

# Bored Tunnel Transportation Notes in support of 12/29/08 Briefing Paper

## Summary of Key Points

- In comparison to the existing AWV facility, the bored tunnel would result in a number of safety benefits, including:
  - It would replace the Battery Street Tunnel (BST) as the new SR 99 alignment through downtown Seattle providing improved sight distance, fewer weaving movements and access points, and thereby reducing crashes and traffic disruptions.
  - The new ramps in the stadiums area will be designed to be safer than existing mid-town and Elliott/Western ramps.
  - Lane and shoulder widths will be wider and consistent through the corridor to provide better traffic safety.
  - It will be designed with modern safety features that comply with the latest national fire protection safety standards.
- It will also result in heavier traffic volumes on surface Alaskan Way, hence mitigating the increased exposure of pedestrians to vehicle traffic as compared to the existing configuration needs to be considered.
- The bored tunnel would provide an important redundancy to I-5 for the north to south link through downtown Seattle.
- Provides sufficient capacity for Aurora N traffic through downtown and maintains route continuity.
- Ballard/Interbay traffic needs to be handled by surface streets, though performance of surface should be reasonably good with improvements and without Aurora N traffic in the mix.
- Provides most capacity of options being considered, though allocated differently than today (relies on Alaskan Way for Elliott/Western trips).
- Little diversion expected.
- Not dependent on I-5 investments.
- Not dependent on other system improvements outside of connecting Elliott/Western Avenues to surface Alaskan Way.
- The bored tunnel can accommodate 2030 traffic reasonably well.
- Improves street grid by reconnecting Elliott/Western to waterfront.
- More options for managing traffic during construction than original alternatives.

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## Connections provided:

- SR 99 through traffic is served by limited access facility from north of Denny Way to south of Spokane Street.
- Traffic accessing the existing AWV via the Elliott/Western ramps (e.g., traffic to/from NW Seattle) would no longer have this option. They would either need to take the surface roadway, or access the bored tunnel facility via Mercer Street. (note, the surface roadway is expected to add 4-5 minutes of travel time to trips between Elliott/Western and the SODO area as compared to travel on the existing AWV)

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- The Railroad Avenue ramps are replaced with ramps to/from the north in the Stadium vicinity.
- The mid-town Columbia/Seneca ramps are removed and replaced with new ramps to/from the south in the Stadium vicinity. Traffic accessing downtown from the south would use these new ramps. This change was planned for all scenarios.

**Trips Served**

- Currently 60-65% of traffic using the AWV is through traffic (i.e., trips without one or the other ends being inside the Center City area).
- With the bored tunnel, travel demand modeling indicates that nearly 75% of traffic served will be through trips.

**Capacity provided (see attached table)**

- The bored tunnel with an improved surface roadway connection provides similar capacity through the corridor as the existing facility. Note, however, that the trips currently served by the Elliott/Western ramps will have increased travel times.
- By replacing the 4-lane Battery Street Tunnel, with its geometric limitations, with the 4-lane bored tunnel which has improved geometrics, through capacity on SR 99 is improved.
- This is the highest capacity alternative of those under consideration.

**Potential for Diversion/Mode Shift**

- Minimal diversion expected to parallel facilities, other than Alaskan Way, which will accommodate Elliott/Western trips.
- As with other scenarios, mode shift and changes in travel behavior could help limit diversion to other routes. Since expected diversion is small for this scenario, there is a higher likelihood that it could be absorbed by other routes/modes.
- If tolling of the tunnel is implemented, additional diversion would be expected. Preliminary studies have indicated that this diversion may range from 35 to 40 percent depending on the toll rate. Likely diversion routes would be through the downtown street grid (including surface Alaskan Way) or to I-5.

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**Traffic Volumes**

- Average daily traffic volumes on the existing AWV north of Seneca Street are approximately 91,000 both directions.
- The bored tunnel is expected to carry approximately 80,000 to 85,000 both directions in a comparable location in the year of opening. This volume is less than on the mid-town portion of the existing viaduct primarily because Elliott/Western trips are accommodated on surface Alaskan Way. The new bored tunnel will carry more traffic than the existing Battery Street Tunnel as this volume is higher than the 63,000 vehicles per day currently using the BST.

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## Safety

- Mitigating the increased exposure of pedestrians to vehicle traffic on the waterfront (Alaskan Way) as compared to the existing configuration needs to be considered.
- The bored tunnel would replace the Battery Street Tunnel as the new SR 99 alignment through downtown Seattle. This new alignment will provide improved sight distance, fewer weaving movements and access points, thereby reducing crashes and traffic disruptions. The new ramps in the stadiums area will be designed to be safer than existing mid-town and Elliott/Western ramps.
- Lane and shoulder widths will be wider and consistent through the corridor to provide better traffic safety.
- Grades into and out of the tunnel will meet state and federal design guidelines and are expected to be 6% or flatter.
- The new tunnel will be designed with modern safety features that comply with the latest national fire protection safety standards.

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## Travel Times (see attached table)

- Maintains limited-access route with higher posted speed limits (50 mph) for SR 99 traffic. Travel times for these trips expected to improve over existing conditions.
- Travel times for trips from Ballard/Interbay may increase by 4 to 5 minutes since they travel on surface streets for a longer distance than they do today.

## Transit

- Access to downtown to/from the south relocated from mid-town ramps to Stadium area ramps. Providing transit priority into the downtown core from these ramps is important.

## Connections Between Neighborhoods

- Mobility for through trips on SR 99 improved.
- Mobility for trips on Elliott/Western corridor would be maintained, but possibly somewhat reduced.
- Local access for trips on Elliott/Western corridor and trips to downtown may be improved.
- The bored tunnel would provide an important redundancy to I-5 for the north to south link through downtown Seattle.

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## Construction Impacts

- Much of the project could be built with the AWW remaining in place and operational.
- Elliott/Western trips would still be diverted at some point to connect these roadways to surface Alaskan Way.

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**Comment [ARW2]:** State an approximate duration for connection of the transitions north and south.

**Comment [ARW3]:** We will need to eventually evaluate the Lenora to BST retrofit feasibility with this option.

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## 2030 versus 2015

- A quick assessment of regional land use projections was made to provide an indication of the level of traffic growth to expect between 2015 and 2030. A

check was also made on traffic forecasts made previously for SR 99 for the 2010-2012 timeframes and 2030. Both of these checks resulted in an estimated traffic growth of 10 to 11 percent to the year 2030.

- Assuming a 10% growth in traffic, year 2030 peak hour travel times on SR 99 between Aloha St and the West Seattle ramps are expected to be only 0 to 2 minutes slower depending on the peak hour and direction (see attached table).
- Travel times on the surface Alaskan Way between Western/Elliott Streets and the SODO area are expected to increase by 1.5 to 3 minutes by 2030.

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#### I-5 Investments:

- Scenario F as analyzed in the Central Waterfront analysis assumed the least amount of improvement to I-5 of all the scenarios. The primary I-5 improvements are Active Traffic Management (which is occurring as part of the Initial Transit Enhancements and other Improvements package regardless of scenario) and the NB shoulder transit lane from Olive Way to SR 520. This latter improvement provides a significant transit benefit, but it only minimally affects general purpose traffic capacity and hence is not likely to have a significant effect on operations of the bored tunnel.
- Because the Bored Tunnel with an improved surface Alaskan Way provides comparable capacity to the existing facility, diversion to I-5 as a direct result of this option is expected to be minimal.
- The conversion of the SB HOV lane to a managed lane was not assumed for Scenario F, but is another relatively low-cost improvement that would provide noticeable capacity benefits for SB I-5 regardless of what scenario is implemented for the Central Waterfront.

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#### Other Points:

- The bored tunnel alternative (Scenario F) was analyzed with minimal I-5 improvements, the baseline level of TDM improvements, relatively minor City surface street improvements, and close to baseline transit service enhancements. Because of this, the analysis undertaken reflects somewhat of a “no frills” assessment. The primary non-SR 99 improvement added was the assumption of a Western/Alaskan Way one-way couplet which provides somewhat more capacity than a two-way street. The current assessment looks at both a couplet and a two-way Alaskan Way option.

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