Roundabouts with Rail: The Valley Metro Experience

ITE Western District Annual Meeting

June 25, 2019
Light Rail – 28 miles

25% of all transit riders
Rail Projects with Roundabouts
Why Roundabouts?

- Provide easier access for turning truck traffic
- Improve intersection traffic capacity
- Create a community gateway feature
- Improve traffic safety
Studies cite fewer collisions at roundabouts than at conventional intersections.
Roundabouts in the United States

Opportunity to learn from more experienced countries

- France: 32,000 roundabouts
- United Kingdom: 25,000 roundabouts
- Other Countries: 15,000 roundabouts
- United States: 4,800 roundabouts

Based on SJC Alliance Research. 2018.
Examples of Roundabouts with Rail

roundabouts with rail found
Different Traffic Control Types Used in Roundabouts with Rail

**Illuminated Conflict Controls (ICCs)**
Lights or electronic signs that are automatically actuated by the rail vehicle.

**Gates**
Horizontal arms perpendicular to traffic to prevent traffic from crossing the

**Signage**
Posted signs without use of gates or ICCs.
Types of Traffic Controls in Roundabouts with Rail

- Signage (10)
- Gates (1)
- Illuminated Conflict Control (49)

60 roundabouts with light rail
Roundabout with Rail and Gates
One Example – Salt Lake City

Salt Lake City, Utah

Signage
“ONE WAY”
“RAILROAD CROSSING: 2 TRACKS”
“YIELD”
“STOP HERE FOR TRAIN”
Example of Roundabout with Rail and Illuminated Conflict Control (ICC)

St. Herblain, France (Nantes)

Signage
“RED FLASHING ABSOLUTE STOP”
ICCs
2 sets of 2 red bouncing balls
Example of Roundabout with Rail and Illuminated Conflict Control (ICC)

Bremen, Germany

Signage
Yield signs
Train/Tram symbol signs
ICCs
2 sets of 2 red bouncing balls
Example of Roundabout with Rail and Illuminated Conflict Control (ICC)

Melbourne, Australia

Signage
“GIVE WAY TO (train or tram symbol)”
“LOOK BOTH WAYS”
“BIKE LANE”
“50” km/h (~31 mph)

ICC
2 train-actuated blank out signs
Gilbert Road Extension Roundabout

- Chicanes to slow traffic
- Embedded pedestrian flashers at crossings
- Bike lanes/shared paths
- Truck apron
Roundabouts Will Reduce Likelihood of Illegal Left-Turns

Typical Four-way Intersection
- Difficult to see trains approaching from behind
- Motor vehicles speeds are greater

Roundabout
- Motorists better able to see oncoming trains
- Roundabout’s chicanes slow motorists’ speeds
South Central Light Rail Extension Roundabouts

LEGEND
- Roadway
- Station
- Right-of-Way Line
- Landscaping
- Landscaping with Trees

Draft design as of August 2018.

Proposed Roundabouts Concept
Tempe Streetcar Roundabout

LEGEND

- Blue: Tempe Streetcar Route
- Black: Tempe Streetcar Stop
ICCs in Future Valley Metro Roundabouts

1. Valley Metro is recommending using ICCs in its future roundabouts

2. Gilbert Road Extension site has gates, but with ability for retrofitting ICCs

3. ICCs provide operational benefits and will not make roundabouts less safe or less efficient.
Why ICCs in Roundabouts with Rail?

<table>
<thead>
<tr>
<th><strong>Reliable</strong></th>
<th>Lower likelihood for ICCs to malfunction.</th>
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<tbody>
<tr>
<td><strong>Minimize Traffic Delay</strong></td>
<td>Gates take more time to lower and raise.</td>
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<tr>
<td><strong>Lower Costs</strong></td>
<td>Lower capital costs to install and to operate/maintain.</td>
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<td><strong>Reduce Noise Impacts</strong></td>
<td>Bells not required; less impact to community</td>
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Why ICCs in Roundabouts with Rail?

Safety

- Roundabouts improve intersection safety.
- ICCs would not sacrifice safety benefits of roundabouts.
- Meets MUTCD guidelines.
MUTCD: Highway/LRT Crossings

- Flashing-light signals **required** if LRT exceeds 35 mph (8C.03)
- Automatic gates **should** be installed if LRT exceeds 35 mph (8C.05)
- At circular crossings several actions **can** be taken, including: (8C.12)
  1. Traffic metering devices, or
  2. Highway traffic signals*, or
  3. Activated signs*, or
  4. Combination of actions

*ICC’s are applicable
Conclusions

1. Roundabouts not desired everywhere
   • application in certain situations
2. Proper design and traffic control important
3. Valley Metro leads the country in rail roundabouts
   • innovative design and traffic control
Questions?

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