RAISED MEDIAN EFFECTIVENESS

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Access Management Overview

- Set of Tools to Help Improve Safety and Protect Public Investments in Roadways
- Balances Access to Developed Land with Traffic Mobility Needs
- Works with Functional Classification Hierarchy
- NOT One-Size-Fits-All
Why and When to Consider a Raised Median

- Play critical role of operations and safety of roadway
- Roadways where aesthetic considerations are a high priority
- Multilane roadways with a high level of pedestrian activity
- High crash locations or where it is desirable to limit left turns to improve safety
  - Clear safety benefit

Source: TRB AM Manual
Safety Benefits of Raised Medians

- Research consistently finds safety benefits
  - Crash volume and rate reductions
  - Crash severity reduced
  - Decrease in fatalities and incapacitating injuries
  - Texas and many other states
<table>
<thead>
<tr>
<th>Total Access Points per Mile</th>
<th>Undivided</th>
<th>Two-Way Left-Turn Lane</th>
<th>Non Traversable Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>3.8</td>
<td>3.4</td>
<td>2.9</td>
</tr>
<tr>
<td>20.01-40</td>
<td>7.3</td>
<td>5.9</td>
<td>5.1</td>
</tr>
<tr>
<td>40.01-60</td>
<td>9.4</td>
<td>7.9</td>
<td>6.8</td>
</tr>
<tr>
<td>&gt;60</td>
<td>10.6</td>
<td>9.2</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Average Rate</strong></td>
<td><strong>9.0</strong></td>
<td><strong>6.9</strong></td>
<td><strong>5.6</strong></td>
</tr>
</tbody>
</table>

Source: NCHRP 420
4-Leg Intersection Conflict Points

Vehicular Conflicts

Conflict Points

- 16 Crossing
- 8 Diverge
- 8 Merge

32 Total

Source - NHI Course 15255
3-Leg Intersection Conflict Points

Vehicular Conflicts

<table>
<thead>
<tr>
<th>Conflict Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Crossing</td>
</tr>
<tr>
<td>3 Diverge</td>
</tr>
<tr>
<td>3 Merge</td>
</tr>
</tbody>
</table>

9 Total

Source - NHI Course 15255
Conflict Points with Raised Median

Vehicular Conflicts

<table>
<thead>
<tr>
<th>Conflict Points</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Crossing</td>
<td></td>
</tr>
<tr>
<td>2 Diverge</td>
<td></td>
</tr>
<tr>
<td>2 Merge</td>
<td></td>
</tr>
<tr>
<td>4 Total</td>
<td></td>
</tr>
</tbody>
</table>

Source - NHI Course 15255
Safety - Reduce Conflict Points
Safety - Reduce Crashes
Cooper Street

Pre-construction Characteristics

- 7-lane cross section

- 2004 ADT range of 26,000 (at US 287) to 58,000 (at I-20)

- Crash rates
  - at least 3.76-4.47 per million vehicle miles traveled (MVMT) – between Pleasant Ridge and Arkansas
  - at least 5.3 per MVMT between Arbrook and Medlin

- Driveway density of at least 60.9/mile – between Pleasant Ridge and Arkansas

- Heavy retail corridor (particularly in Arlington)
Cooper Street Issues

- TWLTL Conflicting Uses
Cooper Street Issues

- Problem caused by offset driveways - results in evasive maneuvers to prevent head-on crashes
Near rear-end crash – result of conflicting uses (acceleration and deceleration)
Cooper Street Issues

- Inappropriate use of TWLTL as acceleration lane (white vehicle in both pictures)
• Indecision on where to turn – vehicle partly in travel lane while stopped
FM 157 (Cooper St.) - Arlington, Texas
*With Raised Medians*
FM 157 (Cooper St.) - Arlington, Texas
With Raised Medians
In some locations, the raised medians are difficult for a driver to see, due to lack of vertical features and color similar to pavement. At problem spots, yellow striping (see picture) and signage helps drivers see the raised medians.
Where necessary, the raised medians were constructed to allow drainage through the medians.
Nighttime Visibility
## Crash Rates per MVMT

<table>
<thead>
<tr>
<th>Period</th>
<th>Section</th>
<th>Miles</th>
<th>ADT</th>
<th>Crashes</th>
<th>Crash Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>North 1</td>
<td>1.21</td>
<td>42,454</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1 year)</td>
<td>North 2</td>
<td>0.85</td>
<td>37,253</td>
<td>140</td>
<td>4.6</td>
</tr>
<tr>
<td>During</td>
<td>North 1</td>
<td></td>
<td>40,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6 mos)</td>
<td>North 2</td>
<td></td>
<td>64,348</td>
<td>71</td>
<td>3.8</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; 6 mos</td>
<td>North 1</td>
<td></td>
<td>40,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>North 2</td>
<td></td>
<td>64,348</td>
<td>60</td>
<td>3.2</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; 12 mos</td>
<td>North 1</td>
<td></td>
<td>50,172</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>North 2</td>
<td></td>
<td>57,943</td>
<td>116</td>
<td>2.9</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; 6 mos</td>
<td>North 1</td>
<td></td>
<td>50,172</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>North 2</td>
<td></td>
<td>57,943</td>
<td>49</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Crash Rates

South Section

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Crash Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>3.5</td>
</tr>
<tr>
<td>During</td>
<td>2.5</td>
</tr>
<tr>
<td>1st 6 months</td>
<td>2.0</td>
</tr>
<tr>
<td>2nd 12 months</td>
<td>1.5</td>
</tr>
<tr>
<td>3rd 6 months</td>
<td>1.0</td>
</tr>
</tbody>
</table>

South Section
## Injury and Fatality Crashes

<table>
<thead>
<tr>
<th>Section</th>
<th>Before</th>
<th>During</th>
<th>1st 6 months</th>
<th>2nd 12 months</th>
<th>3rd 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>33</td>
<td>15</td>
<td>16</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>South</td>
<td>50</td>
<td>20</td>
<td>20</td>
<td>34</td>
<td>11</td>
</tr>
</tbody>
</table>
The Improvements

- Convert TWLTL to raised median
- Optimize signal timing to maximize efficiency of traffic flow along FM 157
- One signal added
- Constructed driveways at some median openings
The Improvements

- Constructed shared access areas between properties
- Constructed 300’ long access road
- TxDOT recommended reducing some posted speeds in light of impending development
By the Numbers

- ~8 miles
- 52 median openings (40 originally planned)
- $2.6 million ($3.2 million estimated)
Travel Times

- Mixed Results
- Differences apparently due to signal timing changes
- No significant changes between signalized intersections
FM 157 General Findings

- Very few U-turn crashes
- Crash severity decreasing
- No migration of crashes to intersections
- Travel times generally unchanged to small increases
Infrastructure Investment Protection

- Many relatively low-cost treatments
- Minimize the need for parallel or widened roads
- Maximize the use of roadway capacity
  - Minimize stop/slow and go traffic
Contact Information

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