Rt 29 Solutions Hydraulic Planning Advisory Panel

October 12, 2017
Agenda Item 1: Introductions

Hydraulic Planning Advisory Panel members

Technical Team members
Agenda item 2: Public Interaction and Feedback

Live Streaming
YouTube Views

Sept. 28, 2017

- YouTube Views: 42

- Reminder – We have changed streaming processes and can no longer provide live-streaming statistics. We will continue to provide the number of times the video has been viewed as of the date of completion of the presentation.
Agenda item 2: Public Interaction and Feedback (continued)

For the period September 28 - October 11, 2017

Inbox and Phone

- Writer requested a copy of the traffic simulation videos that were displayed during the September 28, 2017 HPAP meeting.
Agenda item 2: Public Interaction and Feedback (continued)

For the period September 28 - October 11, 2017

Website input

• None
Agenda item 3: Response to Panel Feedback

- Capacity of one lane and two lane roundabouts
- Comparison of crash rates between roundabouts and traditional intersections
- Illustration of how bike lanes are accommodated in roundabout design
- Percentage of area traffic by movement (i.e. A-C, B-D, D-E, etc…)
- Prepare a list of intersections in the study area with the movements that are accommodated at each
- Provide a list of interim transportation milestones
Agenda Item 4: Transportation Update

Progress Since Last Meeting:

- **Refined future VISSIM model for Scenario 1**
- **Comparison of existing operational performance parameters**
- **Develop transit share assumptions**
Agenda Item 4: Transportation Update

Traditional Intersection vs Roundabout Safety

- **Traditional Intersections**
  - 32 conflict points → Increased risk of accidents
  - Right-angle accidents are common
  - 4 conflict points per approach for pedestrians

- **Roundabouts**
  - 75% fewer conflict points depending on roundabout configuration
  - Side-swipes accidents are common due to merging
  - 2 conflict points per approach for pedestrians
  - 51% reduction in pedestrian accidents

<table>
<thead>
<tr>
<th></th>
<th>Signalized</th>
<th>1 Lane Roundabout</th>
<th>2 Lane Roundabout</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Rd &amp; Hillside Dr</td>
<td>3.20</td>
<td>2.87</td>
<td>2.93</td>
</tr>
<tr>
<td>Hydraulic Rd &amp; District Ave</td>
<td>3.15</td>
<td>2.87</td>
<td>3.02</td>
</tr>
<tr>
<td>Hydraulic Rd &amp; Hillsdale Dr &amp; District Ave</td>
<td>2.87</td>
<td>2.87</td>
<td>0.87</td>
</tr>
</tbody>
</table>

|                      |            |                   |                   |
|                      | Crashes per Year | Crashes with Injuries per Year |                     |
| Hydraulic Rd & Hillside Dr | 1.10       | 0.82              |                    |
| Hydraulic Rd & District Ave | 0.82       | 0.87              | 0.54              |
| Hydraulic Rd & Hillsdale Dr & District Ave | 0.87      | 0.87              | 0.54              |

Source: FHWA
Roundabout Bicycle and Pedestrian Accommodations

- **Pedestrians**
  - Splitter islands slow approaching traffic and allow pedestrians to cross in two stages (shorter crossing distance)
  - Landscaping strips separate vehicular and pedestrian traffic to guide through traffic circle

- **Bicyclists**
  - Terminate bike lanes prior to entrance of roundabout
  - May dismount and walk along pedestrian path
  - May ride in circle with vehicular traffic
    - Bicycle and vehicle speeds are typically similar within the circle
  - Wider or shared-use paths may be considered

Source: FHWA
Agenda Item 4: Transportation Update

Source: MUTCD
Agenda Item 4: Transportation Update

**Hydraulic Rd. at Hillsdale Dr. Footprint Comparison**

Roundabout

Signalized Intersection
Agenda Item 4: Transportation Update

Hydraulic Rd. at District Ave. Footprint Comparison

Roundabout

Signalized Intersection
Agenda Item 4: Transportation Update

Roundabout Capacity

Source: VDOT Road Design Manual
Roundabout Capacity

- Double-lane roundabout may be sufficient (additional analysis needed)
- Single-lane roundabout may be sufficient (additional analysis needed)
- Single-lane roundabout likely to operate acceptably
- Double-lane roundabout likely to operate acceptably

Existing AADT Along Hydraulic Rd.
Near Hillsdale Dr.
Near District Ave.

Source: VDOT Road Design Manual
Agenda Item 4: Transportation Update – Scenario 1 Improvements

What’s Included:

- Grade Separation at US 29 & Hydraulic Rd.
- Roundabouts at Hillsdale Dr. and District Ave. on Hydraulic Rd.
- Grade Separations at Zan Rd. and Angus Rd.
- Relocation of WB 250 ramps to connect with Hillsdale Dr.
- Removal of signal at US 29 & Lenox
Agenda Item 4: Transportation Update – Scenario 1 Improvements

### Scenario 1 Vehicle Movement Comparison

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Major Street Restrictions</th>
<th>Minor Street Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 29 &amp; Greenbrier</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>US 29 &amp; Lenox</td>
<td>Lefts</td>
<td>Thru/Lefts</td>
</tr>
<tr>
<td>US 29 &amp; Seminole</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>US 29 &amp; Hydraulic</td>
<td>None</td>
<td>Lefts</td>
</tr>
<tr>
<td>US 29 &amp; Angus</td>
<td>Lefts (U-Turns Allowed SB)</td>
<td>Lefts</td>
</tr>
<tr>
<td>Hydraulic &amp; US 250</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Hydraulic &amp; Hillsdale (K-Mart)</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Hydraulic &amp; District</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Hydraulic &amp; Commonwealth</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Hydraulic &amp; Georgetown</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Commonwealth &amp; Greenbrier</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
## Agenda Item 4: Transportation Update – Scenario 1 Improvements

### Travel Time Comparison

<table>
<thead>
<tr>
<th>Route</th>
<th>AM Peak</th>
<th>PM Peak</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing Travel Time (min)</td>
<td>Scenario 1 Travel Time (min)</td>
<td>% Measured Demand</td>
</tr>
<tr>
<td>A to C</td>
<td>3.4</td>
<td>4.2</td>
<td>9.7%</td>
</tr>
<tr>
<td>A to E</td>
<td>4.1</td>
<td>4.5</td>
<td>4.7%</td>
</tr>
<tr>
<td>B to C</td>
<td>3.6</td>
<td>3.7</td>
<td>17.7%</td>
</tr>
<tr>
<td>B to E</td>
<td>4.8</td>
<td>4.6</td>
<td>3.3%</td>
</tr>
<tr>
<td>C to A</td>
<td>3.4</td>
<td>2.9</td>
<td>7.3%</td>
</tr>
<tr>
<td>C to B</td>
<td>4.4</td>
<td>4.3</td>
<td>7.9%</td>
</tr>
<tr>
<td>C to D</td>
<td>2.9</td>
<td>2.5</td>
<td>14.1%</td>
</tr>
<tr>
<td>D to C</td>
<td>2.3</td>
<td>2.5</td>
<td>31.3%</td>
</tr>
<tr>
<td>D to E</td>
<td>2.9</td>
<td>2.9</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

- **5% Decrease or more**
- **5% Increase or more**
### Agenda Item 4: Transportation Update – Scenario 1 Improvements

#### Intersection Delay Comparison

<table>
<thead>
<tr>
<th>Intersection</th>
<th>AM Existing Delay (sec)</th>
<th>AM Scenario 1 Delay (sec)</th>
<th>PM Existing Delay (sec)</th>
<th>PM Scenario 1 Delay (sec)</th>
<th>Percent Change AM</th>
<th>Percent Change PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 29 &amp; Greenbrier</td>
<td>21.3</td>
<td>25.9</td>
<td>28.1</td>
<td>28.7</td>
<td>21.6%</td>
<td>2.1%</td>
</tr>
<tr>
<td>US 29 &amp; Lenox</td>
<td>3.2</td>
<td>0.7</td>
<td>8.4</td>
<td>1.1</td>
<td>-78.1%</td>
<td>-86.9%</td>
</tr>
<tr>
<td>US 29 &amp; Seminole</td>
<td>4.4</td>
<td>16.3</td>
<td>21.4</td>
<td>42.7</td>
<td>270.5%</td>
<td>99.5%</td>
</tr>
<tr>
<td>US 29 &amp; Hydraulic</td>
<td>30.4</td>
<td>10.3</td>
<td>70.1</td>
<td>14.8</td>
<td>-66.1%</td>
<td>-78.9%</td>
</tr>
<tr>
<td>US 29 &amp; Angus</td>
<td>12.8</td>
<td>6.9</td>
<td>17.4</td>
<td>3.7</td>
<td>-46.1%</td>
<td>-78.7%</td>
</tr>
<tr>
<td>Hydraulic &amp; US 250</td>
<td>33.7</td>
<td>25.8</td>
<td>56.5</td>
<td>38.6</td>
<td>-23.4%</td>
<td>-31.7%</td>
</tr>
<tr>
<td>Hydraulic &amp; Hillsdale (K-Mart)</td>
<td>11.6</td>
<td>46.9</td>
<td>40.7</td>
<td>51.6</td>
<td>304.3%</td>
<td>26.8%</td>
</tr>
<tr>
<td>Hydraulic &amp; District</td>
<td>7.6</td>
<td>7.8</td>
<td>11.8</td>
<td>33.4</td>
<td>2.6%</td>
<td>183.1%</td>
</tr>
<tr>
<td>Hydraulic &amp; Commonwealth</td>
<td>13.6</td>
<td>21.3</td>
<td>16.3</td>
<td>21.2</td>
<td>56.6%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Hydraulic &amp; Georgetown</td>
<td>19.2</td>
<td>27.8</td>
<td>82.9</td>
<td>32.4</td>
<td>44.8%</td>
<td>-60.9%</td>
</tr>
<tr>
<td>Commonwealth &amp; Greenbrier</td>
<td>23.6</td>
<td>10.2</td>
<td>16.1</td>
<td>16.3</td>
<td>-56.8%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Source: CalTrans
Agenda Item 4: Transportation Update – Scenario 1 Improvements PM
Agenda Item 4: Transportation Update – Scenario 1 Improvements AM
### Agenda Item 4: Transportation Update – Example Alternative Evaluation

<table>
<thead>
<tr>
<th>Project Alternatives</th>
<th>Criteria</th>
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<tbody>
<tr>
<td></td>
<td>Change in Travel Time AM / PM</td>
</tr>
<tr>
<td>Existing Conditions</td>
<td>Basis of Comparison</td>
</tr>
<tr>
<td>Alternative Scenario 1</td>
<td>1.0%/-17.7%</td>
</tr>
<tr>
<td>Alternative Scenario 2</td>
<td>TBD</td>
</tr>
<tr>
<td>Alternative Scenario 3</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Agenda Item 4: Transportation Update

Next Steps:

- Finalize Scenario 1 VISSIM modeling
- Finalize Milestone Schedule
- Begin Work on Scenario 2
- Populate evaluation matrix with Scenarios 1 & 2
- Generate Scenario 3 based on findings of 1 & 2
Agenda Item 4: Transportation Update – Transit Considerations

Framing the discussion:

- Development principles and influence on transit
- Other examples of transit integration
- Hydraulic Small Area Plan opportunities
- Transit share development
Agenda Item 4: Transportation Update – Transit Considerations

**Principles influencing transit:**

- Multiple linkages and interconnectivity
- High-quality pedestrian environment
- Traffic dispersion and speed management
- Parking management
Agenda Item 4: Transportation Update – Transit Considerations
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Some examples:

- **New Town** - Williamsburg, VA
  - 365 ac. / 800,000 sq. ft.

- **Atlantic Station** – Atlanta, GA
  - 138 ac. / 11,000,000 sq. ft. (planned)

- **Birkdale Village** – Huntersville, NC
  - 52 ac. / 450,000 sq. ft.

- **Hydraulic Small Area Plan**
  - 377 ac. / 3,555,000 sq. ft.
Agenda Item 4: Transportation Update – Transit Considerations
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Agenda Item 4: Transportation Update – Transit Considerations
Opportunities:

• Primary destination location
• Access across Route 29
• CAT strategic planning / RTA
• Hierarchy of transit
Transit share estimation:

- Assess current share
- Use Williamsburg transit example (ridership / operations)
- Estimate a travel demand share (intermediate / full buildout)
Historic transit share (journey to work):

- Charlottesville: 8.0%*
- Albemarle Co.: 2.3%
- All Virginia: 4.5%

* Transit share prior to UVA / CAT open rider agreement: 5.1%
Agenda Item 4: Transportation Update – Transit Considerations

Current transit trips (trip purpose):

- Work: 48.9%
- Shopping: 25.0%
- Recreation / Entertainment: 4.5%
- Social Services: 4.5%
- Medical Appt.: 4.5%
- Other: 4.5%
- School: 25.0%
Agenda Item 4: Transportation Update – Transit Considerations
Observations:

- Williamsburg transit usage

Estimated transit travel demand share of all trips:

- Partial buildout: 1.8% - 2.1%
- Full buildout: 2.1% - 3.9%
In retrospect:

“Those suburban new urbanist communities have usually turned out to be internally walkable, but **poorly connected to their auto-oriented surroundings**. Residents can walk to a corner store and a few cafes, but most of them still need cars to get to work, or really to go anywhere more than a half mile away.” - Dan Malouff, Greater Greater Washington.

“Despite the pedestrian-friendly arrangement…**parking is inexpensive and easily available**…indeed most visitors arrive by car.”
– Atlantic Station Wikipedia
Agenda item 5: Phase 2 Upcoming Tasks

To be complete by:

Testing of Additional Alternative Scenarios JAN 11
Significant Completion of Technical Work FEB 22
Complete Alternative Comparison Table MAR 1
SMART SCALE Application Intake Opens MAR 1
Select Preferred Alternative(s) / Project Phasing MAR 8
SMART SCALE Application Creation Deadline JUN 1
SMART SCALE Submission Deadline AUG 1
Rt 29 Solutions

Agenda Item 6: Panel open discussion and request for future agenda items
Agenda Item 7: New business and wrap up

Agenda item 8: Adjourn