 MPH

NOTES:
*1) LANE REDUCTION TRANSITION MARKINGS (LRTM) ARE REQUIRED FOR ALTERNATE MERGE LAYOUTS.
*2) LRTM SPACING IS OFTEN DICTATED BY GEOMETRY; THEREFORE SPACING MAY REQUIRE ADJUSTMENTS.
*3) 1/3 D CAN BE USED WHEN 3 ARROWS PER LANE IS DESIRED.
ALTERNATING MERGE - LAYOUT
55 MPH

NOTES:
*1) LANE REDUCTION TRANSITION MARKINGS (LRTM) ARE REQUIRED FOR ALTERNATE MERGE LAYOUTS.
*2) LRTM SPACING IS OFTEN DICTATED BY GEOMETRY; THEREFORE SPACING MAY REQUIRE ADJUSTMENTS.
*3) 1/3 D CAN BE USED WHEN 3 ARROWS PER LANE IS DESIRED.
**ALTERNATING MERGE - LAYOUT**  
**60 MPH**

**NOTES:**
*1) LANE REDUCTION TRANSITION MARKINGS (LRTM) ARE REQUIRED FOR ALTERNATE MERGE LAYOUTS.
*2) LRTM SPACING IS OFTEN DICTATED BY GEOMETRY; THEREFORE SPACING MAY REQUIRE ADJUSTMENTS.
*3) 1/3 D CAN BE USED WHEN 3 ARROWS PER LANE IS DESIRED.
Bubble Island Layout

Taper (L):
S = Speed of road in MPH
S ≥ 45  \( L = W \times S \)
S < 45  \( L = (W \times S^2)/60 \)

Crosshatching:
See section 2 for crosshatching layout. Width of diagonals equals 12 inch.

Deceleration Layout (Ld):
30 MPH = 120’
40 MPH = 165’
50 MPH = 265’
60 MPH = 370’

Storage Length (Ls):
< 61  Vehicles/HR = 50’
61-120  Vehicles/HR = 100’
121-180  Vehicles/HR = 150’
> 180  Vehicles/HR = 199’
Section 4

Turning Lane Layouts

Offset varies (1ft min)

16" Wide dotted white thermoplastic extension of circulatory roadway edge line

Offset varies (1ft min)

Only as directed by the Region Traffic Engineer
Signalized Intersection with Multiple Turn Lanes

100’ to 300’ length unless Region Traffic Engineer determines a longer solid line is needed.

2’ x 8” dotted line with 6’ gap when a through lane become a mandatory turn lane.

Used (required) when through lane becomes mandatory turn lane.

2’ x 8” dotted line with a 6’ gap.

Optional 2nd only & 3rd arrow.

Solid line (may be broken line where no auxiliary turn lane exists)
Railroad Crossing

If automatic gate is present, stop bar must be at a minimum of 8 feet prior to approaching the gate.

The “R’s” wear off in the wheel paths, therefore this narrow layout is always used.
* A third arrow may be added when a through lane becomes a turn lane or at the leading end of an auxiliary lane (longer than 250').

Lane separation lines & designation markings should start 10' past the beginning of the auxiliary lane when the auxiliary lane is longer than 110'.

Through lane becomes turn lane: The line is 8'' wide and the leading dashes (dots) are 2' L x 8'' W x 6' gap (length of dots is determined by Region Traffic Engineer.)

2' x 4'' line & 6' gap can be used when in a curve.
Stop & Yield

Yellow when island is raised (full height)

Layout only the 1st triangle

4' Min.

6'

4' Min.

24"

30'

30'

30' Max.

MAX. 24"

36"
18-inch layout dash lines must be placed at the beginning and at the end of the edge line curve and, as needed, through the curve.
18-inch layout dash lines must be placed at the beginning and at the end of the edge line curve and, as needed, through the curve.
Island Striping Layout

Layout lines placed as needed

75' to 100'

12' to 24'
Striping Layout for Skew Intersection
Place 18” long layout marks every 200 to 400 feet in curves (beginning at the PC and ending at the PT). Marks should be spaced every 200 to 400 feet for sharp curves and every 400 to 500 feet for gradual curves.)
Rest Area Pulloff
with out Island Striping
Rest Area with Island Striping Layout
Intersection Edge Striping Layout
Non State-Aid Roads
Section 5
BUS 
FIRE

19.1 SF
19 SF
19.9 SF
20 SF
LANE

LEFT
ONLY
PED

20.9 SF
21 SF

17.8 SF
18 SF
10’ lettering for two lane application
8’ lettering for only one lane (33 SF)
Section 6
Handicap Markers

2’

2’-4"

3.9 SF
4 SF

4’

4’

15.9 SF
16 SF
Hospital Symbols (high speed/low speed)

- High speed: 95.6 SF
- Low speed: 71.7 SF

Symbol dimensions:
- Width: 16'
- Height: 12'
- Height of slit: 8'
- Distance between slits: 6'

Symbol area:
- High speed: 96 SF
- Low speed: 72 SF
Left of Straight Option Arrow

7'-6"

11'-6"

24.9 SF

25 SF
Merge Arrow

18'

20° from edge of the pavement

5'-8"

41.8 SF

42 SF
Roundabout Arrows (Type LE & TRE)

- 7'
- 6'-6"
- 13'-8"
- 18'-8"
- 2'-8"
- 27.5 SF
- 27 SF
- 35.0 SF
- 35 SF
Roundabout Arrows (Types TE & LTE)

- 4'
- 6'
- 18'-8''
- 28.2 SF
- 28 SF
- 36.7 SF
- 37 SF
Roundabout Arrows (Types T & LTRE)

- 4'
- 9'
- 18'-8"
- 22.9 SF
- 23 SF
- 43.5 SF
- 43 SF
Roundabout Arrows (Types TR & LT)

18'-8"
6'
27.7 SF
28 SF

18'-8"
6'
31.4 SF
31 SF
Roundabout Arrows (Type TLR)

9'

18'-8"

38.2 SF

38 SF
Large Yield Triangle

Large Yield Triangle

Small Yield Triangle

Small Yield Triangle

53 SF
53 SF

38.6 SF
39 SF
Yield Triangles
"Shark Teeth"

2'

3' to 12"

3 SF

3 SF
Wrong Way Arrow (Reflectors)

35'-9"

58 SF

58.3 SF

4'-9"

2'
Preferential Lane Symbol