

# Battery Street Tunnel Report Out

## Introduction

The Battery Street Tunnel is a 55 year old WSDOT Structure on City of Seattle Right of Way. The lid of the tunnel is the Battery Street surface road, and the overcrossing for 1st, 2nd, 3rd, 4th, 5th and 6th streets and Denny way. The structure has mechanical and electrical systems for ventilation, fire detection, fire suppression and lighting and other systems. Many of the system elements are old and failing. The replacement parts are difficult to obtain.

An emergency repair contract was developed to repair the failing systems to keep the systems operating for a 5-6 year life. This contract was shelved during the Moving Forward phase of the program in favor of a more extensive repair and upgrade project that would extend the useful life out 10 to 15 years. The BST Repairs Project Stage 1 included replacement of systems and earthquake upgrades that were estimated to take 18 months of nighttime closures and cost in the vicinity of \$41 million.

The decision to support a bored tunnel changed the situation. The bored tunnel will bypass the BST so the BST will no longer be a state route and the City of Seattle expects the tunnel to be taken out of service and decommissioned. There is no longer a need to extend the Battery Street Tunnel life out past the opening of the bored tunnel, and doing so would not be the most efficient use of tax dollars.

The Battery Street Tunnel needs to have a repair and maintenance program to keep it operating safely for the next few years with minimum disruption of traffic and minimum expenditure of funds.

## The recommended course of action is as follows.

- **Conduct Soot Cleaning Test contract in early 2009.** This will help to determine the most cost effective method of cleaning the potentially hazardous soot from the tunnel ceiling, cross beams, upper walls and system surfaces. The options considered were to do or not to do the test contract. Not doing the test would avoid the inconvenience of the closure to the traveling public. Doing the test would provide information to use in reducing the risk and cost for removing the soot. This work will require a week end closure for the southbound tunnel bore. The estimated cost is \$50,000 in construction, plus the state force time necessary for inspection and preparation of the plans and specifications.
- **Conduct a test of the fire suppression sprinkler system during the spring 2009 scheduled closure.** This will test the detection system and the valve system to measure the dependability of the existing system. The Fire Marshal is especially concerned that the fire suppression system functions when needed, and he is concerned about the safe use of the between bore connections. Maintenance indicated

they have not pursued repairing the existing valves because of the high cost of the repair parts. Maintenance also indicate that they can repair the between bore doors if they have the funds. The test of the fire suppression system is a routinely conducted test, we would expand the currently scheduled test March 21 and 22 to include the detection system to determine that it works. The expected cost of the test is \$10,000

- **Contract to have the tunnel cleaned and painted in summer 2009 to remove soot and encapsulate what remains.** If we assume that some event will require cleaning the soot, we should schedule a cleaning and painting contract. This will decrease the amount of down time it will take to make repairs in the event of a future system failure. It should allow a more cost effective cleaning than an emergency contract, and eliminates the issue of cleaning the potentially hazardous soot prior to decommissioning the tunnel. The current estimated cost is \$1.87 million for the soot cleaning and \$1.1 million for painting the lower walls. The painting allows us to use prequalified painting contractors for the work, and will dress up the tunnel making it brighter. The estimated price does not include mobilization, construction engineering or contingencies. The cleaning and painting contract is expected to be in the range of \$3 million plus mobilization, construction engineering and contingencies. This contract could include striping, and replacing existing signs, and should include closing the ramps at the south end. The decision for this project will be made after the test cleaning and the system test in March.
- **Develop a plan for repairing the tunnel.** The tunnel may need only maintenance to continue safe operation until 2015, or it may need some repairs. During the inspection in spring 2009 the deficiencies need to be noted and those that require some specific repair work should be included in a repair contract. This plan should include funding the purchase of repair parts and increased maintenance expense to about \$250,000. One major concern of the fire department is the detection and suppression system. The shelved emergency repair contract dealt with that issue and could be dusted off and sent to ad with some modification. The soot cleaning would need to be done before the work described in the contract. The PB team is researching a new technology for a linear heat detection system that could be installed without cleaning the soot. It would reduce the 9 months of closures in the emergency contract by reducing the work inside the tunnel. We should have an answer on the early next week.
- **Fire Door Alarm system.** The fire marshal has expressed a concern about the operation and safety of the fire doors between the tunnel bores. Maintenance has indicated they can repair the existing doors if they had the funding. The fire marshal would like to have as system installed that would notify approaching vehicular traffic that the doors were open. The recommendation is a contract to install flashing beacons in both bores that would activate when the door was open. The cost of this has not been determined, but it appears this work could be done in the lower portion of the tunnel without the soot removal. This work would be part of the repair contract above.

- **Monitoring Program for the BST.** We need to establish more frequent inspections of the BST. The recommendation for the Viaduct is to close 4 times per year to inspect, and the same schedule should extend to the BST. There are specific systems, and cracking and spalling that should be inspected. The items inspected should have certain criteria to inspect, and there should be a plan developed to initiate action when certain thresholds are reached. The cleaning and painting contract would make it easier to identify new cracking and spalling and the inspections would help identify the items to identify and thresholds.
- It is recommended we do not continue with new control room or egress and not acquire any right of way

### Concerns

- The maintenance heavy future could result in a system failure that could close the tunnel.
- Current City position is to decommission the tunnel. In the next 6 years that may change with the discovery of a use for the structure.
- The tunnel is also an overcrossing structure for 7 city streets, and supports Battery Street between the surface streets.
- The tunnel has many utility crossings that may require future access making it difficult to decommission