An Urban Approach To Roundabouts, Mini-Roundabouts and Circles

presented by
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City of Richmond, VA

Presented for
VDOT Roundabout Workshop

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Presentation Outline

• Residential Traffic Circles
  - Used in low volume, typically residential areas
  - Installed or in development-34

• Mini-Roundabouts
  - Used in higher volume, typically collector streets
  - One under construction

• Modern Roundabouts
  - Used at busier (often signalized) commercial/residential intersections
  - Installed or under development -9
Residential Traffic Circle

• Purpose: slow traffic in residential, low volume area
• Provide horizontal deflection 5 to 6 feet
Richmond Model-City of Seattle, WA

- Sought FHWA guidance
- Over 1,000 installed
- Use Object Marker Obstruction Sign (OM1-3)
- Allow left turns both around and in front of circle
Design Criteria

• Must accommodate quint/emergency vehicle on left turn
• Accommodate thru tractor trailer movements (sometimes)
• Landscaping key:
  1. tree’s
  2. shrub’s
  3. flowers
• Obstruction sign (left and right), one-way sign on larger circles, YIELD signs
• Neighborhood encouraged to maintain
Design Criteria

• Larger circles use one-way signs
• Intersection of Bruton, New Kent, and Riverside
Design Criteria

• Larger circles use one-way signs
• Intersection of McDonough and 32nd
Performance

• 64% crash reduction (15 circles)
Mini-roundabout

- Smaller roundabout (up to 80’ diameter)
- Allows trucks to turn left over circle
- Can fit within existing intersection boundaries, lowering costs
Richmond Example

• Bliley/Blakemore intersection

• Cost
  - approx. $50,000
  - uses minimal
  - asphalt paver

• Construction - Fall, 2013
Current Richmond Roundabouts

- Lombardy and Admiral
Current Richmond Roundabouts

• Highland Park
Current Richmond Roundabouts

- Jefferson, 25th and M
Current Richmond Roundabouts

- Monument and Allen
Current Richmond Roundabouts

• Duval and 8th
Current Richmond Roundabouts

• Duval and 8th
Under Design Richmond
Roundabouts

• Fairfield and 23rd
• Award contract-
  Fall 2013
Under Design Richmond Roundabouts

• Nine Mile, Fairfield and M

• Award contract – Fall 2013
Under Design Richmond Roundabouts

• Nine Mile, Fairfield and M
Under Design Richmond Roundabouts

• Six Points (Meadowbridge, Dill, 2\textsuperscript{nd})
• Award contract December 2013
Under Design Richmond Roundabouts

• Six Points (Meadowbridge, Dill, 2\textsuperscript{nd})
Monument and Allen Upgrade

• Begin design - August 2013
Idlewood and Downtown Express Ramp
Idlewood and Downtown Express Ramp

• Begin Design - Fall 2013
Richmond
Roundabouts Rejected

- A P. Hill Statue-Laburnum and Hermitage
- Roanoke and Forest Hill
- Hull and Belt
- Hull and 32nd
Richmond Roundabouts
Rejected

• Hull and Belt
## Roundabout Crash Patterns

<table>
<thead>
<tr>
<th>Location</th>
<th>Crashes Per Year</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lombardy St &amp; Admiral Rd.</td>
<td>Before: 0.8</td>
<td>All “fender benders”</td>
</tr>
<tr>
<td>1st Ave., 3rd Ave., Trigg St., Matthews St.</td>
<td>After: 2.6</td>
<td></td>
</tr>
<tr>
<td>25th, Jefferson &amp; M Sts.</td>
<td>Before: 0.2</td>
<td></td>
</tr>
<tr>
<td>8th &amp; Duval St.</td>
<td>After: 0</td>
<td></td>
</tr>
<tr>
<td>Monument Ave &amp; Allen St</td>
<td>Before: 16.5</td>
<td>Partial roundabout, 75% crashes wet conditions</td>
</tr>
<tr>
<td></td>
<td>After: 9.3</td>
<td></td>
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</tbody>
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Design Considerations - Signage

- MUTCD (2009) Section 2A.04, Excessive use of signs

“Regulatory and warning signs should be used conservatively because these signs, if used to excess tend to lose their effectiveness.”

- Driver’s attention should be focused on roundabout geometrics and other traffic
Design Considerations - Signage

- Highland Park
Design Considerations – Speed Control

• Slow in-Slow out
Design Considerations - Landscaping

• Robust Landscaping to Reinforce Geometrics

• Factors:
  1. Trees and shrubs will enhance traffic control
  2. Visually enhance crosswalks
  3. Low maintenance
Design Considerations - Landscaping
Design Considerations - Lighting

• Use to enhance landscaping, emphasize pedestrian crossings and travel ways
Design Considerations - Lighting

• Use to enhance landscaping, emphasize pedestrian crossings
• Consider concentrating on pedestrian crossings
• Richmond roundabouts typically rely on traditional intersection cobra heads (would “wash out” lighting focused on pedestrian crossings)
Design Considerations - Lighting

- Consider “solar road studs” activated guiding lights system to guide driver
- Approaching car activates running lights as driver passes through roundabout, or simply have all lights on when dark.
Questions?