Florida Workshop on Roundabouts
August 18, 2009 – Maitland, FL

Roundabouts: Implementation in the US

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State of the Union?
Moderate

Infancy

Disclaimer: This is a highly subjective assessment solely representing the opinion of the presentation author based on information related to multiple factors. If you have data to suggest revising this assessment, please contact Mark Doctor at FHWA (mark.doctor@dot.gov)
How can we assess the progress?

- Number of modern roundabouts built
- Number of roundabout projects in design or planned
- State design guidelines
- Agency policy on roundabouts
- Roundabout web page, video, brochure
- Roundabouts in States Driver’s Manual
- Statewide Roundabout Steering Group
Number of modern roundabouts built

- Constantly changing
- Differences among State DOT, local agencies and developers
- “Prorate” considerations?
  - Per capita
  - Per system miles
  - % of intersections on network
Number of modern roundabouts built

The Centenarians (over 100) Club

Definitely AARP Eligible

- Colorado
- Utah
- Indiana
- Washington
- Kansas
- California
- New York
- Florida
- North Carolina
- Maryland
- Virginia
- Michigan
- Wisconsin
In Several States the Locals are “Leading the Way”

- **Carmel, Indiana (pop 85,000)**
  - Installed first 2 roundabouts in 1998
  - Now has over 40 roundabouts in place
  - 99 roundabouts in suburban Indianapolis
  - Indiana DOT: 1 roundabout on State system
    (6 more planned over next 3 years)
Roundabout Policies

Wisconsin DOT Intersection Control Evaluation Policy:

“If an intersection warrants a signal or a four-way stop within the design life of the proposed project, the modern roundabout shall be evaluated as an equal alternative.”

“… the roundabout may be a viable alternative for a two-way stop control in certain circumstances.”

“… roundabouts are a potential intersection control strategy until such time that the evaluation indicates that the roundabout alternative is not appropriate.”

Virginia DOT Policy:

“VDOT recognizes that Roundabouts are frequently able to address safety and operational objectives better than other types of intersections. Therefore, it is VDOT policy that Roundabouts be considered when a project includes reconstructing or constructing new intersections, signalized or unsignalized.”

“When the analysis shows that a Roundabout is a feasible alternative, it should be considered the Department’s preferred alternative due to the proven substantial safety and operational benefits.”
Roundabout Policies

Georgia DOT Policy:

“The Georgia Department of Transportation (GDOT) recognizes that the roundabout is a viable intersection alternative when placed in the appropriate location, and designed properly for the local conditions.

Guidance Statement/Application

Roundabouts are the preferred safety and operational alternative for a wide range of intersections of public roads. A roundabout shall be considered as an alternative in the following instances:

- Any intersection in a project that is being designed as new or is being reconstructed.
- All existing intersections that have been identified as needing major safety or operational improvements.
- All signal requests at intersections (provide justification in the Traffic Engineering Study if a roundabout is not selected).”
GUIDANCE STATEMENT:

Roundabouts are the preferred safety alternative for a wide range of intersections. Although they may not be appropriate in all circumstances, they should be considered as an alternative for all proposed new intersections on Federally-funded highway projects, particularly those with major road volumes less than 90 percent of the total entering volume.

Roundabouts should also be considered for all existing intersections that have been identified as needing major safety or operational improvements. This would include freeway interchange ramp terminals and rural intersections.
So, why aren’t more agencies building roundabouts?
Pick Your Favorite Excuse

- “The public will lynch us if we propose a roundabout.”
- “I know how people drive in my town – they’ll never get used to a roundabout.”
- “We’ll get sued because of all the crashes it will cause.”
- It will cost more than a signal.
FACT: Roundabouts are often confused with other types of circular intersections.
Myth: The public will never accept roundabouts

Sometimes it takes perseverance!!!

Photo source: NYSDOT
Washington State DOT engineer Brian Walsh:

“we have had a lot of people not very happy about the idea of roundabouts, but after they are constructed, those fears mostly go away.”
FACT: Public Attitude Toward Roundabouts Quickly Changes After Their Construction

<table>
<thead>
<tr>
<th>Attitude</th>
<th>Before Construction</th>
<th>After Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Negative</td>
<td>23%</td>
<td>00%</td>
</tr>
<tr>
<td>Negative</td>
<td>45%</td>
<td>00%</td>
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<tr>
<td>Neutral</td>
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<tr>
<td>Positive</td>
<td>14%</td>
<td>41%</td>
</tr>
<tr>
<td>Very Positive</td>
<td>0%</td>
<td>32%</td>
</tr>
</tbody>
</table>

NCHRP Synthesis 264
Drivers Who Favor or Oppose Roundabouts

Insurance Institute for Highway Safety
From Opposition To Support

Before and After Studies, ITE Journal

Before Construction
- DK 14%
- ++ 16%
- + 15%
- 41%
- 14%

After Construction
- DK 9%
- ++ 32%
- + 31%
- 15%
- 13%

++ Strongly favor
+ Somewhat favor
- Somewhat oppose
-- Strongly oppose
DK Don’t know

ITE Journal Sept 2002: Surveys in Kansas, Maryland and Nevada
Opponents Can Become Proponents

Letter to the Editor:

“I must admit it! I was wrong. The roundabout at Marsh and Hamilton roads appears to be working. Congrats to the Ingham County Road Commission and to Meridian Township”

Okemos, MI
Cost Considerations

- Actual cost will depend on project specific conditions
  - Most agencies find the initial construction cost of a roundabout is comparable to the initial construction cost of a signal.
- A “life-cycle” cost comparison should be used since roundabouts do not require signal equipment maintenance ($15,000 + per year)
  - Considering operational and maintenance costs, roundabouts are often less expensive than signals due to reduced costs for signal power, bulb replacement, loop detection and controller equipment maintenance (including need to retime signals).
- Typically, a roundabout requires fewer turn lanes and possibly fewer through lanes than needed at a signalized intersection, so in some instances a roundabout may actually cost less than a signalized intersection.
Benefit Considerations

- Safety Benefits
  - savings due to substantial reduction in fatal and injury crashes

- Operational Benefits
  - consider reduction in person-hours of delay and reduced commercial vehicle delay throughout the day (not just peak hours)

- Environmental Benefits
  - reduced fuel consumption & improved air quality
  - enhanced aesthetic opportunities
Myth: Roundabouts are bad for the nearby businesses

Fact: Most business owners agree that slower speeds and safer travel enhance business along the corridor.

Fact: Some “blightened” communities have actually experienced economic revitalization following roundabout projects.
Case Study: Golden, Colorado

South Golden Road
Case Study: Golden, CO
South Golden Road – 15,000 ADT

- $1.3M project in 1999 to construct four roundabouts, landscaping, medians & sidewalks
- Significant drop in number and severity of crashes
  - 1997 crash rate = 5.9 crashes/MVM
  - 2004 crash rate = 0.2 crashes/MVM
- Slower speeds but faster travel time thru corridor
- 60% sales tax revenue increase along corridor
  - Roundabouts are good for business !!
Where are roundabouts appropriate?

Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

- Intersections with a high-crash rate or a higher severity of crashes

*Roundabouts can greatly improve safety by simplifying traffic movements, reducing vehicle speeds, and providing a clearer indication of the driver’s right of way compared to other forms of intersection control.*
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

- Replacement of all-way stops
- Replacement of signalized intersections, especially where unbalanced movements cause inefficiency
- Replacement of two-way stops when side street delay becomes excessive

Before & After in Asheville, NC College & Oak St.
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

**Intersections with complex geometry, skew angles, or more than four approaches**

Before

After

Albuquerque, NM – Central Ave. and 8th
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

Rural intersections with high-speed approaches

Elongated splitter islands with successive reverse curvature can greatly improve safety at high speed approaches by alerting drivers to a changed traffic condition ahead.
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

**Freeway interchange ramp terminals**

*Roundabouts can facilitate truck turning movements and reduce their need for stopping.*
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

**Intersections with high U-turn movements**

*Roundabouts facilitate the use of raised medians for access management along the roadway by making U-turn movements easier at the intersections.*

Malta, NY – State Route 67
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

**3-leg intersections with heavy left-turn volumes**

*Example of a design using a through movement bypass-lane*
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

- Closely spaced intersections with widening constraints

[Image of a roundabout with a railroad underpass marked]
Roundabouts should be considered under a wide range of conditions, but may be particularly advantageous at:

- Transitions or “Gateways” from higher speed to lower speed areas
- Where aesthetics are important

*Roundabouts make for good transitions in speed change (including rural to urban transitions).*
Roundabout Landscaping

“Musica” at the Music Row Roundabout – Nashville, TN
Keeping up with the Jones’
Principles for Good Roundabout Landscaping

- Make the center island more conspicuous
- Minimize roadside hazards
- Maintain adequate sight distance
- Discourage pedestrian traffic through the center island
- Improve area aesthetics
New FHWA sponsored roundabout tools and resources

• Color brochure: *Roundabouts: A Safer Choice* – currently available

• National Highway Institute one-day workshop on roundabouts – currently available

• FHWA Technical summary on roundabout design details, costs, safety benefits, etc. – late 2009

• FHWA Technical summary on mini-roundabout design details, costs, safety benefits, etc. – late 2009

• Updated Roundabout Informational Guide including mitigation measures for vision-impaired pedestrians (NCHRP Project 03-65A) – late 2009/early 2010

• DVD on the benefits of roundabouts aimed at decision makers – early 2010

• Research studies (NCHRP and others) on roundabout pedestrian safety and treatments for sight-impaired pedestrians – ongoing
For more information ....

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