Traffic Planning Implications of the Operational Characteristics of Roundabouts

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EXISTING SIGNALIZED TRAFFIC PLANNING

Signalized intersections dictate our existing traffic and roadway planning policies and standards:
- Roadway Capacity/Cross section is dictated by Signal Lane Saturation Rates
- Intersection Spacing – Signal Progression
- Access Control

TRAFFIC PLANNING WITH ROUNDABOUTS

Roundabout Operational Characteristics Allow for:
- Capacity at intersection = narrower roadway widths (road diets)
- Design flexibility due to slower speeds
- Intersection spacing versatility (no progression)
- Improved business access opportunities

CAPACITY COMPARISON - U.S. vs U.K.

<table>
<thead>
<tr>
<th>US vs UK Traffic Volumes for Arterial Roadways</th>
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<tbody>
<tr>
<td>Peak hour lane capacity thresholds: US = 600-1000 vph, UK = 1,400-1,500 vph</td>
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<tr>
<td>ADT two-lane roadway capacity threshold: US = 15-20,000 vph, UK = 25-30,000 vph</td>
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CROSS SECTION WIDENING COMPARISON

Roundabouts present opportunities to shape the cross section of a corridor in ways that are perhaps different from those afforded by signalized intersections.

INTERSECTION SPACING

- Traffic Modeling - Measure Congestion
- Intersection Spacing - Signal Progression
- Intersection Spacing = Good Business Circulation

RESOURCES

1. FHWA Roundabout Guide Second Edition – 2.2.4 Spatial Requirements

- Roundabouts present opportunities to shape the cross section of a corridor in ways that are perhaps different than those afforded by signalized crossings.

2. TRB Access Management Manual

- The TRB Access Management Manual also documents the fact that our U.S. roadway planning practices are perhaps different than those afforded by signalized crossings.

3. UK Design Manual for Roads and Bridges – Traffic Capacity of Urban Roads

- The UK Design Manual for Roads and Bridges also provides a basis to indicate that there may be an increase in available roadway capacity of 25-30% on single roadway sections that implement good access control and other roadway features.

- Peak hour directional capacity thresholds: UK = 800-900 vph
- ADT two-lane roadway capacity threshold: UK = 1,400-1,500 vph

CORRIDORS

- Four-roundabout corridor
- Free-roundabout corridor

3-lane bridge with flared entry roundabout

- No on-street parking
- Turn lanes to include TRL, R, and L

No Signal Progression

- Closely spaced
- Maintain a 2 lane wide

INTERSECTION WIDENING

- Traditional 4-lane widening with signals
- 3-lane cross section with flared entry roundabout

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