Intersection Improvement Study at Spring Hill Road and Lewinsville Road

Public Meeting
6/5/2019
Agenda

• Introductions
• Project Purpose/Needs
• Existing Conditions Overview
• Initial Improvement Concepts
• Community Outreach (Spring 2018)
• Revised Improvement Concepts
• Next Steps
• Questions/Comments
Project Purpose/Needs

- Relieve peak hour congestion
- Improve traffic operations and safety
- Develop mitigation measures to address traffic operations and safety
- Enhance pedestrian and bicycle facilities
Previous Efforts

- Tysons Neighborhood Study
- Mitigated traffic signal option recommended as part of study
Based on data collected on Thursday, January 26, 2017

Average Travel Speed (mph)

0  10  20  30+

#. # - Overall Intersection Delay*
*secs/veh - results based on VISSIM analysis
Existing Conditions – Crash History

Summary of Study Area Crashes
January 1, 2011 - December 31, 2015

Total Crashes: 33
Crash Severity: 42% Injuries; 58% Property Damage Only
Peak Period: 21% AM; 36% PM; 43% Off Peak

Crashes by Collision Type
- Rear End (21 crashes, 64%)
- Angle (4 crashes, 12%)
- Head On (5 crashes, 15%)
- Sideswipe - Same Direction (1 crash, 3%)
- Sideswipe - Opposite Direction (1 crash, 3%)
- Fixed Object - Off Road (1 crash, 3%)

Crashes by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Crash Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>11</td>
</tr>
<tr>
<td>2012</td>
<td>2</td>
</tr>
<tr>
<td>2013</td>
<td>4</td>
</tr>
<tr>
<td>2014</td>
<td>8</td>
</tr>
<tr>
<td>2015</td>
<td>8</td>
</tr>
</tbody>
</table>

Four “Head On” crashes occurred within the intersection. All crashes occurred due to the vehicles completing a left turn from Lewinsville Road (3 eastbound and 1 westbound) under permissive green signal conditions.
Existing Conditions – Crash History

- **Head on crashes**
  - Unusual geometry creates driver confusion

- **Angle crashes**
  - No eastbound protected left-turn signal phase (green arrow)
  - Unusual geometry creates driver confusion
  - Large intersection footprint makes it difficult to judge gaps for turning

- **Rear end crashes**
  - Typical crashes at traffic signals due to driver inattention or confusion
  - Northbound right-turn crashes due to failure to yield
  - Eastbound right-turn crashes due to failure to yield
  - No left-turn lanes on the eastbound, northbound, and southbound approaches
Intersection Improvement Concepts

- Preliminary sketch layouts based on updated traffic forecasts
- Geometry and operations refined based on preliminary traffic analysis
- Bicycle and pedestrian accommodations incorporated
  - Countywide Trails Plan, October 2014
  - Countywide Bicycle Master Plan, adopted October 2014
- Refined intersection layout based on community, county staff, and supervisor feedback
- Minimize impacts to private properties and natural environment
Intersection Improvement Concepts

• Four concepts developed with key features
  1. Additional turn lanes → separate through and left-turn traffic
  2. Roundabout configuration → slow traffic and improve safety
  3. Rerouted turning movements → simplify signal operations
  4. Split intersections → reduce intersection footprint and simplify signal operations
     (i.e. two intersections instead of one)
Measures of Effectiveness

- Operations
- Safety benefits
- Bicycle and pedestrian accommodations
- Right-of-way
- Constructability
- Cost
- Environmental Impact
Community Outreach

- Community Meeting (May 2018)
  - Summary of existing conditions
  - Present initial concepts
  - Summary of concept screening against MOEs
- Two-question survey to solicit feedback
  - Rank the improvement concepts
  - Provide feedback regarding the project
  - Survey closed on June 4, 2018
Community Outreach

- 98 unique responses (survey and feedback)
- Recurring and main concerns
  - Do not incentivize cut-through traffic
  - Improve safety above traffic flow
  - Upgrade pedestrian and bicycle facilities
  - Limit right-of-way impacts to neighboring properties
Revised Improvement Concepts

- Conventional Intersection
  - No change to existing travel patterns, enhancements to signal operations
  - Maintains intersection skew
  - Does not improve bicycle and pedestrian accommodations
Revised Improvement Concepts

• Offset T-Intersection
  – Developed based on community feedback (May 2018)
  – Eliminates intersection skew and reduces size of intersection
  – Simplified bicycle and pedestrian flow
  – Creates new green space
Revised Improvement Concepts

- Future (2040) traffic analysis of no-build and revised improvement concepts
- Congestion at the Dulles Toll Road impacts intersection operations
- Analysis considered two scenarios for the improvement concepts
  - One southbound travel lane on Spring Hill Road between Lewinsville Road and the Dulles Toll Road
  - Two southbound travel lanes on Spring Hill Road between Lewinsville Road and the Dulles Toll Road
## Measures of Effectiveness

<table>
<thead>
<tr>
<th>MOE</th>
<th>No Build</th>
<th>Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Conventional Intersection</td>
</tr>
<tr>
<td>Operations</td>
<td>POOR</td>
<td>GOOD</td>
</tr>
<tr>
<td>Right-of-Way</td>
<td>N/A</td>
<td>LOW</td>
</tr>
<tr>
<td>Constructability</td>
<td>N/A</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Cost</td>
<td>N/A</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Bicycle and Pedestrian</td>
<td>POOR</td>
<td>FAIR</td>
</tr>
<tr>
<td>Pedestrian Accommodations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>N/A</td>
<td>LOW</td>
</tr>
<tr>
<td>Safety Benefit (Vehicles)</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>Safety Benefit (Bicycle and</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>Pedestrian)</td>
<td></td>
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**MOE Scoring Scale Bar**

- **Negative**
- **Positive**
Revised Improvement Concepts

- Pros and cons to each of the concepts

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional Intersection</strong></td>
<td>Safety challenges remain</td>
</tr>
<tr>
<td>• Reduced delay</td>
<td>• Does not eliminate skew</td>
</tr>
<tr>
<td>• Limited queue impact</td>
<td>• Challenging to improve bike/ped access</td>
</tr>
<tr>
<td>• Minimal change to existing</td>
<td></td>
</tr>
<tr>
<td><strong>Offset T-Intersection</strong></td>
<td>Greater potential for right-of-way impacts</td>
</tr>
<tr>
<td>• Improved safety for all transportation</td>
<td>to school and park properties</td>
</tr>
<tr>
<td>• Simplified operations</td>
<td></td>
</tr>
<tr>
<td>• Conventional bike/ped access</td>
<td></td>
</tr>
<tr>
<td>• New green space</td>
<td></td>
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</tbody>
</table>
Next Steps

- Solicit feedback on revised concepts through an online survey
- Recommend preferred alternative
- Advance to more detailed design
Questions/Comments

- [https://www.fairfaxcounty.gov/transportation/study/spring-hill-lewinsville-road](https://www.fairfaxcounty.gov/transportation/study/spring-hill-lewinsville-road)
- FCDOT Project Manager – Dan Stevens, daniel.stevens@fairfaxcounty.gov, 703-877-5670