ROUTE 50 STARS SAFETY AND OPERATIONAL IMPROVEMENTS STUDY - ARLINGTON COUNTY

A Study undertaken as part of VDOT’s Strategically Targeted and Affordable Roadway Solutions (STARS) Program

April 30, 2020

Virtual Presentation
Presentation Outline

• Study Overview

• Existing Traffic and Safety Conditions

• Study Progress Since November 2019 Public Information Meeting (PIM)

• November 2019 PIM Survey Results

• Alternatives Summary
  • Traffic operations analysis
  • Safety analysis

• Next Steps
Study Purpose / Elements

- Evaluate operational and safety conditions along Route 50 from Glebe Road to Fillmore Street
- Consider and evaluate potential improvements to enhance safety and operations in the study area
- Develop cost estimates for the preferred alternatives

Project is Not Currently Funded
Study Area

Route 50 (Arlington Boulevard) between Glebe Road and Fillmore Street

Intersections
- 2 traffic signals
  - Irving Street
  - Fillmore Street
- 6 stop-controlled
- 10 driveways
- 5 bus stops per direction
Route 50 Study Area Features

- 0.7-mile corridor
- 62,000 vehicles per day
- 45-mph speed limit
- Six lanes without a median
- No turn lanes at most intersections
- On-street parking between Garfield Street and Fenwick Street
- Frontage roads (segments)
- Recent signal and pedestrian improvements at Irving Street and Fillmore Street
Multi-Modal Accommodations

- Arlington Boulevard Trail along north and south sides (along frontage roads in some areas)
  - Trail Improvements along the south side of Route 50 from west of Irving Street to Fillmore Street
- Route 50 at Irving St – 4 crosswalks
  - 10 pedestrian and bike crossings of Route 50 in peak hour
- Route 50 at Fillmore St – 4 crosswalks
  - 35 pedestrian and bike crossings of Route 50 in peak hour
- Pedestrian bridge east of Jackson St
- 5 bus stops per direction (WMATA 4A); 30 buses per day
Safety Conditions

- Five year crash study period (2014 – 2018)
- 247 total crashes within the study area
  - 61 injury crashes / 0 fatal crashes
  - 7 pedestrian/bicycle crashes
    - 5 near Fillmore Street (4 pedestrian/1 bicycle)
    - 1 near Irving Street (bicycle)
    - 1 on Glebe Road at westbound Route 50 ramps (pedestrian)
- Crashes are concentrated at intersections
- More eastbound than westbound Route 50 crashes during the PM peak period

Crashes were evaluated by location, severity, type, time of day, and circumstances to examine contributing factors and develop appropriate improvements
**Intersection Crashes (2014 – 2018)**

Many crashes are the result of long queues at intersections and vehicles stopping to make left turns.
Intersection Safety and Conflict Points

- Used to evaluate safety performance of alternatives
- Fewer conflict points results in improved safety

Example Intersection Without Raised Median

32 conflict points

Example Intersection With Raised Median

4 conflict points
Irving Street Intersection Existing Operations – AM Peak

- Westbound Route 50 left turns to Irving Street wait for a gap in traffic
  - Westbound Route 50 through vehicles get trapped behind left turns
  - Westbound Route 50 through vehicles change lanes to go around left turns

- Eastbound Route 50 queues back up through Irving Street

Looking Southeast at Irving Street
Fillmore Street Intersection Existing Operations – AM Peak

- NB and SB Fillmore Street left turns must wait for a gap in opposing traffic and also yield to pedestrians

- NB and SB Fillmore Street through vehicles get trapped behind left turns and use the right-turn lane to enter the intersection

- Pedestrians see a WALK indication at the same time as left turns and right turns from Fillmore Street creating potential conflicts
Fillmore Street Intersection Existing Operations – PM Peak

- NB and SB left-turn vehicles must wait for a gap in opposing traffic and also yield to pedestrians.
- NB and SB Fillmore Street through vehicles get trapped behind left turns and use the right-turn lane to enter the intersection.
- Motorist confusion as well as varying levels of driver aggressiveness contribute to potential conflicts.

Looking Southeast at Fillmore Street
Study Progress since November 2019

- Reviewed November 2019 Public Information Meeting survey responses
- Developed improvement alternatives based on survey feedback
- Analysis of existing conditions (No Build) and alternatives
  - Traffic operations analysis
  - Safety analysis
- Cost estimates for alternatives
Survey Summary

* Includes 908 survey participants with unique Internet Protocol (IP) addresses
Survey Summary

• **Top 3 mobility issues**
  • Lack of turn lanes
  • Difficulty making left turns
  • Difficulty when walking within the corridor/crossing Route 50

• **Top 3 safety issues**
  • Congestion
  • Difficulty turning onto side streets from Route 50
  • Aggressive/distracted driving

• **Additional corridor concerns include:**
  • Traffic turning to and from Route 50 results in safety concerns for vehicular traffic, bicycles, and pedestrians
  • Need for dedicated pedestrian and bicycle facilities and improved bus stops
  • Request for median barriers or signage to restrict left turn movements

*For detailed survey results, please visit the study website: [www.virginiadot.org/route50arlingtonstudy](http://www.virginiadot.org/route50arlingtonstudy)*
Summary of Alternatives

Alternative 1: Raised median with left-turn lanes at Irving Street and Fillmore Street
  • Three variations (Alternatives 1a, 1b, and 1c)

Alternative 2: Raised median with left-turn lanes at Fillmore Street
  • No left-turn lanes at Irving Street
  • Prohibit left turns from Route 50 to Irving Street

Alternative 3: No left turns at unsignalized intersections
  • Install right-in/right-out islands at all unsignalized intersections
  • No left-turn lanes at Irving Street
  • Prohibit left turns from Route 50 to Irving Street

Options (may be combined with any Alternative)
  Option A: Service Road east of Old Glebe Road
  Option B: Service Road west of Irving Street
  Option C: Permit on-street parking between Garfield Street and Fenwick Street
  Option D: Service Road between Garfield Street and Fenwick Street
Typical Section – Alternatives 1a, 1b, 1c

Wide Raised Median Separating EB and WB Route 50 Travel Lanes

- Reduces conflict points at unsignalized intersections
- Reduces conflict points at unsignalized trail crossings
- More separation between EB and WB travel lanes with wide raised median (compared to Alternative 2)
- Results in widening impacts along Route 50 requiring curb and a closed drainage system
Left-turn lanes at Irving St reduce the potential for rear end crashes
Increases use of third travel lane on Route 50
Improves bicycle and pedestrian safety at Irving St

Increase in left turn movements at Fillmore St and Irving St
Does not reduce conflict points at Irving St and Fillmore St
Left-turn lanes at Irving St reduce the potential for rear end crashes
Increases use of third travel lane on Route 50
Irving Street and Fillmore St approach delays decrease and operate more efficiently
Improves bicycle and pedestrian safety at Fillmore St and Irving St

Difficult to enforce turn restrictions at Irving St and Fillmore St
Higher traffic volumes on Fillmore St (north leg) and Irving St (south leg)
Higher left turns from Irving St increases potential conflicts with pedestrians and bikes
Alternate Routes for Northbound Through Movement at Irving Street
Alternate Routes for Southbound Through Movement at Irving Street
Alternate Route for Northbound Left Turn at Fillmore Street
Alternate Route for Southbound Left Turn at Fillmore Street
Virginia Department of Transportation

Route 50 STARS Safety and Operational Improvements Study - Arlington County

**Alternative 1c: Raised Median with Left-Turn Lanes at Irving Street and Fillmore Street**

- Left-turn lanes at Irving St reduce the potential for rear end crashes
- Increases use of third travel lane on Route 50
- Irving St and Fillmore St approach delays decrease and operate more efficiently
- Improves bicycle and pedestrian safety at Irving St
- Difficult to enforce turn restrictions at Irving St and Fillmore St
- Higher traffic volumes on Irving St
- Higher left turns from Fillmore St increases potential conflicts with pedestrians and bikes
- Longer EB Route 50 travel time during AM peak hour

**Legend**
- WMATA Bus Stop
- Reconstructed Shared Use Path
- Raised Median
Alternate Route for Northbound Left Turn at Irving Street
Alternate Route for Southbound Left Turn at Irving Street

**Legend**
- WMATA Bus Stop
- Reconstructed Shared Use Path
- Raised Median
- Prohibited Movement
- Alternate Route
Alternate Routes for Northbound Through Movement at Fillmore Street
Alternate Routes for Southbound Through Movement at Fillmore Street
Typical Section – Alternative 2

- Reduces conflict points at unsignalized intersections
- Reduces conflict points at unsignalized trail crossings
- Less widening of Route 50 due to no left-turn lanes onto Irving St (compared to Alternatives 1a, 1b, and 1c)
- Less separation between EB and WB travel lanes with narrow raised median (compared to Alternatives 1a, 1b, and 1c)
- Reduces conflict points at Irving St
- Route 50 at Irving St operates more efficiently
- Increases use of third travel lane on Route 50
- Reduces widening of Route 50 (compared to Alternative 1a, 1b, and 1c)

- Does not reduce turning conflict points at Fillmore St
- Higher traffic volumes and delays at Fillmore St
- Longer EB Route 50 travel times
Alternate Route for Eastbound Left Turn at Irving Street
Alternate Route for Westbound Left Turn at Irving Street
• Reduces conflict points at Irving St and unsignalized intersections
• Route 50 at Irving St operates more efficiently
• Increases use of third travel lane on Route 50
• Does not require widening of Route 50

• Difficult to enforce left-turn restrictions; likely to require overhead sign structures
• Does not reduce turning conflict points at Fillmore St
• Higher traffic volumes and delays at Fillmore St
• Longer EB Route 50 travel time
• No separation between EB and WB travel lanes
Alternate Route for Eastbound Left Turn at Irving Street
Alternate Route for Westbound Left Turn at Irving Street
Route 50 Safety Analysis

- 16 (28%) of 57 angle/left-turn crashes occurred at midblock locations
  - Would be eliminated with a raised median
- 26 (20%) of 133 rear end crashes were specifically attributed to midblock left turns (based on police reports)

Conflict Point Comparison

- Alternative 1a – 56% reduction of conflict points
- Alternatives 1b and 1c – 69% reduction of conflict points
  - Increased safety benefits with turn restrictions at Fillmore Street and Irving Street
- Alternatives 2 and 3 – 63% reduction of conflict points
  - Increased safety benefits with prohibition of left turns at Irving Street

Note: Conflict point reductions assume motorists comply with the turn restrictions
Evaluation of Left-Turn Safety and Operations

- The November 2019 Survey results identified “difficulty making left-turns and/or lack of left-turn lanes” as one of the public’s main concerns
- All Build Alternatives improve corridor operations by prohibiting left-turns to/from unsignalized intersections and increasing the WB left-turn lane storage at Fillmore Street

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Modifications to Left Turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide Median with Turn Lanes</td>
<td>• Dedicated left-turn lanes from Route 50 to Irving St reduces the potential for rear end crashes and improves utilization of the third Route 50 travel lane</td>
</tr>
<tr>
<td>1a</td>
<td>• Dedicated left-turn lanes from Route 50 to Irving St reduces the potential for rear end crashes and improves utilization of the third Route 50 travel lane</td>
</tr>
<tr>
<td>1b</td>
<td>• Prohibiting left-turns from Fillmore St and through movements from Irving Street reduces left-turn conflict points</td>
</tr>
<tr>
<td>1c</td>
<td>• Dedicated left-turn lanes from Route 50 to Irving St reduces the potential for rear end crashes and improves utilization of the third Route 50 travel lane</td>
</tr>
<tr>
<td>2 Narrow Median</td>
<td>• Prohibiting left-turn movements onto Irving St reduces conflict points</td>
</tr>
<tr>
<td>3 No Median</td>
<td>• Prohibiting left-turn movements onto Irving St reduces conflict points</td>
</tr>
</tbody>
</table>
Evaluation of Pedestrian Safety

- The November 2019 survey results identified “pedestrian crossing safety across Route 50” as one of the public’s main concerns
- All Build alternatives improve pedestrian crossings at unsignalized intersections due to less traffic turning from Route 50 onto unsignalized intersections

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Impacts to Pedestrian Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wide Median with Turn Lanes</strong></td>
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</tr>
<tr>
<td>1a</td>
<td>• Signalizing the left-turn movements onto Irving St improves bike and pedestrian safety</td>
</tr>
</tbody>
</table>
| 1b | • Signalizing the left-turn movements onto Irving St improves bike and pedestrian safety  
• Prohibiting left turns from Fillmore St improves bike and pedestrian safety (the location with the highest pedestrian volume) |
| 1c | • Signalizing the left-turn movements onto Irving St improves bike and pedestrian safety  
• Prohibiting left turns from Irving St improves bike and pedestrian safety |
| **Narrow Median** | 2 | • Prohibiting left turns onto Irving St reduces left-turn conflicts with pedestrians |
| **No Median** | 3 | • Prohibiting left turns onto Irving St reduces left-turn conflicts with pedestrians |
## Evaluation of Alternatives

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Existing (No Build)</th>
<th>Alternative 1: Wide Median with Turn Lanes</th>
<th>Alternative 2: Narrow Median</th>
<th>Alternative 3: No Median</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>1a</td>
<td>1b</td>
<td>1c</td>
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<tr>
<td>Left Turn Operations</td>
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<tr>
<td>Vehicle Conflict Points</td>
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<td>●</td>
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<td>% Reduction of Conflict Points</td>
<td>0%</td>
<td>-56%</td>
<td>-69%</td>
<td>-69%</td>
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<td>Separation Between Route 50 Travel Lanes</td>
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<td>Travel Time</td>
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<td>7.6</td>
<td>7.9</td>
<td>8.7</td>
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<td>Total of both EB and WB Route 50 during both AM and PM peak (minutes)</td>
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<td>Enforcement of Turn Restrictions</td>
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<td>Right-Of-Way Impacts</td>
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<td>Preliminary Cost</td>
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<td>$14-18 million</td>
<td>$14-18 million</td>
<td>$14-18 million</td>
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**Note:** “Options” presented in the next 4 slides could be considered with any “Alternative” under consideration and do not impact the evaluation criteria.

Alternative 1 (1a, 1b, and 1c): Raised median with left-turn lanes at Irving Street and Fillmore Street
Alternative 2: Raised median with left-turn lanes at Fillmore Street
Alternative 3: No left turns at unsignalized intersections
Eliminates 5 residential driveways on Route 50
Eliminates 5 conflict points along the Arlington Boulevard Trail

Impacts to residential properties
Increased cost

Legend
- WMATA Bus Stop
- Reconstructed Shared Use Path
- Raised Median

*(may be included in any Alternative)*
(may be included in any Alternative)

- Eliminates 2 residential driveways on Route 50
- Eliminates 2 conflict points along the Arlington Boulevard Trail
- Impacts to residential properties
- Increased cost
(may be included in any Alternative)

- Maintains 9 parking spots (current capacity is approx. 11 spaces)
- Increased impacts to properties
- Does not decrease potential for conflicts along Route 50

Legend

- Reconstructed Shared Use Path
- Raised Median
(may be included in any Alternative)

- Eliminates potential conflicts along Route 50
- Provides additional parking opportunities off of Route 50
- Increased impacts to properties
- Increased cost
Next Steps

• Provide comments using the following link: www.virginiadot.org/route50arlingtonstudy

• Comment period closes May 29, 2020

• VDOT and Arlington County to identify preferred alternative and refine based on public feedback

• Study recommendations will be finalized and posted online this summer 2020

• VDOT will work together with Arlington County to identify project funding (the project is not currently funded)

• Arlington County to submit SMART SCALE funding application in August 2020
THANK YOU!

Your input is essential as we evaluate potential improvement alternatives.

Please take our survey located on our project website!

www.virginiadot.org/route50arlingtonstudy

Comments may also be sent to: meetingcomments@vdot.virginia.gov