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Report Assesses Options for North Dakota Counties Facing Shortage of Gravel

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More than half the roads in North Dakota's extensive road system are gravel. With in-state gravel pits scarce and substantial amounts of gravel needed for county roads, some North Dakota counties are facing immediate shortages of gravel (0-2 years' supply remaining) and others may be facing this challenge in the near future.

What are the alternatives to dealing with gravel shortages? Counties can either find new gravel supplies, or they can reduce the use of gravel.

Obtaining Additional Gravel Supplies

All North Dakota counties except Cass depend on truck transport of gravel. As a result, only gravel pits within a certain distance (on average, within a 15-mile radius) can be accessed by each county. To acquire gravel from pits beyond truck haul limits, counties may explore several options:

- **Transport by Rail:** To make transport economical over longer distances, Cass County uses a shortline railroad. Negotiated contract rates vary by season and year, and rail movements are approximately 50 miles. Counties must consider costs of transport, handling and storage in determining the feasibility of rail transport.

- **Advance Bulk Purchasing:** Cass County, which has low gravel supplies, purchases a given quantity of gravel in the fall, storing it in locations throughout the county to be spread on roads in the spring. This may be an excellent solution for counties needing large quantities of gravel and having the cash reserve to make advance purchases.

- **Multi-County Purchases:** If adjacent counties could coordinate joint purchases and transport gravel together, they could receive substantial savings.

- **Recycling:** Forty percent of North Dakota counties surveyed indicated they reduce purchased gravel by recycling pavement, on average, once every 3.5 years.

Among surrounding states, Minnesota appears to have a large supply of gravel, particularly along its western border. North Dakota counties may also be able to tap into Canadian sources if the costs are economical. Montana and South Dakota, however, face gravel shortages similar to North Dakota's.

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Reducing Road Maintenance

In addition to finding new sources of gravel, counties may reduce the use of gravel by assigning minimum maintenance status, closing roads with little or no traffic, and paving roads with higher traffic volumes.

Some gravel roads handle little traffic and may be used only seasonally. Counties could scale back maintenance significantly on these roads, designating them as "minimum maintenance" either seasonally or throughout the year.

Savings of reduced maintenance must justify any increased travel times and/or costs to road users. Implementing reduced maintenance must conform to state legal requirements and follow legal precautions to minimize tort liability.

One of the main drawbacks of the minimum maintenance option is that the road will be downgraded over time. If the road is to remain open, substantial local government funds would eventually be required to upgrade roads and bridges to an acceptable condition.

Closing Low-Use Roads

Roads with extremely low traffic volumes may be considered for closure. Since maintaining low-use roads can be expensive, particularly when there are other routes available to reach the same destination, closing a road is generally an economic decision.

Closing a road must be evaluated carefully so the cost savings is greater than the cost incurred to reroute traffic. Eliminating some roads may result in higher travel costs to a few road users, who have a longer distance to travel. Roads inheriting additional traffic must also be factored into the evaluation, since they will require additional maintenance and resurfacing costs.

North Dakota provides detailed statutory procedures for closing roads, and counties must follow and document proper procedures to minimized their tort liability.

Paving High-Volume Roads

Gravel roads with extremely high traffic volumes may be considered for paving. To justify paving, counties must consider the initial costs, maintenance costs and user costs for the duration of the life of the surface. Paving requires high initial costs, as well as signing, repairs, crack sealing, overlays and patching. Gravel road maintenance costs include blading, snow removal, signing and periodic regraveling.

User costs must also be calculated and compared. Vehicle operating costs — wear and tear and fuel consumption — are higher on gravel roads. Opportunity costs, measured in costs of delays and additional travel time, are also important.

It must be noted that the paving option may not be feasible for most typical gravel roads. A case study in Cass County revealed that only at traffic levels over 325 vehicles per day does pavement become feasible. Further, user costs had to be included in the analysis.

Conclusion

Counties facing gravel shortages must make some difficult choices. Transportation plays a key role in finding new gravel supplies, and with longer lengths of haul likely for more counties in the future, rail transport may be one option. Coordinating joint and advance purchases may also be cost-effective solutions.

To reduce the use of gravel, counties may consider reducing the level of maintenance, closing low-traffic roads, and paving high-traffic gravel roads. Each alternative has legal and economic considerations, with careful cost analysis necessary before any decision is made.

A copy of the full report,"Gravel Shortage Options" (MPC Report No. 96-65), including detailed information on the methodology described in the Cass County case study, is available from the Upper Great Plains Transportation Institute. Contact: Jill Hough (701) 231-8082.