Project Team

Gary Runco, P.E.
District Bridge Engineer, Structures and Bridge

Dipali Patel, P.E.
Project Manager, Structures & Bridge

Andrew Beacher, P.E.
Manager, Preliminary Engineering
Webex Events Tips

• To ask an oral question:
  • Raise your hand and unmute yourself.

• To type a question:
  • Click the QA symbol
  • Type question in box to ask a written question
  • Ask: All Panelists and click Send

• All participants are muted.

• If you get disconnected, please attempt to rejoin the meeting.
Presentation Outline

- Bridge Location
- Existing Bridge, Existing Conditions - Reason for Replacement
- Hydraulics
- Proposed Bridge Design
- Proposed Bridge Views
- Proposed Roadway Design
- Utilities and Other Features
- Bridge Closure Maintenance of Traffic
- Anticipated Costs and Schedule
- Next Steps
- Guiding Principles
- Feedback
Bridge Location

Bridge 06830 (029-6134)
Bridge Location

- Existing Pedestrian bridge to remain
- Existing Vehicular bridge to be replaced
Existing Bridge

• The existing bridge carries one lane of traffic.
• The bridge is a simple span structure with steel beams and timber plank deck overlaid with asphalt.
• The bridge is 55 years old.
• Constructed in 1965 and rehabilitated in 2000
• Several repairs since.
Existing Bridge Conditions - Superstructure

- Condition Rating = 4 (Poor)
  Rating improved from 3 (Serious) after temporary repairs.
- Significant corrosion of steel girder webs and flanges

▸ Bridge is in Poor Condition
Temporary Improvements as of April 2020

Temporary transverse and diagonal braces added in 2020

Steel Angle bolted to beam bottom flange and diagonal timber

4.1/2” x 9-1/2” Diagonal Timber

Abutment A

Abutment B
Load Posting as of April 2020

• Bridge weight limit was reduced to 15 tons
Reason for Replacement

- **Safety**
  - The bridge is in poor condition.
  - Prior to the temporary repairs done in April 2020, the bridge was in serious condition and on the verge of closing.
  - Several intermittent steel repairs have been done prior to the April 2020 repairs.
  - The bridge is deteriorating fast.
  - The existing bridge can no longer receive sustainable repair strategies over a reasonable length of time.
Limited Scope of Work

- Due to limited availability of funds, scope of work is constrained to:
  - Replacing the poor condition bridge with minimal approach roadway work.
- No bike and/or pedestrian improvements planned.
- No work is planned at the existing pedestrian bridge.
- Other roadway/hydraulic improvements not directly associated with the bridge condition cannot be addressed with this project.
- Added improvements will increase the timeline of the project. The bridge may not be able to perform at current load carrying capacity for an extended time.
Per VDOT’s Drainage Manual Section 6.3.2.1, roadways classified as “Urban Collector” are to be designed for 10 year storm.

The existing roadway does not pass the 5 year storm. The proposed roadway will not pass the 5 year storm either.
Fairfax County Floodpain Viewer

http://fairfaxcountygis.maps.arcgis.com/apps/Viewer/index.html?appid=67ca30a491084ddf92db292337bd87e1
Fairfax County – Difficult Run Watershed

Width of the Watershed
Contours at the Watershed

Based on Preliminary Data

- EL edge of watershed: 288
- EL at the stream: 280
- Depth of water in a 100 year storm = 288 – 280 = 8’

~650’ long watershed

~8’

100 YEAR STORM EL 288

BOTTOM OF STREAM EL 280

BRIDGE, TOP OF BRIDGE EL = 285

SPRINGVALE ROAD BRIDGE
In early 2000’s VDOT proposed replacing the existing bridge with ~300’ long bridge but was opposed profoundly by the community.
Proposed Bridge

Proposed bridge will be a 40’ long single span bridge.

Same as the length of existing truss bridge alongside Springvale Road

Substructure:
Concrete abutments supported on deep foundation.

Superstructure:
Several types considered to achieve an efficient, durable and cost effective structure
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Steel Beams (Match Existing)</th>
<th>Precast Concrete Arch (PCA)</th>
<th>Precast Prestressed Concrete Slab Beams (PCSB)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superstructure Depth</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
<td>Shallow superstructure allows for an increased hydraulic opening allowing more flow of water.</td>
</tr>
<tr>
<td>Bridge Length</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
<td>Shallower superstructure requires shorter bridge length to provide the equivalent area for water to flow.</td>
</tr>
<tr>
<td>Long Term Durability</td>
<td>🟢</td>
<td>🟢</td>
<td>🟢</td>
<td>Concrete’s strength and durability are ideal and can last up to 100 years.</td>
</tr>
<tr>
<td>Corrosion</td>
<td>🟥</td>
<td>🟢</td>
<td>🟢</td>
<td>Corrosion of steel is the primary cause of existing bridge deterioration.</td>
</tr>
<tr>
<td>Maintenance Cost/ Debris</td>
<td>🟥</td>
<td>🟢</td>
<td>🟢</td>
<td>Steel members catch debris that holds water and promotes corrosion. Precast members require minimal maintenance.</td>
</tr>
<tr>
<td>Member Weight</td>
<td>🟢</td>
<td>🟢</td>
<td>🟠</td>
<td>Lighter members result in lighter foundations. However, deep foundations are proposed for all superstructure types to avoid any vibration issues.</td>
</tr>
<tr>
<td>Initial Cost / Total Cost</td>
<td>🟠</td>
<td>🟢</td>
<td>🟠</td>
<td>PCA is hydraulically inefficient – flood elevations will increase, roadway has to be raised, and project costs increase.</td>
</tr>
</tbody>
</table>
Width of the Proposed Bridge

Two options are under consideration:

• **No median option:**
  • Proposed bridge will carry two 11’ lanes and two 4’ wide shoulders.

• **Median option:**
  • Proposed bridge will carry two 11’ lanes, two 2’ wide shoulders and a 4’ wide raised median with a 1’ shy on each side.
• Two 11’ lanes and two 4’ shoulders.
• Total width: 32’
- The proposed bridge will carry two 11’ lanes, 4’ wide median and two 2’ shoulders.
- Total width: 34’
Bridge Widening

• Per VDOT’s Geometric Criteria for One Lane Bridges, File No. 06.01-6

<table>
<thead>
<tr>
<th>One-lane bridges:</th>
</tr>
</thead>
<tbody>
<tr>
<td>VDOT’s general policy is not to build one-lane bridges. However, it is recognized that some conditions may warrant a one-lane bridge. One-lane bridges require a design waiver to be approved by the State Structure and Bridge Engineer. In addition to the normal design waiver request, a letter shall be provided from the locality or county requesting the one-lane bridge. <strong>Design waivers for one-lane bridges only can be considered when the design year ADT is less than or equal to 400.</strong></td>
</tr>
</tbody>
</table>

• To consider single lane bridge, Average Daily Traffic (ADT) must be less than or equal to 400
• ADT on Springvale Road is 4,700; much greater than 400
• **Between 2000-2019**
  • Total Accidents = 41

• A two-lane bridge removes the need for vehicles to stop or yield to an oncoming vehicle preventing rear-end collisions.

• Wider bridge minimizes side swipe type of accidents.
Accident History Comparison

- Comparing the Crash Data on Springvale Road (between Brevity Drive and 0.1M north of Crippen Court)

<table>
<thead>
<tr>
<th>Based on 2018 Summary of Crash Data</th>
<th>Springvale Road</th>
<th>Secondary Roads of Northern Virginia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crash Rate</td>
<td>455</td>
<td>197</td>
</tr>
<tr>
<td>Injury Rate</td>
<td>171</td>
<td>60</td>
</tr>
</tbody>
</table>

- FHWA “Crash Data” calculation:
  - Total number of crashes in the study period
  - Number of years of data
  - Number of vehicles per day (both directions)
  - Length of the roadway segment in miles
Proposed Roadway Plan – No Median Option

- Total Length of the Project: 900’+
- Total Length of Mill and Overlay: 1200’+
The proposed roadway will carry two 11’ lanes and two 4’ paved shoulders.
Proposed Bridge Aerial View – No Median Option
Proposed Bridge Elevation - No Median Option
Before and After No Median Option

Existing

Proposed
Proposed Roadway Plan – Median Option

- Total Length of the Project: 900’+
- Total Length of Mill and Overlay: 1200’+
The proposed roadway will carry two 11’ lanes and two 2’ paved shoulders with a median varying in width from 4’ to 8’.
Proposed Bridge Aerial View – Median Option
Proposed Bridge Elevation – Median Option
Utilities/ Other Features

- The existing pedestrian bridge will remain.
- Overhead lines and light pole on west side will be relocated
- Existing water main and fire hydrant will remain (anticipated)
Bridge/ Roadway Closure

Complete Closure

- Bridge/ Roadway will be closed to traffic
  - Maintenance of Traffic details will be provided at Public Hearing stage.
- Anticipated construction time = Six months
- Partial closure/ Phased construction not achievable
  - Timber bridge deck (existing bridge deck) does not support phased construction.
  - Superstructure is in poor condition and does not have enough load carrying capacity for phased construction.
  - No room to construct a new bridge alongside the existing bridge - pedestrian bridge on the west side and no right of way availability of the east side.
Anticipated Project Costs and Funding

• Total Construction Cost (anticipated):
  • $4 Million - $5 Million
• Plan development is in preliminary stage
• Bridge does not qualify for State of Good Repair funds
• Funding source will be determined after Public Engagement
• Bridge Maintenance Funds may be used.
Next Steps

• Solicit and evaluate community feedback
• Conduct additional public outreach
• Once funding is identified the project can move forward to full implementation.
• Schedule will depend on Date of Funding Procurement and Type of Funding.
• Coordinate schedule with other projects.
• VDOT will provide additional updates to the public as the design phase progresses.
Guiding Principles

• VDOT’s mission is to plan, deliver, operate and maintain a transportation system that is safe, enables easy movement of people and goods, enhances the economy and improves our quality of life.

• As you provide your input, please consider the following:
  • Safety of the travelling public
  • Project limits – project cost and timeline
  • Traffic calming measures
  • Driveway access
  • Codes and Regulations
How to Submit Your Comments

Give feedback on the virtual public information meeting in the following ways by November 2:

Email Us                      Mail Us Comment
MeetingComments@vdot.Virginia.gov
Please reference “Springvale Road over Piney Run Bridge Replacement” in the subject line
Ms. Dipali Patel, P.E.  
VDOT’s Northern Virginia District  
4975 Alliance Drive  
Fairfax, Virginia 22030
In the Questions window during the virtual meeting or online at www.virginiadot.org/SpringvalePineyRun
Webex Events Tips

• To ask an oral question:
  • Raise your hand and unmute yourself.

• To type a question:
  • Click the QA symbol
  • Type question in box to ask a written question
  • Ask: All Panelists and click Send

• All participants are muted.

• If you get disconnected, please attempt to rejoin the meeting.
THANK YOU!