

Pavement Markings: Centerlines and Edgelines



Example of fading centerline and edgeline. (Photo Source: FHWA)

Did You Know?

A study by the American Traffic Safety Services Association and the National Association of County Engineers found that on two-lane rural roads with an ADT of at least 500 vehicles per day, edge lines yield \$17 in safety benefits for every dollar invested.

Background

Providing pavement markings is an effective strategy to prevent vehicles from encroaching on the roadside. Run-off-the-road and cross-over-the-centerline crashes are among the most deadly crashes along U.S. roadways. Lane departure crashes account for nearly half of all fatal crashes in Massachusetts.

A Federal Highway Administration (FHWA) report of ranked countermeasures listed highly visible and well-maintained pavement markings, such as centerlines and edgelines, as the third-most effective low-cost safety improvement behind (1) the installation of edgeline rumble strips and (2) enhanced shoulder or in-lane delineation and markings for sharp curves. Such pavement markings can help prevent lane departure on roadways by guiding the roadway user. While the [Manual on Uniform Traffic Control Devices \(MUTCD\)](#) clearly details standards for installation of pavement markings, the primary challenge facing most communities is the maintenance of existing markings.

Please note that this fact sheet refers to centerline and edgeline pavement markings only. Additional details on all other types of pavement markings can be found in the *Pavement Markings: Other* fact sheet in this toolbox series.

Longitudinal Lines

Centerlines, edgelines, and lane lines are used to guide the road user and delineate travel lanes. These lines are even more critical when visibility is compromised by fog or heavy rain. Centerlines are intended to separate two opposing traffic streams, whereas edgelines are used to separate the travel lane from an adjacent shoulder. The MUTCD states that centerlines must be yellow and edgelines must be white. When used, lane line pavement markings delineating the separation of traffic lanes that have the same direction of travel shall be white. The MUTCD also provides information regarding the width of centerlines, lane lines, and edgelines.



Example of highly retroreflective pavement markings at night. (Source: FHWA)

A solid line discourages crossing and a double line prohibits crossing. A broken centerline, used to indicate a passing zone, indicates a permissive condition. The MUTCD suggests that the broken line should consist of 10-foot line segments and 30-foot gaps, or dimensions in a similar ratio of line segments to gaps as appropriate for traffic speeds and need for delineation.



For more information contact:
MassHighway
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(617) 973-8484

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Centerlines

Centerlines are required on all paved urban arterials and collectors that have a traveled way of 20 feet or more in width and an Average Daily Traffic (ADT) volume of 6,000 vehicles per day or greater. Centerline markings should also be placed on all paved two-way streets or undivided highways that have three or more lanes for travel.

A two-lane, two-direction roadway meeting the above criteria should have one of the following centerline combinations: a double yellow solid centerline where passing is prohibited in both directions, a single solid yellow and adjoining broken yellow line where passing in one direction is permitted, or a single broken yellow line. A highway with four or more lanes, with at least two lanes in each direction should have a double yellow solid centerline along the entire roadway.

Edgelines

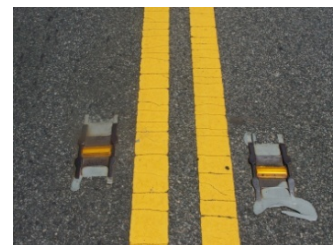
Edgelines shall be placed on paved rural arterials with a traveled way of 20 feet or more and an ADT of 6,000 vehicles per day or greater. Edgelines may also be placed on any paved street or highway where an engineering study indicates a need and does not show that edgelines would decrease safety.


Installation Considerations

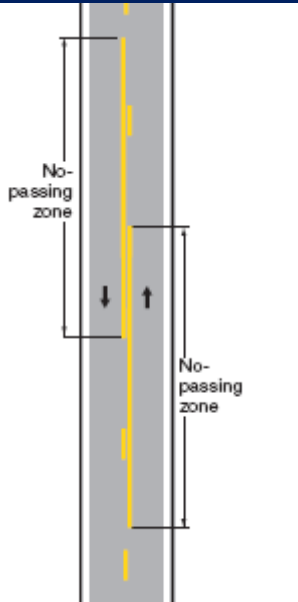
A problem facing many communities is the maintenance of worn centerlines and edgelines. There is a variety of new materials which are more durable, but cost more than older types, such as paint. A brief introduction to the differences between new non-paint-based materials and paint-based materials is included on the next page.

Line width, pattern, and color are all used to convey meaning to the road user. Another consideration may be the use of supplemental signage or markers, such as embedded or raised pavement markers, to emphasize a message.

Some other considerations when selecting materials and pavement marking type include: retroreflectivity in dry and wet conditions, durability, worker safety during application, total cost, ease of application, life expectancy, and supplier availability.



Solid double yellow centerline with embedded pavement markers. 



Typical two-lane, two-way marking with no passing zones. (Source: MUTCD)

EOT

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Materials Comparison

	<u>Thermoplastic</u>	<u>Solvent Based Paint</u>	<u>Epoxy</u>	<u>Grooved in Tape</u>
Relative Cost \$ (per installed linear foot)	.30 – .85	.03 – .15	.08 – .65	1.00 – 2.00
Life Expectancy (asphalt/concrete)	2 – 5 years	4 – 18 months	2 – 3 years	3 – 7 years
Life Expectancy (Portland cement)	1 – 3 years	2 – 7 months	1 – 2 years	3 – 7 years
Approximate Nighttime Visibility in feet (in dry conditions)	340	290	Data not available	320
Approximate Nighttime Visibility in feet (in wet conditions)	200	70		200

Source: *Wet Night Visibility of Pavement Markings: Executive Summary* by Gibbons, R., Hankey, J., and Pashaj, I. 2004.

Additional Considerations

The first step in installing pavement markings is determining the ADT and roadway classification (i.e., arterial, collector, or local). Contact the Executive Office of Transportation and Public Works (EOTPW) Planning Department for help in determining the roadway classification. Next, select appropriate pavement markings based upon the MUTCD. Finally, choose a marking material based upon information provided in this fact sheet as well as local considerations. Questions about pavement markings on state roads and bridges should be directed to [MassHighway](#).

Resources

Massachusetts Traffic Safety Toolbox Series

This series of fact sheets on safety improvements that can be implemented at the local level is available online. Information on problem areas, possible countermeasures, and implementation considerations is included in each fact sheet. Available online at www.mass.gov/mhd/safetytoolbox/

The Manual on Uniform Traffic Control Devices (MUTCD)

The MUTCD defines the standards used by transportation professionals nationwide to install and maintain traffic control devices on all streets and highways. The most recent version (2003) can be found online at <http://mutcd.fhwa.dot.gov/>

Pavement Marking Materials

Additional information on pavement marking materials can be found online through the Iowa State University Center for Transportation Research and Education at <http://www.ctre.iastate.edu/reports/pavemark.pdf>



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