

Research in Progress

Optimizing of MassDOT's High Performance Asphalt Overlay (HPOL) Mixtures

Research Need

MassDOT and municipalities within Massachusetts are interested in utilizing new technologies that enhance the resiliency of their pavements because increased resiliency extends the service life of the road network. One method to enhance road resiliency is to use high performance asphalt overlays (HPOL) as a pavement preservation/rehabilitation strategy. Mixtures used in HPOL are generally required to meet enhanced performance characteristics compared to traditional dense graded hot mix asphalt (HMA).

To allow for innovation and healthy competition, MassDOT has been exploring the possibility of allowing contractors to choose between placing HPOLs either as an Asphalt Rubber Gap Graded (ARGG) mixture, a Superpave High Performance (HP) surface course mixture, or a stone matrix asphalt (SMA) mixture.

The main interest of MassDOT is to determine if using a HP or a SMA mixture will provide the same (or better) performance and life cycle costs/benefits as compared to the ARGG mixtures in which it has more experience. MassDOT also wishes to evaluate and modify its existing ARGG and HP specifications, when utilized for designing HPOL mixtures. Overall, this study will allow MassDOT to optimize the use of HPOL mixtures and improve road resiliency.

Goals/Objectives

The following objectives have been set for this study:

1. Evaluate current MassDOT ARGG and HP HPOL mixtures.
2. Design and evaluate the performance of ARGG, HP, and SMA mixtures for use as a HPOL.

Project Information

This project is being conducted as part of the Massachusetts Department of Transportation (MassDOT) Research Program with funding from Federal Highway Administration (FHWA) State Planning and Research (SPR) funds.

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3. Attempt to optimize materials or design parameters to improve on the current specifications for ARGG, HP, and SMA HPOL mixtures.
4. Compare the performance characteristics (with respect to long-term aging) and life cycle costs of ARGG, HP, and SMA HPOL mixtures.
5. Establish which HPOL mixture is better for MassDOT.

Methodology

1. Conduct literature review to assess previous research related HPOL mixtures.
2. Design three 12.5-mm HPOL asphalt mixtures (ARGG, HP & SMA).
3. Evaluate the performance of the asphalt binders and HPOL mixtures.
4. Determine relative return on investment (ROI) when considering the possible HPOL alternatives.

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