

Jordan Bridge Assessment

City Council Work Session

August 19, 2008



Background

- **Opened to traffic on August 24, 1928**
- **Oldest operating lift bridge in the state.**
- **Over 10,000 lifts a year for over 21,500 marine traffic vessels.**
- **7,000 vehicles per weekday cross the bridge.**
- **Carried 28,000 vehicles per day after Hurricane Isabel flooded the Midtown Tunnel.**
- **Six month inspection schedule**
- **Posted at 3 tons (lowest limit allowed by law)**

Background

- In 1995 the City funded a \$2,222,900 repair project intended to extend the operational life of the bridge five years which was intended to overlap with the replacement of the Gilmerton Bridge.

We are now eight years beyond that repair's life

- In 2004 a ship/crane collision required a \$ 252,000 project to repair the damage - additional deck paving was done at that time.

Concrete filled grid deck has heavy corrosion with up to 100% loss of section to steel pans. Primary grid bars are corroded with up to 100% loss of section primarily at the overhang but extending up to 3 LF inside of exterior stringers. 10% - 85% loss of section to the top flanges of primarily the exterior stringers and 10% -80% loss of section to the bottom flanges at some locations. (At this location stringer has 85% loss of section or full length of the top flange).



Looking at cantilever stub stringers over Pier 2. Stub cantilever beams supporting the edge of the deck at the joints have up to 50% loss of section to the top flange and up to 100% loss of section to the bottom flange and web.



Looking at Beam D in Span GD at Bent 1D. Section loss up to 100% to bottom flanges at bearings of primarily the exterior beams. (At this location bottom flange has 80% loss of section with a 4" wide x 3" long rust perforation.) Webs of beams typically have 1/4" but up to 3/8" loss of section at the bearings with rust perforations typical in the exterior beams. (At this location web has 1/4" loss of section full height with a 6" long x 3" high rust perforation.)



Looking at batten plate in sway member of the west tower. Typically up to 50% but up to 100% loss of section to batten plates in tower sway frame members at intersection gussets and at connections to tower legs. (At this location 99% loss of section with several rust perforations up to 10" long x 6" wide.)



Looking at the west side of Piles 2 and 3 at Bent B3. A majority of the piles have been repaired with concrete jackets. Typically hairline to 1/16" wide but up to 1/8" wide map cracking with efflorescence with some cracks up to 3/8" wide and isolated areas of delamination in jackets.



Inspection Results

- **The annual safety inspection was conducted in March , the mechanical & electrical components were inspected in April and the structure was load rated based on the findings of the annual inspection.**
- **The load rating revealed that the current 3 ton posting is adequate.**
- **The bridge safety inspection revealed 10 critical items that must be repaired within 12 months of the inspection or the structure should be closed to traffic.**

Costs to keep the bridge operable at the current 3 ton weight limit

- **The cost of the repairs required within 12 months totals \$4.08 million dollars.**
- **These repairs include structural repairs to the approach spans superstructure, repairs to the up haul downhaul cable supports on the towers, replacement of the lift span roadway deck and superstructure members in the center lift span, mechanical electrical components and the fender system as well as engineering and project management costs.**
- **The estimate also included 3 months of operating expenses during the time the bridge would be closed for repairs**

- **Additional repairs to keep the bridge operational for an additional 1- 5 years include additional structural repairs and mechanical / electrical repairs totaling an additional \$3.58 million dollars.**
- **If the repairs required in 12 months are combined with the repairs for 1-5 years, and performed at the same time, the estimated cost would be \$7.66 million dollars.**
- **Estimated additional mechanical / electrical repairs that would be required within 5-10 years at a cost of \$9.8 million dollars.**

Overview of Costs

Structural now	\$4.08 M
Struct/Mech/Elec 1-5 years	\$3.58 M
Mech/Elec 5-10 years	\$9.80 M
Substructure	Unknown
Continued deterioration	<u>Unknown</u>
	\$17.46 M +
New bridge	\$200-500M

- **Repairs to the substructure elements (foundation) of the bridge were not estimated but need to be considered. Assessments of the bridge pilings' conditions are difficult due to previous repairs.**
- **The paint system of the structure has failed and testing has revealed the system to be lead based. All lead paint repaired areas will need to be treated / disposed of as hazardous material prior to being repaired. These additional costs are unknown.**
- **All these repairs are not the complete list as deterioration of non repaired members will continue over time.**

- **Toll revenues from the bridge are \$1.6 million / year and cover operating and routine maintenance costs for the structure. Tolling to fund a replacement bridge would normally cover only a small portion of its replacement cost.**
- **If permanently closed, the Coast Guard has indicated that the structure must be removed - last estimate was \$2.3 million +. Salvage value of the steel in the structure is estimated at over \$900,000.**
- **The Jordan Bridge Enterprise account currently has a balance of \$2.3 million dollars.**

Recommendation

- **Public Works and VDOT State & District Bridge Engineers are concerned about the advanced deterioration of the bridge and that even if the superstructure and mechanical/electrical repairs are made that the substructure of the bridge remains in unknown condition.**
 - **We believe that the bridge is at the point of diminishing returns and any additional investments in repairs are returning little useful life.**
 - **Despite active police enforcement, violations of the posted weight restriction persist.**
 - **The continued safety of the public crossing this fracture critical bridge cannot be assured indefinitely.**
- **Recommend scheduling the decommissioning of the bridge this calendar year, subject to the results of ongoing inspections.**

Impacts

- **Traffic diversions, especially to commuters to the Norfolk Naval Shipyard. Diversions would likely be to the Gilmerton Bridge or Downtown Tunnel. However, shipyard commuter traffic generally occurs before the AM and PM peak commuter hours.**
- **The Gilmerton Bridge replacement project is scheduled for advertisement in Feb 2009 with a three year construction schedule. During that period Military Highway at the bridge will be reduced from four to two lanes.**
- **This would be the second bridge in the region to be closed due to limited transportation funding.**

Potential Traffic Mitigation Strategies

- **Park and Ride lot in South Norfolk area with express bus service to the Naval Shipyard**
- **Park and Ride lot with van lease/ride matching coordination thru the TRAFFIX program (which is coordinated thru HRT)**
- **Water Taxi service from the public boat ramp near the Jordan Bridge directly to the Naval Shipyard.**

Next Steps

- **Complete follow up bridge inspection in September**
- **Community Input**
 - **Identifying and implementing mitigation strategies**
 - **Memorializing the Jordan Bridge**
- **Coordination with Federal and State Agencies**
- **Council adoption of a closure resolution**
- **Publish closure date – allow for commuter notice and adjustment**
- **Implement traffic mitigation strategies**
- **Contract for removal / salvage**
- **Transition Jordan Bridge personnel**
- **Enterprise Fund Close out**