Todd Lane Alternative Geometric Design Study
Ben White to St. Elmo
Austin, Texas

Presented by:
Clay Harris, PMP - City of Austin
Federico Mendoza, PE, PTOE – Brown & Gay Engineers, Inc.

September 15, 2011
Project History

Todd Lane Alternative Geometric Design Study
Austin, Texas
Critical Goals and Concerns

- Enhance Vehicular and Pedestrian Safety
- Maintain acceptable Level of Service
- Improve Corridor Appearance
- Pursue Code Compliance
  - Street, pedestrian, signage, etc.
- Stimulate Revitalization
- Maintain Commercial Activity during construction
Original Project Design

• **Alternative 1**
  - 4-lane divided on Todd Lane
  - 4-lane divided boulevard on Pleasant Valley Road
  - Standard signalized intersection at Todd Lane and St. Elmo Road
  - Real Estate acquisition cost prohibitive (2.5 M), substantially delaying project schedule.
Alternate Design

- **Alternative 2A**
  - 3-lane roadway section on Todd Lane
  - 4-lane divided on Pleasant Valley Road; Single-lane NB approach
  - Single-lane Roundabout at Todd Lane and St. Elmo Road
  - Fits within existing ROW
  - Real Estate acquisition estimated at $1m
Alternate Design

• **Alternative 2B**
  - 3-lane roadway on Todd Lane North, expanded on the approach
  - 4-lane divided on Pleasant Valley Road
  - Two-lane Roundabout at Todd Lane and St. Elmo Road
  - Additional ROW corner clips required
Roundabout Benefits

• Improved pedestrian and vehicular safety
• Elimination of left-turn, head-on, and T-bone collisions
• Vehicle-vehicle conflicts decreases from 32 to 8
• Crash reduction:
  – 90% fatal crashes, 76% injury crashes, 35% overall
• Yield operation promotes minimal queuing
• Significant reduction in delay
• Opportunity for community landmark
Study Scope

- Traffic Volumes
- Single-Lane Roundabout Concept Layout
- Two-Lane Roundabout Concept Layout
- Truck Vehicle Paths
- Traffic Simulation Analysis
- Conclusions
Traffic Volumes

• Existing Peak Hour Volumes – Todd Lane at St. Elmo Rd.
  – AM Peak: Heavier Volumes
  – PM Peak: Relatively Balanced Flows

<table>
<thead>
<tr>
<th>Approach</th>
<th>AM Peak Hour (Vehicles per hour)</th>
<th>PM Peak Hour (Vehicles per hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northbound</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southbound</td>
<td>301</td>
<td>474</td>
</tr>
<tr>
<td>Eastbound</td>
<td>458</td>
<td>523</td>
</tr>
<tr>
<td>Westbound</td>
<td>677</td>
<td>327</td>
</tr>
<tr>
<td>Total</td>
<td>1,436</td>
<td>1,324</td>
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</table>

Todd Lane Alternative Geometric Design Study
Austin, Texas
Traffic Projections

- Derived from Existing Counts and CAMPO Estimates
- Daily Traffic Volume Forecasts – Todd Lane at St. Elmo Road

<table>
<thead>
<tr>
<th>Intersection Leg</th>
<th>2015 Daily Volumes (Vehicles per day)</th>
<th>2025 Daily Volumes (Vehicles per day)</th>
<th>2035 Daily Volumes (Vehicles per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>11,100</td>
<td>14,000</td>
<td>18,000</td>
</tr>
<tr>
<td>South</td>
<td>11,400</td>
<td>15,400</td>
<td>15,500</td>
</tr>
<tr>
<td>East</td>
<td>3,370</td>
<td>5,518</td>
<td>7,000</td>
</tr>
<tr>
<td>West</td>
<td>9,100</td>
<td>8,500</td>
<td>7,900</td>
</tr>
</tbody>
</table>
Single-Lane Roundabout Concept
Two-lane Roundabout Concept

Todd Lane Alternative Geometric Design Study
Austin, Texas
WB-50 Design Vehicle
WB-50 Design Vehicle
### Traffic Simulation Results – Year 2025

<table>
<thead>
<tr>
<th>Peak Hour Period</th>
<th>Approach</th>
<th>Control Delay (sec/veh)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Alternative 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Standard Intersection</td>
</tr>
<tr>
<td>AM PEAK</td>
<td>Northbound</td>
<td>50.9</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>17.3</td>
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<tr>
<td></td>
<td>Eastbound</td>
<td>63.1</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>90.6</td>
</tr>
<tr>
<td></td>
<td>ALL</td>
<td>53.8</td>
</tr>
<tr>
<td>PM PEAK</td>
<td>Northbound</td>
<td>37.0</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>38.4</td>
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<tr>
<td></td>
<td>Eastbound</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>31.9</td>
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<tr>
<td></td>
<td>ALL</td>
<td>34.9</td>
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### Traffic Simulation Results – Year 2035

<table>
<thead>
<tr>
<th>Peak Hour Period</th>
<th>Approach</th>
<th>Control Delay (sec/veh)</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Alternative 1</td>
<td>Alternative 2B</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Standard Intersection</td>
<td>Two Lane Roundabout</td>
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</tr>
<tr>
<td>AM PEAK</td>
<td>Northbound</td>
<td>57.3</td>
<td>38.8</td>
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<td>Southbound</td>
<td>21.0</td>
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<td>Eastbound</td>
<td>75.4</td>
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<td>Westbound</td>
<td>105.1</td>
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<tr>
<td></td>
<td>ALL</td>
<td>63.0</td>
<td>52.6</td>
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</tr>
<tr>
<td>PM PEAK</td>
<td>Northbound</td>
<td>41.0</td>
<td>7.2</td>
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<td></td>
<td>Southbound</td>
<td>41.9</td>
<td>7.0</td>
<td></td>
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<td></td>
<td>Eastbound</td>
<td>33.9</td>
<td>10.4</td>
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<tr>
<td></td>
<td>Westbound</td>
<td>52.4</td>
<td>7.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALL</td>
<td>40.9</td>
<td>8.4</td>
<td></td>
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</tbody>
</table>
2025 AM Peak – Signal vs. Roundabout

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Study Conclusions

• The single-lane roundabout will provide:
  – Acceptable level of service through year 2025 during peak hours
  – Least amount of delay to motorists during off-peak hours
  – Higher level of safety (reduction in crashes) for vehicles
  – Higher level of safety for pedestrians and bicyclists
  – A safe and efficient alternative to a standard signal that will fit within the R.O.W. footprint
  – Significant cost savings in R.O.W. and construction costs
Study Conclusions

• The single lane roundabout can be expanded to a 2-lane roundabout after 2025 (if needed) to accommodate anticipated peak hour flows for 2035.
  – This expansion will require additional ROW at the corners.

• The traffic signal option will not operate as well as the roundabout, and will not yield higher safety improvements like the roundabout does.
Project Schedule

• Original Design
  – Complete Real Estate Acquisition – Summer 2012
  – Obtain permits / complete design – Summer 2012
  – Begin construction – Spring 2013

• Alternate Design
  – Complete Real Estate Acquisition - Fall 2011
  – Begin Design Fall 2011
  – Complete Design Fall 2012
  – Begin construction – Spring 2013
Questions? Comments?

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- Email clay.harris@ci.austin.tx.us