

Whitetopping

Concrete overlay offers cost-effective alternative to asphalt overlay



Concrete overlay on existing distressed and rutted asphalt pavement is often referred to as “whitetopping.” Taking into account life-cycle costs, whitetopping can be cost-effective in rehabilitating deteriorated asphalt pavements.

There are three types of whitetopping:

- **Ultrathin whitetopping (UTW).** Typically 2 to 4 inches (in) thick, with joint spacing ranging from 2 to 6 feet (ft), this type of whitetopping is used primarily for urban intersections, city streets, and overall low-volume roads. UTW relies on its bond to the existing asphalt pavement for performance.
- **Thin whitetopping (TWT).** This type is 4 to 8 inches in thick with joint spacing from 4 to 12 ft. Like UTW, TWT relies on the bond with the underlying asphalt pavement for good performance. TWT is the most prevalent type of whitetopping overlay highway agencies use.
- **Conventional whitetopping.** More than 8 in thick, this type of whitetopped pavement follows the behavior of a concrete pavement in terms of performance.

Whitetopping is gaining popularity at the national level, and many states are implementing or experimenting with this technology.

- Whitetopping was first applied in the United States in 1981 over an existing asphalt roadway on South 7th Street in Terre Haute, IN.
- Beginning in the early 1990s, demand for whitetopping technology soared. Many states started experimenting with concrete overlays, including California, Colorado, Florida, Illinois, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nevada, and Virginia.



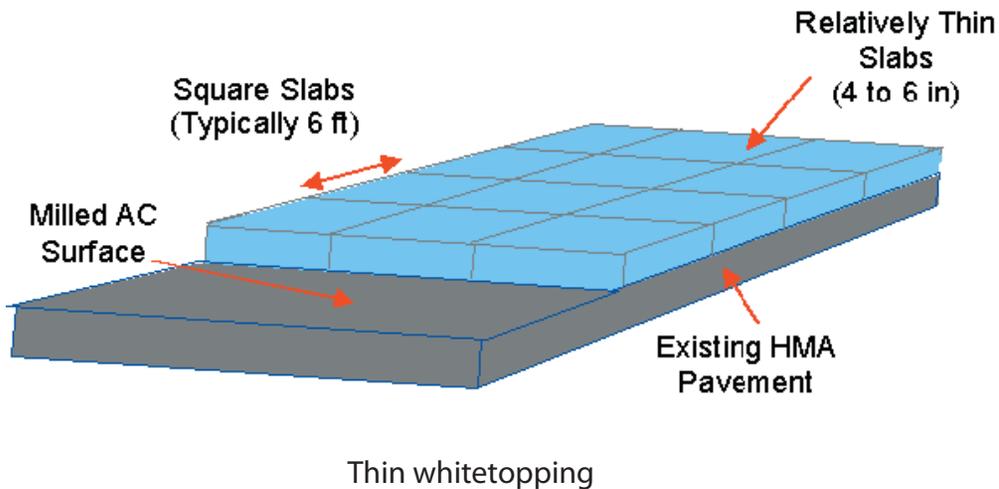
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- The first bonded UTW project was constructed on a landfill disposal facility near Louisville, KY in 1991. By 1997, 200 UTW projects had been built in North America.
- In 1990, the Colorado Department of Transportation began a series of successful whitetopping projects using TWT technology, with more than 705,000 square yards of concrete placed to date. In the 1990 project, test sections (3.5 in and 5 in with 6.5 by 6.5 ft and 12 by 13 ft joint spacing) were placed directly over existing asphalt pavement on SH 68. These test sections performed well over 15 years, and cost analysis showed a savings of 11 percent over asphalt replacement.

Over the past 15 years, many research studies have been conducted on TWT and UTW projects aimed at formulating guidelines for properly designing and constructing TWT and UTW overlays. Major findings from these studies include the following:

- UTW and TWT concrete overlays behave as partially bonded systems.
- A strong bond at the concrete-asphalt interface is essential for good performance of UTW and TWT. Milling and cleaning the asphalt surface enhances the bond and improves performance.
- Newly paved asphalt pavements (milled or nonmilled) are not recommended for whitetopping because bonding potential is dramatically reduced.
- Tie bars are recommended for longitudinal joints to prevent slab slippage.
- Load transfer devices have an insignificant effect on pavement performance in UTW and TWT pavements.



For more information

- Whitetopping—*State of Practice*, American Concrete Pavement Association, www.acpa.org
- *Guide to Concrete Overlay Solutions*, National Concrete Pavement Technology Center, 2007, http://concreteparking.org/PDFs/guide_concrete_overlays.pdf
- *Thin and Ultra-Thin Whitetopping*, National Cooperative Highway Research Program Synthesis 338, 2009, www.trb.org