

Tolling under Construction Risks Summary

1. Purpose and scope

The purpose of this memo is to summarize the risks associated with toll system testing and operations relative to construction phasing requirements for the CRBA DB project. This memo will support CRBA team decisions about constraints or incentives provided in the RFP requirements for the Design-Builder related to accommodating toll system testing and operations.

2. Overview

Tolling is planned at a pre-completion location with toll infrastructure provided by a separate contract, and the CRBA Design Builder would install the ultimate toll infrastructure as well as any toll infrastructure required for potential interim configurations necessary to accommodate staging work to build the new bridges. For each implementation of a new toll zone configuration, whether interim or ultimate, the lane side Toll Vendor will need to perform installation work in and around the tolled lanes, as well as testing with controlled test vehicles and uncontrolled live traffic. Requirements to accommodate the lane side Toll Vendor installation and testing needs prior to toll commencement in the new toll locations were reviewed and analyzed for risks and opportunities.

Under a previous model for the CRBA implementation, WSDOT planned to lead the tolling related efforts using WSDOT based requirements for toll infrastructure and accommodating the WSDOT lane side Toll Vendor installation, testing, and operations needs. The WSDOT tolling assumptions required an installation window followed by 120 calendar day window of testing with live traffic available prior to switching tolling operations to a new site. The CRBA team anticipated that the Design Builder would need to perform extra work to meet these requirements for tolling that otherwise would not be needed for project construction.

Due to the nature of the project transitioning from existing to new bridges, it is highly likely that the Design Builder would need to provide interim tolling locations and that it would be difficult to provide live traffic simultaneously for operations at existing locations and testing at new locations, which could lead to either gaps in toll collection or redundant installations or construction work to accommodate continuous tolling.

Tolling risks and opportunities relative to construction staging were evaluated considering impacts to cost, schedule, and perception of the project by the traveling public and other stakeholders.

3. Evaluation of Risks and Opportunities

3.1 Cost Considerations

- Cost to design, install, and test new lane side systems for each new toll zone
- Cost to design and install new toll infrastructure for each new toll zone
- Cost of extended ODOT oversight during design and construction of new toll zones

- Cost of extended communication efforts to traveling public if toll operations were interrupted or modified
- Costs of reduced toll revenue collection if pre-toll commencement testing was abbreviated. Note the anticipated risk of reduced toll revenue collection under this scenario is low, and of course is much lower than a full stoppage of toll revenue collection.
- Costs of interrupted toll revenue collection (if traffic is moved before the new toll zone is fully tested and ready for toll commencement)

Forecasted Adjusted Total Daily Gross Toll Revenue by Fiscal Year

Fiscal Year	2016	2017	2018	2019	Pre-Completion		Post Completion
					2020	2021	2022
<i>Weekday Daily Gross Toll Revenue (\$ millions)</i>							
Weekday - Northbound (\$ millions)	0.076	0.080	0.084	0.087	0.089	0.093	0.124
Weekday - Southbound (\$ millions)	0.069	0.072	0.076	0.079	0.081	0.084	0.112
<i>Weekend day Daily Gross Toll Revenue (\$ millions)</i>							
Weekend day - Northbound (\$ millions)	0.017	0.018	0.019	0.020	0.020	0.021	0.028
Weekend day - Southbound (\$ millions)	0.017	0.018	0.019	0.020	0.020	0.021	0.028

3.2 Schedule Consideration

- Toll requirements could drive added schedule to the Design-Builder to accommodate toll infrastructure installation as well as the toll vendor system installation and testing prior to toll commencement at a new toll zone.
- Toll System Installation and Testing durations – Installation could be as short as two days per tolled lane and testing duration could vary. Assuming that the performance testing is completed offsite in conjunction with a factory acceptance test, the on-site testing under live traffic prior to toll commencement at a new toll zone could be substantially reduced or even eliminated. Further work would be performed to identify specific examples of operational toll facilities where reduced live traffic testing was performed prior to toll commencement and any impacts to revenue collection would be described.
- Toll infrastructure and toll system design could be coordinated to accommodate shifting over lanes or directionality to minimize the turnaround associated with traffic shifts.
- With pre-completion tolling already in place, assuming the ultimate and any interim installations are performed by the same toll vendor integrating to the same CSC the testing needs would not be as intensive as for a first time installation and integration system.

3.3 Project perception

- Tolling at CRC is anticipated to be the first all electronic tolling implementation by ODOT, and the CRBA is a high profile project with many interested stakeholders. Various parties are expected to monitor the project for conformance with approved policy, impacts to the traveling public, and efficiency of the toll collection system.
- Short term interruptions to toll collection may be acceptable where it can be demonstrated that it is in the best interest of the project and ODOT, in service to the traveling public.

- Reduced testing durations may be acceptable where it can be demonstrated that the risk of revenue loss and negative impacts to customers are minimal. Reduced testing could present a risk of higher incidence of system errors, however it is more likely that errors would be along the lines of missed or incomplete toll transactions rather than incorrect transactions charged to customers and negatively impacting the customers. So the risk to customers is relatively low. Furthermore, as described above, the advance testing off site could be enhanced to address the performance testing requiring minimal on site testing. Also, it is typical for any new system to find minor bugs after the official go-live when the system is under regular operations and customer observations provide new feedback.

4. Recommendation

After review of the risks and opportunities associated with toll system testing and operations, the best option for the project appears to be a reduced testing window for the ultimate and any interim toll zone installations. This can be accommodated by performing extensive off site testing of the toll system prior to installation and provides the least impact to toll revenue loss or impact to the Design Builders schedule, and the associated cost of extended work performed by the Design Builder.

Next steps would include collecting similar examples from within the industry and reviewing these examples relative to any risks with the CRBA project management team for concurrence on the approach. With concurrence the approach would be integrated into the CRBA project requirements.