

# Crossroads

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## Reclaiming — great tool for asphalt pavements

Traditionally, deteriorated asphalt pavements were fixed in two ways: overlays or complete reconstruction. Reconstruction is costly and results in a large amount of waste material that must be disposed of. Overlays tend to develop excess crown on the road and quickly crack in the same places as the underlying pavement (called reflective cracking).

A third choice that is gaining in popularity is reclaiming. A pulverizer or milling machine breaks up the existing asphalt surface, leaving the material to be reused as a base course for a new pavement mat.

"I knew the first time I saw it that this is what we were going to do in Outagamie County," says Highway Commissioner Mike Marsden. They bought a reclaimer three years ago for rejuvenating their own roads and also to contract for reclaiming work in nearby towns and counties. "When you get done it looks like a brand new road. There's no reflective cracking, it's reshaped, and you get a uniform mat. I expect these roads to last 14 to 16 years, the same as new bituminous pavement."

The first step, though, is knowing the existing road: how much and how good is the base, how thick is the mat, and what are the reasons for any localized problems like rutting or alligator cracks. Using records and taking core samples, the engineer or contractor can find out what's there and what is needed. It's also important to determine how much and what kind of traffic the road is carrying, or will carry in the near future.

"The method you choose should follow your goal," says Bill Kahl of WK Construction in Middleton. "You would not build a high volume county road the same as a low volume town road or a parking lot."

### Reclaiming techniques

Road builders, who are constantly improving their methods for producing better roads at the lowest cost, offer various approaches to reclaiming.

*Grinding* Reshaping the surface of a pavement to improve the ride or correct rutting. Can be used on both asphaltic and concrete pavement. The grindings can be recycled.



Reclaiming uses old asphalt pavement to strengthen the road.



### Pulverize and use as base

The least expensive and most popular approach, currently, is to use a machine like a

giant rototiller to break up the full depth of the asphaltic pavement, usually to about six inches. The pulverized material can be reshaped with a grader and compacted to become the base

*Continued on page 5*

## Inside

<i>Idea Exchange: Hydraulic pipe end shaper;</i>	
<b>One person crack filling; Beaver flood control</b> . . . . .	2
<b>Plastic culvert liners cheaper, easier</b> . . . . .	3
<b>Inspect culverts regularly</b> . . . . .	3
<b>Reclaiming methods show varied results</b> . . . . .	4
<b>Mill, sealcoat a temporary fix</b> . . . . .	5
<b>With crash data, simple changes can aid safety</b> . . . . .	6
<b>Efficient utilization pays off</b> . . . . .	7
<b>Training—It starts at the top</b> . . . . .	8

## results



*Injecting foamed asphalt during pulverizing shows promise (far left).*

*Skis help keep grader level (left).*

pavement bonded to the new asphalt, the remaining eight inches were fine and gravelly with very little bonding.

**Milling and cold in-place recycling** This widely-used conventional milling and cold in-place recycling method involves milling asphalt to a maximum of six inches. The reclaimed asphalt is crushed to one inch, screened, and passed to a paver which relays it. No emulsion or rejuvenator is added. Moving the material may produce excess in windrows and the system can be difficult to balance. The cost was \$234 per station. In the core, the top three reclaimed inches looked very similar to the hot mix top. Beneath is 6.5 inches of fine, gravelly, pulverized pavement.

A researcher from Marquette University is evaluating the pavement quality produced by these methods. The goal is to produce high-quality finished roads at the most economical cost. The foaming technique may save money because its strong base permits a thinner overlay mat, cutting per mile costs and stretching the new hot-mix over more miles. It can also be used to build up the base for heavier traffic loads.



*Cores show different results from the four reclaiming methods.*

## **Reclaiming—great tool for asphalt pavements**

*from page 1*

for a new asphalt surface. Some contractors pulverize some of the base beneath the pavement along with the asphalt to achieve a uniform depth. Gravel may also be added over the pulverized material to increase the depth of the base. This process also works on roads with curb and gutter. Excess material can be windrowed or hauled away for recycling.

**Mill and relay** The milling machine removes some of the existing asphaltic surface, but may leave a portion of the asphalt pavement, or the underlying concrete pavement, in place. Milling reduces reflective cracking problems and can also be used to cut down excessively thick pavements. Milled material can be reshaped with a grader, but in milling the asphalt material is often picked up off the surface so it can receive other treatments: salvaging for recycling or later use, crushing to size, injection or spraying with new asphalt emulsion, delivery to a paving machine to be relaid, etc. Milling and relaying generally requires a bigger equipment train but uses more of the strength of the existing pavement.

**Mill/pulverize, add asphalt emulsion, and relay** Asphaltic pavement is broken up, crushed to a uniform size (smaller than 1½ inches, for example), and then uniformly sprayed or injected inside the machine with a specified asphalt emulsion. The material is then relaid on the road and compacted, producing a relatively stronger base that can carry higher traffic loads. Like the other techniques, this still requires a new asphalt surface.

**Mill/pulverize, add foamed asphalt, and relay** An experimental new technique involves injecting water along with hot asphalt emulsion to better coat the reclaimed asphalt. This technique also gives a strong pavement base. (See accompanying story.)

“Reclaiming is a huge tool and there’s lots of flexibility involved,” says Bill Kahl of WK Construction. “As many ways as you can think of, it’s been done. You have to be flexible to adapt to the problems you find in the field.”

## **Mill, sealcoat a temporary fix**

The Town of Carlton, near Kewaunee, is milling and sealcoating about five miles of asphalt pavement each year. The process improves broken asphalt surfaces by converting them into smoother riding sealcoated gravel roads. In a couple years, when all the worst roads have been milled, the town will begin to put hotmix overlays on them.

Milling to a depth of about 10 inches and adding gravel over the top produces a base of about 12 inches, according to Town Supervisor Ken Papham. Without sealcoating the cost is about \$14,000 a mile.

“It gives the roads a chance to settle down. If there are soft spots they show up and we know where to dig,” says Papham.