

# The Center Line

North Dakota Local Technical Assistance Program • North Dakota State University • A Service for Local Transportation Agencies

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Summer 2007

## FIVE-STATE LOCAL ROAD CONFERENCE

By Vernon Monger

The 23rd Annual Local Road Conference was held at Rapid City, October 16th - 18th. The five states involved are South Dakota, Nebraska, Colorado, Wyoming and North Dakota. A large delegation of county road department staff from throughout the state attended the conference.

An excellent agenda was presented with discussion on Federal Highway Administration programs, National Association of County Engineers activities, road safety audits, workforce training, dust control, seal coats, recycled asphalt pavement, communicating at the local level, sign management and economic impacts on highways.

One of the highlights of the conference was the “You Show Us” contest. County road departments were encouraged to submit safety and operational efficiency improvements that they had made. North Dakota had five county applicants and their submissions will be printed in our newsletters. We asked a committee to select North Dakota’s submission to the regional meeting, which was Towner County’s large tire trailer transport. The project competed against submissions from the other four states. The regional committee selected North Dakota’s submission as the most useful and beneficial item for the five-state region. Congratulations to Larry Halvorson and the Towner County road crew for the honor. An article on their invention can be found on page 6 of this newsletter.

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*Watch for the other four county submissions to the “You Show Us” contest in the next centerline newsletter.*



L. to R. Dave Levi, Larry Halvorson, Gary Berreth



## BACKS GET SOME SLACK FROM MINI PAVER

Pieced together by a city employee in his home garage, a prototype paver could do away with the back-breaking practice of repairing street cracks by hand.

City of Cottage Grove project backers estimate that the mini paver, when mounted on a skid-steer loader, can lay twice the pavement as the old method in a day. More importantly, they say, such an innovation will reduce the strain on workers, cutting labor and workers' compensation costs while making repairs that hold streets together longer.

Cracks in asphalt roads first appear along the curb line (when water seeps between the curb and asphalt) and centerline seams. Hand patching prevents further degradation of the road surface, but is time-consuming and labor-intensive. The patches make roads bumpy and visually unappealing, don't usually last through the freeze/thaw cycle, and don't uniformly seal the joints.



City worker Jay Johnson designed and built a \$2,000 prototype at his home

on his own time, for which he was recognized by the city council. The mini paver is essentially a small-scale version of a regular paver. It has two screed plates that can be adjusted manually during paving operations: a flat plate and one with a 3/8-inch crown for paving centerlines. With a 1,100-pound capacity, the paver can lay a 2-foot-wide swath for 105 feet on one load. Depending on the application, the paver can be mounted on the center or right side of a skid steer, keeping the operator out of traffic during curb-side operations.

In the summer of 2006, Cottage Grove used the mini paver to lay four miles of skin patching along the curb line. Since then, they've been measuring how well the pavement has held up to traffic and weather and will determine whether residents notice a difference in the driving surface.

Cottage Grove will also test overlay application along curbs, centerline paving, and gravel shoulders. Durability and cost evaluations of the new device will conclude this summer, but the city expects to see fewer injuries, cost savings, neater patches, and longer-lasting roads.

—*Jim Hammerand, LTAP intern (MN Technology Exchange)*

## CRUNCHING THE NUMBERS OF RECYCLED ASPHALT

As CEO of ASTEC Industries, Inc. (the largest manufacturer of asphalt plants in the United States) and the holder of approximately 90 patents, Don Brock is an expert on asphalt recycling. At the 2007 Minnesota Pavement Conference, he shared some knowledge on the subject.

### **The times they were a-changing**

Until the 1970s, Brock noted, the price of asphalt had remained about the same for about half a century. Then several factors dramatically changed the picture. First, when OPEC manipulated oil prices in the 1970s, the cost of asphalt increased by an order of magnitude: by 1979, it was about \$200 per ton. This price spike coupled with the advent of milling brought the cost of recycling below that of virgin materials.

(Cont. on page 3)



### Why not separate recycled material?

But Brock pointed out a discrepancy in the way materials are handled today. A common practice, is to separate virgin material by size but to throw all RAP (reclaimed asphalt pavement) together in one bin. As shown in Table 1, this leads to mix design problems because different sizes of RAP retain different amounts of asphalt.

“So as the rock is segregated,” Brock said, “it’s also segregating the liquid asphalt content.” This tends to limit the use of RAP in pavements to about 20 percent.” But excellent products can be made if recycled material is separated just like virgin material.

### RAP is worth it

Brock’s next point was that paving materials obtained from RAP are a bargain compared to the virgin materials they replace. For example, in 30,000 tons of recycled pavement, there are typically about 28,200 tons of aggregate and about 70 6,000-gallon transport loads of liquid—worth roughly \$1 million. The cost to reuse that RAP is only the cost of the trucking and processing, because the same material is taken out of the road and then put back into the road. He assumed this trucking/processing cost to be \$6.40 per ton. He then compared that with typical prices of virgin material: rock at \$9.40 per ton + asphalt at \$18.00 per ton = \$27.40 per ton. Thus, the savings from using recycled material would be \$21 per ton.

### Overlay vs. inlay

Brock then compared overlays with mill-and-inlay operations: Putting an overlay on a rutted road is very likely to yield a rutted road again, but milling a pavement gets rid of the rutting. Also, the rough milled surface will interlock well enough with the inlay that a tack coat is probably unnecessary. Furthermore, Brock said, “One of the best benefits is we eliminate joint density problems. When you put down a 2-inch overlay, you put down 2½ inches, and as you try to compact it, you can’t contain it on the edges, so it spreads out. As it spreads out, you create low-density areas.” But with mill and inlay, the unmilled shoulder creates a dam on each side, so the material has no place to spread out.

Furthermore, with an inlay there is no need to raise either guardrails or shoulders—and no need to decrease the posted clearance under bridges or the weight limits on bridges. Finally, Brock said, if the tack coat isn’t necessary and a transfer machine is used, a paver can follow 200 feet behind the milling machine, and by double hauling (mix out, milled material back), save tremendously on hauling costs.

Brock did say recyclers need to work out some problems. For example, they need to allow more mixing time to allow water to evaporate, the superheated virgin material to cool, the RAP to heat up and melt the old liquid from recycled material, then mix new liquid. By allowing that evaporation time, they will produce a product that mixes the RAP and virgin material more homogeneously. Nonetheless, Brock ended by stating confidently that, as the cost of virgin materials continues to increase—and as we become more committed to decreasing our dependency on foreign oil—he expects all agencies to turn more and more to recycling.

**Table 1: Liquid Asphalt Content in Recycled Pavement**

Aggregate Size in Rap	Typical Asphalt Content
3/16 x 0	7%
3/8 x 1/4	4%
1/2 x 3/8	3%

- Richard Kronick, LTAP freelancer



## WORK ZONE SAFETY AND MOBILITY RULE

By Dave Levi

In September 2004, the Federal Highway Administration (FHWA) published updates to the work zone regulations at 23 CFR 630 Subpart J. The updated rule is referred to as the Work Zone Safety and Mobility Rule and applies to all state and local governments that receive Federal-aid highway funding. Transportation agencies are required to comply with the provisions of the rule by October 12, 2007. The changes made to the regulations broaden the former rule to better address work zone issues of today and the future.

The rule requires each agency to develop a work zone safety and mobility plan. The North Dakota Department of Transportation (NDDOT) developed the processes and procedures to support the implementation of the rule. The regulations require training for personnel involved in the development, design, implementation, operation, inspection, and enforcement of work zone related transportation management and traffic control.

The following training courses have been scheduled on the Transportation Learning Network (TLN) to address the training requirements required by the Work Zone Safety and Mobility Plan. To get registration information for these required courses and other scheduled training go to the TLN website at: <http://www.translearning.org/>

### Construction Inspectors

The ATSSA Traffic Control Technician (TCT) Course has been scheduled for **January 29, 2008**. This class will meet the Work Zone Safety and Mobility Plan's training requirements for construction inspectors. There will be a cost of \$25 per public employee or \$50 for non-public employees. The course normally costs \$180 for members and \$205 for non-members

Maintenance Supervisors (course would also be beneficial to construction field personnel).

A Roadway Work Zone Construction Safety Course (aka The OSHA 10-hour Program) has been scheduled for **March 10 & 11, 2008**.

The course will focus on safety issues for the worker in highway construction or maintenance work zones. This class meets the Work Zone Safety and Mobility Plan's training requirements for maintenance section supervisors. It will also benefit construction field personnel. We intend to offer this class free of charge. If a large amount of training materials are needed there may be a slight fee. The cost of this training is normally around \$195 per participant.

### Design & Planning Personnel

The Advanced Work Zone Management and Design course is tentatively scheduled for **April 1, 8 & 15, 2008**. This is normally a three day NHI course, but will be given over a span of three weeks on the TLN system. We intend to offer this class free to public employees. If a large amount of training materials are needed there may be a slight fee. There may be an additional charge to non-public employees taking the training. The course cost is normally \$300 per participant. This class will meet the Work Zone Safety and Mobility Plan's requirements for design and planning personnel.

### Project Engineers and Managers

AGC of America's Traffic Control Supervisor course has been scheduled for **April 23 & 24, 2008**. This class will meet the Work Zone Safety and Mobility Plan's requirements for project engineers and managers. There will be a charge of about \$35 per participant for public and non-public employees. The training materials provided will consist of Part 1, 5 & 6 of the MUTCD.



## FALL WORKSHOPS

by Vernon Monger

ND LTAP recently completed our fall workshops for winter maintenance and bridge maintenance. There was good attendance at the sessions and the operators had a strong interest in new maintenance practices. In light of the bridge collapse at Minneapolis, there was considerable interest in our bridge inspections and the corrective maintenance that can be performed.



## UPCOMING EVENTS

### ND LTAP Events

#### Aggregate Testing Workshops

December 11 - Valley City

December 12 - Devils Lake

#### Gravel Roads Maintenance

February 5 - Bismarck

February 6 - Oakes

#### Erosion & Sediment Control

February (date to be established)

#### Work Zone for Utilities

February (date to be established)

#### Asphalt Conference

March 25-26 - Bismarck

#### *TLN Sessions:*

#### ITS Telecommunications

Dec.4 & 11

#### Managing a Diverse Workforce

Dec.5

#### White Topping Pavements

Dec.6

#### Unbonded Overlays

Dec.20

<http://www.translearning.org>

Please check the ND LTAP website for any workshop updates

<http://www.ndltap.org>

### Looking for your ideas and news articles

Contact Dave Levi at

(701) 328-9857 or

[dave.levi@ndsu.edu](mailto:dave.levi@ndsu.edu)

to share your ideas and

articles for upcoming

editions of The Center Line.



## LARGE TIRE TRAILER TRANSPORT

COUNTY: Towner  
CONTACT PERSON: Larry Halvorson, Road Foreman  
ADDRESS: RR 1, 850 9th St.  
Cando, ND 58324-6458  
TELEPHONE: (701)968-4366



### PROBLEM STATEMENT:

With motor graders and front-end loaders located throughout the county, it is necessary to haul tires in for repair. Manually handling these tires is very difficult and, if they are not handled properly, the process can be unsafe for workers.

### SOLUTION:

Larry and his staff built a small trailer as shown in the photo to transport the large tires to and from the work site as necessary. The trailer has a 2-inch axle with 16-inch wheels. The trailer carriage is five 5-feet long, 2-inches wide and 39-inches high, using 1½-inch square steel tubing. The trailer bed is pinned at the front to the trailer hitch for easy tilting. The tail-gate is hinged and can then be dropped to the ground level, making it very easy to roll the tire into the cage. The top of the tailgate has a chain attached to partially raise the tailgate when the tire is in place. When the front of the trailer is tilted down, the tire rolls ahead and the tailgate can be closed. There is a winch located on the trailer hitch to assist in pulling the trailer carriage into place so the pin can be reinserted. The procedure is reversed for unloading the tire.

With this design a tire on the roadway can be transported within the posted speed limit to the repair shop. This has worked out very well and three trailers will be built to serve the road maintenance shops in the county..

### COST:

New material was purchased at a cost of approximately \$600. All labor was done in the shop by the operators, working during slack periods in the winter when there was no snow removal required. The 16-inch wheels were purchased to take advantage of the availability of used tires.

### SAFETY:

Handling large tires is very difficult. It required two individuals to load them into a truck (pickup), and with the heavy lifting required, a possibility existed for injury. With the trailer, very little lifting is required, and therefore a less possibility for injury. One individual can handle the removal, loading, unloading, and replacement of a tire.



## KENNY NELSON – MERCER COUNTY RETIREE

By Vernon Monger

Kenny Nelson, Mercer County Road Superintendent, retired May 2007 after serving in the position for the past 20 years.

Kenny was born in the Maddock area and grew up in the Maddock and Washburn areas. He attended Lake Region Junior College at Devils Lake and following that he began his career with road construction and maintenance. Kenny was employed with the McLean County road department for 20 years, serving the later years as road superintendent. He worked for a contractor in road construction for two years prior to going to Mercer County as road superintendent in 1987.

Mercer County is very active in energy development, coal processing for the gasification and the electrical power plants. Therefore, there have been many changes to the local road system in the area. Also, with tourism and recreation along Lake Sakakawea and development of ND 1806 (scenic route) there has been considerable effort required of the county road department to upgrade the facilities in the area.

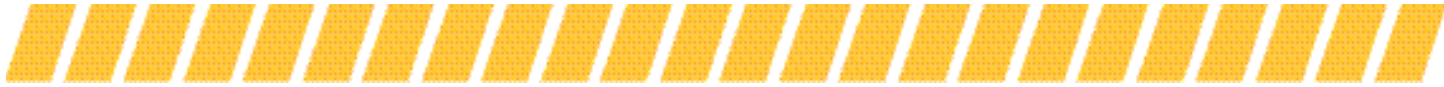
Other major accomplishments during Kenny's career were to bring the roads up to acceptable standards with the many miles of gravel roadways becoming hard surfaced. Also, the bridge replacement program involved replacing many of the county's deficient bridges, often replacing with culverts.

Kenny is a member of the National Association of County Engineers (NACE). Kenny is also a very involved member of the North Dakota Association of County Engineers (NDACE); he has served on the executive board for a number of years.

Kenny has been active and supportive of the ND LTAP program. He received his Road Scholar I certification in 2006. He has also supported the ND LTAP training program by having his employees participate in the training courses.

Kenny and his wife, Earline, have three children. They reside in Beulah. During his retirement he plans to do a little fishing and hunting and also do some traveling.





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