

Improving Maintenance Practices

Last summer, the ODOT Research Group and Technology Transfer (T2) Center funded a four-month trial of a piece of shoulder maintenance equipment called “The Retriever.” Research staff also inspected a berm shaper developed by District 3 crews.

The Retriever

Through cooperative efforts of ODOT District 4 and Benton County Public Works, the Retriever was front-mounted on a county-owned motorgrader. During the trial, both state and county personnel operated the equipment. The excellent performance of the unit resulted in its purchase by ODOT maintenance forces.

The Retriever uses disks that rotate as the device is pulled through shoulder material. As they rotate, the disks churn the soil, mulch vegetation, and pull material up the shoulder to be placed in position by the motorgrader’s blade. A sweeping vehicle follows to broom off any material still on the pavement.

Material on a steeper shoulder grade can also be reclaimed with the Retriever. It can be installed on different types of equipment and in different positions depending on the application. In areas that have cut banks along with narrow shoulders (< 4 feet), the Retriever pulls too much material to be effective.

With this equipment, shoulder conditioning can be done with one pass of a motorgrader and sweeper. The standard conditioning operation requires one pass to churn the shoulder material and pull it up to the top of the shoulder, another to reposition the material

correctly, and a sweeping operation to clean the road surface of remaining debris. If the shoulder is tilled just prior to the spray operation, the Retriever may reduce or eliminate the use of a contact herbicide.



The Retriever can be mounted on many types of equipment.

The Retriever operation moves more quickly than a typical blading operation. Where there are no delineators, about 35 miles of shoulder can be conditioned daily. With delineators or other obstacles to maneuver around, the Retriever could still condition 20 miles in 6.5 hours. The standard blading operation travels about 10 miles in 8.5 hours.

The ODOT/Benton County Trials

On the first day of full operation with the Retriever, the cost to condition 19.6 miles of shoulder was calculated at \$1033, or approximately \$53 per mile. The distance covered would have been greater, but the initial miles were used to familiarize the operator with the equipment. By comparison, the average cost of the normal ODOT two-grader operation is \$122 per mile. Even if both operations moved at the same speed, the cost of the two-grader operation would still be greater: about \$81 per mile. At savings of roughly \$30 per mile, the Retriever is expected to pay for itself quickly (the full cost of the equipment was \$15,600).



Benton County and the District 4 maintenance office plan to continue their motorgrader/Retriever partnership. The county will use the motorgrader primarily for snow removal work, and ODOT will use the equipment for fall and spring shoulder work. Installation or removal of the Retriever can be accomplished in an hour.

District 3's Berm Shaper

District 3 built their own shoulder conditioner, combining two rows of angled disks, two blades, and a hydraulic "wing" assembly to control material flow. District 3 produced a video of the berm shaper, which shows the device in action. One pass can do it all!



District 3's berm shaper in action



District 3's berm shaper

The two sets of disks break up the sod and bring up the rock. The material is filtered through the grader bits. The wing, which uses ice bits, can filter and distribute the sod, or can be "closed" to carry material to fill in low spots. Crewmembers report that the berm shaper cuts down on the need for spray as it removes the sod.

The crew's modifications have made the equipment adjustable and easy to maintain. It uses standard grader bits, a 3-point hitch attachment, and a hydraulic coupler to control the wing from the cab.

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For more information on ODOT's Research Program and Projects,
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