

Targeted Overlay Pavement Solutions (TOPS)

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

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U.S. Department
of Transportation
**Federal Highway
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Stone Matrix Asphalt

Stone matrix asphalt (SMA), also called stone mastic asphalt, is a tough and rut-resistant gap-graded asphalt mixture that relies on a stable stone-on-stone skeleton offering strength and a rich mixture of asphalt binder, along with stabilizing agents such as fibers and/or asphalt modifiers that provide durability. SMA was developed in Germany in the 1960s to provide a durable, rut-resistant wearing course resistant to damage from studded tires for heavily traveled roads. SMA was first introduced into the U.S. in the early 1990s and by 2018, SMA was used in at least 40 States. SMA is routinely used by 18 State departments of transportation (DOTs), while it is not a common practice in other States.

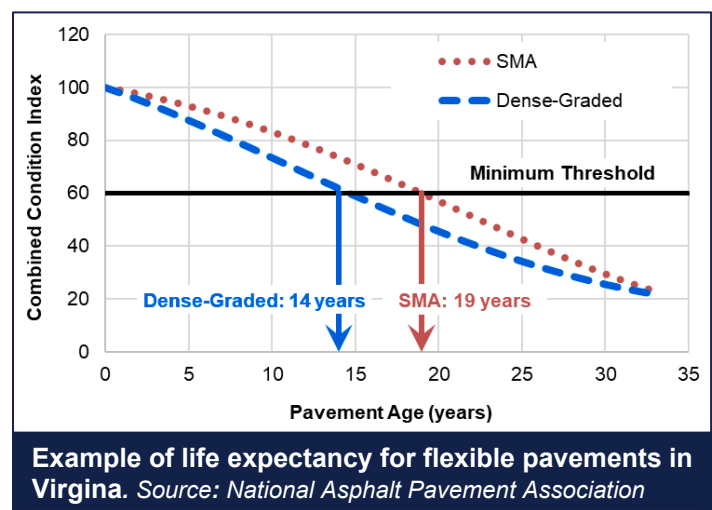
SMA mixtures are commonly placed on pavements with heavy traffic such as State and interstate routes, high-stress pavement areas (e.g., intersections, bus stops, and toll booths), thin overlays, airfields, and racetracks due to the expectation of increased service life. There is no consistent conclusion on comparing the cost effectiveness of SMA versus conventional dense-graded mixtures. SMA is generally more expensive than the conventional mixtures, mainly due to higher asphalt contents, specifications for more durable aggregates, and inclusion of fibers as stabilizers. SMA mixtures range between \$6 to \$31 more per ton than polymer-modified dense-graded mixtures. On the other hand, SMA generally had equivalent or better field performance (varied from 1 to 13 years) than conventional dense-graded mixtures.

Thus, selection criteria and policies to identify when SMA should be used are agency specific.

Examples of SMA policies:

- Alabama DOT: Projects with 20-year design traffic greater than 30 million equivalent single axle loads (ESALs); projects with rutting concerns (such as intersections).
- Illinois Tollway: All mainline pavements.
- Maryland DOT: Projects with 20-year design traffic greater than 30 million ESALs; projects with a functional class of principal arterial or greater.
- Virginia DOT: Projects with greater than 3 million ESALs; heavy to extremely heavy traffic volume where the higher cost can be justified with improved performance.
- Wisconsin DOT: Projects with 20-year design traffic greater than 5 million ESALs; projects where low maintenance is beneficial (such as high-traffic areas); projects where SMA is economically feasible.

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



Asphalt Materials

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