December 8, 2008

Dear Stakeholders and Project Team:

We are a group of tunneling professionals writing to urge you to carry forth the Deep-Bored Tunnel option for further analysis as a viable solution for the Alaskan Way Viaduct replacement project. We have broad collective experience, having built machines for and designed or built scores of deep bore tunnels around the world. Although we work for different firms and compete against each other to design and build these tunnels, we have come to the same conclusion: The Deep Bored Tunnel provides a reliable, cost effective and socially responsible solution for the replacement of the Viaduct and the development of the downtown waterfront. We universally applaud your efforts to consider the investment in a solution for the Viaduct that includes a deep-bored tunnel.

The Deep-Bored alternatives offer significant short and long-term economic and regional benefits in terms of increased greater public amenity, reduced congestion, increased property values, greater seismic resilience, reduced downtown disruption, and the ability to keep the existing Viaduct in operation during construction. While we believe that these benefits outweigh any cost differential, we would also like to offer additional cost data that we believe indicates that the Bored Tunnel solution would cost less than the $3.5 billion currently proposed—a price tag we believe diminishes the chance that the deep-bored option will get a fair evaluation.

The attached chart provides project costs from tunnel projects around the world, normalized to cost per mile of single tunnel. While these costs have not been updated for construction inflation, the current prediction for the Seattle tunnel is higher by a significant margin than any similar tunnel project built anywhere in the world. While we are not in a position to analyze the detail of the estimate, we question several aspects of the cost estimate:

1. **Twenty-five percent of total cost is added for "design fee."** Our experience indicates that the design fee could be much smaller, perhaps even half that amount.

2. **Assumption of 10-year construction period inflates costs and results in excessive inflation premium costs.** The assumption of twin bores using a single boring machine causes the time to construct to be extended, penalizing it with additional risk, contingency and inflation costs.

3. **Inflated risk premium.** Our experience in designing and managing construction of the 3rd Avenue bus tunnel in Seattle tells us that ground risk can be minimized since most of the downtown is already surveyed and conditions are widely understood. Locating tunnels in the public right of way where they are visible, placing tunnels as far from the shoreline as possible, and selecting routes with wider public right of way are just a few items that could reduce risk and cost of construction. This risk is further reduced as a result of developments in tunneling technology in recent years, along with experience gained on local tunnel projects.

4. **There are other opportunities to reduce costs and increase benefits by considering other innovative approaches such as** use of a single large diameter tunnel rather than twin bores.

Once again, we commend the Stakeholders Committee and the technical team for their fair consideration of all solutions, including the Deep-Bored Tunnel option. We understand and respect your need to carefully weigh all the options before you.

The actions you take will influence the shape of our city and region for many decades to come. Based on our extensive experience, we believe there is ample justification to carry the Deep-Bored option forward for further analysis. This presents the ultimate opportunity to create a legacy that reclaims our waterfront, sustains regional mobility, preserves urban neighborhoods, protects the flow of freight and goods, and is ultimately the most affordable option in front of you.

Respectfully,

Richard Prust
Associate Principal, Arup

Vladimir Khazak
Vice President, HNTB

Dick Robbins
Founder, Robbins Company

Kern Jacobson
Independent Transportation Engineering Consultant

Gerhard Sauer
President, Sauer Corporation

Attachments:

A) High Level Summary of Long-term Benefits of Deep-Bored Option
B) Summary of ARUP cost analyses
C) Comparison of Tunnel Costs (p. 11 in attachment)

Attachment A
High Level Summary of Benefits of Deep-Bored Tunnel Approach

- Diverts the 66% of bypass traffic on the Viaduct from the city grid, allowing the cityscape to be used for more noble purposes
- Can be built with the least construction disruption and lowest mitigation costs of any alternative, thereby protecting Seattle's downtown neighborhoods
- Allows continued use of the Alaskan Way Viaduct during construction
- Potential to eliminate the Battery Tunnel turn, and eliminate the barrier of Aurora Avenue north of Battery Street to knit Uptown and S. Lake Union neighborhoods back together
- Creates a mechanism to collect water runoff and particulate air pollution
- Eliminates noise impacts
- Has the lowest life cycle cost and can be expected to last longer than any other scenario (the BN tunnel under Seattle is more than 100 years old)
- Can reduce freight traffic through downtown, making pedestrian and biking safer and more attractive
- Enhances and protects throughput capacity for freight, maritime and industrial uses, the Port, Boeing, and even transit
- Tunnels and underground space generally have a very long life:
  - Some tunnels have been in continuous use contributing to the environment and sustainable development for centuries.
  - Tunnels have been demonstrated to behave very well during earthquakes—in fact, better than surface structures. A tunnel would provide an important north-south corridor in a seismic event.
- Despite potential initial cost, the Life-Cycle Cost of deep bored tunnels can be competitive or even lower than Surface Alternatives, ultimately resulting in far lower replacement costs.
- Can be funded through tolls and allows the easiest mechanism to manage traffic through tolls