Route 29 Corridor Assessment Update

Development of Solution Sets

June 23, 2016
Purpose of Developing Solution Sets

- To focus on steps to implement corridor goals and objectives
- To accommodate consideration of a broad range of solution strategies and tactics for preserving corridor capacity
- With input from key stakeholders, to incorporate local land use and economic development concerns
- To identify a range of access management measures
- To identify a range of low-cost improvements
- To identify multi-modal options
Solution Sets Development Process

Public involvement input from past studies is considered, and indicates:

1. Concern with congestion along the northern segments (approaching US 460)
2. Safety, particularly in accessing fronting properties, is a consistent concern
3. Access to adjacent development is disjointed
4. Coordinate planning for land use and transportation
5. Travel mode choice is severely limited
Route 29 Solution Sets Development Process

- Adds to what has previously been accomplished

1. Documents findings and recommendations of previous studies

2. Updates analysis of existing conditions for operations, capacity and safety

3. Expand potential solutions to consider Intelligent Transportation System (ITS) measures

4. Identifies potential funding sources for improvements, such as
   a. Highway Safety Improvement Program (HSIP)
   b. Smart Scale (formerly HB2)
   c. Revenue sharing
   d. State of good repair (state)
Summary of Findings – Previous Corridor Studies

**Issues**
- Unsafe roadway and intersection design
- Frequent and unsafe median crossovers without turn lanes
- Proliferation of strip development resulting in too many driveways
- Accommodating heavy trucks
- Absence of multi-modal (transit, bike and pedestrian) service

**Recommendations**
- Address high crash rate areas in corridor
- Closure of unsafe median crossovers
- Consider installation of frontage roads
- From Liberty Mountain Drive to Colonial Highway, limit new signal installation only to Lynbrook Drive (total of 7 signals on segment)
- Develop a network of local street connections
- Implement corridor zoning overlay district
- Apply access management principles to land development activities
- Provide for safe multi-modal access
## Relationship of Goals, Objectives and Measures

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Performance Measure(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provide a SAFE transportation system</strong></td>
<td>Reduce motor vehicle crash risk</td>
<td>• Crashes per mile&lt;br&gt;• Number of rear-end crashes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Number of crashes involving vehicles entering and exiting highway&lt;br&gt;• Number of stops</td>
</tr>
<tr>
<td><strong>Provide an EFFICIENT Transportation system</strong></td>
<td>Reduce delay</td>
<td>• Number of times peak travel time through corridor is below 20 minutes&lt;br&gt;• Number of driveways per mile&lt;br&gt;• Number of median crossovers per mile</td>
</tr>
<tr>
<td></td>
<td>Improve travel time reliability</td>
<td>• Degree of variation in weekday travel speeds on a day-to-day basis</td>
</tr>
</tbody>
</table>
### Relationship of Goals, Objectives and Measures

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Performance Measure(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide a transportation system that is COMPATIBLE with land uses</td>
<td>Improve vehicular access to points for passenger travel</td>
<td>• Delay for turning left and right into certain businesses</td>
</tr>
</tbody>
</table>
| | Improve pedestrian access along corridor | • Multi-modal connectivity index  
• Number of parcels with connection points for pedestrians |
<p>| | Improve freight access within the corridor | • Travel time to the Norfolk Southern general freight facility |
| | Provide adequate parcel access | • Multi-modal service level for pedestrians and bicyclists |</p>
<table>
<thead>
<tr>
<th>Year</th>
<th>Segment I NB</th>
<th>Segment I SB</th>
<th>Segment II NB</th>
<th>Segment II SB</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>2011</td>
<td>8</td>
<td>1</td>
<td>36</td>
<td>21</td>
<td>66</td>
</tr>
<tr>
<td>2012</td>
<td>10</td>
<td>3</td>
<td>22</td>
<td>29</td>
<td>64</td>
</tr>
<tr>
<td>2013</td>
<td>6</td>
<td>1</td>
<td>36</td>
<td>36</td>
<td>79</td>
</tr>
<tr>
<td>2014</td>
<td>4</td>
<td>5</td>
<td>29</td>
<td>33</td>
<td>71</td>
</tr>
<tr>
<td>2015</td>
<td>9</td>
<td>7</td>
<td>38</td>
<td>28</td>
<td>82</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>17</td>
<td>161</td>
<td>147</td>
<td>362</td>
</tr>
</tbody>
</table>

Crash Rate*  

Note: The 2014 statewide average crash rate for a Rural Principal Arterial is 73.

Crashes by Corridor Segments

*Per 100 Million vehicles miles of travel.
### Existing Conditions Analysis Findings

#### Summary of Signalized Intersection Analysis

- **Overall arterial capacity is adequate for existing volumes**
- **Delays at several turning movements are lengthy**
- **Widening of Route 29 may not be needed to address existing deficiencies**

<table>
<thead>
<tr>
<th></th>
<th>Rt. 29 &amp; Liberty Mountain Drive</th>
<th>Rt. 29 &amp; Russell Woods Drive</th>
<th>Rt. 29 &amp; Lawyers Road</th>
<th>Rt. 29 &amp; English Tavern Road</th>
<th>Rt. 29 &amp; Calohan Road</th>
<th>Rt. 29 &amp; Colonial Highway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AM Peak Hour</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.7 (B)</td>
<td></td>
<td>8.3 (A)</td>
<td>15.1 (B)</td>
<td>20.2 (C)</td>
<td>21.4 (C)</td>
<td>21.5 (C)</td>
</tr>
<tr>
<td><strong>PM Peak Hour</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.8 (B)</td>
<td></td>
<td>12.6 (B)</td>
<td>21.9 (C)</td>
<td>19.0 (B)</td>
<td>19.1 (B)</td>
<td>18.0 (B)</td>
</tr>
</tbody>
</table>
Traffic Volumes by Segment

Segment 1: Colonial Highway to English Tavern Road

Segment 2: English Tavern Road to US 460
Solution Sets Development Process

- Emphasis Themes
  1. Arterial Capacity and Throughput
  2. Safety
  3. Economic Development
  4. Multi-modal service
  5. Smart Scale funding potential
Access Management Refresher

Purpose of Access Management

- Reduce traffic congestion, motorist’s time waiting in traffic
- Lower the number and severity of traffic crashes
- Preserve critical roadway capacity
  - Maximize the performance of existing highways, reducing the need for new highways & adding lanes to highways
  - Protect taxpayer investment in highways
- Support economic development
  - Better mobility expands the market reach of businesses and lowers the cost of transporting goods
- Provide property owners with reasonable access to the highway
Access Management Refresher

VDOT will permit reasonably convenient access to the highway:

- Fewest number of entrances to reduce turning movements
- Focus on side streets
- Use of right-in/right-out entrance design
- Demonstrate safety of proposed entrance & its impact
- Mitigate any impacts on highway operation and safety.

Too many entrances can lead to a reduction in the flow of traffic and potential collisions.
Access Management Refresher

**Access Management Requirements**

1. **Keep entrances out** of the functional area of intersections and **away from** interchange ramps

2. **Share the entrance** with adjoining property owner

3. **Provide connections to property line** for vehicular and pedestrian circulation between land uses

4. **Control** traffic movements at entrances

5. **Comply with spacing standards** to separate signals, intersections, median openings, and commercial entrances

*Exceptions to the requirements are referenced in the Regulations.*
## VDOT Spacing Standards

<table>
<thead>
<tr>
<th>Highway Functional Classification</th>
<th>Minimum Centerline to Centerline Spacing (Distance) in Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spacing from Signalized Intersections to Other Signalized Intersections</td>
</tr>
<tr>
<td></td>
<td>Spacing from Partial Access One or Two Way Entrances to Any Type of Entrance, Intersection or Median Crossover</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Principal Arterial</strong></td>
<td></td>
</tr>
<tr>
<td>≤ 30 mph</td>
<td>1,050</td>
</tr>
<tr>
<td>35 to 45 mph</td>
<td>1,320</td>
</tr>
<tr>
<td>≥ 50 mph</td>
<td>2,640</td>
</tr>
<tr>
<td><strong>Minor Arterial</strong></td>
<td></td>
</tr>
<tr>
<td>≤ 30 mph</td>
<td>880</td>
</tr>
<tr>
<td>35 to 45 mph</td>
<td>1,050</td>
</tr>
<tr>
<td>≥ 50 mph</td>
<td>1,320</td>
</tr>
<tr>
<td><strong>Collector</strong></td>
<td></td>
</tr>
<tr>
<td>≤ 30 mph</td>
<td>660</td>
</tr>
<tr>
<td>35 to 45 mph</td>
<td>660</td>
</tr>
<tr>
<td>≥ 50 mph</td>
<td>1,050</td>
</tr>
<tr>
<td><strong>Local Street</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Commercial entrance spacing: See Figure 4-11.</td>
</tr>
</tbody>
</table>

See Appendix F, Table 2-2, VDOT Road Design Manual.
Access Management Benefits

- Improved Capacity
- Improved Safety
- Good for Business
Examples of Access Management Tools

Protect Traffic Movements at Intersections

Motorists stopping to turn at entrances too close to an intersection can cause crashes, congestion, vehicles backing up on to main highway.

Corner Clearance on Minor Side Street: Locate entrances away from Intersections
Examples of Access Management Tools

Keep Entrances & Intersections Away From Interchange Ramps

- Prevents traffic backups onto ramps
- Reduces crash potential near the ramps
Examples of Access Management Tools

Share Entrances

- Reduces the number of entrance/exit points along the highway
- Businesses can share (gain) customers; share construction cost
- Record agreement for joint use and maintenance of the entrance

Top Right: 23 entrances, 28 parcels

Bottom Right: 10 entrances, 29 parcels

EXCEPTIONS

- Physical constraints such as topography, environmental, hazardous land uses
- Adjoining property owner will not agree to share entrance
Examples of Access Management Tools

Vehicles travel on site; less traffic on the highway
Facilitate customer circulation between businesses

- Record access easement, construct connection to adjoining undeveloped parcel boundary
- Adjoining parcel connects when developed

**EXCEPTION:** Physical constraints to the connection such as topography, environmentally sensitive areas, adjacent hazardous land use
Examples of Access Management Tools

Cross Access Interparcel Easement
Examples of Access Management Tools

Control Turning Movements at Entrances

74% of Crashes at Entrances Involve Left Turns
Examples of Access Management Tools

- More efficient traffic progression
- Reduces stop & go delay
- Simplifies signal synchronization
- Use less gas; less vehicle emissions
Examples of Access Management Tools

Fewer Intersections: U-Turns vs. Left Turns

Making a U-Turn at an Intersection is 25% Safer than a Left Turn Across Highway Lanes*

* 2001 Research Study for Florida Dept of Transportation
Where do we go from here?

Process For Development and Implementation of Corridor Solution Sets

**Today**
- Stakeholder Meeting
  - Suggestions & Comments

**September**
- Analyze Solutions Sets Using Performance Measures

**October**
- Select Preferred Solution Set

**January**
- Prioritize Implementation of Preferred Solution Set

- Develop Forecasted Traffic Volumes
- Evaluate Funding Sources
QUESTIONS AND COMMENTS

June 23, 2016