

Targeted Overlay Pavement Solutions (TOPS)

Targeted overlays match treatments to high-priority, high-need locations.

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U.S. Department
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**Federal Highway
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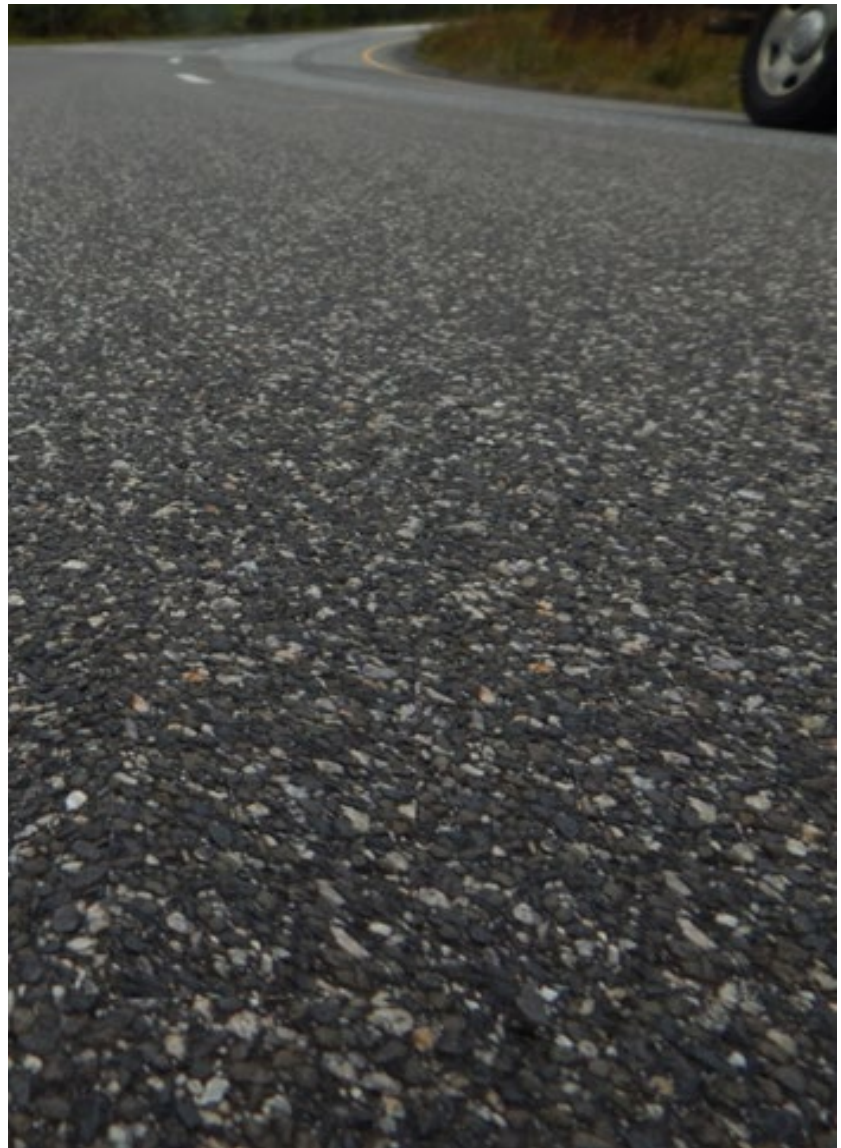
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Enhanced Friction Overlay

The enhanced friction overlay (EFO) is a 4.75 mm nominal maximum aggregate size gap-graded mixture that uses enough calcined bauxite (~40 percent) to enhance friction. Calcined bauxite is a hard, angular aggregate, which enhances friction when exposed on a pavement surface. Calcined bauxite is commonly used in high-friction surface treatments (HFST). The EFO uses a polymer-modified asphalt binder and has a gradation and appearance similar to a stone matrix asphalt mixture. As such, it typically has a higher asphalt binder content (~8 percent) than conventional mixtures.

The EFO mixture is most suitable in locations with higher crash rates due to inadequate pavement friction, such as horizontal curves, deceleration ramps, and intersection approaches. It can be placed on either milled or unmilled surfaces and has a total compacted thickness of $\frac{3}{4}$ inch. Preliminary studies indicate the EFO has comparable friction values to HFST with the expectation of better longevity and reduced cost.

As of late 2020, EFO has only been placed on the 2015 research cycle and is still in service in 2020. Through 12½ million equivalent single axle loadings, the frictional characteristics of the EFO are comparable to the values measured on the HFST at the same level of loading.



Enhanced friction overlay in horizontal curve on National Center for Asphalt Technology (NCAT) Pavement Test Track.
Source: NCAT

[Visit our website](#) for more information on Targeted Overlay Pavement Solutions.

Asphalt Materials

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