

**1999 HOUSE FINANCE AND TAXATION**

**HB 1390**

1999 HOUSE STANDING COMMITTEE MINUTES

BILL/RESOLUTION NO. HB 1390

House Finance and Taxation Committee

Conference Committee

Hearing Date January 25, 1999

Tape Number	Side A	Side B	Meter #
1		x	11.2
Committee Clerk Signature <i>Janice Stein</i>			

Minutes:

REP. BELTER Opened the hearing.

SEN. HARVEY TALLACKSON, DIST. 16, Testified in support of the bill. This bill will allow the county commissioners to levy surcharges to repair roads in the counties that haul gravel where there are large amounts of travel which cause the roads to need repair.

REP. SCHMIDT This is a good deal for the counties. But in our instance we have a large gravel pit at the county line. All of the gravel coming out of that pit, goes to Devils Lake, and they have ruined a lot of roads. I wish they would word this so it could be adjoining counties.

SEN. TALLACKSON Suggested that possibly two counties could go together and share it.

REP. RENNERFELDT Wouldn't this ten cents per cubic yard, amount to about a twenty cent tax?

SEN. TALLACKSON I don't think so.

REP. BOB HEUTHER, DIST. 27, Testified in support of the bill as the prime sponsor.

He stated their county had several gravel pits and a number of them are located along county roads. A lot of this gravel goes out to many projects outside of their county. The intent here is to try and maintain the roads to the gravel pits. It would be an advantage to the local landowners also. This surcharge would give a little break to the counties that have to repair the roads.

JUDY TANGEN, RANSOM CO. COMMISSIONER, Testified on behalf of the taxpayers of Ransom County in support of the bill. See written testimony. She also submitted a news article from the Fargo Forum, see attached copy.

SHERYL DAGNON, RANSOM COUNTY COMMISSIONER, Testified in support of the bill. Submitted handout from the North Dakota Transportation Technology Transfer Center, NDSU. See attached copy.

REP. BELTER The gravel that is railed out of the county, do they run the railroad tracks down into the gravel pit?

SHERYL DAGNON Yes, they do.

REP. BELTER The stuff that is railed out, would also be taxed?

SHERYL DAGNON Yes.

REP. FROELICH You do have the authority as county commissioners, to establish weight limits?

SHERYL DAGNON Yes, we do have weight limits on those roads and have the sheriff go out and check it every once in awhile, and they do. The problem is, if they do get stopped, we don't get any of the income from the fines.

ALLEN (could not hear name) WALSH COUNTY COMMISSIONER, Testified in

support of the bill. We have an awful lot of gravel in Walsh County. It is causing a lot of problems to our roads . We have gravel pit owners in Walsh County, who own their own gravel pits and the land. They do a lot of the work for the county. The state hauls a lot of gravel out of these pits. They do help us with repair, but once the road is beat up, it is hard to get it back to its original design. We have a lot of repair work to be done. I don't think ten cents per cubic yard is too much. We need help on this.

JON R. MILL, BURLEIGH COUNTY ENGINEER, Testified in support of the bill. We have a real problem in Burleigh County also. The impact we are talking about is to all roads. A typical hauler right now is a five axel semi, even with the reduced speed, there is still damage to the roads. We have our problem with several commercial people hauling out of the pits north of McKenzie, there is really no rhyme or reason for their hauling, they haul week-ends, early in the day, when it is raining. There is no project hold on these people, we don't have a whole lot of teeth in current law, so there isn't a whole lot we can do, except load limits and speed limits. It has caused a lot of problems to residents along that road. To answer the questions about prices, if you were to buy gravel here, you would be paying about eight dollars per yard. If you take aggregate and turn it into asphalt, you are talking about twenty eight dollars per ton. The maximum of ten cents per cubic yard would be about seven and a half cents per ton. The amount of money that is being looked at here, is not very harmful to the final product. Don't look at this as a tax, look at it as a user fee.

DOUG SCHONERT, FORMER BURLEIGH COUNTY COMMISSIONER, Testified in

support of the bill. We do have a severe problem out there, the township roads are beat all to pieces. It is a fairness item, there should be a user fee.

BRYAN JOIME, NORTH DAKOTA TOWNSHIP OFFICER'S ASSN., Testified in support of the bill.

CURT PETERSON, ASSOCIATION OF GENERAL CONTRACTORS, Testified in support of the bill. At this point of time with the amount of activity that is taking place in North Dakota, we are well aware the beating the county roads are taking.

RAY ZINK, DEPUTY DIRECTOR OF DEPARTMENT OF TRANSPORTATION, Appeared to make a point. If the counties choose to impose a tax, they need to impose it across the board, including themselves. (COULD NOT HEAR VERY MUCH OF THE TESTIMONY)

REP. BELTER The way this is written, the state would have to pay the tax?

RAY ZINK The project will have to pay the tax.

REP. GROSZ Asked how much do the counties get?

REP. NICHOLAS Explained what happens when they haul gravel out of his pit. The contractors, in most cases, if they beat up the road in certain places, they just dump gravel in there and dump it, blade it, they take care of it. It probably provide the free gravel for it, that is how it is done in the real world.

REP. GROSZ Stated there is a huge gravel pit in Oliver County, they drive from the pit right onto Highway 200, it could add costs to somebody's project. There should be a fiscal note on this so we know how much we are talking about.

JUDY TANGEN Addressed the committee again, stating she tried to find out how much the costs would be, but when there is no law in place, it is hard to find out this information. They don't want to pay the tax, so they will not give the information. As far as a fiscal note, I wouldn't know what to tell you about that. If you read the information on Clay County you will see what information they have, the amount was approximately \$150,000 per year to the township where the pit is located.

With no further testimony, the hearing was closed.

COMMITTEE ACTION 1-25-99, Tape #2, Side A, Meter #14

Committee members discussed how the money would be distributed. This would only help counties where there were large amounts of gravel. Discussion was held also regarding amendments to the bill.

The bill will be held and acted on at a later date.

COMMITTEE ACTION 1-26-99, Tape #2, Side A, Meter #54.0 to Side B

REP. WARNER Presented amendments prepared by the legislative council.

REP. WINRICH Made a motion to adopt the amendments as presented.

REP. GRANDE Second the motion. MOTION CARRIED BY VOICE VOTE.

REP. RENNER Made a motion for a DO NOT PASS AS AMENDED.

REP. GRANDE Second the motion. MOTION CARRIED

With 9 Yes 5 No 1 Absent

REP. CLARK Was given the floor assignment.

Please type or use black pen to complete

Date 1-26-99

Roll call vote # 1

1999 HOUSE STANDING COMMITTEE ROLL CALL VOTES

BILL/RESOLUTION NO. HB 1390

House HOUSE FINANCE & TAX Committee

- Subcommittee on \_\_\_\_\_
  - Conference Committee
- } Identify or check where appropriate

Legislative Council Amendment Number \_\_\_\_\_

Action Taken Do Not Pass as amended

Motion Made By Rep. Seconded By Rep.

Representatives	Yes	No	Representatives	Yes	No
BELTER	✓		WINRICH		✓
RENNERFELDT	✓				
CLARK	✓				
FROELICH	A				
GRANDE	✓				
GROSZ	✓				
HERBEL		✓			
KROEBER		✓			
MICKELSON	✓				
NICHOLAS	✓				
RENNER	✓				
SCHMIDT		✓			
WARNER		✓			
WIKENHEISER	✓				

Total 9 5  
(Yes) (No)

Absent 1

Floor Assignment Rep. Clark

If the vote is on an amendment, briefly indicate intent:

DO NOT USE HIGHLIGHTER ON ANY FORMS

REPORT OF STANDING COMMITTEE (410)  
January 27, 1999 1:13 p.m.

Module No: HR-17-1285  
Carrier: Clark  
Insert LC: 90508.0201 Title: .0300

**REPORT OF STANDING COMMITTEE**

**HB 1390: Finance and Taxation Committee (Rep. Belter, Chairman)** recommends **AMENDMENTS AS FOLLOWS** and when so amended, recommends **DO NOT PASS** (9 YEAS, 5 NAYS, 1 ABSENT AND NOT VOTING). HB 1390 was placed on the Sixth order on the calendar.

Page 1, line 6, after "severing" insert "any" and after "county" insert "which is transported by truck"

Renumber accordingly



**1999 TESTIMONY**

**HB 1390**

TESTIMONY TO THE  
HOUSE FINANCE and TAXATION COMMITTEE

February 25, 1999  
Judy Tangen, Ransom Co. Commissioner

CONCERNING HOUSE BILL No. 1390

Chairman Belter and members of the committee, I am before you today on the behalf of the taxpayers of Ransom County, to express support for House Bill 1390. Thank you to Rep. Robert Huether for being the sponsor of HB 1390.

Ransom County has a population of 5921 residents. We are blessed with 115 miles of the Sheyenne River angling through our county and with 12 active gravel pits and we have counted close to 10 inactive pits. Most of the gravel pits are on our county roads. The condition of these roads are very poor by the end of the gravel hauling season. The expense of regravelling and grading these roads are a direct expense to the taxpayers of Ransom County. I tried to find out how much of the gravel is hauled out of Ransom County, but I couldn't get the answer. We estimate that approximately 75-80% mined in Ransom County leaves the county, the same percentage of haulers are from out of the county as well. We have residents asking us, "why don't you put a tax on the gravel?" We tell them, St. law does not allow us to do so.

Clay Co. which is one of our neighboring counties to the east, has had a gravel tax implemented since 1962. They started out with a .05 cent per cubic yd. tax, but have now gone to .10 per cubic yd. on gravel. The handout I have shared with you shows how Clay Co. distributes the gravel tax they collect and we would like to follow in their footsteps. The county would collect the tax and share it with the townships and with the gravel pit owner to help in restoring the pit. As HB 1390 states, the money would have to go back into road and bridge program, we see this as a direct tax relief to our county residents.

We talk to many Co. Commissioners from counties across ND who are experiencing the same gravel problems. The gravel business has increased in our county because we have the gravel, our county residents are paying the bill to keep their roads in good condition. This puts an unfair burden on our county taxpayer. A gravel tax would help defray the expense to the taxpayer.

Mr. Chairman and committee members, I ask you to support HB 1390 with a "Do Pass" recommendation.

# Enforce the county gravel tax

**C**lay County's decision to get tough with gravel tax sand-baggers is justified and overdue.

In 1962, the county began assessing a 5-cent tax per cubic yard of gravel extracted from Clay County pits. The tax rose to 10 cents per cubic yard in 1980.

## Forum editorial

But some haulers have long abused an honor system that allowed them to voluntarily estimate – and often fudge – the gravel

taxes they owed.

That's going to end. Minnesota law now allows counties to check the books of gravel companies they suspect are cheating and bill them accordingly. Since recently enforcing the statute, Clay County gravel tax collections have increased 8 percent.

Three haulers paid the additional \$3,358 they owed for the second quarter of 1997. Another contractor, owes an estimated \$5,000 and has not responded to billings sent via certified mail, according to county records.

In 1996, the county collected more than \$152,000 in gravel taxes. Those revenues help fund county and township road, bridge and gravel pit improvements.

Last year, individual Clay County gravel tax collections ranged from \$74 to \$61,599. Some haulers paid the full tax. Others didn't pay a dime. That's flagrant abuse.

The hope is the new law will instill honesty and equalize the tax burden to all who mine gravel in Clay County. The county can use all the revenue it can generate. The key concern, however, is not money – it's fairness.

One third of the 27 gravel contractors who received county tax forms during this year's first quarter did not return them. That cannot continue.

Side-stepping the tax is more than an ethical lapse. It also provides an unfair advantage to those bidding on work contracts that use gravel. The companies not in compliance are, in effect, enjoying an improper subsidy.

Clay County should enforce the law. Those who do not follow the rules should find a different sandlot in which to play.

# Piles of cash missing in gravel tax collections

1997

## Clay County to step up enforcement

By Karyn Spencer  
The Forum

Say you're paying the bill for a cartful of goods at Wal-Mart. "Don't worry about the sales tax now," the clerk says. "Just file your quarterly report."

Four times a year, you tell the government how much merchandise you bought so they know how much sales tax you should pay.

It's on your honor - the government has to take your word for it. So do you tell the truth, or do you fudge a little? Or have you miraculously not purchased a thing the last three months?

For 35 years, that's how Clay County has collected its gravel tax.

"We know for sure not all contractors are paying the tax," county engineer Jack Cousins says. "There's no way of stopping it without the authority to monitor books."

They just got that authority. The Minnesota Legislature passed a law this year so counties can check books if they feel gravel companies

are fibbing. And Clay County is ready to enforce it.

"What we're interested in is getting everyone paying at least a share of the pie," county planning director Tim Magnusson says.

### Reports often ignored

Someone, usually the gravel hauler, is expected to pay a per-cubic-yard or per-ton tax for gravel removed from Clay County.

A ton sells for \$6 to \$12 depending on how far it is hauled. A cubic yard is roughly 1.25 tons.

Every quarter, the county sends a form to the gravel companies to report how much gravel they used and to calculate the tax.

Clay County was the first Minnesota county to have a gravel tax, starting in 1962.

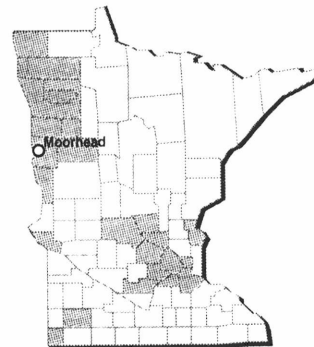
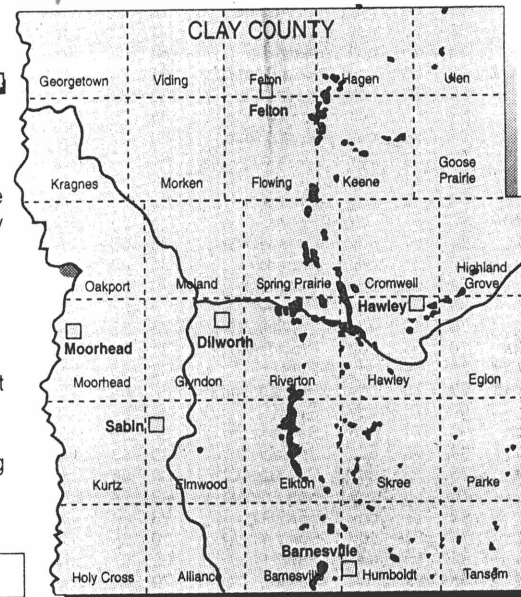
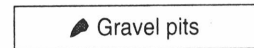
The proceeds are split between the county and townships to maintain roads and to restore closed gravel pits.

■ See **GRAVEL**, Page A13

## GRAVEL mining

Gravel mining areas are common throughout Clay County.

- Most of the pits are concentrated in the eastern 18 townships.
- There are about 236 gravel mining sites. About 75 are active.
- The industry employs about 500 people during peak construction season.



■ Aggregate material tax collecting county

■ See **GRAVEL**, Page A13

■ See **GRAVEL**, Page A13

■ See **GRAVEL**, Page A13

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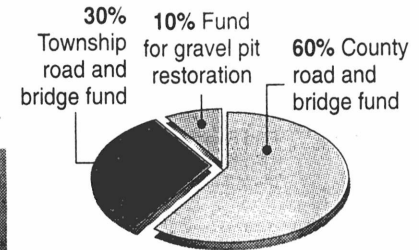
### Aggregate material tax

Commonly known as the "gravel tax," the aggregate material tax is a Minnesota state statute that is imposed in 25 counties.

• The aggregate material tax originated in Clay County in the 1960s and was later amended to include other counties.

• The tax is calculated on a per cubic yard or per ton basis. The tax is imposed upon operators at the rate of 10 cents per cubic yard of gravel produced in any county imposing this tax. According to the statute, an operator is any person engaged in removing aggregate material from the surface or subsurface for the purpose of sale.

### Gravel tax distribution



### 1996 Clay County gravel tax collections

CAMAS Kost Division	\$61,599
Asplin Sand and Gravel	\$19,917
Ames Sand and Gravel	\$18,758
Fitzgerald Construction	\$11,634
Border States Paving	\$11,488
Northern Improvement Co.	\$8,147
Turner Sand and Gravel	\$6,886
Central Specialties	\$5,251
Lampy Ready Mix	\$3,702
Strata Corp.	\$3,553
Cass County Highway Dept.	\$744
Kerwin Lomsdalen	\$402
Dave Dunham	\$81
Kermit Lomsdalen	\$74
<b>TOTAL</b>	<b>\$152,236*</b>

(\*Numbers may not be exact due to rounding)



### Total gravel hauled

942,391 tons  
and  
862,688 cubic yards

Sources: Clay County Planning and Zoning, Clay County Beach Ridges Forum.

ROB BEER / The Forum

Continued from Page A1

In the first year, Clay County collected \$32,111, with 25 firms paying the 5-cent-per-cubic-yard tax.

Now the tax has been bumped to 10 cents a cubic yard. Last year, Clay County collected \$152,236 in taxes from 14 firms.

But until now, there was no way to know what they should be paying.

"We feel that most people are honest and are paying the tax," Cousins says. "We also feel that there are one or more that aren't paying at all, and that's sad."

For instance, for the first quarter this year, Clay County sent gravel tax forms to 27 contractors. One-third of them didn't even return the form.

## Time to get tough

That's frustrating for those in the gravel industry who do pay their taxes.

It skews the playing field when gravel firms are vying for the same contracts. "In contracting, that's a huge advantage," Cousins says.

The companies have 15 days after the quarter ends to file their reports. Then if the county suspects the reports aren't accurate, the auditor has 15 days to send back an estimated bill.

But that's not an easy number to guess, Cousins says.

"How is the county auditor supposed to know? I don't even have any idea," he says. "They may be hauling from 10 different pits."

But new county auditor Lori Johnson wants to try. With help from other county officials, she will

make estimates and send bills after July 15 for this quarter.

Magnusson says they'll use past payments as a history for those who have paid gravel tax.

"For anyone who hasn't, we will make an estimate that will be high enough to get their attention," he says.

After the estimates are sent within 15 days, contractors have another 30 days to dispute the figures.

The new law will bolster the county's collections. If the county suspects a contractor isn't paying enough tax, the auditor's staff can check their records.

"I think that it might be negative for the people who aren't paying, but I think everyone else will appreciate it," Magnusson says. "If we get tough on it, we don't have to be on them all the time."

Sheryl Dagnon handout  
HB 1390

# The Center Line

A Service for Local Transportation Agencies

## North Dakota Transportation Technology Transfer Center

North Dakota State University

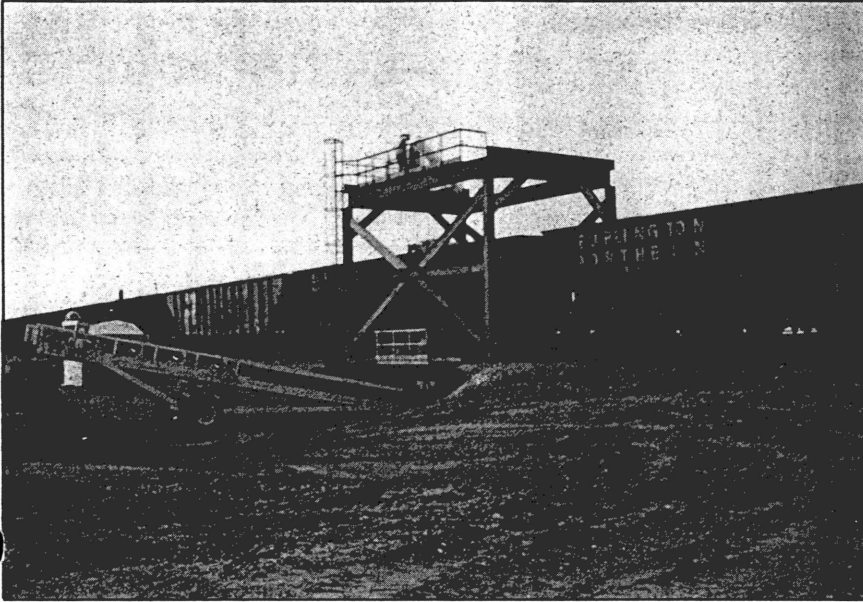
*James Chong*

Vol. 13, No.2

### Winter 1997

#### In this issue

- 1 Gravel by Rail
- 2 LaMoure County Studies Knock-Down Bridge Markers
- 3 A Summary of Gravel Shortage
- 5 New Shortline Railroad Formed in North Dakota
- 6 Always Expect a Train
- 8 Computer Corner
- 9 Jamestown Creates Construction Sign Library
- 10 Evaluation of Plastic Snow Fence
- 12 You Show Us Some More Contest
- 14 Worksite Traffic Supervisors Training Course
- 15 Fargo-Moorhead Targets Incident Management



## GRAVEL BY RAIL

by Keith Berndt, Cass County Engineer

Like many North Dakota Counties, Cass County is facing diminishing supplies of quality surface gravel within a reasonable transportation distance. Obtaining gravel from distant sources not only increases costs, but causes additional road wear. In 1995, Cass County started contracting with Red River Valley and Western Railroad to transport gravel to Cass County from a gravel pit near Lisbon, North Dakota. The gravel is transported to a county owned unloading facility near Durbin, North Dakota. This is a one-way distance of about 50 miles. Cass County purchased the land for a storage

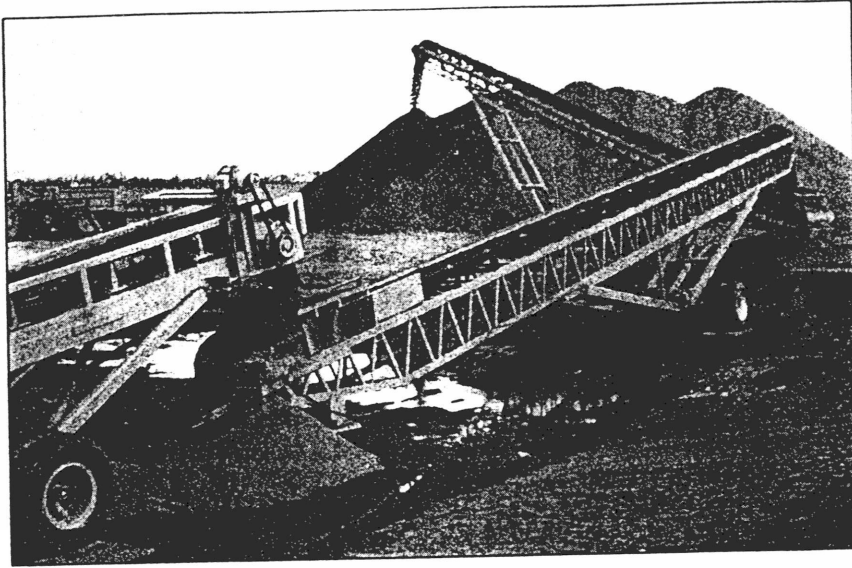
area and county employees constructed an under track unloading pit. The unloading area includes a shacker to remove the gravel from the rail cars. A small conveyor moves gravel from the pit to the larger stacking conveyors. Between 8 and 15 rail cars are received at a time with 70 yards of gravel per car. The gravel is mined from a privately owned pit. The county has contracted with the railroad to haul gravel crushed by county employees as well as contractor crushed gravel.

*Continued on page 2*

## NEW FAX NUMBER

NORTH DAKOTA TRANSPORTATION TECHNOLOGY TRANSFER CENTER

1-701-231-6185



## Gravel By Rail

*Continued from page 1*

Gravel from this operation is used to supply gravel to the central and southeastern parts of Cass County. While it has not been the answer to all of the county's gravel requirements, it has been a definite benefit and has proven to be cost effective. In 1996, the county hauled about 30,000 yards of gravel by rail. The contract cost of transporting the 50 mile distance by rail is 4.5 cents per ton-mile. The cost of operating the unloading facility and handling the gravel from the train to trucks with county crews adds about another 2 cents per ton-mile for a total transport cost of about 6.5 cents per ton-mile. This compares to contract truck delivery rates of about 11 cents per ton-mile. In addition to the direct savings, using rail transport results in reduced haul road deterioration.

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# A Summary of Gravel Shortage Options and Alternatives

By: Lance Schulz, Jill Hough, and Ayman Smadi

North Dakota has over 106,000 miles of roads, of which over 50 percent are gravel. Given the large number of gravel roads, adequate supplies of quality gravel are necessary to maintain the extensive system in an acceptable condition for those traveling on the roads. The roads of North Dakota, particularly the gravel roads, have been experiencing changes in travel patterns. Changes in the agricultural industry and increased commuter traffic are redistributing traffic within several counties. As the purpose of rural trips changes, the demands for improved maintenance increase.

Adjustments in road maintenance are necessary to accommodate the shifts in traffic patterns. Roads with increased traffic volumes will require additional maintenance, i.e., more frequent graveling and blading, while roads with decreased traffic may require less maintenance. Several counties in North Dakota may face two primary problems with increasing maintenance on roads. First, counties have budget constraints, which makes increasing maintenance difficult or impossible.[1] Second, some county road officials indicated they are experiencing a gravel shortage.

The North Dakota Department of Transportation provided funding for the Upper Great Plains Transportation Institute to assess the gravel shortage and consider alternatives counties may seek to implement when addressing a gravel shortage. A case study analysis was included when considering the different alternatives.

## NORTH DAKOTA GRAVEL INVENTORIES

The North Dakota Department of Transportation (NDDOT), Secondary Roads Division, conducted a telephone survey to assist in estimating the status of the gravel shortage and the quality of gravel available within the state. The survey findings are based upon the perceptions of consulting engineers and county road superintendents. Survey results indicate that 11 percent of North Dakota counties are experiencing an immediate gravel shortage they have less than a three-year supply of gravel remaining. Furthermore, the majority of gravel remaining within these counties is of poor quality. It was also perceived that 20 percent of the counties were experiencing a short-term shortage. These counties have a three to five year supply of gravel remaining. Most of the gravel within these counties is of fair quality. Finally, it was perceived that 59 percent of counties have an adequate supply of gravel. Counties with an adequate supply have over a six-year supply of gravel remaining. When mapping the gravel inventory perceptions, it is clear that gravel deposits are not evenly distributed across North Dakota.[2] The counties experiencing a gravel shortage will have some difficult choices to make in the future.

## GRAVEL SHORTAGE ALTERNATIVE STRATEGIES

Two main strategies can be used to address the gravel shortage: 1) find new gravel supplies and 2) reduce the demand and/or use of gravel. For example, by using rail to transport gravel, counties can reach supplies that may have been uneconomical (because of prohibitive trucking cost). On the demand reduction side, one option would be to convert the surface of gravel roads with high traffic volumes to pavement. It is presumed that any decisions of this nature are supported by detailed economic analysis and that these decisions meet legal requirements in state and county laws. Other

options to reduce demand are to declare minimum maintenance roads or close certain roads with low traffic volumes and other access routes. Legal issues must be addressed before either of these options are implemented. [3]

## Feasibility Factors

The feasibility of paving, declaring minimum maintenance, or closing a road will vary among roads. The decision to pave will depend upon the costs and benefits incurred. The cost of converting a gravel road to pavement consists of the increased outlays made by the county. Paved roads require a large initial investment besides routine maintenance whereas, gravel roads only require the routine maintenance. The benefits of paving a road include reductions in vehicle operating and opportunity costs. Vehicles do cost more to operate on gravel roads than on paved roads for three main reasons: the rolling resistance and less traction increase fuel consumption, the roughness of the road increases tire wear and other maintenance costs, and dust causes extra engine wear. Opportunity costs incurred by drivers and passengers also differ between pavement and gravel surfaces. These costs are important because the time passengers spend in vehicles reduces the time they could spend in productive events such as employment. Travel speeds, which differ between surface types, influence opportunity costs the most. The average operating speed on gravel roads is about 40 MPH whereas the average operating speed on a paved road is 50 MPH. The difference in operating speed when examined in regard to the average North Dakota wage rate of \$10.02 an hour, illustrates that time delays traveling on gravel roads do have a cost.

Though traffic levels may be high enough on a gravel road to justify a paving the road, the initial cost may be

*Continued on page 4*



# A Summary of Gravel Shortage Options and Alternatives

Continued from page 3

too high for a county to afford the paving process. On the other hand, reducing maintenance or closing a road typically raises opposition. Road closings or reduced maintenance may be politically unpopular for the decision makers because of the major inconveniences some residents may experience due to rerouting the traffic. However, the more county officials can work with other local agencies/groups, i.e., mail carriers, school systems, to educate them about developing a smaller road system with a higher level of service, residence may be more accepting of the road options.

## CASE STUDY ANALYSIS

Cass County was selected to participate in the case study analysis because of their depleted gravel inventory, many miles of gravel roads, and their increasing volume of traffic. Keith Berndt, the Cass County Engineer, selected five different five-mile stretches of homogeneous roads to be evaluated. Traffic counts and maintenance costs were collected for these segments to conduct the analysis. While analyzing the data, it was clear that maintenance costs vary with traffic levels. Therefore, the need for proper and accurate data is paramount to the success of an analysis. The analysis primarily evaluates the traffic level at which Cass County would consider paving specific road segments. Unfortunately, not enough detailed data were available to evaluate closing or declaring a minimum maintenance road.

The table below shows the results of a benefit-cost analysis. As the table shows, the costs outweighed the benefits unless there are substantial traffic volumes. On a segment with only 100 ADT, the net benefits to paving are -114,936, while on a segment with an ADT of 325, the net benefits are \$20,931. If the price of gravel increases, paving may become justifiable at a lower ADT. In conclusion, some counties are experiencing a gravel shortage. These counties can either increase their supply of gravel by transporting gravel from other areas or reducing the demand of gravel. The ways to reduce demand are paving, reducing maintenance, or closing roads. An analysis with detailed data must be conducted before any decision should be made. In some case's roads with high ADT levels may justify paving. Yet, in several cases' counties may not have the revenue to absorb the initial investment of paving.

- [1] The Upper Great Plains Transportation Institute is currently conducting a study, Innovative Rural Road Financing Methods for the Midwest and Mountain-Plains States, which describes potential revenue generating methods for counties to implement.
- [2] The final report MPC 96-65, Gravel Shortage Options, contains a map illustrating the gravel shortage perceptions for each county.
- [3] These legal issues and options are discussed in more detail in MPC report 96-69, Legal Implications to Close or Abandon or Assign "Minimum Maintenance" Low Volume Roads in North Dakota, by Welte, Hough, and Smadi.

## BENEFIT COST ANALYSIS OF PAVING A ROAD

Segment	ADT	Benefits	Costs	Benefits minus Cost
1	100	47,759	162,695	-114,936
2	150	71,639	163,239	-91,600
3	175	81,680	185,696	-104,016
4	250	119,397	186,869	-67,472
5	325	155,217	134,286	20,931

A word of caution to readers, this case study analysis should only serve as a model. All road segments differ and estimates should be based on actual data collected from each segment. For a full copy of the Gravel Shortage Option report, contact the Upper Great Plains Transportation Institute at (701) 231-7767 and ask for MPC report 96-65, by Hough, Smadi, and Schulz.