SCOPING REPORT

Project No. **PCN**

W ND 30 Int E to E of Cleveland Int

Prepared by

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
BISMARCK, NORTH DAKOTA

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

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23 USC § 407
NDDOT Reserves All Objections

SCOPING REPORT

A. GENERAL INFORMATION

Project Number:
District: Valley City
Highway: 94 - WB
Location: W of ND 30 Int E to E of Cleveland Int
Reference Point: 227.31 to 240.09 – 12.78 Miles

Counties: Stutsman
Legal Description: T139N, R67N, Sec 2-6
T139N, R68N, Sec 1-9

Functional and Funding Roadway Classification: Interstate
National Highway System: Yes
Speed Limit: 75
Freight Level: 1
Freight Constraints: No
Project Schedule: Proposed to be added to the STIP as Structural Improvement

dTIMS Recommendations: Constrained: PM Concrete 2028
Unconstrained: PM Concrete 2028

B. PURPOSE, NEED, AND IMPROVEMENT

Purpose and Need of Project:

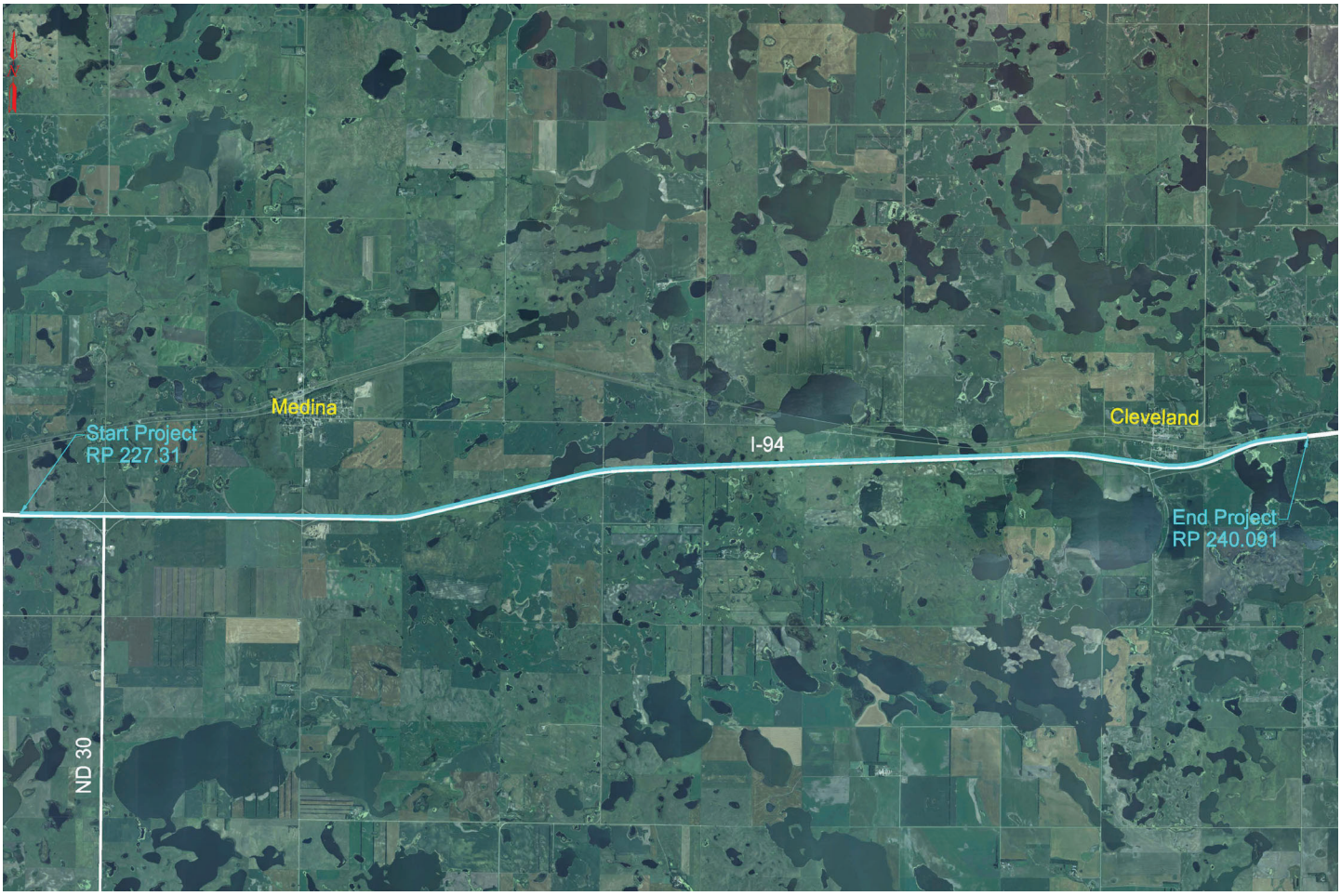
This segment had a preventative maintenance CPR project during the summer of 2023. The spall repairs and full depth repairs needed greatly exceeded the plan quantity with the district stopping at 140% of the planned quantity. Untreated spalls and cracking were sealed or patched but remain an issue. The resulting pavement is unsightly, and the distress score may remain in the fair category.

Proposed Improvement:

A structural improvement crack and seat with HMA overlay is proposed to restore the structural integrity of the road. Concrete pavement repairs would be completed on any untreated or patched spots prior to the crack and seat process. Safety hardware not compliant with NCHRP Report 350 performance criteria will be upgraded to MASH standards. The last half mile on the east end (RP 239.64 – 240.09) is from a 2020 grade raise. A 2” mill & overlay of this section is included to put it on a similar HMA lifecycle and allow it to be tied to the adjacent roadway in the future. A 2” mill & overlay of the ramps and crossroads is also included.

The overlay would decrease the vertical clearance under three structures. An option is included to reconstruct the areas near the two of the interchanges to where the vertical clearances would not meet or would approach the minimum of 16’. If not advanced, limiting or excluding the crack and seat with overlay may be required to maintain clearances based on NDDOT standards. The third structure was just reconstructed in 2022 with 17’2” clearance for this bound.

Project Location Map



C. TRAFFIC AND CRASH ANALYSIS

	Year	Pass	Trucks	Total AADT	Flex ESALS	Rigid ESALS
Current Traffic	2023	2,770	1,205	3,975	1,075	1,750
Forecast Traffic	2043	3,575	1,630	5,205	1,455	2,365

Crash Analysis:

Traffic Operations completed a review of the segment's crash data. The 5-year study period used was 10/1/2018 – 9/30/2023. Non-Injury animal crashes were not included.

			Intersection?				Severity					Surface Conditions			Work Zone
			YES	NO		Total									
Yr	Start Date	End Date	(or Alley / Drvwy)	Single Veh	Mult. Veh		K	A	B	C	O	Dry	Wet	Ice/Snow	
1	10/1/18	9/30/19		2	3	5			1	2	2	1		4	
2	10/1/19	9/30/20		6	2	8			1		7	3		5	
3	10/1/20	9/30/21		8	1	9	1		1	1	6	6		3	
4	10/1/21	9/30/22	1	7	1	9		2	1		6	5		4	1
5	10/1/22	9/30/23		9	2	11		1	2		8	4	1	6	1
			1 (2.4%)	32 (76.2%)	9 (21.4%)	**42**	1	3	6	3	29	19	1	22	2

Severity Codes: K = Fatal, A = Incapacitating Injury, B = Non-incapacitating Injury, C = Possible Injury, O = Property Damage Only

Notes/Trends:

- 76% were single vehicle crashes; 1 was fatal and 3 reported incapacitating injuries
-22 of the 32 single vehicle crashes were related to road surface conditions due to weather (ice/snow/sleet or extreme winds) and too fast for conditions
-2 single vehicle crashes occurred on the off-ramp at Exit 230
-2 single vehicle crashes occurred at the off-ramp at Exit 233 and 1 at the gore area of the off-ramp

Recommendations = 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″

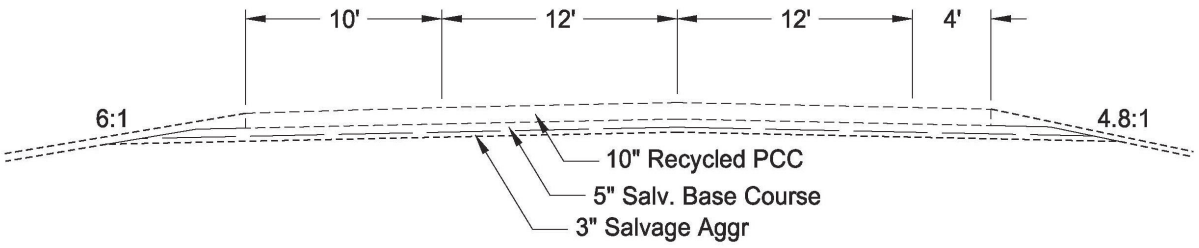
RP 227.31 TO 240.065

Actual Age	IRI	IRI Rating	SI or SCI	Faulting
37	46	Excellent	N/A	0.08
Effective Age	Distress	Distress Score	Rutting	Rutting Score
37	87	Fair	N/A	N/A

CONSTRUCTION HISTORY				
Year	Construction	Depth (in)	Width (ft)	Oil
1958	Grade	-	48.0	-
1958	C-C 75 Feet	-	-	-
1986	Recycled Bituminous Base	5.0	44.0	-
1986	Recycle PCC	10.0	24.0	-
1986	Non-Reinf PCC	10.0	10.0,0,4.0	-
1999	CPR/Dowel Bar Retrofit	-	24.0	-
1999	Grinding	-	18.0	-
2016	Concrete Pavement Repair	-	24.0	-
2016	Grinding	-	30.0	-
2023	Concrete Pavement Repair	-	24.0	-

Existing Foreslopes: 6:1

Existing Typical Section



E. EXISTING GEOMETRY

Horizontal Curves & Superelevations: Use existing horizontal curves and attempt to correct superelevations to AASHTO standards.

Vertical Curves: Use existing.

Ramps: Use Existing.

Interchange and Ramp Location	Degree of Curve	Acceleration Taper	Deceleration Taper
Streeter Interchange – NE Ramp	4°	---	40:1
Streeter Interchange – NW Ramp	4°	50:1	---
Medina Interchange – NE Ramp	4°	---	40:1
Medina Interchange – NW Ramp	4°	50:1	---
Halfway Lake Interchange – NE Ramp	2°	---	40:1
Halfway Lake Interchange – NW Ramp	2°	50:1	---
Cleveland Interchange – NE Ramp	4°	---	40:1
Cleveland Interchange – NW Ramp	4°	50:1	---

F. EXISTING STRUCTURES

Bridges:

Bridge No.	Name	Vertical Clearance	Length (ft)	Width (ft)	Rating			
					Deck	Super-Structure	Sub-Structure	Culvert
0094-228.318	Streeter Interchange	TBD	256	36	9	9	9	N/A
Work History: Built in 2022 **Condition:** No defects noted in inspection report. All elements in CS1. **Recommendation:** No work recommended at this time								
0094-230.288	Medina Interchange	16' 7"	264	36	8	7	8	N/A
Work History: Built in 2009 **Condition**: North roadway approach and approach panel seam separating with a minor bump. All four corners of approach curb near bridge ends are cracked. Minor erosion to SW and SE corners and along backside of SW wing. Minor spalling of north endwall at beam ends. Minor shear cracking identified on several beam ends. All deck and railing cracks have been sealed as of 11/26/2019 inspection. Detailed defect information can be found on the inspection report. **Recommendation**: Mill and Overlay Pavement Transitions Curb Spall Repair Erosion Repair								

*Streeter Interchange structure had clearance of 17’2” in 2022 plans.

Bridge No.	Name	Vertical Clearance	Length (ft)	Width (ft)	Rating			
					Deck	Super-Structure	Sub-Structure	Culvert
0094-233.343 L	Halfway Lake Interchange	-	115	40	6	6	6	N/A
Work History: Built in 1958; Steel encased columns painted in 1991; Replace silicone sealant and backer rod, girder repair, spall repair in 2014; bridge deck overlay in 2018. **Condition:** Bridge end pourable joints have seal damage or adhesion failures. Cracks with seepage at both abutments. Various cracking with seepage and efflorescence on facia beams, primarily at the control joints of the barriers. Spalling, delamination, and settlement of East and West approach panels. 2021 Deck chaining indicated 5.84% delamination. **Recommendation:** Structure scheduled for replacement in 2028. No work recommended.								
0094-237.322	Cleveland Seperation	16' 4"	212	24	7	5	6	N/A
Work History: Built in 1958; Joint repair, deck overlay, and rail retrofit in 2018 **Condition:** Pourable seals at piers 2 and 4 show signs of leakage. Cracking with seepage and efflorescence on diaphragms at pier 2 and. Spalling, delamination, and exposed rebar on beam ends at pier 2 and pier 4. Some minor erosion at North and South embankment. High load impact damage to beam 1 in span 3. Deck was chained in 2018 and indicated 1.11% delamination. Additional defect information can be found in the inspection report. **Recommendation:** Joint Repair Repair Beam End Erosion Repair Penetrating Water Repellent								
0094-238.793 L	Cleveland Interchange	-	115	40	5	5	6	N/A
Work History: Built in 1958; Deck overlay and jersey barriers installed in 1983; Steel encased columns painted in 1991; Deck spall repair, joint repair, and special surface finish installed in 1999; Girder patching and deck spall repair in 2022. **Condition:** Moderate map and longitudinal cracking throughout entire length of wearing surface. Cracks with seepage and efflorescence throughout the bottom of the deck and superstructure. High load impact patches on beams in span 2. Moderate rusting on steel encased columns. Cracking throughout both abutments. 2021 deck chaining indicated 1.88% delamination. **Recommendation:** Structure scheduled for replacement in 2029. No work recommended.								

Centerline Pipes: The district will complete a pipe survey and propose any pipe improvements during the project development process.

G. LAND INTERESTS

Communities: None
Reservation: No
Surface Trust Land: No
National Parks/Grasslands: No
State Parks/Forests: No
Waterfowl Production Area:
Wildlife Management Area: No
Adjacent Land Usage: Agricultural

H. ISSUES AND APPURTENANCES CHECKLIST

1. Curb and Gutter? Yes ____ No X
2. Sidewalk? Yes ____ No X
3. Multi-Use Path? Yes ____ No X
4. ADA Ramps? Yes ____ No X
5. State Bicycling Network? Yes ____ No X
6. Lighting? Yes ____ No X
7. Signals? Yes ____ No X
8. Storm Sewer? Yes ____ No X
9. Manholes? Yes ____ No X
10. Water, Sewer, or Other Underground Work? Yes ____ No X
11. Parking Facilities? Yes ____ No X
12. Frontage Roads? Yes ____ No X
13. Utility Issues? Yes ____ No X

    There are various utilities present along the corridor, conflicts are not anticipated.

14. Landscaping? Yes ____ No X
15. Approach or Ditch Block Flattening? Yes ____ No X
16. T Intersection Recovery Approaches? Yes ____ No X
17. Fence? Yes X No ____

    The existing fence is primarily wood post with numerous issues along the corridor. Replacing the fence meets the current fencing policy and is included in estimate.

18. Railroad Crossings? Yes ____ No X
19. Detours? Yes ____ No X

    It is proposed to construct this project under traffic without crossovers.

20. Automatic Traffic Recorder Locations? Yes X No ____

    There is an ATR at RP 231.3 EB, no suggested improvements.

21. Weigh-In-Motion Sites? Yes ____ No X

22. ITS (Deicing, Snow Gates, VMS, RWIS, etc.)? Yes ____ No X

There is an environmental sensor & camera site at RP 231.3 EB, no suggested improvements.

23. Highway Patrol/Truck Pullouts or Rest Areas? Yes ____ No X

24. Additional Right of Way? Yes ____ No X

The existing ROW varies from 150' to 225'. Construction easements may be needed in select areas to facilitate fence replacement, see District Engineer comments. Addressing the snow impact area, if selected (see Issue 26), would also require an easement(s). The ROW line also needs to be reestablished with new pins and markers.

25. Drainage Issues? Yes ____ No X

26. Snow Impact Areas? Yes X No ____

The district reported a problem area from RP 235.90 to 236.00. This issue is likely the small hill that peaks at the ROW line and extends onto the adjacent property. With no major dirt work or borrow required for this project, specifying the hill as a mandatory borrow site is not applicable. The district would still like the area to be addressed with the project due to it being a higher investment strategy and the likely limited opportunity to address it in the future. Addressing the snow impact area is included as option.

27. Subgrade Issues? Yes ____ No X

28. Noise Analysis: Type I Project? Yes ____ No X Maybe ____

29. Maintenance Issues? Yes ____ No X

30. Guardrail? Yes X No ____

There are several locations of guardrail. Existing guardrail that is in compliance with NCHRP Report 350 except for rail height, may be reset to correct rail height for compliance, otherwise it should be upgraded to MASH.

31. Milling? Yes X No ____

Milling is anticipated at the grade raise area as well as on the ramps and crossroads.

32. Repeated ER Events? Yes ____ No X

33. Interstate Access Gates? Yes X No ____ N/A ____

The districted reported nine access locations that could be removed when the fence is replaced: RP 229.30, 231.30, 232.33, 234.32, 235.35, 237.32, 237.35, 238.81, 238.82.

34. Steep Slopes? Yes ____ No ____ N/A X

I. LOAD RESTRICTIONS

Travel Information Map Proposed Load Restriction: Legal Weight
Freight Level Required Minimum Load Restriction: Legal Weight
Projected Load Restrictions after project is complete: Legal Weight

J. ROADWAY WIDTHS

Required Minimum Roadway Width: Maintain existing.
Freight Level Required Minimum Width: 28’
Surrounding Corridors: 38’

K. PERFORMANCE GUIDELINES

Design Speed: 75 mph
Clear Zone: 20 feet
Foreslopes: 4:1 max

L. PROPOSED IMPROVEMENTS

Primary Improvements:

- Structural improvement crack and seat with HMA overlay
- 2” mill & overlay of the 2020 grade raise section (RP 239.64 – 240.09)
- 2” mill & overlay of the ramps and crossroads

Optional Work Items:

Medina Interchange (RP 230.288)

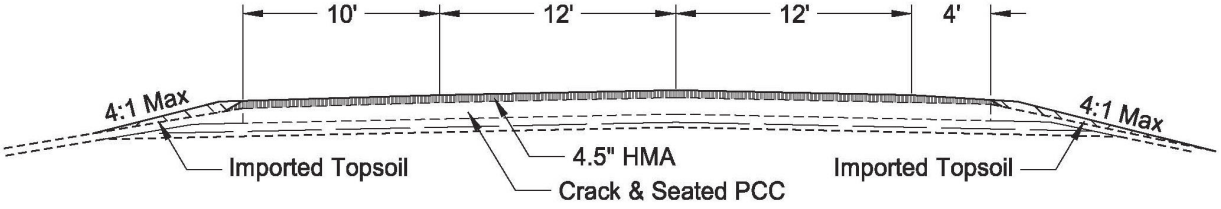
- Reconstruction –Vertical Clearance = Min. 16’ 6”
- Limit or Exclude C&S w/Overlay - Vert. clearance ~ 16’ 4” – 16’ 7”
- Overlay with Project - Vert. clearance ~ 16’ 2.5”

Cleveland Separation (RP 237.322)

- Reconstruction –Vertical Clearance Min. 16’ 6”
- Limit or Exclude C&S w/Overlay - Vert. clearance ~ 16’ 1” – 16’ 4”

Address Snow Impact Area (~RP 235.90 to 236.00)

Proposed Typical Section



M. ADDITIONAL COMMENTS

District Engineer:

- The majority of access control fencing should be able to be completed from our ROW without a construction easement. There may be selected areas where drainage is supposed to cross the fence line and the high spot should be cleaned out and this would require an easement.

- For the snow impact area near RP 236.0, this is the investment strategy or type of project where these issues should be corrected. If we can't correct these issues on this type of project, they will never get corrected. The common ex material from the snow impact area could be used to widen the inslope near RP 234.0, to eliminate the cattails and standing water near or within the clearzone. This would be similar to the type of work that was previously completed near RP 232.8.

Scoping Meeting Discussion:

- 6:1 median inslopes should be considered so that future flattening is not required if high tension median cable guardrail would be installed.

- SMA should also be considered as an option going forward. Materials should investigate if there are any cost saving measures that could be done to bring down the cost difference.

- A full asphalt pavement section should also be considered when reconstructing under any structures.

- Snow impact areas should be bundled as a separate project and scoped.

O. DECISIONS

1. Should this project advance as a Structural Improvement Crack & Seat w/ HMA overlay?

   __X__ Yes ____ No

2. If the Crack & Seat is advancing, what should be done at the following interchange areas regarding vertical clearance?

   Medina Interchange (RP 230.288)

   _____Reconstruction –Vertical Clearance = Min. 16’ 6”

   __X__Limit or Exclude C&S w/Overlay - Vert. clearance ~ 16’ 4” – 16’ 7”

   __X__Overlay with Project - Vert. clearance ~ 16’ 2.5”

   Cleveland Separation (RP 237.322)

   __X__Reconstruction –Vertical Clearance Min. 16’ 6”

   _____Limit or Exclude C&S w/Overlay - Vert. clearance ~ 16’ 1” – 16’ 4”

3. If the Crack & Seat is advancing, should the snow impact area (~RP 235.90 to 236.00) be investigated and reproposed during project development?

   _____ Yes

   __X__ No

DDP Comments:

For the Medina Interchange, the project development team should work through which of the 2 selected options would be best.