Training: It starts at the top

Training can have many benefits: to bring a new employee up to speed, or upgrade skills among existing employees; to learn techniques for meeting new standards, and bring in fresh ideas. Many managers rely on training as an important tool in their effort to improve efficiency.

However, training alone will not solve all problems. Personnel performance and motivation problems, for example, need individual counseling and performance reviews. You can’t simply send a poor performer to training and expect something good to happen. Training won’t make up for outdated policies and procedures or for inadequate resources. Management must review the entire organization and identify what problems the agency faces and how to address them. Training is only one tool.

In other words, effective training starts at the top.

Training is an investment

Expect your investment in training to pay dividends. Training is an investment other words, effective training starts at the top. employees who participate, and a followup strategy. In other words, effective training starts at the top.

Be prepared for change

Nothing is more discouraging to an employee than seeing management ignore or not take seriously their suggestions for improvements. While some suggestions may not work for your agency, management needs to develop an attitude and an environment receptive to change. This encourages employees to benefit from training and motivates them to be on the lookout for ways to improve your operations. Implementing improvements can be a challenge. Sometimes it takes a few tries and some mistakes. Anticipate this and accept it as the price of getting better. If management is extremely negative when the first difficulty arises, it will discourage any future interest in improvement.

If you choose appropriate training and provide a workplace where employees can take part in implementing improvements, you’ll have motivated employees, and that’s the key to a successful operation. It starts at the top.

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 reclaming. 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 reclamer three years ago for rejuvenating their own roads and also to contract for reclaming 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 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 reclaming.

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.
Hydraulic pipe end resharper

Crushed culvert ends are a common rural road maintenance problem. The lack of proper flow means water backs up in ditches and saturates the road base. From Oklahome comes this idea for a hydraulically powered jack that quickly reopenculvert ends.

The device is a welded hydraulic cylinder with a scissors jack attached to the actuating rod. Collapsed, the jack fits inside the crushed pipe end. When the cylinder is retracted the jack expands, opening the pipe end in just seconds. Several resharpers are in use in Oklahoma and Arkansas. You can make one for about $300 in materials costs. Parts are “off the shelf” and assembly requires minimal machining and welding.

For help with beaver problems contact your nearby Wisconsin DNR office. A booklet, Beaver Damage Control, is available from WOPN, P.O. Box 7921, Madison, WI 53707. From the Fall 1996 newsletter of the Cornell Local Roads Program.

Efficient utilization pays off

Every county must balance equipment, employees and productivity. An aggressive program of improving equipment utilization has made St. Croix County’s balance very favorable. From 1987 to 1996 the amount of work produced went from $80,000 per employee over $140,000 with the same number of employees.

“We started looking at how to better use each piece of equipment so it’s not costing the taxpayers to have it here,” says County Highway Commissioner Dan Fedderly. Each machine has certain minimum fixed costs (insurance and depreciation) and operating costs (gas, maintenance, etc.). “In round numbers, it costs you $10,000 a year for a truck and you only use the truck 100 hours, at a rental rate of $50 per hour you’ve just lost $500,” Fedderly explains.

First they analyzed the total revenues generated from each major “client”—county, state, and township— in terms of who paid what portion of the operating minimum for each piece of equipment. This analysis identified the county’s workload and revenue sources. Next, they looked at the number of employees and the work each produced.

“Then we looked at how do we do better? We increased the amount of work we did by trying to put the right pieces of equipment in the right places,” Fedderly says. Twice a year county office manager Tim Ramburg reports to a committee on each piece of equipment. Some equipment needed for emergencies will never cover the minimums, but others, left behind by workload shifts, are disposed of.

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More revenue, lower costs

Determining need was the first step. “Do we really have to have four graders in different places at the same time, or could the work be done by one unit within the same time period?” Fedderly asks. “The urgency is with snow plowing, so we put wings on the truck plows. That buys additional time for the grader fleet to get around.” It was necessary to invest in better graders that could cover more ground faster.

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CD-I (Compact Disc Interactive) training: CD-I is an individualized training tool using television, CD-I disc, and a special player (all now available from the T.I.C. library). Users respond to questions or situations presented by the disc. To organize individual training for your employees, all you need is the player and disc, a TV, and a quiet place for the training.

NEW! NHI Course No. 15255, 1993, 492 pp. Protect street capacity and reduce traffic volume roads, which typically carry less than 500 vehicles per day. It includes discussions and references on planning, construction and commercial driveways, review development plans, and develop or administer street access policies and practices.

Low Local Volume Roads and Streets, US-DOT, Federal Highway Administration and American Society of Civil Engineers, November 1992, 138 pp. This reference manual contains a breadth of information related to the design, maintenance, and operation of low volume roads, which typically carry less than 500 vehicles per day. It includes discussions and references on planning, construction and commercial maintenance, traffic and safety design, pavement management and rehabilitation, drainage design, traffic control, and much more. It is written to be particularly useful to individuals with limited technical expertise and experience.

Inspect culverts regularly

It is easy to ignore culverts until the road surface sinks over them and there is an emergency. Rust and bacteria (in north central counties) take a toll on galvanized steel culverts, and road salt can seriously damage aluminum culverts under higher volume roads. Routine culvert inspection allows you to plan and budget for their replacement. WISDOT corrosion specialist Bob Patenaude developed the following rating scale. Concrete and aluminum culvert scales are available.

To get corrosion rating sheets for concrete, aluminum, and steel culverts, call, fax or write the T.I.C. see page 7.

Crossroads

Plastic culvert liners cheaper, easier

You can rehabilitate deteriorating metal culverts by installing plastic liners. When culverts are still round, but rust or bacterial action has weakened them, plastic slip-lining can be cheaper, faster, and easier than excavation and replace-ment, according to a WISDOT report, Culvert Pipe Rehabilitation Using Slip-Liners. Slip-lining has been around for many years. In a 1994 project, WISDOT rehabilitated a number of culverts, including corroded aluminum culverts, under high volume roads. Three types of HDPE and PVC pipes were installed in Junction and Marathon Counties. When the culverts were inspected three years later, all but one of the liner types were performing adequately and showed no deterioration.

Slip-lining was 52% less expensive than conventional metal culvert replacement which involves excavating, replacement, backfilling and paving. During road reconstruction slip-lining is about 4% less. This does not calculate any costs for detouring traffic or for traffic delays or potential crashes associated with traditional excavation and replacement.

Hydraulically, reducing culvert diameter with a liner can be offset by the plastic’s higher flow rate. It is smoother, so a smaller culvert can often carry as much water as the larger corroded metal culvert it is replacing. Inlet control can be a problem and should be evaluated.

While the plastic liners are relatively simple to insert using common highway department equipment, grouting between the liner and the old culvert generally has been done with a concrete pump. It can be expensive because there are not many alternatives available.

For a copy of the report, Culvert Pipe Rehabilitation Using Slip-Liners, #WI-01-97, contact the WISDOT, Pavements Section, 1502 Kinman Blvd., Madison, WI 53704.
Reclaiming methods show varied results

Last fall Dodge County tested ways of reclaiming asphalt pavement in demonstration sections on CTH V. They used four different reclaiming techniques for preparing the base, following all with a 2 1/2 inch hot mix mat. All sections looked good this spring, reports Bob Sindelar, Dodge Co. highway engineer. However, cores taken in July showed that an innovative asphalt foaming technique and a conventional milling and cold in-place recycling method both produced a strong base while pulverizing followed by a split lift compaction with no added asphalt produced a weaker one. The methods and their results are:

Foamed asphalt injection

This method improves on a European technique and involves pulverizing existing asphalt pavement to full depth, reshaping and repulverizing the top four inches. It is simultaneously injected with hot liquid asphalt cement (AC 120-150) that has been expanded 8-10 times by spraying 1% to 1 1/2% water into it producing a foam. The coated aggregate is relaid and compacted by a grader fitted with a ski and automatic slope control. The aggregate remains workable for up to eight hours and when cured it appears much like standard asphalt.

This section produced strengths of 4000-4500 pounds at 72° F in modified Marshall stability tests made shortly after completion. Core results show the four inches of foamed, pulverized pavement appear dense and well bonded. It cost about $250 to pulverize, foam and shape 100 feet of two-lane pavement (one station), plus about $200 for the AC.

Emulsion asphalt injection

Existing asphalt is pulverized in place to full depth of the existing pavement. After reshaping, on a second pass, the material is injected to a four-inch depth with asphaltic emulsion (HFE-300) at 160° F, then shaped and compacted. The material sets up quickly, giving it shorter workability time. Modified Marshall density tests at 72° F showed this section at about 1800-2000 pounds. The five-inch emulsion-injected section of the core appears less dense with poorer bonding than the foamed asphalt core. Pulverizing, grading and injecting emulsion cost $315 per station and the emulsion an additional $190.

Split lift compaction

This method pulverized the asphalt to full depth, 10-12 inches, then followed a new WiDOT requirement to compact the material in two lifts or layers with water added to each. The top level is graded to the side while the lower half is compacted. The loose material is then spread back on the road and compacted. The cost was $315 per station. The top 1.7 inches of the core showed pulverized 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. Mowing the material may produce excess in windows 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 6.3 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.

Core samples show different results from the four reclaiming methods.

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.

Milling 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 relayed, 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 1/2 inch, for example), and then uniformly sprayed or injected inside the machine with a specified asphalt emulsion. The material is often relayed on the road and compacted, producing a relatively stronger base that can carry heavier 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.
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Injecting foamed asphalt during pulverizing shows promise (far left). Skis help keep grader level (left).

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Snow Plow Roadeo

There's still time to enroll your best plowing crew in the Snow Plow Roadeo, sponsored annually by the Wisconsin Chapter of the American Public Works Association. It’s a great way to get your drivers ready for winter. Call Bill Kappel at 414/286-2369 or Mark Hochschild at 414/761-5376. Wednesday, Oct 11, at the Waushara County fairgrounds.

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**NEW! Tricommerce**

Seven modules designed for the truck driver. Each includes a CD-I disc and self-teaching guidebook which present materials, equipment, and methods. Users can test themselves with the question-and-answer format. Each module takes one to two hours depending on the subject and the user’s experience and knowledge. Based on US-DOT guidelines, the training meets or exceeds DOT requirements in every area.

**Pre-Trip Inspections #18043**

Drug Alcohol Awareness #18047

Speed Management #18044

Hazardous Materials #18048

Backing and Turning #18045

Hours of Service #18049

Space Management #18046

Access, Location, & Design, Participant Notebook, NHI Course No. 52555, 1993, 493 pp. Protect street capacity and reduce traffic conflicts by applying the principals, standards, and methods in this well-organized resource and design guide. Useful for state, county and city engineers, planners and contractors also design teams and commercial driveways, review development plans, and develop or administer street access policies and practices.

**Local Low Volume Roads and Streets, US-DOT, Federal Highway Administration and American Society of Civil Engineers, November 1992, 138 pp.** This reference manual contains a breadth of information related to the design, maintenance, and operation of low volume roads, which typically carry less than 500 vehicles per day. It includes discussions and references on planning, construction and maintenance, traffic and safety design, pavement management and rehabilitation, design and resurfacing of streets and roads and so as to be particularly useful to individuals with limited technical expertise and experience.

**Inspect culverts regularly**

It is easy to ignore culverts until the road surface sinks over them and there is an emergency. Rust and bacteria (in north central counties) take a toll on galvanized steel culverts, and road salt can seriously damage aluminum culverts under higher volume roads. Routine culvert inspection allows you to plan and budget for their replacement. WisDOT corrosion specialist Bob Patenaude developed the following rating scale. Concrete and aluminum culvert scales are available. To get corrosion rating sheets for concrete, aluminum, and steel culverts, call or fax to the T.I.C. see page 7.

**Corrosion ratings for zinc galvanized steel pipe**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Condition of pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No corrosion, Galvanizing or cladding intact.</td>
</tr>
<tr>
<td>1</td>
<td>Staining or superficial oxidation. No pitting.</td>
</tr>
<tr>
<td>3</td>
<td>Fairly heavy rusting. Some scale. Nodules. Some pitting.</td>
</tr>
<tr>
<td>4</td>
<td>Heavy rusting. Rust scale easily removed. Deep pitting but metal is sound.</td>
</tr>
<tr>
<td>5</td>
<td>Heavy scale. Deep pitting.</td>
</tr>
<tr>
<td>6</td>
<td>Small perforations in pipe.</td>
</tr>
<tr>
<td>7</td>
<td>Large perforations in pipe.</td>
</tr>
<tr>
<td>8</td>
<td>Invet gone from pipe.</td>
</tr>
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**Plastic culvert linings cheaper, easier**

You can rehabilitate deteriorating metal culverts by installing plastic linings. When culverts are still round, but rust or bacterial action has weakened them, plastic slip-lining can be cheaper, faster, and easier than excavation and replacement, according to a WisDOT report, Culvert Pipe Rehabilitation Using Slip-Liners. Slip-lining has been around for many years. In a 1994 project, WisDOT rehabilitated a number of culverts, including corroded aluminum culverts, under high volume roads. Three types of HDPE and PVC pipes were installed in Junction and Manistee Counties. When the culverts were inspected three years later, all but one of the liner types were performing adequately and showed no deterioration.

Slip-lining was 52% less expensive than conventional metal culvert replacement which involves excavating, replacement, backfilling and paving. During road reconstruction slip-lining is about 4% less. This does not calculate any costs for detouring traffic or for traffic delays or potential crashes associated with traditional excavation and replacement.

Hydraulically, reducing culvert diameter with a liner can be offset by the plastic’s higher flow rate. It is smoother, so a smaller culvert can often carry as much water as the larger corroded metal culvert it is replacing. Inlet control can be a problem and should be evaluated.

While the plastic linings are relatively simple to insert using common highway department equipment, grouting between the liner and the old culvert generally has been done with a concrete pump. It can be expensive because there are not many alternatives available.

For a copy of the report, Culvert Pipe Rehabilitation Using Slip-Liners, #8I-01-97, contact the WisDOT, Pavements Section, 3500 Kimball Blvd., Madison, WI 53704.
Hydraulic pipe end reshaper

Crushed culvert ends are a common rural road maintenance problem. The lack of proper flow means water backs up in ditches and saturates the road base. From Oklahome comes this idea for a hydraulic powered jack that quickly reopens culvert ends.

The device is a welded hydraulic cylinder with a scissors jack attached to the actuating rod. Collapsed, the jack fits inside the crushed pipe end. When the cylinder is retracted the jack expands, opening the pipe end in just seconds.

Several reshapers are in use in Oklahoma and Arkansas. You can make one for about $300 in materials costs. Parts are “off the shelf” and assembly requires minimal machining and welding.

For help with beaver problems contact your nearby Wisconsin DNR office. A booklet, Beaver Damage Control, is available from WOPR, P.O. Box 7921, Madison, Wisconsin 53707. From the Fall 1996 newsletter of the Cornell Local Roads Program.

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Efficient utilization pays off

Every county has enough equipment to cover the demand. But with a budget, the question becomes: how do we get the most out of the equipment we have? Economic analysis is a useful tool to determine utilization. It helps determine what equipment you have, the efficiency of using it, and how to be more effective.

Determining need was the first step. “Do we really have to have four graders in different places at the same time, or could the work be done by one unit within the same time period?” Fedderly asks. “The urgency is with snow plowing, so we put wings on the truck plows. That buys additional time for the grader fleet to get around.” It was necessary to invest in better graders that could cover more ground faster.

More revenue, lower costs

Increasing revenue also helps. As Fedderly notes: “You can only increase equipment utilization if you have the work.” The county promoted services to townships: simple maintenance and plowing to complete design, engineering and reconstruction of roads. Revenues from townships doubled from $1.5 million in 1987 to over $3.5 million in 1996.

Containing costs is a must. Some equipment just doesn’t perform. For example, a group of tri-axle trucks was continuously in the red because of breakdowns, bad set-up, and changes in usage. Even though some of them may have been newer than other trucks in the fleet, the county began disposing of them. “We couldn’t afford to keep them,” Fedderly says. Similarly, once they set their effective fleet size (35 maintenance and 18 tri-axles), they began to turn over about five trucks a year. This ensures that, ideally, no truck in the fleet is older than 10 years old. Operating and repair costs are then held down and are on the road generating revenue.

“You have to manage each part of the equation: workload, employees, effectiveness,” says Fedderly. “Put them all together and that gives you the best utilization and productivity. Management is the key, and that comes down to individuals. Patrol Superintendent James Harer manages the day-to-day operation ensuring effective utilization, and Maintenance Superintendent Steve Schofield manages equipment purchase and monitors daily utilization. Everyone employee, working together with the Transportation Committee, ensures our operation’s success.”

Crossroads

This newsletter provides information on roads and bridges to local officials and is published quarterly by the Wisconsin Transportation Information Center. Crossroads is produced with assistance from the Federal Highway Administration, the Wisconsin Department of Transportation, and the University of Wisconsin-Extension.

Crossroads is available free to erotische articles appearing here. Please contact us for a list of updates or corrections. Wisconsin Transportation Information Center, U.S. Department of Wisconsin Department of Engineering Professional Development, 432 N. Lake St., Madison, Wisconsin 53706

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Training: It starts at the top

Training can have many benefits: to bring a new employee up to speed, or upgrade skills among existing employees; to learn techniques for meeting new standards, and bring in fresh ideas. Any managers rely on training as an important tool in their effort to improve efficiency. However, training alone will not solve all problems. Personnel performance and motivation problems, for example, need individual counseling and performance reviews. You can’t simply send a poor performer to training and expect good things to happen. Training won’t make up for out-dated policies and procedures or for inadequate resources. Management must review the entire organization and identify what problems the agency faces and how to address them. Training is only one tool.

When training is chosen, management must have a clearly defined reason for it, clear expectations of the employees who participate, and a follow-up strategy. In other words, effective training starts at the top.

Training is an investment

Expect your investment in training to pay dividends. Training is an investment other words, effective training starts at the top.

Carefully select employees to receive training. Make sure they understand why they are going and their responsibility. Be positive. Let employees know that being sent to a workshop shows management’s confidence in their abilities and value. Sometimes they are made to feel it is punishment for not knowing the job. At T.I.C. workshops occasionally people come with no idea why they were sent or what the course is about. They usually have a negative outlook that is not conducive to learning or making improvements.

Managers should debrief the persons who were trained when they return and involve them in any changes that the training produces. This means management has to be prepared to make improvements suggested by employees as a result of the training.

Be prepared for change

Nothing is more discouraging to an employee than seeing management ignore or not take seriously their suggestions for improvements. While some suggestions may not work for your agency, management needs to develop an attitude and an environment receptive to change. This encourages employees to benefit from training and motivates them to be on the lookout for ways to improve your operations. Implementing improvements can be a challenge. Sometimes it takes a few tries and some mistakes. Anticipate this and accept it as the price of getting better. If management is extremely negative when the first difficulty arises, it will discourage any future interest in improvement. If you choose appropriate training and provide a workplace where employees can take part in implementing improvements, you’ll have motivated employees, and that’s the key to a successful operation. It starts at the top.

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 reclamining.

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.

“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.

You would not build a high volume county road the same as a low volume town road or a parking lot. Build a high volume county road.

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 cracking. 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.

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You would not build a high volume county road the same as a low volume town road or a parking lot.

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 reclamining.

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.