



## Roadway Shouldering Machine Modification

**Project Number** 2014-10

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**Problem** Otter Tail County's Ulrich shouldering machine was mounted on the front of its motor grader. The machine required two people to operate, with one person sitting in a very unsafe position out on the shouldering machine while the other operated the grader from inside the cab. In addition, the machine's power unit was old; when the gear box that ran the conveyor belt failed, there were no parts available to fix it. Replacing the machine was also not an option: the county's budget did not support the purchase of a \$65,000 machine that would only be used for three weeks each year.



**Solution** County staff rebuilt the existing machine to fit on a 624J John Deere loader, which has better capacity to handle the machine's load. The rebuilt machine is also able to make use of hydraulic power from the loader, ultimately lowering operational costs and increasing efficiency. The redesign has also allowed the machine and the loader to be operated by a single individual seated safely inside the loader's cab.

**Procedure** To rebuild the machine, county staff first removed the existing power unit (engine/clutch assembly and gear box). They then reinforced the back of the shouldering machine frame and installed an attachment that allowed the machine to fit on the loader's quick attach mechanism. The machine's existing wing assembly was replaced by a newer, lighter wing. Mekalson Hydraulics designed and installed the necessary hydraulic controls on the loader to operate the shouldering machine; it is now driven by an Eaton Controller and a hydraulically driven motor.

**Results** Otter Tail County achieved its safety goal by removing the operator platform from the shouldering machine and going to an in-loader operator control system. In addition, the county realized a productivity increase of at least 30 percent for roadway shouldering tasks. County staff also recognized a need for heavier shouldering machine ground wheels, which eliminated flex in the shouldering machine's frame that had been allowing misalignment of the conveyor belt.

**Approximate Cost** \$32,000

**OPERA Funding** \$10,000

**Implementation** Otter Tail County is currently using the improved roadway shouldering machine to add aggregate to the shoulders of its more than 1,000 miles of bituminous roads.

**Status** Complete

**Prepared by:**

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