Modern Roundabouts
An Informational Presentation Prepared For:
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“Roundabout implementation in constrained urban environment - achieving proper design while minimizing impacts”

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Presentation Outline

• Review 4 Case Studies of how roundabouts achieved transportation solutions

• Illustrate the ‘Principle’ Based Design Methodology utilized to achieve these solutions

• Demonstrate that roundabouts are not homogenous and require proper design for optimal operations
Case Study #1
Mount Horeb, WI
Problem Statement

- Traffic ~2,000 VPH
- 6% Heavy Truck
- Average 7 crashes per year
- Signals knocked down 2-3 times per yr
Mount Horeb, WI
Problem Statement

- Poor Pedestrians Mobility
- Peak Hour Congestion (LOS D-F)
- Business Access Not so good
Mount Horeb, Wisconsin
STH 78/92

Roundabout Alternative

Modern Roundabout Improvement

» PROS
» Avoids Residential Impacts

» Preserves Business Access

» Provide Future Capacity

» Truck Movements Improved
GUEST COLUMN

Beware the scourge of traffic circles

By Robert A. Hall

The Wisconsin State Journal tried to disguise the bad news by using a British word to make it sound quaint. But the headline Saturday — “Mount Horeb to get first roundabout in the county” — struck ice in our hearts.

We are refugees from that quintessential East Coast state, New Jersey. And trust me, it’s not the Sopranos that make the Garden State frightening — it’s the traffic circles.

Make no mistake, what they plan to build in gentle Mount Horeb is a traffic circle. You’ll find traffic circles widely used out East, though once you get into New England, they’re called “rotaries.” All are bad, but none are worse than New Jersey’s. If you’ve seen the movie with a vacationing family stuck endlessly rounding a traffic circle, you know what I mean.

We are refugees from that quintessential East Coast state, New Jersey. And trust me, it’s not the Sopranos that make the Garden State frightening — it’s the traffic circles.

Don’t say we didn’t warn you.

Hall is executive director of the American Academy of Cosmetic Dentistry in Madison.
Final Design

• Capacity & Geometric Refinement

• Design for Trucks 6% (WB-62)

• Ensure Sight Distances Envelopes

• Utilities, Drainage, Vertical

• Lighting, Signing, Markings
Vehicle Path Overlap
Sudden lane change

Perpendicular entries

Entry Path Overlap

Tight exit radii

Exit Path Overlap
Correct Geometry is safe and provides full capacity
Final Design
Fastest Speed Paths

- FHWA Roundabout Geometric Guidelines -
Final Design

Fastest Speed Path Curves
Final Design

Fastest Speed Path Curves
Final Design
Accommodate Trucks L.T.
Mount Horeb, Wisconsin
STH 78/92
Final Design

Principle Based Design

» Non-circular

» Varying width circulating roadway 24’-32’

» Single and Multi-Lane entries

» Use of standard pavement marking and signing
Construction

- 60 (calendar) day construction schedule
- Opened May 28th, 2004 on-time, on-budget
**Construction**

- Missed the guide dots by only 2-3 tenths substantially changed the radii and therefore direction of travel at entry…not good
- Scrubbed off
- Re-Painted
- Poor guidance & creates “Entry Path Overlap”
Mount Horeb, Wisconsin

Opening Day
Mount Horeb, Wisconsin
Mount Horeb, Wisconsin
Mount Horeb, Wisconsin
Mount Horeb, Wisconsin
Mount Horeb, Wisconsin

- Truncated Domes
- Directional Grooving
Mount Horeb, Wisconsin

Pedestrian Comparison
Mount Horeb, Wisconsin
Pedestrian Comparison
Mount Horeb, Wisconsin
Operational
Mount Horeb, Wisconsin

Operational
Mount Horeb, Wisconsin
Operational
Mount Horeb, Wisconsin

• 1 fender bender since opening May 28th, 2004
• Community is planning 4 more on same road instead of signals
Case Study #2
Case Study
Wisconsin Rapids, WI

Existing Infrastructure
Constrained Urban
Safety/Capacity
Business/Residential Impacts
ROW
Wisconsin Rapids, WI
Existing Condition

• Challenging Geometry
• Evaluate Alternatives
  - Costs
  - Operations
  - Business Impacts
Wisconsin Rapids, WI
Existing Condition

- Challenging Geometry
- Evaluate Alternatives
  - Costs
  - Operations
  - Business Impacts
Wisconsin Rapids

All Conventional Alternatives Create Substantial Residential and/or Business Impacts (High Cost)
Wisconsin Rapids
Roundabout
Wisconsin Rapids
Roundabout

Testimonial
As a resident of the neighborhood for 55 years, Earl Keding, 82, figures the roundabout will control traffic flow.

"They've got it marked well and it'll help, because people will have to slow down some," said Keding, who took his turn around the intersection Tuesday.

"I went around it. It's not any worse than any other street."
Case Study #3
Interchanges
Diamond Interchange
Anchorage Alaska
SYSTEM EFFECTS
Diamond Interchange
Anchorage Alaska ~5,500 VPH
Case Study #4
Case Study
Highway 30/Thompson Drive
Madison, WI
Existing Conditions

3 Year Crash History
• 10 crashes per year
• 8 serious injuries/yr
• 1.2 crashes MEV
• 80% Injury Crashes

• Peak Hour Congestion and Delay
Existing Conditions

Peak Hour Congestion and Delay
Existing Conditions

Missing Sidewalk / No Bike Lanes

Poor Pedestrian Facilities
Project Objectives

- Improve Safety for all Modes
- Provide For Future Traffic Growth
- Provide Pedestrian & Bicycle Connectivity

- Minimize Residential Encroachment
- Preserve Residential ‘Character’
STH 30/Thompson Drive - Madison

Signal Alternative

- Purchase Homes
- Shorten Drives

Roundabout

[Diagram of STH 30/Thompson Drive - Madison with Signal Alternative and Roundabout options.]
Alternatives Analysis

Signal Alt = 4-Lane Cross-Section
Alternatives Analysis

Roundabout = 3-Lane Cross-Section
Thompson Drive
Thompson Drive
Thompson Drive
End / Summary

• Roundabout Design is Based on:
  - Traffic/Transportation Engineering Science and Principles
  - Alternative Analysis Necessary
  - Roundabouts are Not a Cure All

• Significant benefits can be achieved
• Correct Design Required for Optimal Operations