

Project No.
NH-7-002(156)022

PCN
20845

Williston N to 63rd St. NW - EB



Prepared by

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

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

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SCOPING REPORT

Report Completed By: Scott Clausen

A. GENERAL INFORMATION

Project Number: NH-7-002(156)022

District: Williston

Location: Williston N to 63rd St. NW - EB

Reference Point: RP 22.386 – 31.954 -9.568 miles

Counties: Williams

Legal Description: T154N, R101W, Sec 2 to T156N, R101W, Sec 24

Functional and Funding Roadway Classification: Rural Interregional Corridor

National Highway System: Yes

Project Schedule: Proposed to be added to the STIP for a 2019 Structural Improvement

dTIMS Recommendations: Constrained: Do Nothing Unconstrained: Struc_Ovl2020

B. PURPOSE, NEED, AND IMPROVEMENT

Purpose and Need of Project:

The IRI score is in the excellent range. The distress score is in the poor to fair range. There are transverse cracks, alligator cracks, and longitudinal cracks on the roadway along with patching and rutting.

Proposed Improvements:

A Structural Improvement PCC overlay is proposed to extend the useful life of the highway by restoring the pavement structure. The safety items that will be addressed are safety hardware that does not meet NCHRP 230 standards or better and safety items within the 20' clear zone. All other safety items will be addressed as part of the Statewide Safety Program.

A decision item is included to extend the project limits to include RP 20.383 to RP 22.386. This section is part of the urban system.

C. TRAFFIC AND CRASH ANALYSIS

Traffic:

RP 22.386 to RP 22.413

| | Year | Truck AADT | Total AADT | Flexible ESALs | Rigid ESALs |
|------------------|------|------------|------------|----------------|-------------|
| Current Traffic | 2015 | 1,510 | 13,780 | 1,270 | 1,890 |
| Forecast Traffic | 2035 | 2,250 | 22,375 | 1,890 | 2,815 |

RP 22.413 to RP 25.678

| | Year | Truck AADT | Total AADT | Flexible ESALs | Rigid ESALs |
|------------------|------|------------|------------|----------------|-------------|
| Current Traffic | 2015 | 2,030 | 12,330 | 1,705 | 2,540 |
| Forecast Traffic | 2035 | 3,330 | 20,225 | 2,800 | 4,165 |

RP 25.678 to RP 28.445

| | Year | Truck AADT | Total AADT | Flexible ESALs | Rigid ESALs |
|------------------|------|------------|------------|----------------|-------------|
| Current Traffic | 2015 | 3,150 | 8,460 | 2,650 | 3,940 |
| Forecast Traffic | 2035 | 5,170 | 13,880 | 4,345 | 6,465 |

RP 28.445 to RP 31.954

| | Year | Truck AADT | Total AADT | Flexible ESALs | Rigid ESALs |
|------------------|------|------------|------------|----------------|-------------|
| Current Traffic | 2015 | 2,625 | 5,680 | 2,205 | 3,285 |
| Forecast Traffic | 2035 | 4,305 | 9,315 | 3,620 | 5,385 |

Speed Limit:

| From RP | To RP | Speed Limit |
|---------|--------|-------------|
| 22.386 | 22.477 | 40 |
| 22.477 | 26.284 | 55 |
| 26.284 | 31.954 | 70 |

Crash Analysis: There were a total of 181 crashes from 7/1/2012 to 6/30/2015. Animal crashes were not included. The crash rate per 1 million vehicles is 2.23.

- There were 2 fatal crashes: the first crash involved a SB and NB vehicle, the SB vehicle attempted to make a left turn, failed to yield to V1, and V1 hit V2. The second crash involved a NB vehicle, unknown why V1 left the roadway and rolled over.
- This segment is noted as a high crash segment on the 2011-2013 State Highway Segment Crash Map.
- 112 Intersection Related Crashes: 39 Angle, 30 Rear End, 13 Single Vehicle, 9 Left Turn, 9 Sideswipe, and 12 Other. The intersections of US 2 & 58th St W, US 2 & 57th St NW, and US 2 & 58th St NW have a majority of the intersection crashes, but all intersections have had improvements in the past 2 years. There is an additional project planned at the 58th St. intersection (PCN 20750).
- 41 Multiple Vehicle Non-Intersection Crashes: 20 Rear End, 10 Angle, 6 sideswipe, 4 sideswipe opposite direction, and 1 left turn. No clear area of a trend.
- 28 Single vehicle crashes: 17 ran off roadway, 4 poles/supports, and 7 other. No clear area of a trend.

There are no recommendations 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" |

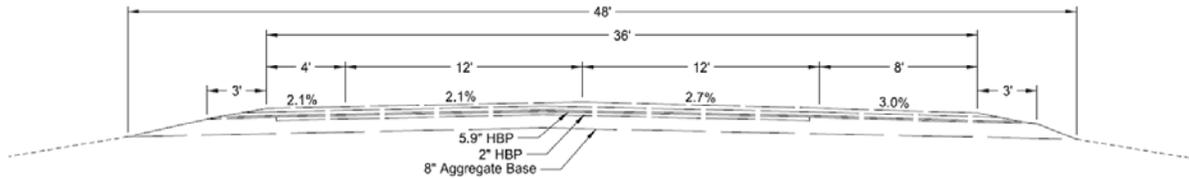
RP 22.386 to RP 31.954

| Actual Age | IRI | IRI Rating | SI or SCI | Faulting |
|---------------|----------|----------------|-----------|---------------|
| 9 | 59 | Excellent | 18 | N/A |
| Effective Age | Distress | Distress Score | Rutting | Rutting Score |
| 9 | 73 | Poor | .41 | Fair |

| CONSTRUCTION HISTORY | | | | |
|----------------------|--------------------------|------------|------------|----------|
| Year | Construction | Depth (in) | Width (ft) | Oil |
| 1978 | GRADE | - | 48.0 | - |
| 1979 | AGGREGATE BASE | 8.0 | 42.0 | - |
| 1979 | HOT BIT PAVEMENT | 2.0 | 40.0 | - |
| 1979 | HOT BIT PAVEMENT | 2.0 | 27.0 | - |
| 1990 | SAFETY ENHANCEMENTS 90-1 | - | - | - |
| 1990 | CONTRACT CHIP SEAL | - | 24.0 | HFMS-2 |
| 1998 | CONTRACT CHIP SEAL | - | 24.0 | HFMS-2 |
| 2006 | HBP SUPERPAVE FAA 45 | 2.5 | 36 | PG 58-28 |
| 2006 | HBP SUPERPAVE FAA 45 | 2.0 | 36 | PG 64-28 |
| 2009 | SLURRY SEAL | - | 24 | CRS2P |

Existing Foreslopes: 6:1

Existing Typical Section:



E. EXISTING GEOMETRY

Horizontal Curves: Use Existing

| Location | Speed (mph) | Radius (ft) | | Superelevation (%) | |
|-----------|-------------|-------------|----------|--------------------|----------|
| | | Existing | Required | Existing | Required |
| RP 20.404 | 40 | 11459 | 485 | NC | 0.0 |
| RP 22.181 | 40 | 8185 | 485 | NC | 0.0 |
| RP 22.808 | 55 | 5730 | 1061 | NC | 2.4 |
| RP 23.479 | 55 | 5730 | 1061 | NC | 2.4 |
| RP 24.386 | 55 | 28648 | 1061 | NC | 0.0 |

Vertical Curves: Use Existing

F. EXISTING STRUCTURES

Bridges:

| Bridge No | Description | Feature | Length (ft) | Width (ft) | Rating |
|-----------------------------|------------------------------|------------|-------------|------------|--------|
| 0002-025.394 | Double, 8'X8'X217'RCB | Camp Creek | 17 | - | 97.7 |
| Recommendation: Do Nothing. | | | | | |
| 0002-028.575 | Single, 11'7"X7'5"X288' SPPA | Creek | 11 | - | 97.7 |
| Recommendation: Do Nothing. | | | | | |
| 0002-029.275 R | 3 South of US 85 North | Cow Creek | 82 | 40.0 | 94.9 |
| Recommendation: Do Nothing. | | | | | |

Centerline Pipes: All the centerline pipes meet the required clear zone. All centerline pipes in the optional section meet the required clear zone.

G. LAND INTERESTS

Communities:

Urban Area Limits of Williston, RP 22.386 to RP 25.67, Population 20,850

Reservation:

None

Surface Trust Lands:

T156N, R101W, Sec 36, SW4, RP 28.45 to RP 28.95

Refuge:

None

Adjacent Land Usage:

Agricultural, Industrial and Commercial

H. ISSUES AND APPURTENANCES CHECKLIST

1. Curb and Gutter? Yes No
2. Sidewalk? Yes No
3. Multi-Use Path? Yes No
4. ADA Ramps? Yes No
5. Detectable Warning Panels? Yes No
6. Lighting? Yes No
7. Signals? Yes No
 There are two traffic signals, one at RP 22.400, signal number H0002022.400 and one at RP 25.681, signal number H0002025.681. No suggested improvements.
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
 There is a frontage road along the route from RP 22.386 to RP 22.400 within the Right of Way. There is also a portion of 2nd Ave. W from RP 23.5 to RP 24 that is within the Right of Way. No suggested improvements.
13. Utility Issues? Yes No
14. Landscaping? Yes No
15. Approach or Ditch Block Flattening? Yes No
16. T Intersection Recovery Approaches? Yes No
17. Fence? Yes No
18. Railroad Crossings? Yes No
19. Detours? Yes No
 A Median Crossover exists on the North end of the project. A new crossover will need to be built on the South end unless it is chosen to extend the limits to 20.383.
20. Automatic Traffic Recorder Locations? Yes No
 There is an active automatic traffic recorder at RP 27.63.
21. Weigh-In-Motion Sites? Yes No
22. ITS (Deicing, Snow Gates, VMS, RWIS, etc.)? Yes No
 There is an active DMS site at RP 22.602. No suggested improvements.
23. Highway Patrol/Truck Pullouts or Rest Areas? Yes No
24. Additional Right of Way? Yes No
25. Drainage Issues? Yes No
26. Snow Impact Areas? Yes No
27. Subgrade Issues? Yes No
28. Noise Analysis: Type I Project? Yes No Maybe
29. Maintenance Issues? Yes No
30. Guard Rail? Yes No

| RP | L/R | Length (ft) |
|--------|-----|-------------|
| 29.205 | L | 267 |
| 29.235 | R | 171 |
| 29.251 | L | 83 |

Recommend a complete guardrail survey to determine height tolerance. There is a cost provided to remove and reset the existing guardrail.

31. Milling? Yes X No _____
Preliminary Pavement Design recommends a maximum of 3.5" of milling to allow for the concrete overlay.

I. Load Restrictions

Travel Information Map Proposed Load Restriction: Legal weight
HPCS Load Restriction: Legal weight
Projected load restrictions after project is completed: Legal weight

J. Roadway Widths

Required minimum Roadway Width: 32'

K. PERFORMANCE GUIDELINES

Design Speed:
40, 55, 70 mph.

Clear Zone (from edge of driving lane): 20'
Ride/Distress Goal: Excellent
Operational Reliability: Highly Reliable
Foreslope: 4:1

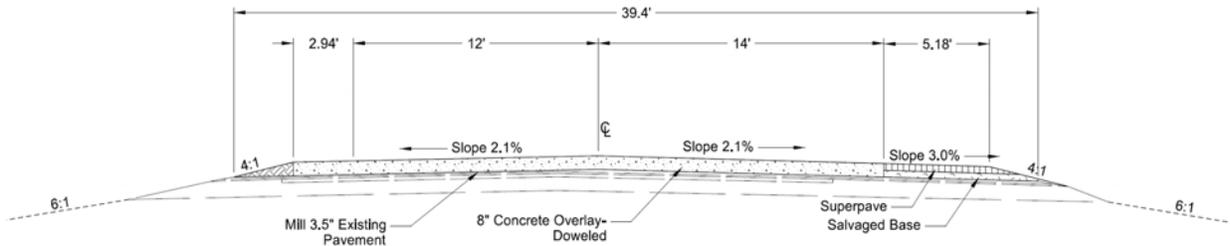
L. PROPOSED IMPROVEMENTS

Proposed Improvements:

A Structural Improvement Concrete Overlay is proposed. The safety items that will be addressed are safety hardware that does not meet NCHRP 230 standards or better and safety items within the 20' clear zone. All other safety items will be addressed as part of the Statewide Safety Program.

Proposed Typical Section:

Proposed typical section used for estimating purposes only.



M. ADDITIONAL COMMENTS

District Engineer:

The NB or EB lanes had a 1 ½ inch overlay for RP 20- 22 and 1" mill with 4 ½ inch overlay for RP22 -31 all in 2006 or pre-oil boom. Since the ESALS in 2012 warranted an 8 ½ inch concrete overlay for the WB lanes, I thought that the 2006 overlay has probably prematurely fatigued since it was never designed for that loading. In addition the 2012 project changed some major intersections to concrete overlays for both WB and EB because of excessive rutting. This section of US 2 continues to be a major arterial for oil field traffic accessing all of the oilfield

services in heart of the Williston basin. It will continue to fulfill this strategic necessity for a long time into the future. Therefore, it is essential that this four lane facility have a pavement structure similar on all four lanes – Concrete for the RP22 -31 portion.

Safety Division Director:
None

N. COST ESTIMATE

(Inflation factor of 8% was used to estimate costs for bid year 2019)

| ITEM | ESTIMATED COST |
|---|----------------|
| Contract Bond | \$96,000 |
| Mobilization | \$512,000 |
| Hot Bit Pavement (Includes AC, Tack, Prime and Cores) | \$998,000 |
| Doweled PCC (8", Includes Material and Placement) | \$9,371,000 |
| Milling (3.5") | \$933,000 |
| Topsoil, Seeding and Erosion Control | \$75,000 |
| Median Crossover | \$180,000 |
| Field Lab and Office | \$70,000 |
| Traffic Control | \$250,000 |
| Reset Guardrail | \$45,000 |
| Pavement Markings and Rumble Strips | \$257,000 |
| Subtotal | \$12,787,000 |
| 20% Engineering | \$2,557,000 |
| Total Cost | \$15,344,000 |

O. DECISIONS

1. Should this project advance as a Structural Improvement PCC Overlay proposed for an **Estimated Cost of \$15,344,000?**

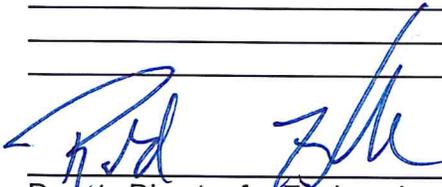
Yes No

The following item(s) should be considered for advancement at additional cost:

2. Should the project limits be extended to include RP 20.383 to RP 22.386 for an **Estimated cost of \$4,385,000?**

Yes No

DDE Comments: _____


 Deputy Director for Engineering

9/21/15
 Date