



MEMORANDUM

**Highway
Department**

Jason Benson, P.E.
County Engineer

Richard S. Sieg
Superintendent

Thomas B. Soucy, P.E.
Design and Construction
Engineer

TO: Cass County Road Advisory Committee
FROM: Jason Benson, Cass County Engineer *JB*
DATE: March 14, 2012
SUBJECT: Road Advisory Committee Meeting
March 19, 2012 2:00 p.m.

A Road Advisory Committee meeting has been scheduled for Monday, March 19, 2012 2:00 pm in the Cass County Commission Room. The agenda is as follows:

2:00 – 2:15	Review 2012 Construction Projects	Information
2:15 – 2:25	Update on Posted Bridges on County Roads	Information
2:25 – 2:45	Review Draft of the Cass County Comprehensive Highway Plan	Information
2:45 – 2:55	FM Diversion Transportation Plan for the area north of Cass Hwy 20	Information
2:55 – 3:00	Other Business	
3:00	Adjourn	

1201 Main Avenue West
West Fargo, North Dakota
58078-1301

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701-298-2370
Fax: 701-298-2395



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Engineer

TO: Cass County Road Advisory Committee
FROM: Jason Benson, Cass County Engineer *JPB*
DATE: March 14, 2012
SUBJECT: Road Advisory Committee Meeting March 19, 2012
Background Information

2012 Planned Highway and Bridge Projects:

Overlay Projects:

Cass 26 from State 38 to Cass 5N: (8 miles, \$2 Million, \$1.619 Million Federal, \$381,000 Local) This section of Cass 26 was last paved in 1994 and is in need of a thin maintenance overlay.

Cost per Mile: \$250,000

Current Road Dimensions: 2 Lanes/12' Wide with 6' Gravel Shoulders

Planned Future Road Dimensions: 2 Lanes/12' Wide with 5' Paved Shoulders

Last Year Paved: 1994

Cass 5, 10, and 32 from Absaraka to I94: (9.5 miles, \$1.5 Million) The 1.5 mile section on Cass 10 was paved in 2009 to fill wheel ruts and the sections of Cass 5 and 32 were last paved in 1990. This 9.5 mile length of road is in need of a thin maintenance overlay.

Cost per Mile: \$157,895

Current Road Dimensions: 2 Lanes/ 12' Lanes with 1' Paved Shoulders (C-10 from C-5 to I-94), 2 Lanes/12' Lanes with 2' Paved Shoulders (C-32 from Absaraka to C-5, C-5 from C-32 to C-10)

Planned Future Road Dimensions: 2 Lanes/ 12' Lanes with 1' Paved Shoulders (C-10 from C-5 to I-94), 2 Lanes/12' Lanes with 1' Paved Shoulders (C-32 from Absaraka to C-5, C-5 from C-32 to C-10)

Last Year Paved: 1990

Cass 5 from I94 to Cass 6: (7 miles, \$1.2 Million) This section of Cass 5 was last paved in 1987 and is in need of a thin maintenance overlay. Based on available funding, this project may be moved to 2013.

Cost per Mile: \$171,429

Current Road Dimensions: 2 Lanes/12' Lanes with 4' Gravel Shoulders

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West Fargo, North Dakota
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Planned Future Road Dimensions: 2 Lanes/12' Lanes with 4' Paved Shoulders
Last Year Paved: 1987

Cass 6 from Barnes County to Cass 38: (6 miles, \$600,000) This section of Cass 6 was last paved in 1995 and is in need of a thin maintenance overlay.

Cost per Mile: \$100,000

Current Road Dimensions: 2 Lanes/12' Lanes with 2' Paved Shoulders

Planned Future Road Dimensions: 2 Lanes/12' Lanes with 1' Paved Shoulders

Last Year Paved: 1995

Grading Projects:

Cass 4 from Cass 11 to Drain 13: (7 miles, \$5.7 Million) This road is very narrow and has almost no base under the existing pavement. For these reasons, the best alternative is to recycle the existing asphalt for new base material and re-grade the road in 2012 and place an asphalt surface in 2013. This project was originally approved to start in 2011 but the need for right of way precluded 2011 construction.

Cost per Mile: \$814,285

Current Road Dimensions: 2 Lanes/12' Lanes with 2' Gravel Shoulders

Planned Future Road Dimensions: 2 Lanes/12' Lanes with 6' Paved Shoulders

Last Year Paved: 1995

Subgrade Repair Projects:

Cass 20 from Cass 11 east 5 miles: (5 miles, \$100,000) Sections of this five mile segment will be targeted for reshaping and subgrade repair.

Drain Tile: (25 miles, \$500,000) We have significant subgrade moisture issues on our gravel road system from recent floods and rains. This drain tile project will reduce the miles of gravel roadway with significant subgrade problems and reduce the maintenance and additional gravel needed to keep these roadways to standard. The exact location of this project will be determined this winter during the design phase.

Subgrade Repair: (2 miles, \$300,000) In 2011 we bid a Subgrade Repair project for Cass 11 north of Cass 4. This will be used to repair and reinforce the subgrade of an additional two miles of gravel road.

Bridge Projects:

35/36 Wiser – Cass 31: This is a County bridge with settling and moving of the south abutment. The existing bridge is 20 feet in length and was built in 1940. Estimated cost is \$200,000.

24 Howes/19 Gill – Cass 7 on a Branch of Maple River: This is a County bridge with a posted limit of 30 tons and a rating of 56.5. It was built 1943, with a length of 31 feet. Estimated cost is \$500,000.

23/24 Walburg – Township Road on Buffalo Creek: This is a Township bridge with an alert Code 3, a posted limit of 18 tons, and a rating of 50.8. It is an existing Timber Box Culvert structure built in 1971, with a length of 21 feet. A hydraulic analysis has been completed with a recommended double 4 ft x 10 ft Box Culvert. Estimated cost is \$175,000.

20/29 Mapleton – Township Road on Drain 14: This is a Township bridge with an alert Code 3 and a rating of 56.4. This structure was built in 1970, with a length of 50 feet. Estimated cost is \$600,000 (\$360,000 Water Resource District and \$240,000 Cass County).

31/32 Noble – Township Road on Drain 32: This is a Township bridge with a posted limit of 6 tons and a rating of 39.0. This structure was built in 1941, with a length of 37 feet. Estimated cost is \$375,000 (\$225,000 Water Resource District and \$150,000 Cass County).

Review of Posted Bridges:

Three Bridges Removed from Posted List:

Design data was found for these three bridges and submitted to the NDDOT Bridge Division for review. All three bridges were found to meet the weight requirements for the road:

1. Cass Hwy 9 (17/18 Durbin)
2. Cass Hwy 26 (34 Rochester/3 Lake)
3. Cass Hwy 6 (15/22 Clifton)

Status of Remaining Posted Bridges (with data from NDDOT):

Cass Hwy 7 (24 Howes/19 Gill):

- We have plans showing beam sizes
- If asphalt removed it is really borderline 35 ton rating.
- Built in 1943
- Current Sufficiency Rating is 56.5
- Scheduled for Replacement in 2012

Cass Hwy 32 (35 Cornell/03 Tower):

- No existing data for this bridge, used field measurements to determine rating
- Built in 1955
- Current Sufficiency Rating is 53.3

- Recommend Replacement, this bridge is eligible for 40:60 cost share with Maple River WRD

Cass Hwy 32 (27/28 Amenia):

- No existing information, used field measurements
- Does not meet 36 ton rating “if there are no shear connectors.” If there are shear connectors, the load rating would be 40 tons and no posting required.
- Inspected and no shear connectors were found
- Built in 1953
- Current Sufficiency Rating is 57.3
- Recommend Replacement

Cass Hwy 34 (15/22 Gunkel):

- Existing Wooden Box Culvert
- Built in 1953
- Recommend Replacement

Cass Hwy 36 (1/2 Normanna):

- No existing data, used field measurements
- Exterior beams in spans 1 & 3 control ratings. Re-rating with LFR is 34 tons which still requires load posting.
- Built in 1956
- Current Sufficiency Rating is 67.3
- Still determining options for this bridge

Cass Hwy 4 (3/10 Cornell):

- We have no prestress data for this bridge.
- It was rated at H15 because at the time of the construction that was the normal design load.
- Checked with ND Concrete Products and they do not have the shop drawings for this bridge.
- Built in 1965
- Current Sufficiency Rating is 70.1
- Recommend Load Testing

Cass Hwy 32 (10/30 Rush River):

- We have no prestress data for this bridge.
- It was rated at H15 because at the time of construction, that was the normal design load.
- Checked with ND Concrete Products and they do not have the shop drawings for this bridge.
- Built in 1960
- Current Sufficiency Rating is 70.1
- Recommend Load Testing



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TO: Cass County Road Advisory Committee
FROM: Jason Benson, P.E. County Engineer *JAB*
DATE: March 15, 2011
SUBJECT: Cass County Comprehensive Highway Plan

Former County Engineer, Keith Berndt had initiated a process to revise work done by the Upper Great Plains Transportation Institute on a comprehensive planning document aimed at defining and communicating the County's process in Highway improvements and maintenance. The idea was to develop a document that effectively communicated the inventory of the County Highway System as well as the method of preservation employed to maintain our County roads and bridges.

This Transportation Plan is intended to assist both the Highway Department and Commissioners in the decision making process to develop our construction and maintenance activities for the County Highway System. Included in the plan is a short discussion on the important factors that are used to determine a five-year plan of maintenance and improvements.

Over the past few months Engineering and Planning Staff have been meeting internally to further develop this plan. We plan to continue these internal working group meetings, with an anticipated final completion of the plan for the July Road Advisory meeting. Once the final plan is adopted, it is intended to be updated annually prior to the July Road Advisory meeting and to assist in the budgeting process for determining future projects and costs. This document will serve as an administrative tool setting the framework of our maintenance and construction activities on the County Highway System.

At the March 19, 2012 meeting we would like to deliver to the Road Advisory Group a draft of the plan and provide a short presentation.

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TO: Cass County Road Advisory Committee
FROM: Jason Benson, P.E. County Engineer *JB*
DATE: March 15, 2011
SUBJECT: FM Diversion North Master Transportation Plan

The FM Diversion Technical Group has developed a Draft Report on the North Master Transportation Plan. This plan covers the transportation issues from Cass County Highway 20 north to the diversion outlet on the Red River. This portion of the diversion crosses Cass Hwy 20, Cass Hwy 22, Cass Hwy 32, Cass Hwy 81, Cass Hwy 4 and Cass Hwy 31.

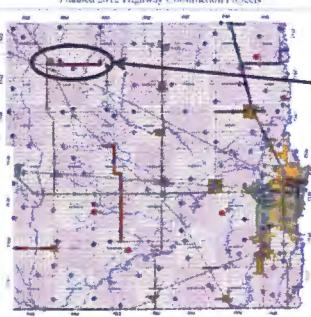
At the March 19, 2012 meeting we would like to deliver to the Road Advisory Group a short presentation discussing this Master Transportation Plan and our Cass County Highway System.

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Cass County Highway Department
Planned 2012 Highway Construction Projects

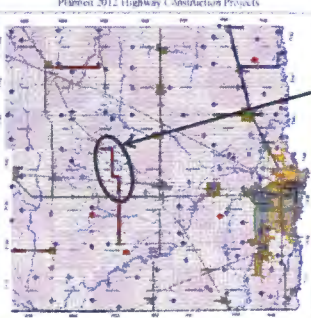


Cass Highway 26 Overlay

- Project Length: 8 miles,
- Project Cost: \$2 Million (\$1.619 Million Federal, \$381,000 Local)
- Cost per Mile: \$250,000
- Current Road Dimensions: 2 Lanes/12' Wide with 6' Gravel Shoulders
- Proposed Future Road Dimensions: 2 Lanes/12' Wide with 5' Paved Shoulders
- Last Year Paved: 1994

CASS COUNTY GOVERNMENT

Cass County Highway Department
Planned 2012 Highway Construction Projects

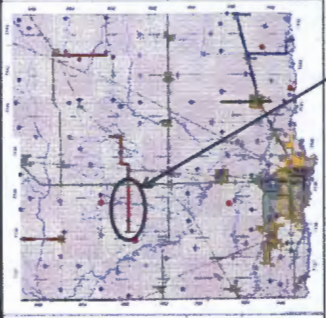


Cass Highway 5 Overlay (North of I94)

- Project Length: 9.5 miles,
- Project Cost: \$1.5 Million
- Cost per Mile: \$157,895
- Current Road Dimensions: 2 Lanes/ 12' Lanes with 1' Paved Shoulders (C-10 from C-5 to I-94), 2 Lanes/12' Lanes with 2' Paved Shoulders (C-32 from Absaraka to C-5, C-5 from C-32 to C-10)
- Proposed Future Road Dimensions: 2 Lanes/ 12' Lanes with 1' to 2' Paved Shoulders
- Last Year Paved: 1990

CASS COUNTY GOVERNMENT

Cass County Highway Department
Planned 2012 Highway Construction Projects




Cass Highway 5 Overlay (South of I94)

- Project Length: 7 miles,
- Cost: \$1.2 Million,
- Cost per Mile: \$171,429
- Current Road Dimensions: 2 Lanes/12' Lanes with 4' Gravel Shoulders
- Proposed Future Road Dimensions: 2 Lanes/12' Lanes with 4' Paved Shoulders
- Last Year Paved: 1987

CASS COUNTY GOVERNMENT

Cass County Highway Department
Planned 2012 Highway Construction Projects




Cass Highway 6 Overlay

- Project Length: 6 miles
- Project Cost: \$600,000
- Cost per Mile: \$100,000
- Current Road Dimensions: 2 Lanes/12' Lanes with 2' Paved Shoulders
- Proposed Future Road Dimensions: 2 Lanes/12' Lanes with 1' Paved Shoulders
- Last Year Paved: 1995

CASS COUNTY GOVERNMENT

Cass County Highway Department
Planned 2012 Highway Construction Projects



Cass Highway 4 Grading

- Project Length: 7 miles,
- Project Cost: \$5.7 Million
- Grading in 2012 and asphalt surfacing in 2013.
- Cost per Mile: \$814,285
- Current Road Dimensions: 2 Lanes/12' Lanes with 2' Gravel Shoulders
- Proposed Future Road Dimensions: 2 Lanes/12' Lanes with 6' Paved Shoulders
- Last Year Paved: 1995

CASS COUNTY GOVERNMENT

Cass County Highway Department
Planned 2012 Highway Construction Projects

Drain Tile, Reshaping, & Subgrade Repair

Drain Tile:

- Project Length: 20 miles
- Cost: \$500,000
- Cost per Mile: \$25,000

Reshaping:

- Project Length: 5 miles
- Cost: \$100,000
- Cost per Mile: \$20,000

Subgrade Repair:

- Project Length: 2 miles
- Cost: \$300,000
- Cost per Mile: \$150,000

Cass County Highway Department
Planned 2012 Highway Construction Projects

Cass Highway 31 Bridge

35/36 Wisner Township:

- Existing bridge is 20 feet in length
- Built in 1940.
- Estimated Cost: \$200,000.

Cass County Highway Department
Planned 2012 Highway Construction Projects

Cass Highway 7 Bridge

24 Howes/19 Gill – on a Branch of Maple River:

- Existing bridge has a posted limit of 30 tons, a rating of 56.5 and a length of 31 feet.
- Built in 1943
- Estimated Cost: \$500,000

Cass County Highway Department
Planned 2012 Highway Construction Projects

Walburg Township Bridge

23/24 Walburg – Township Road on Buffalo Creek:

- Township bridge with an alert Code 3, a posted limit of 18 tons, and a rating of 50.8.
- Existing Timber Box Culvert structure built in 1971
- Install new double 4 ft x 10 ft Box Culvert.
- Estimated cost is \$175,000.

CASS COUNTY GOVERNMENT

Cass County Highway Department
Planned 2012 Highway Construction Projects

Mapleton Township Bridge

20/29 Mapleton – Township Road on Drain 14:

- Township bridge with an alert Code 3 and a rating of 56.4.
- Existing structure was built in 1970, with a length of 50 feet.
- Estimated cost is \$600,000 (\$360,000 Water Resource District and \$240,000 Cass County).

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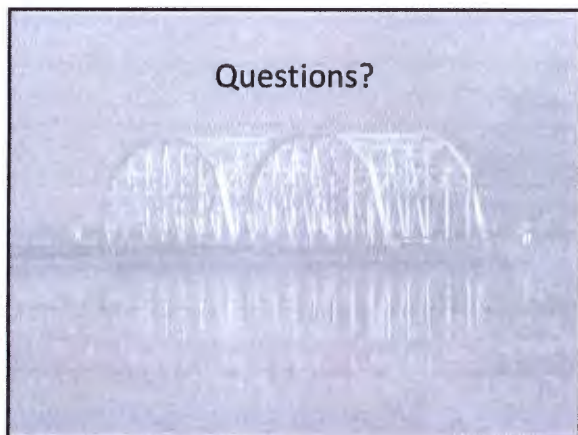
Cass County Highway Department
Planned 2012 Highway Construction Projects

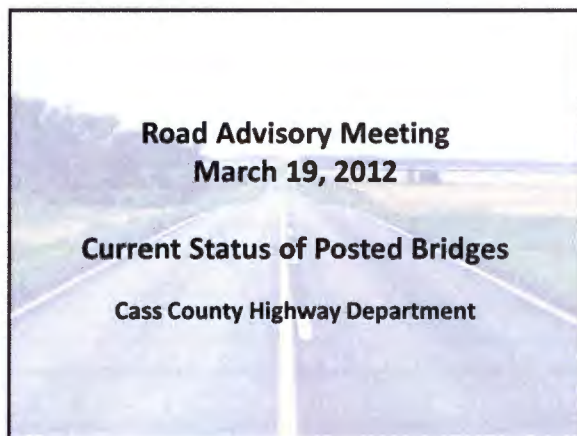
Noble Township Bridge

31/32 Noble – Township Road on Drain 32:

- Township bridge with a posted limit of 6 tons and a rating of 39.0.
- Existing structure was built in 1941, with a length of 37 feet.
- Estimated cost is \$375,000 (\$225,000 Water Resource District and \$150,000 Cass County).

CASS COUNTY GOVERNMENT





Posted Bridges Cass County Heavy System
Old version

Bridges Removed from Posted Limits

- C-26 west of Page
- C-6 west of Alice
- C-9 north of Durbin
- Design data was found for these bridges and submitted to the NDDOT Bridge Division for Review
- All three bridge where found to meet the weight requirements for the road

CASS COUNTY GOVERNMENT

Posted Bridges on Cass County Highway System

**Cass Hwy 7
(24 Howes/19 Gill)**

- We have plans showing beam sizes
- If asphalt removed it is really borderline 35 ton rating.
- Built in 1943
- Current Sufficiency Rating is 56.5
- **Scheduled for Replacement In 2012**

CASS COUNTY GOVERNMENT

Posted Bridges on Cass County Highway System

**Cass Hwy 32
(35 Cornell/03 Tower)**

- No existing data for this bridge, used field measurements to determine rating
- Built in 1955
- Current Sufficiency Rating is 53.3
- **Recommend Replacement, this bridge is eligible for 40:60 cost share with Maple River WRD**

CASS COUNTY GOVERNMENT

Posted Bridges on Cass County Highway System

**Cass Hwy 32
(27/28 Amenia)**

- No existing information, used field measurements
- Does not meet 36 ton rating "if there are no shear connectors." If there are shear connectors, the load rating would be 40 tons and no posting required.
- Inspected and no shear connectors were found
- Built in 1953
- Current Sufficiency Rating is 57.3
- **Working to determine if a cost effective repair is available. If not, Recommend Replacement**

CASS COUNTY GOVERNMENT

Posted Bridges on Cass County Highway System

**Cass Hwy 34
(15/22 Gunkel)**

- Existing Wooden Box Culvert
- Built in 1953
- Recommend Replacement**

CASS COUNTY GOVERNMENT

Posted Bridges on Cass County Highway System

**Cass Hwy 36
(1/2 Normanna)**

- No existing data, used field measurements
- Exterior beams in spans 1 & 3 control ratings. Re-rating with LFR is 34 tons which still requires load posting.
- Built in 1956
- Current Sufficiency Rating is 67.3
- Still determining options for this bridge, there may be a cost effective method to raise the load limit. **We'll know by May 1st.**

CASS COUNTY GOVERNMENT

Posted Bridges on Cass County Highway System

**Cass Hwy 4
(3/10 Cornell)**

- We have no prestress data for this bridge.
- It was rated at H15 because at the time of the construction that was the normal design load.
- Checked with ND Concrete Products and they do not have the shop drawings for this bridge.
- Built in 1965
- Current Sufficiency Rating is 70.1
- Recommend Load Testing**

CASS COUNTY GOVERNMENT

Posted Bridges on Cass County Highway System

Cass Hwy 32 (10/30 Rush River)

- We have no prestress data for this bridge.
- It was rated at H15 because at the time of construction, that was the normal design load.
- Checked with ND Concrete Products and they do not have the shop drawings for this bridge.
- Built in 1960
- Current Sufficiency Rating is 70.1
- **Recommend Load Testing**

Posted Bridges on Cass County Highway System

Old version

Overall Status

- **Three bridge** where found to meet the weight requirements for the road
 - Cost = \$0
- **Three Bridges** can be removed with Load Testing and Minor Repairs
 - Estimated Cost = \$80,000
- **Three Bridges and One Box Culvert** to be Replaced
 - Estimated Cost = \$1.5 Million

Why Load Testing?

- Existing load rating based on theoretical formula may not always accurately determine true load capacity
- May avoid unnecessary replacements
- Evaluate the need for load restrictions on damaged bridges or removal of load restrictions where not necessary

Who Else Can Perform this Testing

- Reportedly only two major firms in the Country are able to perform this type of testing
 - BDI offers specialized testing for this application
 - Positive checks on references



Comments From ND DOT

- *“The load testing method is absolutely acceptable in load rating of a bridge. In some cases, load testing gives ratings greater than the theoretical formulas that we use to rate structures.”*
“We do agree that this cost makes sense rather than blindly replacing these structures that are in relatively good condition. Part of the sufficiency rating is the inventory load rating of the structure, so if the rating is greater than what has been assumed, the sufficiency rating will go even higher.”
 - Gary L. Doerr PE
Bridge Management Section Leader
ND Department of Transportation



What do we get?

- Load Rating Report
 - Executive Summary of Results
 - General outline of all instruments and testing procedures
 - Set of “as-built” plans that show the geometry and the primary moment and shear reinforcement
 - General observations
 - Development and calibration of finite element model with field data for each superstructure
 - Load rating results
 - Conclusions and recommendations

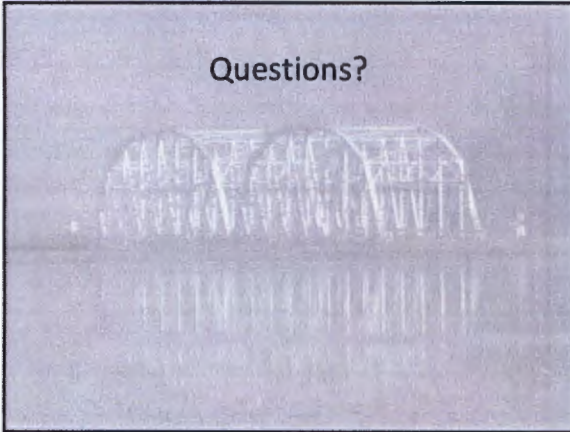


Recommendation

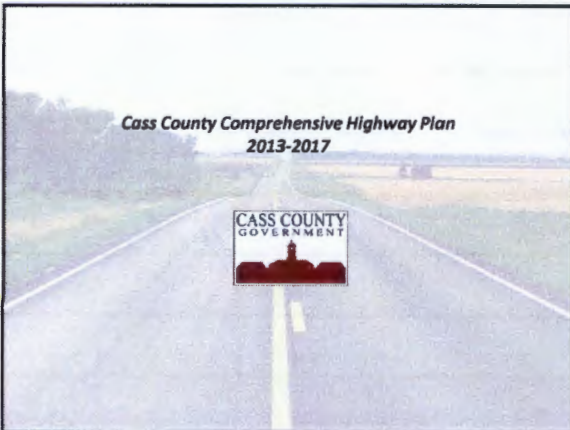
- The cost of this testing is \$29,360 per bridge, compared to a new bridge cost of \$300,000.
- I am recommending today to the Commission that they approve of a contract with Bridge Diagnostics, Inc. to test two bridges in Cass County.



Questions?



*Cass County Comprehensive Highway Plan
2013-2017*



Why is the Plan Needed

- Nearly 700 miles of roads
- Approximately 500 structures
- Natural process of decline in roads and structures due to age, wear, increased traffic, different types of traffic, changing demands of the public
- Steady increase in costs
- Limited sources for increased funding



Where Does the Plan Come From

- NDCC 11-31-03.2 Powers and Duties
 - Under the direction and supervision of the board of county commissioners, the county engineer shall: ...
 - 2. Set up a comprehensive plan of county highways, showing by the use of maps, existing roads, operations in progress, and future plans.
- Vision and Mission of Cass County Highway Department
 - **Vision** - *To be recognized as a premiere county road program in the Northern Plains states.*
 - **Mission** - *To provide and maintain an efficient, safe, environmentally sensitive, and cost effective county road system that effectively meets the citizen's needs for personal mobility and the movement of freight consistent with the importance of the economy.*



Plan Tied to Adopted 2005 Comprehensive Plan

- **2005 Cass County Comprehensive Plan Goal Two:**
"To provide the citizens of Cass County with essential public facilities, services, and infrastructure."
- **2005 Cass County Comprehensive Plan Goal Three:**
"To provide an efficient, safe, environmentally sensitive, and cost effective county transportation system to effectively meet citizen's current and future needs for personal mobility and movement of goods."



What is the Purpose of the Plan

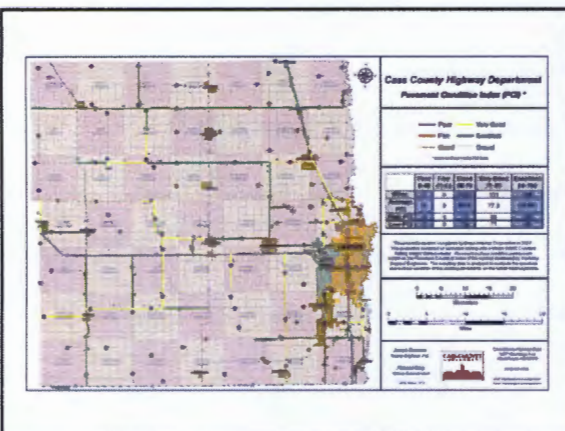
- To better prioritize future road projects
- To effectively maintain a schedule of maintenance that most efficiently realizes the life of roads and structures to avoid re-building roads and structures as much as possible
- To efficiently inventory and provide our data in readable formats and identify further data needs
- To more effectively communicate the process taken in planning our construction schedule

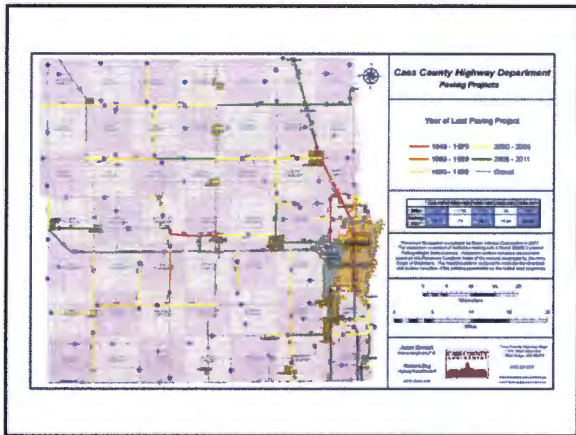


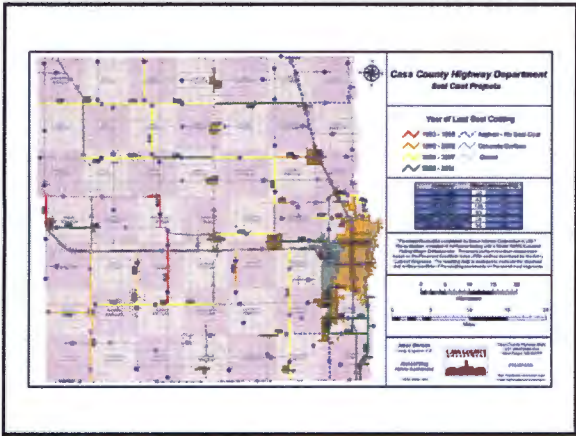
What is Behind the Plan

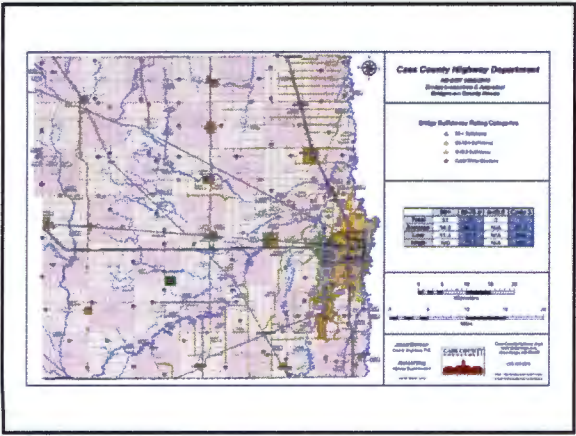
- Data obtained on 5-year schedule by way of non-destructive testing from contracted 3rd party consultant
- Ongoing Traffic Counts obtained from ND DOT and FM Metro COG
- Crash Data obtained from ND DOT
- Bi-annual Bridge Inspection Data received from ND DOT
- Local GIS data from Cass County Geodatabase
- Population characteristics and numbers from FM Metro COG Demographic Forecasting and US Census
- Land use data from Planning Office and Tax Equalization
- Local ordinances and planning studies

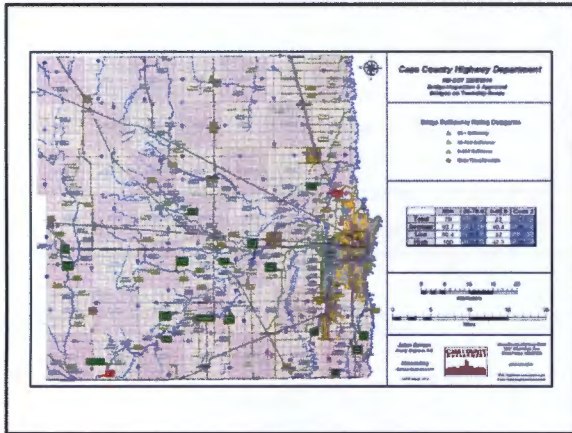












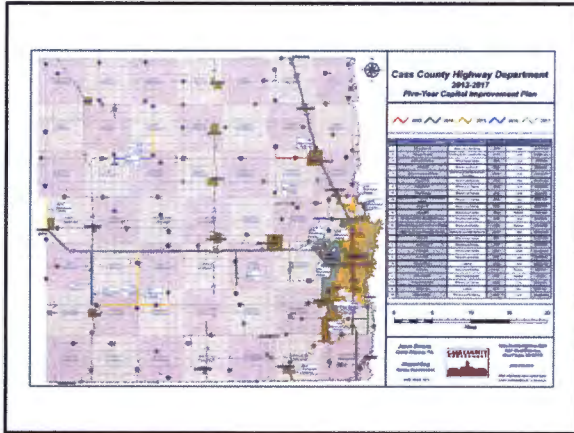
Improvement Plans

- Paved Highway Improvements
 - Maintenance Overlays
 - Grading and surfacing Cass 38, Cass 15 through Kindred, C10 project with West Fargo and Fargo
 - Grading 15 north of I-94
- Gravel Highway Improvement
 - Drain Tile
 - Subgrade Repair
 - Reshaping
- Bridge Improvements
 - County Highways
 - Township Road
 - Flood Repair

CASS COUNTY GOVERNMENT

2013-2017 Paved Highway Improvement Plan

Item	Project Location	Typical Project	Year	Funding Source	Project Cost
4	C11 to Brainer 13	Maintenance Surfacing	2013	Local	\$1,750,000
15	through Kindred	Grading & Concrete Surfacing	2013	Local	\$1,000,000
15	C28 north to A Millie	Maintenance Overlay	2014	Local	\$114,000
20	C27 to 28	Maintenance Overlay	2014	Local	\$475,000
20	28 to University Dr (Fargo)	Maintenance Overlay and Add Turnoffs	2014	Local	\$4,000,000
16	C22 to C28	Maintenance Overlay	2014	Local	\$3,000,000
9	94 to Dublin	Maintenance Overlay	2014	Local	\$900,000
23	C12 to Propper	Maintenance Overlay	2014	Local	\$445,000
20	West Ave Street Project to 1.4 miles South & East	Maintenance Overlay	2014	Local	\$300,000
21	C14 to C16	Maintenance Overlay	2014	Local	\$448,000
14	22 to 23	Maintenance Overlay	2014	Federal	\$307,900
15	12th Ave N to Main Ave (West Fargo)	Maintenance Overlay	2014	Local	\$301,071
21	14th Ave S (Fargo City Limits) to C14 West	Maintenance Overlay	2014	Federal	\$304,000
7	48 to C14	Maintenance Overlay	2015	Local	\$1,300,000
5	48 to C13	Maintenance Overlay	2015	Local	\$800,000
6	C13 to C1	Maintenance Overlay	2015	Local	\$1,000,000
5	C1 to C14	Maintenance Overlay	2015	Local	\$946,000
10	C13 to City of Fargo Limits (12th Ave N.)	Grading & Concrete Surfacing	2015	Local	\$4,000,000
3	48 to C1	Maintenance Overlay	2015	Federal	\$59,300
4	C1 to C1 North	Maintenance Overlay	2016	Federal	\$43,300
10	C1 to 1st Street West	Maintenance Overlay	2016	Local	\$50,000
10	44 to C1 East	Grading	2016	Local	\$480,000
18	44 to C1 East	Maintenance Overlay	2017	Local	\$480,000
15	44 to C10	Grading	2017	Local	\$100,000



Next Steps for Plan

- Continue to develop a fiscally constrained plan for the next five construction years
- Receive latest ND DOT Bridge Inspections and develop a priority schedule based on needs, traffic, and other variables for structure repair or replacements
- Develop schedule to inventory structures under 20 feet
- Submit final draft at July Road Advisory Meeting and submit for adoption to County Commission by August, 2012



Questions?






Introduction

The purpose of this study is to analyze the disruptions to roadway system continuity for the north section of the Red River diversion alignment (Maple River to the outfall), analyze the resulting impacts these disruptions have on roadway users and formulate recommendations intended to mitigate these impacts. This study employed a public input-centric approach that focused on consensus and relationship building. Input solicited from the following groups guided the development of study goals, deliverables and recommendations:


• Cass County Engineering and Planning	• Cass County Sheriff's Office
• Berlin Township Board	• Harwood Fire Station
• Hardwood Township Board	• Mapleton Fire Station
• Raymond Township Board	• Gardner Fire Station
• Wisner Township Board	• Northern Cass School District
• Red River Regional Dispatch Center	• West Fargo District
	• Harwood Post Office

*Argusville Fire Station, Mapleton School District and Central Cass School District were solicited for input but did not attend their respective meetings.



Connectivity

- Bridges are required to maintain connectivity across the diversion channel. Based upon the diversion alignment, existing infrastructure, traffic volumes, bridges are proposed on the following roadways:
- Combination of County Road 4 and County Road 31
- County Road 20
- County Road 22
- County Road 32
- County Road 81



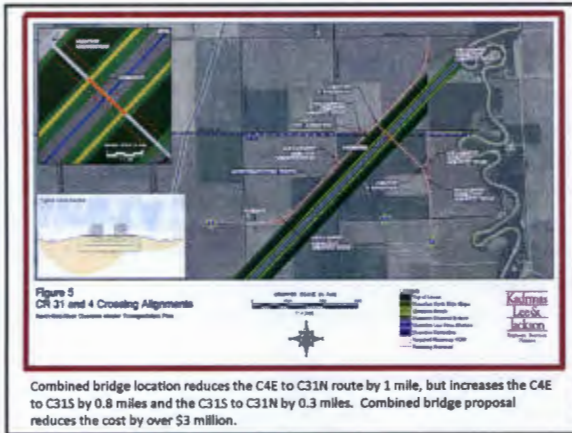


Additional Bridge Location Factors

- Proposed diversion alignment results in many of the county road bridges would not cross the channel perpendicularly.
- Significant because each degree of skew at a bridge requires additional bridge deck to compensate for the longer crossing.
 - For example, a bridge that would be 600 feet if perpendicular to the diversion would be nearly 250 feet longer if the bridge was skewed by 45 degrees. However, this is not a constant rate.
 - For example, a 10 degree skew requires 10 feet of additional bridge length.
- Using cost estimates, nearly 100 feet of gravel roadway can be built for every foot of bridge deck. As such, all bridges were first designed to perpendicularly cross the diversion.
- Analysis indicated a bridge across the diversion perpendicularly at both CR 4 and CR 31 would result in bridges approximately one mile apart. Based upon input from the County Engineer and Townships, the construction of one bridge, shared and located between the two county roads, was selected as the optimal decision in terms of bridge cost and practicability.

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Construction Accommodations

- Bridges will be built prior to the Diversion channel.
- At lower volume county roads, bypass routes using existing township roads are proposed.
- At higher volume locations and where surrounding infrastructure is incomplete or would require long detours, new bypass roads are proposed.
- The proposed combination bridge for CR 4 and CR 31 will not be located on the existing roadways. As a result, this bridge does not require a temporary bypass route.



Bridge Project Costs

Cost	Roadway	Bridge	Bypass	Total
County Road 4/31	\$3,004,100	\$3,784,500	\$0	\$6,788,600
County Road 81	\$717,000	\$4,205,000	\$1,010,900	\$5,932,900
County Road 32	\$694,600	\$4,241,300	\$329,200	\$5,265,100
County Road 22	\$95,900	\$4,045,500	\$329,200	\$4,470,600
County Road 20	\$81,700	\$4,640,000	\$1,010,900	\$5,732,600
167th Ave SE Improvements	\$2,370,800	\$0	\$0	\$2,370,800
27th St SE Connection to CR 81	\$502,400	\$0	\$0	\$502,400
Roadway Terminations at Diversion	\$323,400	\$0	\$0	\$323,400

Note: Cost Includes 25% Contingency and 20% Engineering Fee



