

SCOPING REPORT

Project No.

PCN

State Line N to S Jct 11 Forman



Prepared by

**NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
BISMARCK, NORTH DAKOTA**

<http://www.dot.nd.gov/>

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SCOPING REPORT

A. GENERAL INFORMATION

Project Number:

District: Fargo

Highway: 32

Location: State Line N to S Jct 11 Forman

Reference Point: 0.000 to RP 10.308 – 10.308 Miles

Counties: Sargent

Legal Description: T129N R55W Sec 6, 7, 18, 19, 30, & 31

T129N R56W Sec 1, 12, 13, 24, 25, & 36

T130N R55W Sec 6, 7, 18, 19, 30, & 31

T130N R56W Sec 1, 12, 13, 24, 25, & 36

Functional and Funding Roadway Classification: District Corridor

National Highway System: No

Speed Limit: 65 mph

Freight Level: 2

Freight Constraints: Roadway Width Restriction

Project Schedule: Proposed to be developed if additional funding becomes available.
Preventative Maintenance in priorities for 2025.

dTIMS Recommendations: Constrained: PM Asphalt 2021

Unconstrained: PM Asphalt 2021

B. PURPOSE, NEED, AND IMPROVEMENT

Purpose and Need of Project: This segment currently has a width restriction due to not meeting the Freight Plan's minimum roadway width of 26' for freight level 2. This segment is currently 25' wide with a couple areas that wider. The pavement was sealed in 2020 and is in decent condition, with good IRI score and a fair distress score.

Proposed Improvement: Two different options are being proposed for this segment, each being a different strategy. A minor rehabilitation sliver grading and overlay is proposed as the first option to widen the roadway to 29' and restore the pavement structure. The second option is a major rehabilitation widening and overlay to widen the roadway and restore the pavement structure. The major rehabilitation allows a wider roadway section to be constructed and two different width options are being proposed, 30' or 32'. The additional width included would provide for a longer unrestricted future and should also allow additional future overlays. The preliminary pavement design for the major rehabilitation varied from 2" – 3.5" depending on the mill depth. A 1" mill and 3" HMA overlay was assumed for all options, minor or major, meeting a 20-year design life.

Addressing safety issues would vary by option. A major rehabilitation would include completing a 90-1 survey and areas needing safety improvements would be addressed. Safety hardware would also be upgraded to be in compliance with MASH performance criteria. Under the minor rehabilitation option, safety issues would be identified and addressed as part of the Statewide Safety Program. Safety features would remain as they exist unless a need is identified. Safety hardware that is not in compliance with NCHRP Report 350 performance criteria will be upgraded to be in compliance with MASH* performance criteria.

C. TRAFFIC AND CRASH ANALYSIS

RP 0.000 to RP 1.000	Year	Pass	Trucks	Total AADT	Flex ESALS	Rigid ESALS
Current Traffic	2019	320	200	520	190	325
Forecast Traffic	2039	390	270	660	260	435

RP 1.000 to RP 10.308	Year	Pass	Trucks	Total AADT	Flex ESALS	Rigid ESALS
Current Traffic	2019	585	205	790	195	330
Forecast Traffic	2039	715	280	995	270	455

Crash Analysis: The 5 – year study period used was 10/1/2015 – 9/30/2020. Animal crashes were not included. On 8/1/2019 the cost threshold for a reportable crash increased from \$1,000 to \$4,000 due to legislative change, so recent years may show fewer crashes than previous years.

General Summary of Crashes						
Year	Start Date	End Date	Intersection (or Alley/Drwy)	Non-Intersection		Total
				Single Vehicle	Multiple Vehicles	
1	10/1/2015	9/30/2016	1	1		2
2	10/1/2016	9/30/2017		1		1
3	10/1/2017	9/30/2018				
4	10/1/2018	9/30/2019				
5	10/1/2019	9/30/2020				
			1	2	0	3

Notes/Trends:

- The 2017-2019 Rural Highway Segment Crash Map shows this segment is in the low range for weighted crashes per mile.
- No crash patterns/trends were identified.

Recommendation: None at this time.

D. EXISTING ROADWAY CHARACTERISTICS

	International Roughness Index (IRI)	Distress Score	Rut
Excellent	< =60	≥ 98	< 0.25"
Good	61 – 99	88 – 97	0.25" to 0.375"
Fair	100 – 145	77 – 87	0.376" to 0.50"
Poor	> 145	≤ 76	> 0.50"

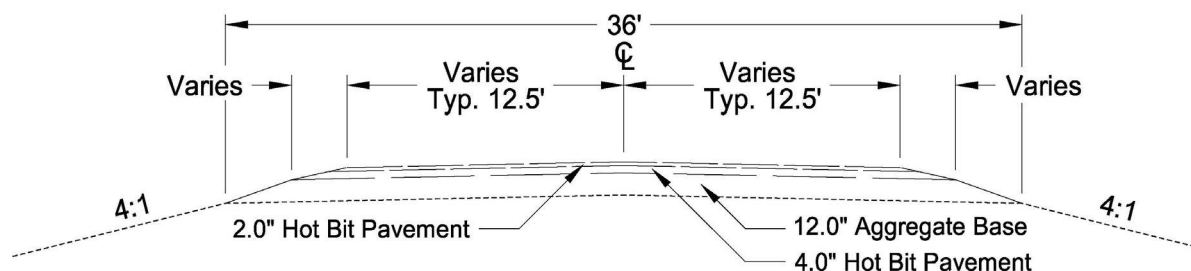
RP 162.802 TO 168.508

Actual Age	IRI	IRI Rating	SI or SCI	Faulting
22	92	Good	7	N/A
Effective Age	Distress	Distress Score	Rutting	Rutting Score
22	87	Fair	0.21	Excellent

CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
1950	GRADE	-	36	-
1950	TRAFFIC SERVICE GRAVEL	3.5	22	-
1955	AGGREGATE BASE	5	34	-
1955	STABILIZED BASE	2	32	-
1955	HOT BIT PAVEMENT	2.5	24	120 – 150
1971	HOT BIT PAVEMENT	1.5	24	60 – 70
1990	MILLING	-1	24	-
1990	HOT BIT PAVEMENT	2.5	27	120 – 150
1990	SAFETY PROJECT	-	-	-
1996	CONTRACT CHIP SEAL	-	24	HFMS – 2
1998	AGGREGATE BASE	12	36	-
1998	HOT BIT PAVEMENT	4	36	PG 58 – 28
2003	DISTRICT CHIP SEAL	-	24	HFMS – 2
2010	HOT BIT PAVEMENT	2	25	PG 58 – 28
2013	CONTRACT CHIP SEAL	-	27	HFMS – 2
2020	CONTRACT CHIP SEAL	-	25	HFMS – 2

Existing Foreslopes: 4:1

Existing Typical Section:



There is some variation in the width of this segment. The pavement width is primarily 25', but there is 0.9 mile stretch of 26' and 0.5 mile grade raise section that is 34' wide.

E. EXISTING GEOMETRY

Horizontal Curves: All curves and super elevations meet a design speed of 65 mph.

Location	Speed (mph)	Radius (ft)		Superelevation (%)	
		Existing	Required	Existing	Required
RP 0.014	65	3016	1657	5.2	4.8
RP 0.776	65	3016	1657	5.2	4.8
RP 1.449	65	3016	1657	5.2	4.8

Vertical Curves: All curves meet at design speed of 65 mph.

F. EXISTING STRUCTURES

Bridges:

Bridge No.	Name	Vertical Clearance	Length	Width	Rating			
			(ft)	(ft)	Deck	Super-Structure	Sub-Structure	Culvert
0032 – 006.121	Quad, 10X10X106' RCB	N/A	43	N/A	N/A	N/A	N/A	9
Recommendations: Do nothing. It is not anticipated that extending will be required.								

Centerline Pipes: There are approximately 27 pipes within this segment. Existing pipes should be used, and pipes impacted by widening should be extended. For the major rehabilitation options, pipes should be extended beyond the clear zone or updated to traversable end sections.

There is a flooded cattle pass @ RP 1.15 that has separated and is also too short, requiring guardrail to protect the ends. The district also has subgrade issues in this area and has had to patch it numerous times. With proposed options including widening, replacing the cattle pass with a pipe is included in the proposed work and cost estimate. Addressing this pipe/problem area removes the need for guardrail and also allows the district to use this segment to divert certain truck traffic/large loads. The district will complete a centerline pipe inspection and propose correcting any additional pipe issues during project development.

G. LAND INTERESTS

Communities: Havana, ND (Population = 69)

Reservation: None

Public Land: None

Waterfall Production Area: Olson/BN Sargent County Waterfowl Production Area on west side roadway (RP 7.2 to RP 7.7).

Adjacent Land Usage: Agricultural

H. ISSUES AND APPURTENANCES CHECKLIST

- | | | |
|-----------------------------|------------------|-----------------|
| 1. Curb and Gutter? | Yes _____ | No <u> X </u> |
| 2. Sidewalk? | Yes _____ | No <u> X </u> |
| 3. Multi-Use Path? | Yes _____ | No <u> X </u> |
| 4. ADA Ramps? | Yes _____ | No <u> X </u> |
| 5. State Bicycling Network? | Yes _____ | No <u> X </u> |
| 6. Lighting? | Yes <u> X </u> | No _____ |

Destination Light at intersection of ND 32 & 101st St SE. No suggested improvements.

- | | | |
|-------------|-----------|-----------------|
| 7. Signals? | Yes _____ | No <u> X </u> |
|-------------|-----------|-----------------|

8. Storm Sewer? Yes ☐ No ☒
9. Manholes? Yes ☐ No ☒
10. Other Underground Work? Yes ☐ No ☒
11. Parking Facilities? Yes ☐ No ☒
12. Frontage Roads? Yes ☐ No ☒
13. Utility Issues? Yes ☒ No ☐

There is buried natural gas, telephone, and water line as well as overhead electric throughout project limits.

14. Landscaping? Yes ☐ No ☒
15. Approach or Ditch Block Flattening? Yes ☒ No ☐

Approaches should be investigated to determine if they meet current standards during project development.

16. T Intersection Recovery Approaches? Yes ☒ No ☐

There is a T-intersection with County Highway 3 that should be evaluated for a recovery approach during project development.

17. Fence? Yes ☐ No ☒
18. Railroad Crossings? Yes ☒ No ☐

There is an existing Dakota Missouri Valley Western railroad crossing at RP 0.75.

19. Detours? Yes ☐ No ☒
20. Automatic Traffic Recorder Locations? Yes ☐ No ☒
21. Weigh-In-Motion Sites? Yes ☐ No ☒
22. ITS (Deicing, Snow Gates, VMS, RWIS, etc.)? Yes ☐ No ☒
23. Highway Patrol/Truck Pullouts or Rest Areas? Yes ☐ No ☒
24. Additional Right of Way? Yes ☒ No ☐

ROW ranges from 60 – 333' throughout project limits. Additional ROW/easements may be needed to accommodate the widening.

25. Drainage Issues? Yes ☒ No ☐

As mentioned under the centerline pipe discussion, the cattle pass at RP 1.15 is flooded and separated.

26. Snow Impact Areas? Yes ☐ No ☒27. Subgrade Issues? Yes ☒ No ☐

As mentioned under the centerline pipe discussion, there are subgrade issues above and adjacent to the cattle pass at RP 1.15.

28. Noise Analysis: Type I Project? Yes ☐ No ☒ Maybe ☐29. Maintenance Issues? Yes ☒ No ☐

As mentioned under the centerline pipe discussion, the district has maintenance issues above and adjacent to the cattle pass at RP 1.15.

30. Guardrail? Yes ☒ No ☐

Type	RP	L/R	Length
Cable	1.1215	R	3680'
Cable	1.1215	L	300'

31. Milling? Yes ☒ No ☐

Milling may be included to produce RAP.

32. Repeated ER Events? Yes ☐ No ☒33. Interstate Access Gates? Yes ☐ No ☐ N/A ☒

I. Load Restrictions

Travel Information Map Proposed Load Restriction: Legal Weight

Freight Level Required Minimum Load Restriction: 8 – Ton

Projected Load Restrictions after project is complete: Legal Weight

J. Roadway Widths

Required Minimum Roadway Width: Minor - 26', Major - 30'

Freight Level Required Minimum Width: 26'

Surrounding Corridors: ND 11 (E) – 26'
ND 11 (N) – 26'

K. PERFORMANCE GUIDELINES

Design Speed: 65 mph

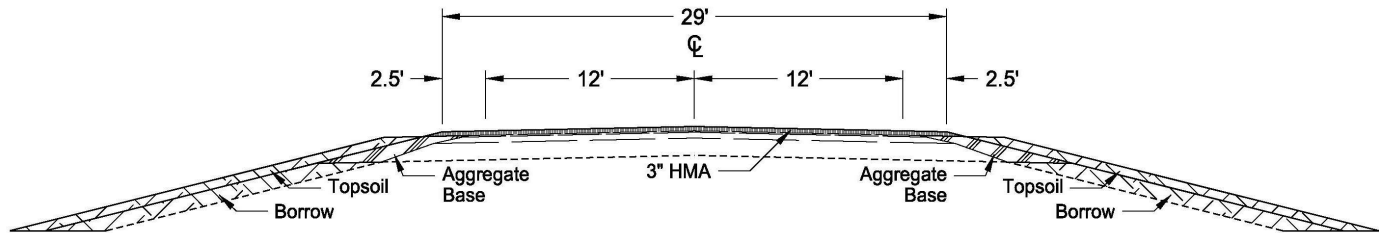
Clear Zone: Minor = Use existing, Major = 20'

Foreslopes: 4:1

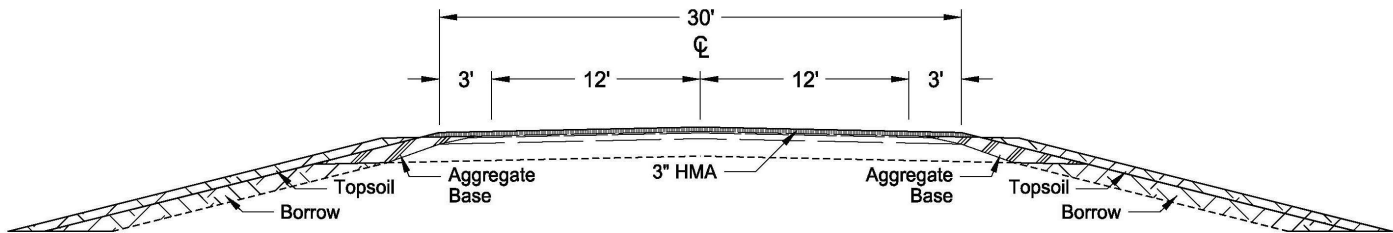
L. PROPOSED IMPROVEMENTS

Proposed Typical Sections

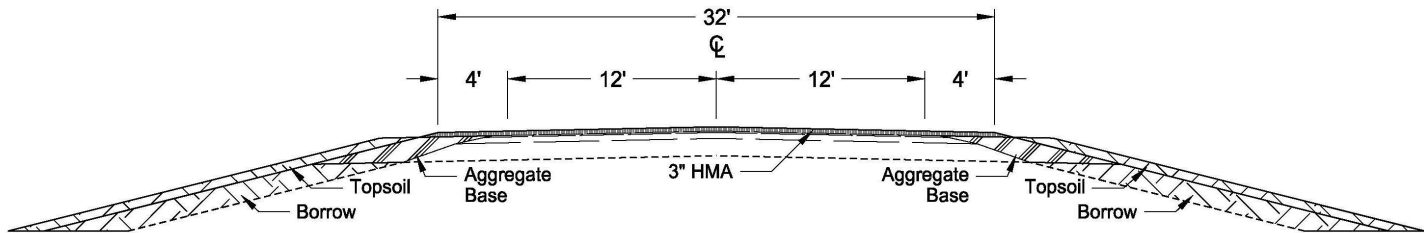
Minor Rehabilitation Sliver Grading & HMA Overlay – 29’ Pavement Width



Major Rehabilitation Widening & HMA Overlay – 30’ Pavement Width



Major Rehabilitation Widening & HMA Overlay – 32’ Pavement Width



* Widening exception area from RP 8.030 to 8.500

Future Outlook

The long-term future will vary with each width option in regards to when a width restriction will be reimplemented as well as how many overlays can be completed before the highway reaches its minimum width. The following table compares the variations in future overlay details based on current requirements of the NDDOT’s Freight Plan and Design Guidelines.

Future Overlay Info			
	29' Roadway	30' Roadway	32' Roadway
Number of subsequent overlays that reintroduces width restriction*	3	3	5
Thickness of pavement when width restriction reintroduced	>12"	>13.5"	>16"
Number of subsequent overlays before minimum width of 24' is reached*	4	4	6
Thickness of pavement when minimum width of 24' is reached	~15.0"	~16"	~19"

*May vary with milling strategies, patching, and slough slopes (4:1 assumed)

M. ADDITIONAL COMMENTS

District Engineer: I recommend Major Rehabilitation Widening and HMA Overlay – 30' width. The ND 32 crossing of the South Dakota border is often the only border highway open between US 281 and I-29 due to spring flooding. ND 1 floods at Ludden, ND 18 floods at the State line and has seasonal load restrictions.

L. COST ESTIMATE

(Inflation factor of 4% was used to estimate costs for bid year)

Item	29' Width Estimated Cost	30' Width Estimated Cost	32' Width Estimated Cost
Contract Bond & Mobilization	\$325,000	\$345,000	\$365,000
Removals	\$340,000	\$340,000	\$340,000
Dirtwork	\$900,000	\$1,050,000	\$1,250,000
Aggregate	\$740,000	\$825,000	\$1,050,000
HMA	\$2,250,000	\$2,350,000	\$2,500,000
Concrete	\$0	\$0	\$0
Structures	\$0	\$0	\$0
Pipe	\$160,000	\$160,000	\$175,000
Striping/Signing/Rumble Strips	\$90,000	\$90,000	\$90,000
Erosion Control	\$340,000	\$340,000	\$340,000
Trees/Landscaping/Fencing	\$0	\$0	\$0
Field Office/Labs	\$50,000	\$50,000	\$50,000
Work Zone Traffic Control	\$360,000	\$375,000	\$400,000
Subtotal=	\$5,555,000	\$5,925,000	\$6,560,000
Inflation=	\$725,000	\$760,000	\$805,000
Engineering=	\$1,111,000	\$1,185,000	\$1,312,000
Estimated Total Cost =	\$7,391,000	\$7,870,000	\$8,677,000
Estimated Cost Per Mile=	\$720,000	\$765,000	\$840,000

M. DECISIONS

1. Which option should advance with the project?

☐ Minor Rehabilitation Sliver Grading & HMA Overlay – 29' width
Estimated Cost = \$7,391,000

☒ Major Rehabilitation Widening & HMA Overlay – 30' width
Estimated Cost = \$7,870,000

☒ Major Rehabilitation Widening & HMA Overlay – 32' width
Estimated Cost = \$8,677,000

DDE Comments: _____

DocuSigned by:

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Deputy Director for Engineering

10/21/2021
Date