

Choosing cold mix

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COLD MIX ASPHALT has a place in paving technology that goes back to the earliest days of the automobile. Local governments in Wisconsin sometimes choose cold mix to overlay pavements on roads with low traffic volume.

Produced at a central plant or on site, cold mix asphalt is a mixture of asphalt cutback or emulsion, and aggregate. The cold mix remains pliable as it cures, a process that makes it easy to place and compact.

Niche material

The advantages of cold mix are significant, says Hussain Bahia, a Civil and Environmental Engineering Professor at the University of Wisconsin who also directs the Modified Asphalt Research Center (MARC) on the Madison campus. "The cold mix process has minimal impact on the environment and is efficient to produce locally," Dr. Bahia observes. "Nonetheless, it remains a niche material in the United States, a fact that prompted me to explore the technology further." Among research projects he oversees is one documenting best practices in mix design for cold mix asphalt.

One factor in its favor is that the material costs less to produce than hot mix asphalt (HMA). Although the liquid asphalt in the mix is expensive, savings occur in production since cold mix is not heated.

Advantages

Cold mix is a good option for local roads, says John Delmore, Regional Manager with Scott Construction. The Lake Delton-based Wisconsin firm has extensive experience with cold mix asphalt having produced and placed cold mix for hundreds of municipalities in the state.

Cold mix asphalt is workable over a range of air temperatures, he notes, and there is minimal cracking once the mixture cures. Curing times vary depending on weather conditions.

Delmore observes that cold mix performance, like other asphalt technologies, depends on the condition of the existing road. "A good base helps any road surface hold up to traffic," Delmore says. "And many of the rural roads we pave with cold mix manage some pretty heavy loads."

Eric Otte of the consulting firm JE Arthur and Associates of Fond du Lac is working with Delmore to analyze several of Scott Construction's cold mix projects. From initial observations, Otte says the limited amount of pavement cracking was his main impression. Even pavements he studied that date back 25 years appear to be holding up well with minimal maintenance. He notes the flexibility that keeps a cold mix pavement from cracking could be a drawback where there is a combination of heavy loads on a newly paved road in hot weather.

Cold mix gains strength as it cures, a process where the moisture in the mix evaporates over time after paving. One aspect of Dr. Bahia's work is to identify mixes that set quicker, updating an old technology for an age of busier roadways road officials need to re-open with minimal delay.

Cold mix on local roads

Jack Dittmar became familiar with the technology as an engineer with Waupaca County for 10 years and continues to use cold mix on roads he manages today as Monroe County Highway Commissioner. More than half the 90 miles of highways in the county paved since Dittmar took over 12 years ago are cold mix roads. Monroe County uses hot mix on highways and at intersections with higher truck traffic.

Dittmar says a key advantage with cold mix is its flexibility. Seams knit together after laydown and cracks that form over time repair themselves. "My feeling is cold mix surface will last longer on low-volume town roads than hot mix because of this flexibility," he says. "We see that in pavements that are holding up well 10 years or more after initial laydown."

The main disadvantage for his operation is the weather sensitive nature of cold mix. Rain and high humidity can delay a paving project so scheduling during a dry stretch of weather is imperative. Maintenance involves a seal coat five to eight years after paving with cold mix to slow surface deterioration.

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Resource

<http://uwmarc.wisc.edu/>
Modified Asphalt Research Center website with information on projects, collaborations and links to publications.



SCOTT CONSTRUCTION

Cold mix paving on a town road in Sheboygan County.

On cost, Dittmar estimates saving \$800,000 during the last dozen years using cold mix asphalt on Monroe County highways. He requests bids at both hot and cold mix prices and, over the years, has seen the range of savings on cold mix go from \$5 per ton a decade ago to almost \$15 per ton savings today. County crews paving with cold-mix work from stockpiled materials or mix it a batch at a time with a portable plant.

Town roads too

The Town of Rockland in Manitowoc County and Brown County's Town of Glenmore also use cold mix asphalt on most road projects. Rockland County Town Chair Randy Brandes says cold mix paving accounts for 95 percent of his local roads. He says they do not see the longitudinal cracks at the centerline that can cause early deterioration. When cracks occur, the road surface "kneads" back together, regaining its strength. And it lasts, Brandes notes, citing a road resurfaced 19 years ago that remains in excellent shape with only one seal coat treatment in that time.

Don Kittell, Town Chair in Glenmore, says cost is the main issue for his community. They generally place cold mix asphalt or do chip seal over gravel on the 60 miles of roads and lanes under the town's jurisdiction. Farm equipment and heavy trucks put lots of weight on local roads, but Kittell says with a good base and timely maintenance, they perform well. He also notes the advantage with cold mix is its ability to mend itself, delaying the need for maintenance.

In the mix

Asphalt paving covers thousands of miles in Wisconsin, many of those miles the responsibility of local governments. Understanding more about advances in mix technology and materials production will help agencies evaluate all their options. Given cold mix asphalt's reputation as a flexible, portable, low-energy technology for paving low-volume roads, it belongs in the mix. ■

New online source for local roads issues

PUBLIC AGENCIES responsible for local roads have a new online source for timely information and commentary on the transportation issues that concern them. The **Local Roads Compendium** <http://localroads.wisc.edu/> is a clearinghouse of articles, reports, manuals, training materials and other resources covering a range of local roads topics.

The Wisconsin Transportation Information Center (TIC), the Wisconsin Transportation Center (Wistrans) and the Wisconsin Department of Transportation's Local Roads and Streets Council developed the site as a way to gather valuable information from a variety of sources in one place. The Compendium also invites users to submit content and give feedback.

Navigate topics and news

The Compendium consolidates available resource materials on 29 roads-related topics and content updates in an easy-to-navigate format. Searching for information on a specific topic, site visitors will find links to publications, design tools, policies and ordinances, experts and videos. The site allows visitors to rate and offer comments on the relevance and value of each selection.

A page on the site dedicated to questions and comments gives local road officials visiting the site a chance to exchange questions and concerns about local roads management in Wisconsin. The "news" page is an outlet for site administrators and users to report on transportation-related activities or issues going in the state. A training and events page lists activities in Wisconsin and the surrounding area.

The mix of Compendium content already includes articles from past issues of **Crossroads** cataloged under specific resource topics and links to *Wisconsin Transportation Bulletins*, both published by TIC. Other sources to date include technology transfer

centers across the country; state DOTs and local road officials in Wisconsin.

User participation important

To build the Compendium into a robust online resource for public officials who manage and maintain local roads, the developers hope the site facilitates discussions among those officials. Researchers doing work on roads issues are another audience the site targets.

Visitors to the site can view all topic resources without being a member, but signing up gives users full access to the Compendium and the chance to participate in forums and exchanges. Members can submit content recommendations, including news articles (subject to review by content manager), create forums and post comments, contact other users and publish a brief profile on the site.

Active participation of local road officials and researchers will create a community of professionals who have knowledge and experience to share—through online give-and-take about challenging issues, best practices and the development of training materials. ■

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Resources

<http://localroads.wisc.edu/>
Homepage for Local Roads Compendium with links to resources, a feedback forum, news pages, and activities.

<http://tic.egr.wisc.edu/>
Wisconsin Transportation Information Center website.

www.wistrans.org/
Wisconsin Transportation Center website.

www.dot.wisconsin.gov/localgov/
Programs for Local Governments page at Wisconsin Department of Transportation website.