Barnes County
Cold-In-Place Recycling Project

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Introduction

- Barnes County Facts
- Why CIR
- Existing Conditions
- Planning & Design Process
- Construction
- Questions
Population: 12,000
Valley City Population: 7,000
Highway Department
18 FT Employees
230 Miles Bit. Surf. Roads
110 Miles Gravel Roads
1000 Miles Gravel Twp. Roads
60 Bridges > 20’
Many Structures < 20’
Annual Budget ~ $2.5 million
2007 TRAFFIC DATA (AADT)
North 1.0 Mile = 1800
South 8.5 Miles = 600

2009 TRAFFIC DATA (AADT)
Entire Project = 400
Selection of CIR

- Why CIR?
  - Reflective Cracking/Maintenance Costs
  - Life Cycle Costs
  - Budget Constraints
    - Phased Construction
      - Phase I CIR & Chip Seal
      - Phase II HBP Overlay
Roadway Information & Construction History

Roadway Section

- 1958 – 1959  32’ Graded Roadbed
- 1958 – 1959  6.5” Aggregate Base
- 1960          2.25” HBP Surfacing
- 1982          3.25” HBP Overlay
Existing Roadway Condition

- TRANSVERSE CRACKING
  - 10’ to 25’ Spacing
- RUTING
  - 0” – 0.5”
- CROSS SLOPE
  - 0.5% – 2%
Alternatives Considered

- (20 - 30 yr) Total Reconstruction
- (20 - 30 yr) Shoulder Widening, Blended Base and Structural Overlay
- (20 - 30 yr) Shoulder Widening and Structural Overlay
- (20 yr) 4” CIR & Thin-Lift HBP Overlay
- (10 - 15 yr) 4” CIR & Microsurface
- (10 - 15 yr) 4” CIR & Double Chip Seal
- (10 yr) Thin-Lift HBP Overlay
2005 Estimated Costs

- $750,000/mile  Total Reconstruction
- $600,000/mile  Shoulder Widen, Blended Base and Structure Overlay
- $350,000/mile  Shoulder Widen and Structure Overlay
- $170,000/mile  4” CIR & Thin-Lift HBP Overlay
- $125,000/mile  4” CIR & Microsurface
- $115,000/mile  4” CIR & Double Chip Seal
- $90,000/mile   Thin-Lift HBP Overlay
Planning & Design

- 2005 NACE
- ARRA Seminar (Feb. 8th)
- Dakota County, MN
- Core Roadway (March)
- Contractor & Emulsion Supplier Meeting (April)
- CIR Mix Design (AET)
- Plans & Specifications
- Bid Letting May 17, 2007
Typical Sections

EXISTING TYPICAL SECTION

PROPOSED TYPICAL SECTION
Construction

- CIR
- June 2nd to 14th, 2007
Construction

- Weather Issues
  - Rain
  - 1.5” (June 1st – 2nd)
  - 3” (June 6th – 7th)
  - 7” (June 16th – 17th)
    - Flooded Road Ditches
    - Overtopped Highway
  - 11.5” of rain during Month of June
On-Going Monitoring

- November 1st – FWD Testing
  - 10 Ton Load Rating
    - Layer Coefficient = 0.26 – 0.28
- Rutting
- Cracking
- Other Distresses
Lesson Learned

- Public Relations Success
- Keep heavy traffic off as long as possible
- Longer cure time
- Adjust Mix Properties
  - More resistant to rutting
Conclusion

- Costs
  - 4” CIR & 1.5” HBP Surfacing $180,000/Mile
  - 4” CIR & County Chip Seal $80,000/Mile
- Continue to Monitor
- Plan for Future Projects