Burleigh County
ND Hwy 1804 & N Washington St
Roundabout

Whitney Schroeder, PE, PTOE

33rd Annual North Central Local Roads Conference
Rapid City, SD - October 17-18, 2018
ND Hwy 1804 and N Washington Street
Existing Intersection

[Map of an intersection with a 6.5% grade, right turn lane, and stop signs.]
Safety Concerns

- 4 Intersection Crashes between 2012-2016
  - 1 Fatality
  - 2 Injuries

- Highway Safety Improvement (HSIP) Funds
  - Collaboration between NDDOT and Burleigh County

- Intersection Alternatives
Preferred Roundabout Alternative

- Single Lane Roundabout
  - With Right Turn Slip Lanes
  - Option for Future Dual Lane Expansion
Design Considerations

• County Goals
  – Consistency
  – Uniformity

• ND Hwy 1804
  – Pavement Design
  – Shoulder Widths

• Driver Behavior
  – Entrance Angles
  – Deflection

• Alignment
Design Considerations
Roundabout Design

- Signing
- Pavement Markings
- Design Vehicle
- Entry/Exit Curvature
- Speed of Travel Paths
- Sight Distance

Lane and Splitter Island Widths

R1 — entry path radius
R2 — circulating path radius
R3 — exit path radius
R4 — left-turn path radius
R5 — right-turn path radius

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Roundabout Design

Design Elements
- Splitter Island
- Drainage
- Utilities

Speed
Reduction
Curves

Fastest
Path
Radii & Speeds

Optimized
Performance

Constructability

Project Footprint

Sight Distance Triangles
Final Roundabout Design
Final Roundabout Design
Final Roundabout Design

- 200’ Inscribed Diameter
- Entry Width: 24’
- Exit Width: 32’
- One 16’ Circulating Lane
  - Can be expanded to 30’ in Future (Two 15’ Lanes)
- 45 MPH Approach Speed
- 25 MPH Roundabout Circulatory Speed
Final Roundabout Design

- Flush Concrete Shoulders
- Mountable Curb on Splitter Islands
- Stamped Colored Concrete
- Center Island Landscaping
Public Education

• Educate People on Roundabout Navigation
  – Basic Rules

• Share Data Comparisons Between Other Intersection Control Types and Roundabout
  – Safety
  – Operations

• Measure of Effectiveness
  – Near Misses
  – Learning Curve
Public Education Video - City of Red Deer

- **Roundabout Basics**: Slow down.
- **Roundabout Basics**: Slow down, choose lane.
- **Roundabout Basics**: Slow down, choose lane.
- **Roundabout Basics**: Slow down, choose lane.
- **Roundabout Basics**: Enter.
- **Roundabout Basics**: Look left and yield to oncoming traffic.
- **Roundabout Basics**: Enter.
- **Roundabout Basics**: Enter.
- **Roundabout Basics**: Stay in lane.
- **Roundabout Basics**: Stay in lane to your exit.
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N Washington St & ND 1804 Intersection

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