Single-Lane Roundabouts
Implementation and Justification

PIMA COUNTY TRANSPORTATION
Federal Highway Administration
Proven Safety Countermeasures

• FHWA published guidance memorandum in 2012
  • Promoted implementation of effective safety countermeasures
  • Roundabouts listed high for reduction of fatal and injury crashes
What Is a Roundabout?

- A circular intersection
  - Yield control
  - Splitter islands
  - Reduced speeds

- Not a rotary

- Not a traffic circle
Safety Benefits

- Roundabouts eliminate 75% of conflict points
- All crossing conflicts are eliminated
Safety Benefits

- FHWA and “Insurance Institute for Highway Safety” studies show roundabouts reduce crashes

![Reduction in collisions chart](chart)

Source: Federal Highway Administration and Insurance Institute for Highway Safety (FHWA and IIHS)
Typical Signalized Intersection Crash Types

- Right angle
- Rear end
- Left turn
- Sideswipe
- Pedestrian/bicycle
Traffic Operations Benefits

- Traffic simulations for Pima County intersections show significant delay reductions for roundabouts over all-way stops and traffic signals.

<table>
<thead>
<tr>
<th>AM Peak Hour</th>
<th>Total Cumulative Delay (Hours)</th>
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<tbody>
<tr>
<td></td>
<td>All-Way Stop</td>
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<tr>
<td>Los Reales Rd and Swan Rd</td>
<td>6.1</td>
</tr>
<tr>
<td>Continental Rd and Whitehouse Canyon Rd</td>
<td>3.3</td>
</tr>
<tr>
<td>Lambert Ln and Shannon Rd</td>
<td>2.6</td>
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</tbody>
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Environmental Benefits

- Limit noise pollution
- Reduce fuel consumption and emissions

![Graph showing percent reduction of fuel consumption and emissions for a roundabout compared to a traffic signal.](Source: Nevada Department of Transportation)
Usability Benefits

• Power outages do not change the operation of a roundabout
• Roundabouts are user friendly for drivers of all ages and experience levels
• Roundabouts have high usability for pedestrians and bicyclists
Pima County Experience

• In 2009, Pima County constructed a roundabout at Camino Del Sol and Continental Road
• Safety has improved
  • 12 crashes in five years before
  • 0 crashes in five years after
• Green Valley residents are pleased
  • Report more efficient traffic operations
  • Describe the yield control as intuitive and familiar
Roundabout Examples
Roundabout Examples
Benefits of Single-Lane Roundabouts

- Fewer conflict points: reduce frequency and severity of crashes
- More efficient than traditional intersections
- Reduce noise pollution, emissions, and fuel consumption
- Lower lifecycle maintenance costs
- Comparable or lower construction costs versus traffic signals
- Simple to use with high driver acceptance rates
- Reduces the speed of the vehicle traveling through intersection
- Eliminates multiple-threat pedestrian crashes
- Self-regulating and durable