

# The Center Line

North Dakota Local Technical Assistance Program • Upper Great Plains Transportation Institute • North Dakota State University

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## TRAINING – A LOOK TO THE FUTURE

by Gary Berreth, ND LTAP Director

Over the years, classroom training with 30-40 people in a room has proven to be effective. Participants have the benefit of communicating with the instructor face-to-face and having hands-on visual aids to assist them in learning. Classroom sizes are small enough so most individuals are not intimidated and are willing to ask questions. The one problem with this type of training is it is not cost effective. Not only is there a fee for the instructor and the classroom, but there is a larger indirect cost in travel reimbursement, the time it takes to travel to the training session and the per diem reimbursement. These costs often exceed the actual cost of the registration fee.

The LTAP program has begun coordinating training efforts with the Transportation Learning Network (TLN). This program, like LTAP, is also a part of the Upper Great Plains Transportation Institute/ NDSU. TLN uses an interactive video network to host training sessions. Watching a presentation using the video network is similar to being in the room with the presenter. Individuals are in a classroom, generally with coworkers, and have the ability to talk directly to the instructor as the course is being conducted. The difference with TLN is the instructor is not present in the classroom with the participants. The instructor is viewed on a video screen and has the ability to interact with the classroom participants.

Individuals sometimes viewed that this type of training not as good as past instructor-led classroom training; others may be more comfortable and enjoy it more because they are in a classroom with coworkers.

The biggest advantage of TLN courses is the majority of courses are offered much closer to the individual's home office, thus overnight stays are seldom necessary. With the reality of shrinking budgets and the ever increasing cost of training, distance learning is often the only training most agencies can afford to offer.

If you have not had the opportunity to take a course over the TLN network, I would encourage you to do so. To view a list of the upcoming courses and to register for a course, visit our website at [www.ndltap.org](http://www.ndltap.org) or call Denise Brown at 701-328-9855 or 1-800-726-4143.

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### Looking for your ideas and news articles

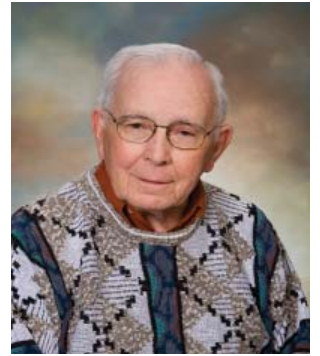
Contact Dave Levi at (701) 328-9857 or [dave.levi@ndsu.edu](mailto:dave.levi@ndsu.edu) to share your ideas and articles for upcoming editions of The Center Line.

## COMPUTER CORNER

by Russ McDaniel, ND LTAP

In recent years the terms “Asset Management” and “Sign Retroreflectivity” crop up often in discussions among highway and city street managers. And most would agree that the time to begin dealing with these issues is fast approaching.

The NDLTAP has developed and provided computer programs over a period of years that will help. Recently, we arranged to make them available via our web site at [www.ndltap.org](http://www.ndltap.org). The programs include:



1. Microcomputer Data Management System (MDMS) – This program, designed for county road or city street departments, tracks labor, equipment and material costs for each road or street, project and district. It also tracks equipment repair and fuel costs for each piece of equipment.
2. Minor Structure, Culvert & Cattle Guard Management System – Users are encouraged to think of the program as three separate and independent programs packaged as a single application. One module can be used to inventory and manage small bridge-type structures and box culverts, another for culverts/pipe, and a third for cattle guards. The program can also be used to manage all three structure types as it provides for the inventory of a wide variety of structure types and geometric data.
3. Roadway Sign Inventory & Management System – This program is designed to meet the needs of county road and city street departments. It provides a procedure for collecting and recording initial sign inventories and serves as a vehicle for maintaining the inventory and managing the system. The program was updated in February, 2008, with special attention to the need for more detailed sign retroreflectivity assessments. The program provides for observed and electron sign reflectivity assessments.
4. Rural Roadway Inventory & Management System – This program, sometimes referred to as a Pavement Management Program, includes three modules – one for asphalt pavement, another for concrete pavement, and a third for gravel roadways. In addition to roadway geometric data and pavement distress assessments, version 3.0 includes an added feature that calculates estimated per mile values based on criteria provided by users.

We are excited about another procedure not included with these four programs. We now can link the Roadway Sign Inventory & Management System, Rural Roadway Inventory & Management System, and the Minor Structure, Culvert & Cattle Guard Management System program to North Dakota county GPS maps.

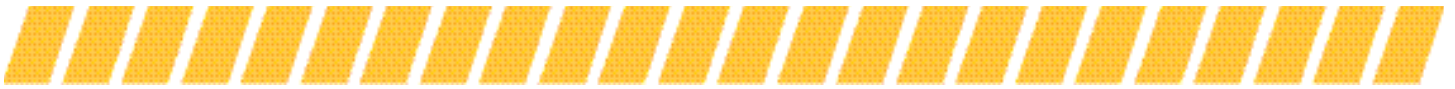
Details of the procedure are beyond the scope of this article. However, it is important to understand that we can provide the needed map for each North Dakota county and that it uses a “Linear Referencing System” to identify roadway item locations. With a Linear Referencing System, it is not necessary to record GPS coordinates for each inventoried item. Give me a call if you would like a demonstration.

The procedure is available only for North Dakota counties.

The only negative with the programs is that they will not run on machines using the Windows Vista operating system. We are currently searching for a solution to this issue.

In the fall 2007 issue of the Center Line, Dave Levi, the NDLTAP Program Manager, had an article titled, “Sign Retroreflectivity Final Rule Published.” I encourage you to read it. It includes a brief description of new standards that are scheduled to be included in the Manual of Uniform Traffic Control Devices (MUTCD) as revision No. 2 of the 2003 Edition.

(Computer Corner continued on page 3)



(Computer Corner continued)

Dave also indicated we are in the process of updating the signing program to accommodate the changes needed to satisfy the provisions of the final rule. We can report when program changes are completed.

All four programs along with accompanying operations manuals were written by Russ McDaniel. Russ is a member of the NDLTAP staff and questions regarding program operations as well as program downloading procedures should be directed to him. To contact Russ call, email or visit him at:

**Phone (701) 328-9855**  
**E-mail russell.mcdaniel@ndsu.edu**  
**Visit at 515 ½ E Broadway, Suite 101, Bismarck, ND 58501**

To download any of all of the programs, follow these steps:

1. Go to our web site at [www.ndltap.org](http://www.ndltap.org).
2. Under the Resource Library icon, select “Software Downloads”
3. The four programs along with a brief description of each are displayed. The first is the Microcomputer

Data Management System (MDMS). I will use it to illustrate the procedure but it is the same for all of the programs.

Select the “Download the Zip file” option. The File Download screen appears with two option buttons . . . “Open” and “Save”. If you select the open option, the program files and the operations manual file are displayed. There are 22 program files in addition to the operations manual file.

The operations manual file is named “mdms7.1Update.doc”. It is a word 2003 document. You can open this file and print it or save it to your computer from this screen. Right click file name and select the open option from the dropdown display.

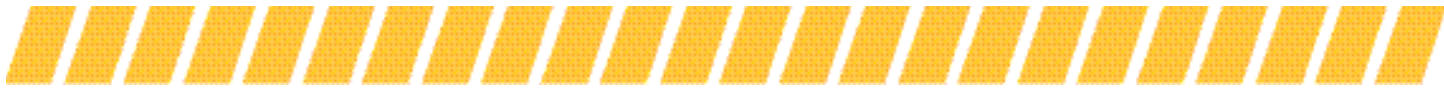
It is recommended you open, save the file to your computer and print it as the first step. It includes detailed step-by-step installation procedures in addition to program operations procedures.

Similarly, you can install the MDMS program directly from this screen display. If you wish to do this, right click the “SETUP.EXE” file and select the open option from the dropdown display. The MDMS installation procedure opens and walks you through the process.

If you select the save option, the “Save As” screen appears. You can choose to save the program to disk or to a folder on your computer. It is recommended that you save it to a disk.

To do this, insert a disk in your drive. Click the arrow on the right side of the “Save in” window and select your drive. Leave the defaults in the “File Name” cell and the “Save as type” cell. Click the “Save” button and the files are copied to the disk.

Use this disk when you are ready to install the program.



## PROTECTING WORKERS FROM EFFECTS OF HEAT

During emergency response activities or recovery operations, workers may be required to work in hot environments, and sometimes for extended periods. When the body is unable to cool itself by sweating, several heat-induced illnesses can occur, and can result in death. The following information will help workers understand what heat stress is, how it may affect their health and safety, and how it can be prevented.

### Factors Leading to Heat Stress

- High temperature and humidity; direct sun or heat; limited air movement; physical exertion; poor physical condition; some medicines; inadequate tolerance for hot workplaces; and insufficient water intake can all lead to heat stress.

### What kind of heat disorders and health effects are possible and how should they be treated?

- *Heat Stroke* is the most serious heat related disorder and occurs when the body's temperature regulation fails and body temperature rises to critical levels. It is a medical emergency that may result in death. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature. If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. Until professional medical treatment is available, the worker should be placed in a shady, cool area and the outer clothing should be removed. Douse the worker with cool water and circulate air to improve evaporative cooling. Provide the worker fluids (preferably water) as soon as possible.

- *Heat Exhaustion* is only partly due to exhaustion; it is a result of the combination of excessive heat and dehydration. Signs and symptoms are headache, nausea, dizziness, weakness, thirst, and giddiness. Fainting or heat collapse is often associated with heat exhaustion. Workers suffering from heat exhaustion should be removed from the hot environment and given fluid replacement. They should also be encouraged to get adequate rest, and when possible, ice packs should be applied.

- *Heat Cramps* are usually caused by performing hard physical labor in a hot environment.

Heat cramps have been attributed to an electrolyte imbalance caused by sweating and are normally caused by the lack of water replenishment. It is imperative that workers in hot environments drink water every 15 to 20 minutes and also drink carbohydrate-electrolyte replacement liquids (e.g., sports drinks) to help minimize physiological disturbances during recovery.

- *Heat Rashes* are the most common problem in hot work environments where the skin is persistently wetted by un-evaporated sweat. Heat rash looks like a red cluster of pimples or small blisters. It is more likely to occur on the neck and upper chest, in the groin, under the breasts, and in elbow creases. The best treatment for heat rash is to provide a cooler, less humid environment. Keep the affected area dry. Dusting powder may be used to increase comfort, but avoid using ointments or creams—they keep the skin warm and moist and may make the condition worse.

### Administrative or work practice controls to offset heat effects

- Acclimatize workers by exposing them to work in a hot environment for progressively longer periods.
- Replace fluids by providing cool water or any cool liquid (except alcoholic and caffeinated beverages) to workers and encourage them to drink small amounts frequently, e.g., one cup every 20 minutes. Ample supplies of liquids should be placed close to the work area.
- Reduce the physical demands by reducing physical exertion such as excessive lifting, climbing, or digging with heavy objects. Use relief workers or assign extra workers, and minimize overexertion.
- Provide recovery areas such as air-conditioned enclosures and rooms and provide intermittent rest periods with water breaks.
- Reschedule hot jobs for the cooler part of the day, and routine maintenance and repair work in hot areas should be scheduled for the cooler seasons of the year.
- Monitor workers who are at risk of heat stress, such as those wearing semi-permeable or impermeable clothing when the temperature exceeds 70°F, while working at high energy levels. Personal monitoring can be done by checking the heart rate, recovery heart rate, and oral temperature.



(Protecting Workers continued)

### What Personal Protective Equipment is effective in minimizing heat stress?

- **Reflective clothing**, worn as loosely as possible, can minimize heat stress hazards.
- **Wetted clothing**, such as terry cloth coveralls or two-piece, whole-body cotton suits are another simple and inexpensive personal cooling technique. It is effective when reflective or other impermeable protective clothing is worn.
- **Water-cooled garments** range from a hood, which

cools only the head, to vests and “long johns,” which offer partial or complete body cooling. Use of this equipment requires a battery- driven circulating pump, liquid-ice coolant, and a container.

Additional Information

- **For more information on this, and other health related issues affecting workers, visit OSHA’s Web site at [www.osha.gov](http://www.osha.gov)**

*Information Provided by OSHA*

## BARNES COUNTY OPTS FOR COLD IN-PLACE RECYCLING PAVEMENT REHABILITATION METHOD

*By Ross Eberle, KL&J and Kerry Johnson, Barnes County Road Superintendent*

Barnes County Highway 21 is located between North Dakota Highway 46 (3 miles south of Kathryn) and I-94 at Valley City. Barnes County 21 is a major collector route paralleling the beautiful Sheyenne River Valley. In 2002 this 20-mile segment of Barnes County 21 was designated as a National Scenic Byway and is a part of the 62-mile Sheyenne River Nation Scenic Byway that spans Barnes and Ransom Counties.

The existing pavement section consisted of 4.5-6.5 inches of asphalt pavement and 6-8 inches of aggregate base material. For many years the standard repair or rehabilitation treatment was to place a HBP overlay on the surface which corrected many of the surface irregularities and provide additional strength. However, the existing roadway was severely cracked with deep depressed transverse cracks, which negatively impacts ride quality and has the potential for premature pavement failure. A goal of the project was to improve ride quality and minimize reflective cracking. Our concern with reflective cracking led us to explore other rehabilitation strategies.

In searching for alternative solutions, cold in-place recycling (CIR) quickly came to the fore. The northern-most one-mile segment of Barnes County 21 near Valley City has significant traffic with 1860 ADT. Our desire was to maintain a 24-foot top traveling surface and the structural capacity of the roadway. Preliminary research indicated that the CIR process could achieve these goals.

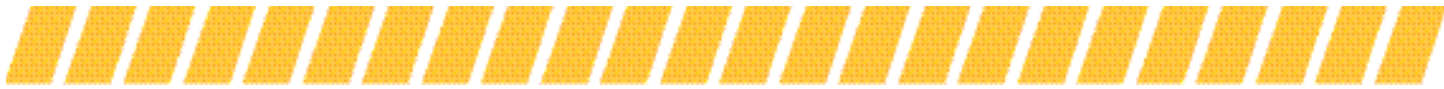
The CIR process was an entirely new pavement rehabilitation strategy consideration for KL&J and Barnes County. In 2005 the North Dakota Association of County Engineers (NDACE)



hosted the National Association of County Engineers (NACE) Conference in Bismarck, ND. The conference provided an excellent opportunity for to meet other regional county engineers and highway superintendents that had experience with the CIR process. Follow up contacts were made with many of the conference attendees and they provided us with additional design and construction information.

We attended a one-day ARRA Recycling & Reclaiming Seminar in February 2007 at Brooklyn Center, MN. At this conference we met Dave Rettner with American Engineering Testing (AET) who was recommended by several contacts for preparing CIR mix designs. We were also put in contact with Dan Wegman, engineer with SemMaterials L.P., who supplies engineered asphalt emulsion additives for the CIR process. In addition to developing a relationship with these two key project team members, Tom Johnson, owner of MidState Reclamation & Trucking (MR&T) and president of the Asphalt Recycling and Reclaiming Association (ARRA) presented us with a proposal.

(Barnes County continued on page 6)



(Barnes County continued)

Tom was confident that our project was an ideal candidate for CIR and he made the following proposal. MR&T would mobilize to the project site and run for the first day (2-3 lane miles) and if we were not happy with the product produced they would pull up their equipment, clean up the site and leave without any payment due.

KL&J in partnership with AET and SemMaterials prepared the project plans and specifications for the project. The project was bid on May 19th and MidState Reclamation and Trucking was awarded the project construction. MR&T mobilized onto the project site June 2, 2007.



After two days of rain everyone was anxious and exited when the first 4-inch deep by 12.5 foot wide cut was made by a Terex PR-1050 Roto-Mill Paving Profiler. A

conveyor transferred the milled material to a crushing system being pulled behind that included a 1.25-inch maximum aggregate size screen opening. Any material that did not pass through the screen was rerouted back through the crusher and broken down until it passed through. After the material passed through the screen it was weighed on a belt scale and then the specified engineered emulsified asphalt binder material (Reflex) was added and mixed to produce the final product which was placed on the roadway in a windrow.

The material was then picked up from the windrow and transferred into a Cedarapids 561 asphalt pavement laydown machine. The material was placed and compacted back in the original 12.5-ft. wide cut made by the profiler. A Hamm HD130 double steel drum vibratory roller was used as the breakdown roller making three passes. The intermediate and finish roller was a 25-ton Hamm GRW18 pneumatic rubber tired roller. A nuclear gauge was used to check the optimum rolling pattern each day and to check the density every half mile.

The project team also checked and recorded the following measurements every half mile: milling depth, gradation, moisture content, emulsion content, pavement surface smoothness, and cross-slope.

Traffic was allowed on the roadway about three hours after finish rolling.

MR&T was able to process and complete approximately three lane miles per day. After the second day of running and consistently passing test results, the county was pleased with the product and added 2.5 miles to the original 7-mile project. MR&T finished the projects CIR process on June 14 and moved onto their next project allowing the CIR mat to cure before the Barnes County Highway Department would apply a chip seal to the surface.

On June 16-17 segments of the roadway received seven inches of rain and water overtopped the roadway in one area. We were concerned that this amount of rain would negatively impact the CIR mat integrity and the curing process. Our concern was that the moisture would percolate through the CIR mat and saturate the roadbed sublayers. During the first 17 days of June the project site received 11.5 inches of rain. In spite of all the rain, the roadway held up and carried traffic. After 35-45 days of curing time, in which the CIR mat moisture content had leveled off to 2.5%, the Barnes County Highway Department applied a chip seal on the south 8.5 miles. Border States Paving was hired to place a 2-inch HBP wearing course on the north mile due to higher traffic volumes on this segment.

County officials and the public are very pleased with the roadway and the County is very optimistic that the CIR project will perform well. We are continually monitoring the roadway performance. The county plans to apply a second chip seal in 2009 in conjunction with plans to complete a second CIR project on the south 10.5 miles of Barnes County 21.

*Editors note: A recent field inspection of the project with the road superintendent revealed the project is holding up very well, heavy truck hauling on the north half of the project has caused rutting, particularly in the north-bound lanes, of 1/4 to 1/2 inch. The cost of the project, including the chip seal applied by the county, was approximately \$80,000 per mile.*

## NEW FHWA ADMINISTRATOR NAMED LTAP ADVISORY BOARD MEMBER

by Vernon Monger ND LTAP

Wendall Meyer, recently appointed to the North Dakota Division Administrator for the Federal Highway Administration (FHWA), was also named to the LTAP Advisory Board. He replaces Allen Radliff.

Meyer came to North Dakota from Kansas, where he was the assistant division administrator. Meyer is a civil engineer, having received his B.S. from the University of Nebraska in 1989. He began his career with FHWA in 1989 and has served in various technical positions in nine states. His technical background is in the areas of environment, design, construction, safety, traffic operations and ITS.



Meyer and his wife, Ann, along with their two children, reside in Bismarck. His personal interests include travel, outdoor activities and, of course, watching college football, particularly the Cornhuskers.

### COMING EVENTS

#### ND LTAP Events

Defensive Driving Course - TLN  
September 23, 2008  
1:00 PM – 5:00 PM

Work zone Safety for Law Enforcement (ATSSA) - TLN  
September 24, 2008  
9:00 AM – 1:00 PM

Traffic Control for Utilities (ATSSA) - TLN  
October 7, 2008  
Ramkota Inn, Bismarck  
8:00 AM – 5:00 PM

Incident Traffic Control for Responders (ATSSA) – TLN  
October 16, 2008  
9:00 AM – 1:00 PM

**Reminder: "You Show Us How" contest submission deadline is August 15, 2008.**

### Videos & Publications

Go to the ND LTAP website: [www.ndltap.org](http://www.ndltap.org)

**Publications** can be ordered online by visiting the Online Dakota Information Network (ODIN) search engine (Opens a new window)

**Videos** can be ordered using one of the following methods:

Order Videos Online

Mail or fax your order using the video request form (PDF, 23K)

E-mail your order directly to [denise.brown.1@ndsu.edu](mailto:denise.brown.1@ndsu.edu)



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