

NJDOT Pavement Preservation Program

Historically, the emphasis of highway departments has been on building new roads, but the focus has shifted to maintaining and preserving our existing infrastructure via preservation treatments of roads and bridges. The New Jersey Department of Transportation (NJDOT) has implemented a pavement preservation programmatic approach, which is a proven and effective asset management policy. The pavement preservation program approach allows the department to allocate a portion of pavement funding to keeping good roads in good condition, via sealing with thinner less expensive treatments that allow for treating more lane miles of pavement at the same amount of funding. This is a strategy not only utilized by NJDOT, but supported by the National Center for Pavement Preservation (NCPPI), the Federal Highway Administration (FHWA), and is employed by many agencies across the U.S. System preservation is a requirement under federal MAP-21 and FAST legislation.

Pavement preservation is a critical component of many agencies' asset management plan to achieve and sustain a desired state of good repair and a safe roadway condition over the lifecycle of roadway assets. Pavement preservation reduces the amount of pavements requiring corrective or emergency maintenance, resurfacing, major rehabilitation, and reconstruction, but it does not completely eliminate the need for these other strategies. Typical pavement preservation treatments take less time to construct, reducing impacts to the motoring public. Incorporating and increasing the amount of pavement preservation is a more responsible, environmentally sustainable, and prudent way to maintain the NJDOT roadway network. The goal is a balanced cost effective approach of preservation, resurfacing, rehabilitation and reconstruction that best optimizes allocated funding to produce the best possible roadway network condition. Pavement preservation is an integral part of that approach. It is completing the right treatment on the right road at the right time for the right cost.

Instead of waiting until a pavement deteriorates to a poor condition requiring conventional resurfacing or rehabilitation treatments, preservation treatments are applied at a fraction of the cost to roadway sections in good or fair condition. While the majority of the pavement funding is still applied to conventional resurfacing, rehabilitation and reconstruction of deficient pavements, the preservation strategy applied to non-deficient pavements slows the rate of deterioration and allows NJDOT to reduce the backlog of deficient pavements with the funding available. NJDOT has increased the use of pavement preservation treatments to provide better stewardship of the NJDOT roadway funding, better performance of the roadway network and a better chance for a healthy NJ economy. Because our preservation program is relatively new compared to many U.S. agencies, and NJ experiences a unique combination of factors (including but not limited to some of the highest traffic, diverse climate, aged pavement infrastructure, as well as many other factors), we will continue to monitor and refine of our approach as we progress into the infrastructure asset management era.

NJDOT Pavement Preservation Treatments

Pavement preservation treatments extend the life of the roadway by sealing and waterproofing the pavement surface. Pavement preservation treatments can improve and better maintain the ride quality or smoothness of a roadway. They also do this while reducing lane closures and construction time, thereby saving substantial fuel costs. Another benefit is that these treatments do not require milling, which creates reclaimed asphalt pavement (RAP) that would need to be hauled off site and deposited in landfills or recycled back into other roadway projects. The NJ Asphalt Pavement Association has declared to NJDOT that the amount of RAP going back to asphalt producers is a “crisis” for the industry and that the industry will need to send more RAP to landfills in the future. Pavement preservation treatments are one of the tools utilized by NJDOT to reduce RAP and our negative impact to the environment while maximizing our return on funding invested in our roadway network.

Some of the treatments NJDOT is using are as follows:

Slurry Seal – A mixture of polymer modified asphalt emulsion, well-graded high quality aggregate, mineral filler, water, and other additives, properly proportioned, mixed, and spread on a paved surface. It is used to fill minor cracks and seal areas of aged pavements, to restore a uniform surface texture, to seal the surface to prevent moisture and air intrusion into the pavement, and to improve skid resistance. Slurry seal can be used as a final riding surface or as an intermediate layer prior to a final overlay treatment.

Microsurfacing – A mixture of polymer modified asphalt emulsion, well-graded high quality aggregate, mineral filler, water, and other additives, properly proportioned, mixed, and spread on a paved surface. Microsurfacing differs from slurry seal in that it can be used on higher volume roadways to correct wheel path rutting and provide a skid resistant pavement surface. Microsurfacing can be used as a final riding surface or as an intermediate layer prior to a final overlay treatment.

Chip Seal – A surface treatment in which the pavement is sprayed with liquid asphalt, then immediately covered with aggregate and rolled. Chip seals seal the surface of a pavement with little to no non-load associated cracks and to improve surface friction. Chip seals are also commonly used as a wearing course on lower volume roads, but can also be used as an intermediate layer prior to a final overlay treatment.

Cape Seal – A surface treatment that involves the application of slurry seal or microsurfacing over a newly constructed surface treatment, usually chip seal. Cape seals provide a dense, waterproof surface with improved skid resistance and ride quality.

Ultra-thin Friction Course (UTFC) – An ultra-thin application of a gap/open graded (9.5 mm nominal maximum aggregate size) polymer modified hot mixed asphalt (HMA) friction course placed over a heavy application of polymer-modified asphalt emulsion tack coat. UTFC, also known as ultra-thin bonded HMA overlay in other states, is placed using specially designed equipment called a spray paver that spreads tack coat immediately before the thin layer of hot mix asphalt in a single pass. UTFC provides a more durable overlay than most thin overlays due to superior bonding. UTFC is skid resistant, smooth surface that improves ride quality, improves wet weather safety and reduces tire-pavement noise.

High Performance Thin Overlay (HPTO) – A thin application of a fine graded (6.25 mm nominal maximum aggregate size) polymer modified HMA course typically placed at a thickness of approximately 1-inch, but can be paved in thicknesses ranging ½-inch to 1-1/2-inch. HPTO can be placed with conventional HMA paving equipment or with a spray paver. HPTO treatments provide a waterproof, skid resistant, smooth

surface that improves ride quality and reduces tire-pavement noise. HPTO is typically used as a surface course, but can also be used as an intermediate layer prior to a final overlay treatment.

Micro-Milling – The finest type of milling, or cold planing, that is used to remove a thin layer of the pavement surface primarily for improving ride quality and surface texture while removing minor surface distresses such as surface oxidation, cracking, faulting and minor rutting of less than 1-1/2” depth. Also known as profile milling, micro-milling uses a milling drum with more teeth in a tighter pattern than standard or fine milling designed to create a smoother surface than the traditional milling process. If the quality of the micro-milled surface meets the criteria in the specification, then it can be opened to traffic and in some cases with no further treatment. The micro-milling provides a better surface in preparation for thin overlays such as those mentioned above. Micro-milling is used for maintaining pavement elevations in locations such as drainage inlets, manholes, curbs, barrier curbs, guiderail, bridges and beginning/ending of the project where a thin pavement preservation treatment is applied.

For more information click [NJDOT Pavement Preservation Program Overview Video](#) to watch a video presentation.

For short training modules on the various pavement preservation treatments click [AASHTO SHRP2 Just-In-Time Pavement Preservation Training](#)

Also, follow these links for additional information about asset management, pavement preservation and preventive maintenance:

<https://www.fhwa.dot.gov/asset/>

<https://fp2.org/>

<https://www.pavementpreservation.org/>

<https://roadresource.org/>