

hot mix
asphalt is
the best buy
all of the time

Thin Hot Mix Asphalt Surfacing Wins Kudos As Preventive Maintenance

Agencies, Motorists Agree: For A Better Ride, Choose Hot Mix Asphalt

For preventive maintenance, local governments are finding that thin Hot Mix Asphalt surfacings return a pavement to good-as-new status, pleasing citizens and road users with a fresh, smooth, quiet driving surface at only a fraction of the cost of a new pavement.

And in placing thin Hot Mix Asphalt (HMA) surfaces, local governments are prolonging the life and increasing the strength of the pavement structure, while using funds that would have been spent on preventive maintenance treatments that offer less service to the public.



Recent federally sponsored research has shown that pavement condition is the No. 1 priority for the motoring public.

Local road agencies are challenged by the need to preserve their pavements through timely preventive maintenance while keeping their citizen customers satisfied.

Only thin HMA overlays can provide a smooth-as-new surface and increase pavement structure life. That's why Hot Mix Asphalt is your best buy all of the time for preventive maintenance.

Maintain pavements, please patrons

Today, preventive maintenance is getting attention as local road agencies preserve their existing systems. Road agencies are undertaking the right preventive maintenance treatments at the right moment to make their road funds and pavements go farther.

Research at both national and state department of transportation levels has determined that a minimum of dollars spent on pavement maintenance — at exactly the right time — will have a maximum impact on a pavement's service life.

Underscoring preventive maintenance is the inclusion of funding for pavement maintenance in federal surface transportation laws through the Transportation Equity Act for the 21st Century (TEA-21, 1998) and its predecessor, the

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA).

The 1996 National Quality Initiative's National Highway User Survey was the nation's first attempt at surveying road user attitudes using commercial consumer research techniques. This Coopers & Lybrand survey determined that pavement condition (31 percent) is the highest priority of the motoring public, even higher than safety (21 percent) and continuous traffic flow (19 percent).

"It is clear that the top priority for improving the nation's highways is to focus on the quality of the roadway surface," the NQI analysis stated. "This is the factor that will most significantly increase public satisfaction with the highway system."

HMA the preferred pavement

If the motoring public prefers quality road surfaces, the nation's road agencies already have shown their preference for Hot Mix Asphalt. Without question, HMA is the preferred paving medium for municipalities, counties, and state governments across the United States. Of the 2.27 million miles of paved roads and highways in the United States, 94 percent is surfaced with asphalt, including 65 percent of the Interstate system.

Ton for ton, HMA is by far the greater value when compared to competing pavement materials. It's placed quickly, cutting labor costs and minimizing driver and worker danger in construction work zones. HMA pavements can be opened to traffic soon after they're compacted, minimizing lane closures and rush-hour backups.

Today's HMA pavements are smoother than ever before, averting vehicle wear-and-tear and winning citizen approval. And HMA pavements are 100 percent recyclable, conserving resources, sustaining the environment, and gaining support for your operations.



Most pavements perform well and deteriorate very slowly through the first period of their lives, then decline precipitously as a variety of ills — weathering, excessive loading, drainage problems and the like — does them in.

A homeowner would not wait until his or her roof had rotted through before getting a new roof. The same goes for your roadway network. It's important to maintain pavements which might appear in otherwise good shape. Conversely, for neglected pavements, "worst first" maintenance expenditures almost always constitute throwing good money after bad.

The trick for road agencies is to determine at what point the road is on its life cycle "curve" and apply preventive maintenance just before the road hurtles down that curve.

And the best way to do that is with thin HMA overlays. Crack sealing and patching — however well-intentioned — simply keep a rough driving surface rough, to the irritation of drivers. But your motoring public instantly notices when a quiet, smooth, fresh HMA surfacing goes down and goes to work for them ... and for you.

Thin HMA overlays leverage funds

For many roads and streets, the best preventive maintenance strategy will be a thin HMA overlay. This thin (0.5 to 1.5 inch) surfacing combines the best attributes of Hot Mix Asphalt's strength, smoothness, and quiet with a low cost that can make your maintenance dollars literally go farther.

Because they add structural strength, thin HMA surfacings will extend pavement life beyond that provided by simple crack filling and pothole patching. They will improve ride quality and correct surface defects, pleasing your citizens and road patrons.

Safety is a paramount concern of road agencies and owners. Thin-lift HMA overlays will improve road safety by increasing skid resistance. New pavement markings will enhance safety. And by re-establishing road crown, drainage is improved, reducing spray and skidding.

Neighborhoods don't react well when their HMA street that has given such good service is chip-sealed, whereas with a thin HMA overlay the overall impression is of a brand-new road. Other benefits include HMA's "trademark" quiet pavement, the result of reduced noise at the improved tire/road interface, and the smoothness and sure-footed traction that road users look for.

Thin surfacings work for you

Engineers responsible for road maintenance can choose from a variety of functional HMA mixes suited for thin overlays.

One thin surfacing mix design that has been successful since the 1950s is the "Smooth Seal" dense-graded friction course developed by the City of Rockville, Maryland. The mix is a rich, fine, dense-graded HMA containing 65 percent "crusher dust" and 35 percent natural sand. A medium-grade (AC-10) asphalt binder is used to maintain the overlay's long-term durability and provide plasticity that will heal cracks.

"Sand asphalt" thin surfacings are characterized by natural sand as the principal aggregate. One North Carolina mix is natural sand with 7 percent asphalt binder. These have been used successfully on low-volume secondary roads. They've been placed as thin as one-quarter inch, and as thick as three inches.

Other mixes are required for heavier traffic loads and higher average speeds. These durable, rut-resistant mixes have good friction properties, and include Stone Matrix Asphalt (SMA), characterized by a stone "skeleton" of high-quality coarse aggregate, a high asphalt cement content, and mineral filler or fibers.

Open-Graded Friction Courses (OGFCs) also are appropriate for thin overlays in high-traffic conditions. These are characterized by an open-graded aggregate mix. OGFCs suppress road spray and attenuate tire/pavement noise, winning raves from road users and neighbors alike.

Close, but no cigar

There are other thin surfacing alternatives to Hot Mix Asphalt that mimic some of the attributes of HMA thin surfacings, but fall short of genuine HMA.

These include chip seals, which add no structural strength. Their binder run-off also can discolor concrete curbs and gutters.

Chip seals also incur citizen complaints due to broken windshields and "free undercoats" which speck automobiles with black chips. One state department of transportation measured the success of its rural chip seals by the lower number of cracked windshield reimbursements it had to make.

Premium slurry surfacings and microsurfacing are another option, but these high-cost alternatives also don't add structural strength.

Yet another highly touted option to thin HMA surfacings is "ultra-thin whitetopping," placement of a thin layer of Portland Cement Concrete over existing HMA pavements. While it's been promoted and studied for years, experience with thin (1-inch, 2-inch, or 3-inch) whitetopping has been mixed at best.

The public can't afford all the traffic delays associated with whitetopping. And, even the newest whitetopped pavements cannot provide the smoothness and quiet of an HMA pavement.



That's why there will never be a substitute for full-depth HMA, thick HMA overlays, or the new generation of thin HMA surfacings. HMA is less expensive in the short- and long-term than competing surfacings; it goes down faster; it is open to traffic sooner; and HMA is 100 percent recyclable. It has the smoothness and quiet that your citizens expect.

That's why now, as ever, Hot Mix Asphalt pavements are your best buy all of the time for preventive maintenance.

Want more information? It's available from your NAPA-member Hot Mix Asphalt producer or contractor, or from the National Asphalt Pavement Association. Ask for NAPA Publication IS-110, *Thin Hot Mix Asphalt Surfacing*; or QIP-122, *Designing and Constructing SMA Mixtures — State-of-the-Practice*.



Thin Surface Overlays Part Of Three-Layer Pavement

A new three-layer, full-depth Hot Mix Asphalt (HMA) pavement design first publicized in the United States in 1999 may provide pavement life-expectancies of 50 years or more, and dovetails well with thin HMA pavement maintenance strategies for optimum rideability.

Through the early 1990s, pavements in the United States generally were designed for a 20-year life span. But a new approach stresses a three-layer, full-depth HMA pavement, the lower layers of which are significantly stronger than the top.

"These pavements typically develop distress from the top down, rather than bottom-up like thinner pavements," says Jim Huddleston, P.E., executive director of the Asphalt Pavement Association of Oregon. "This top-down phenomenon is attributed to the very low stress at the bottom of the full-depth HMA. And more importantly, it allows the pavement manager to manage the system at the surface with thin treatments, avoiding thick overlays or total reconstruction."

The Modified Full-Depth Asphalt design provides two bottom layers designed specifically to carry anticipated loads and to resist fatigue, while the top layer provides a superior driving medium and resists rutting.

"Maintenance will occur at the surface layer only, including periodic milling and replacement as necessary to maintain optimum surface characteristics," Huddleston says. "This can be done rapidly during off-peak traffic hours with little or no impact to motorists. The two lower layers require no maintenance and can be designed to last 30, 40, or 50 years, or even longer. These are truly permanent pavements."



**NATIONAL ASPHALT
PAVEMENT ASSOCIATION**

5100 FORBES BOULEVARD
LANHAM, MD 20706-4413

TEL: 301.731.4748

TOLL FREE: 1.888.468.6499

FAX: 301.731.4621

E-MAIL: napa@hotmix.org

www.hotmix.org