

# Alaskan Way Bored Tunnel vs. Boston's Big Dig

## More differences than similarities

**Comment [A1]:** Should probably say "SR99" instead of Alaskan Way so people don't think the tunnel is on the waterfront. Agree (JJR)

### Boston's Big Dig Central Artery/Tunnel

Substantially larger and more complex including:

- 1) Very disruptive cut-and-cover tunnel through Boston's central business district, under the existing elevated roadway and 2 subway lines
  - 2) a signature cable-stayed bridge over the Charles River, cut-and-cover tunnel through South Boston
  - 3) 2 sets of immersed tubes under the harbor to the airport and the complex interchange with very poor geotechnical conditions
- Project was disruptive for years and required extensive traffic management and mitigation measures
  - The initial project cost estimate did not address the real scope of the total project, necessary mitigation and environmental requirements, and an appropriate allowance for risk and escalation
  - The Central Artery/Tunnel did not have a strong agency management or consistent leadership throughout the course of the project
  - As a result, the project was delivered grossly over budget and years behind schedule

**Comment [A2]:** We will have cut/cover sections on the ends which will be disruptive. Maybe we should add the relative lengths of cut/cover between the 2 programs? We have new issues on the South End transition we should discuss....Could do - let's discuss (JJR)

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**Comment [A3]:** I don't think any initial project estimates really include added scope, so this may not be a fair comparison.

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**Comment [A4]:** I think this is the same as inflation and is therefore redundant

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	Bored Tunnel & South End Project	Big Dig Projects
Total Project Length	2.8 miles	8 miles
Number of tunnels*	1	3
Length of tunnels*	2 miles	5 miles
Total lane miles	12.8 miles	> 160 miles

**Comment [A5]:** Does this include the removal of the viaduct and subsequent Alaskan Way street restoration?

\*Boston Big Dig tunnels included cut-and-cover, immersed tubes, jacked tunnel and other special tunneling methods but no deep-bore tunnels.

### The SR99 Deep-Bore Tunnel

- Only the tunnel portals will be cut/cover. The majority of the tunnel will be bored up to 200 feet underground minimizing traffic disruption and impacts to the Waterfront and downtown.
- WSDOT uses the CEVP® process on all state projects over \$100M to ensure costs are complete, reasonable, defensible and appropriately represent risk and uncertainties.
- WSDOT is a strong owner with well developed policy, management and technical capability. Governor Gregoire is the project authority.

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- WSDOT will maintain this strength over the life of the project, assisted by eminent private-sector engineers and contractors —all, accountable to the public, Governor and Legislature

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### Lessons Learned for Successful Tunnel Delivery

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- Maintain a strong owner role and draw upon technical advice from knowledgeable and experienced industry experts.
- Maintain a financial management program to accurately predict potential cost exposure of all program work elements, are appropriate and used properly.
- Maintain an effective risk management program to ensure all risks are identified and managed to an acceptable level (as low as reasonably practical).
- Institute cost containment practices with rigorous controls to limit changes in scope.

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Comment [A6]: Dangling clause, not sure what this is supposed to say?

### Examples of Successful Tunnel Excavation in Urban Areas

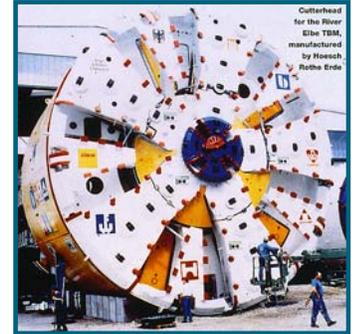
Comment [A7]: Should define "successful", does this mean on time and on budget?

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- 4th Elbe River, Hamburg: Successfully excavated 1.6 miles at 46.6-ft-diameter.
- Lefortovo Tunnel, Moscow: Rebuilt Elbe TBM successfully excavated 2 bores each 1.4 miles long at 46.6-ft-diameter. Same machine refurbished for another 2 tunnels in Moscow.



- Madrid M30 EPB: Successfully excavated 2 bores each 1.3 miles long at 50-ft-diameter by 2 closed-face TBMs built by different manufacturers. M30 diameter was about 10 ft larger than previous TBMs (~50% greater face area).



- Shanghai Yangtze River Mixshield: Successfully excavated 2 bores each 4.6 miles long at 50.6-ft-diameter.

This TBM is the current record holder for diameter. Tunnel completed about a year ahead of original schedule.

Elbe Tunnel Slurry Machine

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