

The Center Line

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

Vol. 24, No. 3

Spring 2008

NDSU - UGPTI SIGN ADDED TO BISMARCK OFFICE

by Jerome Horner - UGPTI

A new sign marks the downtown location of the NDSU's Upper Great Plains Transportation Institute in Bismarck. The exterior sign was added to the office location at 515 ½ Broadway on May 12. The downtown office opened during January of 2007. The office provides administrative support for several UGPTI programs including the North Dakota Local Technical Assistance Program (NDLTAP), the North Dakota Small Urban & Rural Transit Center (NDSURTC), and the North Dakota Department of Transportation Support Center. The sign will enhance the UGPTI's visibility in the community and will assist clients and collaborators in finding the office.

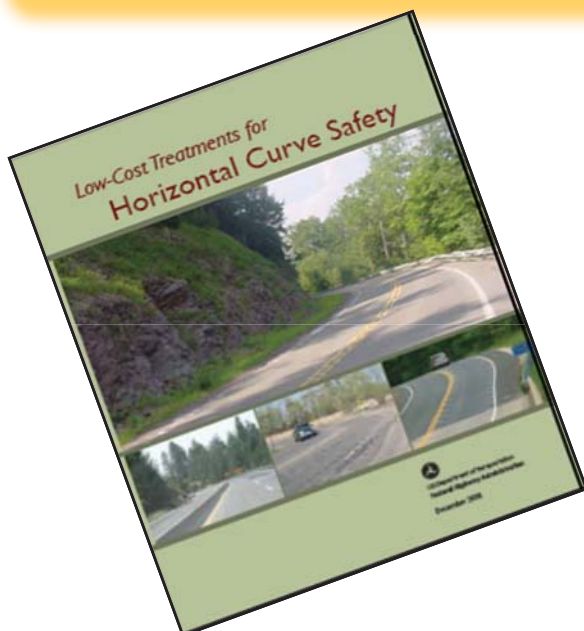


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Looking for your ideas and news articles

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

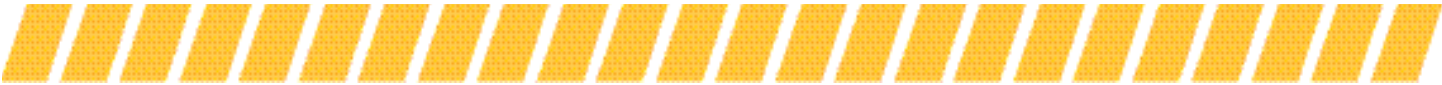


Our office has copies of the following publications:

**FHWA-SA-07-020
(New MUTCD Sign
Retroreflectivity Requirements)**

**FHWA-SA-07-002
(Low-Cost Treatment for
Horizontal Curve Safety)**

Please call if you would like one sent to you, or visit this website:
www.fhwa.dot.gov



Pick Cutting Edges

Project Title Pick Cutting Edges
Project Number 2006-05
Project Leader Gene Busacker
Agency Scott County Public Works
 600 County Trail E.
 Jordan, MN 55352
Phone (952) 496-8031



Problem Using straight cutting edges to cut out wash boarded roads disturbs more gravel than necessary.

Solution Use a pick cutting edge to comb the road top instead.

Procedure Replace the straight cutting edges with pick cutting edges; install a roller/packer on the back of the grader for compaction.

Results The picks cut out the wash boarding and left the gravel mostly in place, and had many other beneficial uses. In winter, the picked blades removed snow and ice from the road surface but left the gravel, cutting down on time and money spent on spring gravel replacement operations. The picks also evenly spread vegetation caught up during roadside cutting instead of leaving chunks of sod and grass along the shoulder. The pick blades have lasted since June 2004, while regular cutting blades are replaced monthly. The rubber-tired roller/packer mounted on the back of the grader compacted the freshly graded gravel back into the road top, ensuring a smooth and well-compacted road top without float or loose gravel. Heavily traveled roads, once graded three times a week, are now graded once a week.

Approximate Cost \$37,000 (\$5,000 approved for project)

Implementation The county will continue to use the pick cutting edges and the roller/packer on its gravel roads.

Status Completed

Reprinted from: The Technology Exchange, Minnesota LTAP, University of Minnesota.

Please check the ND LTAP website for any workshop updates
<http://www.ndltap.org>
 TLN website
<http://www.translearning.org>

To enter the "You Show Us How" Contest. Submittals must be received by August 15, 2008.



2007 “You Show Us How” Participant

Culvert “Separation” Puller

COUNTY: Stark

CONTACT PERSON: Allen Heiser, Road Supervisor
Telephone (701) 456-7662

ADDRESS: PO Box 130
Dickinson, ND 58601-0130

PROBLEM STATEMENT

Culvert companies ship culverts to us by nesting them inside one another, such as a 15-inch inside an 18-inch, and then these are being placed inside a 24-inch or larger pipe. This accommodates their shipping space on the transporting vehicle, keeping shipping costs down. It can be difficult and time-consuming to separate them if proper tools are not available.

SOLUTION

Lincoln Holz, an operator, along with co-worker Raymond Sand designed and made a culvert puller. This small device as shown in the photo, can be hooked into the corrugations at the end of the pipe, and with the chain attached, the smaller diameter culvert can be removed from the larger culvert. As the chain is tightened, the mechanism tightens on the metal pipe, and with a continued pull on the chain the culvert is removed.

LABOR, MATERIALS AND COSTS

Scrap materials from around the shop were used to make this. Once the idea was developed, approximately three hours of labor was involved. Miscellaneous costs for welding rod, bolts, etc no more than \$50.00 for assembly of the device.

SAVINGS AND BENEFITS

Using this device, speeds up the process of separating culverts, providing extra time for other projects. Also, workers are less likely to damage fingers or other body parts if they use the device to separate culverts.



2007 "You Show Us How" Participant

Pulverizer for Road Maintenance

COUNTY: Adams
CONTACT PERSON: Theo Schalesky, Hwy Supervisor
Telephone (701) 567-2235
ADDRESS: PO Box 589
Hettinger, ND 58639



PROBLEM STATEMENT

Over time a considerable amount of roadway aggregate is moved onto the inslope of the roadway. It is important to recover the material and place it back on the road surface. In the process of placing the material back on the roadway with the motor grader considerable vegetation that is moved with it. It is necessary to get rid of the vegetation and have the aggregate material in a suitable condition to place on the roadway.

SOLUTION

While there are commercial pulverizers on the market, the county was not in a financial position to purchase one. Theo had noted that several years ago an out-of-state county had made one. After getting some ideas from examples Theo and welder, Gene Krambeer, determined they could make a pulverizer that would better serve their needs at much less than the cost of a new one. Much of the necessary material was available in the yard. The framework was made from used bridge beams. The drive train from a 1983 Ford truck was salvaged to transmit power to the pulverizer beaters, from the PTO of a tractor. Two sets of beaters were installed. The beaters, as shown in the photo, were made from scrap material. Four doors located on top provide easy access to the beaters for cleanout purposes. The adjustment height of the beaters is controlled hydraulically by the wheel adjustments. Rake tines are installed on the rear for leveling off the windrow and removing trash.

The machine has been used for two seasons, doing approximately 70 lane miles each spring. The machine has been holding up very well.

LABOR, MATERIALS AND COST

Approximately \$850 was spent for new materials such as hydraulic hoses, tires, welding rods and other miscellaneous items. Approximately three weeks of shop time was required to assemble the pulverizer. Projects of this type are done during inclement winter weather when outside work cannot be done.



SAVINGS AND BENEFITS

In the past, the procedure has been to pull gravel materials off the shoulders, work the windrow with the motor grader(s) several times to get the vegetation dried up and removed, then lay down the material on the roadway. This procedure could take several days for the vegetation to dry up, raising concerns relative to the safety and liability of having a windrow on the roadway for a period of time. Using the pulverizer, the work can be accomplished in one day.

A smaller work crew can accomplish more maintained miles in less time.

2007 "You Show Us How" Participant

Cold Mix Asphalt Heater

COUNTY: Adams
CONTACT PERSON: Theo Schalesky, Hwy Supervisor
Telephone (701) 567-2235
ADDRESS: PO Box 589
Hettinger, ND 58639



PROBLEM STATEMENT

During the cool seasons of the year it can be very challenging to get the cold mix asphalt to stay in place and bond properly. It is necessary to use smaller quantities at these times for pothole repair and other such uses. Proprietary mixes are available and can be purchased in bulk at a much cheaper price. However, the material will work better if slightly heated.

SOLUTION

The county had a used garbage dumpster which was modified for use as a storage/heater as shown in the photo. A heating tube was installed across the length of the dumpster's bottom. A torch, attached to the propane tank on the front of the dumpster, is then inserted into the heating tube. Gates were installed on the front of the dumpster for removal of the material. Hookups were mounted on the back of the dumpster for the quick hitch attachment to the front end loader. The dumpster is then transported to the work zone area. Approximately 1 ½ cubic yards of material can be placed in the dumpster. Heating time is for approximately one hour to get the material warm enough for sufficient workability.

LABOR, MATERIALS AND COST

The dumpster had been discarded as a garbage collector and therefore was available at no cost. Other materials for the heating tube, gates and loader attaching device were also available in the yard. No new materials were needed, other than bolts, welding rods and other miscellaneous items. Approximately 30 man hours were spent converting the dumpster to a heater.

SAVINGS AND BENEFITS

The county is also responsible for the street maintenance in the city of Hettinger. As such, there is considerable pothole patching on the city streets. In addition to the county road repair, there are a lot of potholes on the city streets and this works very well for doing those repairs. The material is readily available at the worksite, requiring very little lifting (handling) of the material. With less handling and lifting of heavy materials there is less of a possibility of injury to the worker.



FULL DEPTH RECYCLING DEMONSTRATION PROJECT COMPLETED IN LARAMIE

by Gregory E. Halsted

All across the Cowboy State, thousands of miles of federal, state, county, and city roads are rapidly deteriorating and in need of immediate rehabilitation.

The majority of these roadways were constructed utilizing flexible-granular base materials and were often under-designed for today's heavier traffic loads. The presence of ruts, potholes, and severe cracking are common problems that are usually maintained with additional asphalt patches and thin overlays. However, these problems often are not attributed to normal surface wear and may be the result of a failed or inadequate base course. When this situation occurs, it is important to fix these base problems in order to have long-lasting pavement rehabilitation.

Salvaging these existing failed flexible pavements is a good practice, both environmentally and economically, because they still contain good granular material that, when blended with portland cement can be reused and recycled into a strong, durable new base. A process commonly referred to as full-depth reclamation (FDR) is a technique in which the old asphalt pavement and a portion of the underlying base, subbase, or subgrade materials are pulverized and blended together with portland cement to create an enhanced roadway base material. The steps for FDR consist of the pulverization of the existing materials, the incorporation of any additional materials, mixing, initial shaping of the new base mixture, compaction, final shaping, curing, and the application of a new surface or wearing course.

On October 12, 2007, an FDR demonstration project was undertaken by the University of Wyoming, (Reclaimer mixing portland cement, asphalt, and base course Volume 23, Number 4, Winter 2008, page 2) under the direction of Rock Morgan, Supervisor, Construction Design/Contracts Division of Physical Plant. Other participants included Gorman Engineering, LLC (engineering and surveying services), Simons Contracting (prime contractor), ARS, Inc. (stabilization contractor), and Terracon Consultants, Inc. (testing services). The 400-foot roadway project is situated in Laramie off of Grand Avenue, adjacent to the Spanish Walks Apartments. On this particular project, the asphalt and base material had been previously removed to facilitate placement of



the curb and gutter. After the material was hauled back on to the site, ARS reclaimed the materials to ensure proper mixing and sizing of the old asphalt and base course. Normally, the asphalt and base course would be reclaimed in-place.

The design called for 4% by weight of portland cement, which was placed using specially designed trucks with hoods to reduce dusting. After the cement was spread over the reclaimed base, ARS made another pass with their reclaimer to mix the cement and base, while adding a measured amount of water to control density. Finally, the newly mixed base material was shaped by a blade, and compacted using a roller to achieve final density. A wearing course of 2 inches of asphalt was subsequently placed over the FDR base course.

Refreshments for the demonstration project were provided by the Concrete Association of Wyoming. Jamie Johnson, PE, Pavement Engineer for the Rocky Mountain Cement Council, was also on hand to field questions, along with Bill Gorman, PE, Gorman Engineering and Kurt Sommermeyer, ARS. According to Rock Morgan, "the University of Wyoming wanted to try the FDR process to determine if it is a viable rehabilitation technique for failed asphalt pavements. We like the idea of recycling the asphalt and base course, saving virgin aggregate vs. conventional reconstruction."

Whether Interstate, industrial, or residential, portland cement is the key to reconstructing flexible pavements that have failed. The incorporation of the cement with the old base course material, often including the old asphalt surface, provides a versatile, practical, and cost-effective means of strengthening worn-out pavements.

(Full Depth Recycling continued on page 7)

The cement binds the granular particles together to form a paving material capable of withstanding moisture infiltration and degradation. It increases the strength of the base without the need for removing the old material and hauling in large quantities of expensive new base materials.

The reclamation of failed flexible pavements using portland cement has many advantages: the conservation of non-renewable resources through the reuse of existing materials, the elimination for the need of new granular base materials, a reduction in both hauling and energy costs, and the elimination of bumps, dips, ruts, potholes, cracks, and preliminary patches.

More information on this subject will be presented at this year's Transportation & Safety Congress.

Reprinted from WY. T2 Roads on the Range Vol.23 No.4

Driver Behaviors

Driver behavior has the potential to either increase danger or improve safety on the road. Two driver behaviors that are of particular concern to North Dakota are driver drinking and speeding.

North Dakota traffic fatalities were alcohol-related 42 percent of the time in 2006. To learn more about the severity of the problem and what initiatives are being put in place to address this issue, go to http://www.ugpti.org/rtssc/briefs/downloads/2007_DriverDrinking.pdf

Speeding was a contributing factor in a third of all fatal crashes in North Dakota in 2005. For more information about the rural challenges that North Dakota faces and what can be done to address the issue of speeding, go to http://www.ugpti.org/rtssc/briefs/downloads/2007_Speeding.pdf

North Dakota Department of Transportation Initiates Training for Department Technicians

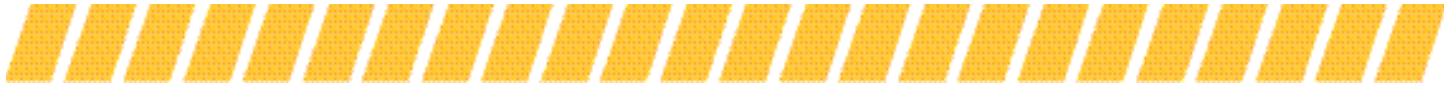
During the first week of May the North Dakota Department of Transportation (NDDOT) initiated a new training course for the department's newly designated Transportation Technicians.

The course was designated "Introduction to Construction". The course was attended by 38 employees from 8 districts statewide. The course provided an overview of the basic skills needed to function on a highway construction project. Students received training in math, plan reading, surveying, construction inspection, materials, and traffic control.

The instructors for the training were from staff within the NDDOT and staff of the Bismarck office of UGPTI – NDSU.

May 8, Darcy Rosendahl, Director of Operations for NDDOT, provided certificates of completion to all 38 students for completing the course.





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