



NJAPA

POSITION PAPER

THINLAYS: THE PAVEMENT PRESERVATION TOOL OF CHOICE

NJAPA Position on Thin Asphalt Overlays for Pavement Preservation

Every day in 2011, more than 48 million tons of goods, worth some \$46 billion, were transported across the United States and over 73 percent of those tons was carried over the nation's highways and roads.¹ According to the Federal Highway Administration (FHWA), 49.4 percent of vehicle miles traveled (VMT) on the Federal-Aid Highway System failed to meet the standard of "good ride quality" in terms of smoothness and 18 percent failed to reach the less stringent "acceptable" level.² FHWA notes that pavement condition has a "... direct impact on vehicle operating costs in the form of increased wear and tear on vehicles and repair costs. Poor pavement can also impact travel time costs ... and can have an impact on crash rates."³ Given the value of goods being transported over U.S. highways and roads, and the effect of road condition on costs, time, and safety for the public, it is critical that our nation's highways and roads be kept in proper condition.

Many agencies apply pavement preservation techniques to cost effectively maintain or improve roads in a good condition. Pavement preservation is defined in the Moving Ahead for Progress in the 21st Century (MAP-21) Act, which was signed into law in July 2012, as "programs and activities employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety, and meet road user expectations."⁴ The precept of pavement preservation is that it is more cost effective to maintain pavements in good condition rather than allow pavements to deteriorate to such a condition that costly and time-consuming rehabilitation or reconstruction is the only recourse.

Several pavement preservation techniques are available; of those Thinlays™ offer the highest value to public and private pavement owners alike. Thinlays are a suite of asphalt mixes that can be placed at a depth of 5/8 inch or more.

Thinlays share many of the benefits seen in overlays and inlays: extended pavement life, smooth ride, a modest improvement in pavement strength, enhanced safety, and responsible use of natural resources through reuse and recycling. A comparison of the versatility, benefits and costs of the palette of preservation treatments reveals Thinlays rank the highest.

THE NEED FOR MAINTAINING GOOD PAVEMENT CONDITION THROUGH PAVEMENT PRESERVATION

NJAPA supports a well-funded asset management program that includes pavement preservation as one of the tools available to ensure a desired state of good repair over the life cycle of a pavement at minimum practical cost.

The focus for America's highway and road network has shifted from construction in the 1950s through the 1980s to current maintenance and restoration efforts. America's road network is mature, with lane mileage due to new

construction increasing only 8 percent from 1980 to 2009. Given that the condition of highway infrastructure can have large effects on the economic outcomes of infrastructure investment,⁵ it is vital that U.S. highways and roads be kept in good condition. For this reason, as well as to preserve the estimated \$1.75 trillion invested in the national highway system, pavement preservation is a standard practice for many highway agencies.

MAP-21 recognizes that the nation's highway system is mature and that pavement performance must be monitored and maintained. Agencies will be required to report on road conditions to assure taxpayers that their money is being well spent. Pavement preservation is a cost-effective approach to maintaining and improving the condition of existing highways and roads and meeting performance goals.

THINLAYS IN PAVEMENT PRESERVATION

Asphalt overlays are well established as effective pavement maintenance and preservation strategies. The versatility of asphalt to be designed, manufactured and constructed in any pavement thickness makes it well suited for preservation projects where surface

conditions vary and only minimal thickness is needed. As states have shifted focus to on pavement preservation, Thinlays, a new generation of thin-lift asphalt overlays, have seen greater use. Thinlays successfully extend the life of structurally sound pavements. Thinlays can be as thin as 5/8 inch and of greater thickness as surface conditions necessitate; the result is optimization of material use, benefits received and pavement preservation dollars invested.

The engineering viability of using Thinlays has been demonstrated in research, field studies, demonstration projects, and long-term performance tests and analysis.^{6,7,8,9} Significant advances in materials, mixture design, and construction of surface layers during the past few decades have increased the range of thin asphalt overlays' applications, especially for preservation. Research has shown thin overlays perform better than other pavement preservation treatments under more pavement conditions and traffic levels.¹⁰ When used appropriately, thin asphalt overlays are safe, reduce costs, and are sustainable through the incorporation of recycled materials. Construction is fast, with less impact on drivers, and there are additional environmental benefits, such as noise reduction. In addition, thin asphalt overlays provide a

smooth driving surface, improving ride quality and reducing fuel consumption compared to rough pavements.

Pavement structure must be considered in pavement preservation. Though pavement preservation tends to focus on functional benefits received from preserving the pavement surface, the benefit received from protecting the pavement structures is real and deserves recognition. Thinlays can actually improve the structural capacity of pavements that are structurally sound, greatly extending the pavement's life. By minimizing strains at the bottom of an asphalt pavement, distresses can be limited to the surface where they are easily managed through Thinlays and other preservation treatments.

So long as bottom-up fatigue cracking is not present in the lower levels of a pavement, Thinlays can be strategically placed to construct a long-life Perpetual Pavement over time. Because Perpetual Pavements are designed to minimize fatigue in the lower levels of a pavement, periodic maintenance of the pavement surface is all that is required to keep them in good working condition.

NAPA's goal is to ensure that Thinlays are the pavement preservation tool of choice for federal, state, and local transportation agencies. This position statement is offered to advance the use of Thinlays in pavement preservation applications. It is intended to provide leadership and direction to NAPA members and customers for the use of thin asphalt overlays in the United States.

THINLAY
SAFE. SMOOTH. DURABLE.

NJAPA POSITIONS

1. Surface distresses and structural adequacy of the road must be evaluated prior to using pavement preservation treatments, including Thinlays.
2. Thinlays for pavement preservation offer economic, engineering, and sustainability benefits.
3. Thinlays should be considered as part of any pavement preservation program.
4. Consideration should be given to protecting the pavement structure and the benefits of creating a Perpetual Pavement, particularly for thinner lower volume pavements, through the strategic application of Thinlays over time (staged construction).
5. Selection of Thinlays should include a review of the economic and engineering suitability.
6. Restrictions that prohibit the use of Thinlays due to possible addition of structural capacity and without technical basis should be removed from specifications and guidance.
7. Milling prior to overlay should be allowed, and in some cases encouraged, to allow removal of surface distresses and provide optimum smoothness for long-term performance.
8. The use of warm-mix asphalt (WMA) should be allowed for the construction of Thinlays.
9. The use of reclaimed asphalt pavement (RAP) and/or reclaimed asphalt shingles (RAS) should be permitted for Thinlays.

IMPLEMENTATION

To accomplish the goals set forth in this position statement, NAPA and State Asphalt Pavement Associations (SAPA) will work with industry partners to promote the use of Thinlays as a pavement preservation strategy. This position will be implemented by:

People

- Establishment of a NAPA/SAPA Thinlay Task Group
- NAPA staff will provide national guidance on effectively using Thinlays for pavement preservation
- SAPA staff will market and promote the use of Thinlays for pavement preservation

Partnering

- Foundation for Pavement Preservation (FP2)
- National Center for Pavement Preservation
- State Asphalt Pavement Associations
- FHWA Pavement Preservation Expert Task Group (ETG)
- AASHTO
- The Asphalt Institute

Promotion and support

- Thinlays for pavement preservation are part of NAPA's strategic plan
- Provide technical resources and develop guidance, technical briefs, and case studies of Thinlays in pavement preservation
- Place educational magazine articles in trade press
- Promote concept of building a Perpetual Pavement 1 inch at a time through pavement preservation
- Promote Thinlays at select trade shows, including the Regional Pavement Preservation Partnership meetings.

REFERENCES

1. Keenan, C., M. Sprung, E. Strocko, R. Schmitt, C. Rick, and J. Sedor (2012). Freight Facts and Figures 2012. Report FHWA-HOP-13-001. Federal Highway Administration, Office of Freight Management and Operations, Washington, DC. http://ops.fhwa.dot.gov/freight/freight_analysis/nat_freight_stats/docs/12factsfigures/
2. DOT (2014). 2013 Status of the Nation's Highways, Bridges, and Transit: Conditions & Performance: Report to Congress. U.S. Department of Transportation, Washington, D.C., 2014.
3. *ibid.*, Exhibit 3-3.
4. Moving Ahead for Progress in the 21st Century Act. U.S. Statutes at Large 126 (2012): 405-988.
5. Shatz, H.J., K.E. Kitchens, S. Rosenbloom, and M. Wachs (2011). Highway Infrastructure and the Economy: Implications for Federal Policy. The RAND Corporation, Santa Monica, CA.

6. Chou, E.Y., D. Datta, and H. Pulugurta (2008). Effectiveness of Thin Hot Mix Asphalt Overlay on Pavement Ride and Condition Performance. Report FHWA/OH-2008/4. Ohio Department of Transportation, Columbus, OH.
7. Labi, S., G. Lamptey, S. Konduri, and K.C. Sinha (2005). Analysis of Long-Term Effectiveness of Thin Hot-Mix Asphaltic Concrete Overlay Treatments. In Transportation Research Record: Journal of the Transportation Research Board, No. 1940. Transportation Research Board of the National Academies, Washington, DC., pp. 3–12.
8. Corley-Lay, J. and J. Mastin (2007). Ultrathin Bonded Wearing Course as a Pavement Preservation Treatment for Jointed Concrete Pavements. In Transportation Research Record: Journal of the Transportation Research Board, No. 2005. Transportation Research Board of the National Academies, Washington, DC., pp. 11–17.
9. Bausano, J.P., K. Chatti, and R.C. Williams (2004). Determining Life Expectancy of Preventive Maintenance Fixes for Asphalt-Surfaced Pavements. In Transportation Research Record: Journal of the Transportation Research Board, No. 1866. Transportation Research Board of the National Academies, Washington, DC., pp. 1–8.
10. Wiser, L. (2011). TechBrief: Results of Long-Term Pavement Performance SPS-3 Analysis: Preventive Maintenance of Flexible Pavements. Report FHWA-HRT-11-049. Federal Highway Administration, McLean, VA. <http://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltp/11049/index.cfm>

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