

Deep Bore Breakthrough

**The deep bore tunnel costs a lot. It's worth it.
Here's why we hope they don't goof it up.**

Dozens – no, hundreds – of questions are yet to be answered about the proposal to replace the Alaskan Way Viaduct with a deep bore tunnel. They include questions about cost, the potential for cost overruns, design challenges, and even the propriety of considering such a big idea while the world suffers through the worst economic slump since FDR was conducting fireside chats with Lucy Mercer.

But, there is also an outstanding argument in favor of the deep bore option and, assuming Mother Nature cooperates, it goes like this:

- 1) Leave the Alaskan Way Viaduct standing while the tunnel is engineered, designed, and bored;
- 2) Connect the tunnel openings with related roadways while as much of the viaduct as possible remains open to traffic;
- 3) Divert viaduct traffic into the tunnel after it is completed; and then
- 4) Tear down the viaduct.

The process would not be painless. The deep bore tunnel may require three to six months of significant traffic detours as the street connections are built that will allow SR 99 traffic to move from the viaduct to the tunnel. But any other viaduct replacement option would cause far more pain for far longer periods of time.

A new elevated structure would cause worse disruption for three to five years on the waterfront due to construction and traffic detours; construction overall would have lasted between 6.5 and 8.5 years. The earlier cut-and-cover tunnel plan proposed by city and state leaders would have shut down SR 99 and the central waterfront for four years and clogged up Interstate 5 for the better part of a decade.

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Comment [A1]: This isn't comparing apples to apples. The 3 to 5 years for the elevated compares to the 4 years for the tunnel, but there is no comparison of the clogging up I-5 for better part of a decade with the full duration of the elevated construction.

The Well, Duh! surface option of simply removing the viaduct and replacing it with road and transit improvements would not cause disruption so much as strangulation, permanently shrinking regional north-south traffic capacity while clogging Interstate 5,

Seattle surface streets, and the central waterfront with tens of thousands of cars, trucks, and buses.

Like the surface option, the deep bore tunnel scenario would remove the viaduct, opening the way for a nicer waterfront. But the nicer waterfront would be a secondary benefit to the primary value of the deep bore option to a regional economic juggernaut that is, according to the US Department of Commerce, the fourth largest export production center in the United States of America.

Since the 2002 Nisqually earthquake, the viaduct debate has covered a lot of ground, from the future of the waterfront to the future of the planet to the soul of the city. BS.

With the deep bore proposal, it all boils down to money, and not Wall Street subprime money, Berni Madoff stolen money or government printing press bailout money, or even the money that it will cost to build the deep bore tunnel. The deep bore is instead all about wealth-creating, family-raising, house-buying, tuition-paying export dollars and the fact the deep bore tunnel is by far the best option for keeping the regional export ATM machine churning while the viaduct is being replaced.

That is a huge intellectual and philosophical shift in the public planning process for what to do about the viaduct and it comes with an enormous caveat because it is still extremely possible that our elected leaders might still find a way to goof it all up.

To get a better sense of the value of the deep bore tunnel, it helps to visit one of the overpasses in downtown Seattle that carry streets like Madison over Interstate 5. At times, the “whoosh” of the cars, trucks, and buses thundering along the freeway below is so loud you can’t hear yourself whistle.

Traffic volumes on I-5 have not changed over the past ten years because it can’t carry any more vehicles. SR 99 has added about 10,000 vehicles per day during that time, and today its busiest stretch, the viaduct in the middle of downtown, now carries 110,000 vehicles daily.

From east to west along Madison, it is barely four-tenths of a mile from the western shoulder of I-5 to the eastern edge of the viaduct, but the two roadways are actually far more closely tied than that.

Between them, I-5, SR99, and the Alaskan Way Viaduct carry about 340,000 cars, trucks and buses every workday. That is by far the largest volume of commuters and commerce carried by any corridor in the state. I-5 south of Tacoma comes in a low second, with about 180,000 vehicles.

I-5 and SR99 share another key distinction. They are the only roads, large or small, that completely cross Seattle north to south. The importance of this cannot be overstated, and, since all this is about Seattle, it is, of course, all about global warming.

During the last Ice Age, the future home of the Seahawks was covered by a huge glacier. As the world warmed and the glacier retreated, it left behind a landscape that had been ruggedly and deeply scoured by the enormous weight of the ice dragging across it. Salt water soon filled the gaping, deep valley to the west while fresh water filled the one to the east and a few big puddles formed on some of the land in between.

Today, under a bright sun and blue skies, the outcome is an urban landscape that is drop-dead gorgeous, graced with thousands of viewpoints along hills and ridges from which it can all be appreciated. Unfortunately, the hills, ridges, bays, and waterways also make Seattle highly prone to stop-dead, work-day ruining traffic jams the likes of which some cities never see.

Most cities are flatter, drier, and not as pretty as Seattle is, but they are served by street grids with lots of straight stretches and 90-degree turns. Seattle's street network also has street grids, but they don't fit together well. They collide like tectonic plates with traffic clogging subduction zones, and they have to weave around dozens of miles of hills and shorelines.

If you are driving north-south in Seattle, I-5 or SR 99 can carry you above all this. If you are trying to drive north-south on the surface, the crazy-quilt streets funnel you inexorably to one of four drawbridges.

That's because the city is not only bound by water on the east and west, it is entirely bifurcated by a human-built ship canal that can only be crossed by drawbridges at four points: Ballard, Fremont, the University District, and Montlake.

¹To make things even more interesting, these bridges are subject to federal requirements that they open whenever a tall enough boat approaches, even if it's a single yacht for a big-shot lawyer making an early afternoon summer getaway with her boyfriend Andres who is lounging with an umbrella drink on the poop deck, wearing a bright red Speedo.

In spite of all these obstructions, most times, somehow, the big grid functions. But if a car gets a flat tire in the wrong place at the wrong time, the whole place can grind into gridlock, and when something goes wrong on the Viaduct – let's say a two-car accident requiring a police investigation – the whole place clogs up worse than Uncle Joe's arteries.

Even on weekends when the viaduct is closed for inspections or repair work, traffic on the west side of downtown Seattle crawls until the viaduct reopens.

Now, imagine doing that to ourselves for three, five, seven, or nine years while the viaduct is replaced. If we didn't have to, we wouldn't, and, thanks to the deep bore option, now we don't have to.

¹ And they have to fully open both wings. According to bus driver info, for smaller boats they used to be able to only raise one, or raise it partially.

Ugly? Maybe, maybe not. But the Alaskan Way Viaduct is picture-perfect when it comes to carrying SR 99 above and across downtown Seattle, serving as a usually unclogged alternative to the frequently jammed I-5. It also provides a key link for regional and local export-enmeshed supply chains that join together tens of thousands of highly productive workers like Herald Ugles.

Ugles is a strapping guy who played basketball in community college and spent 29 years working his way up through the ranks of Local 19 of the International Longshore and Warehouse Union. The local represents some of the highest paid industrial workers in the world.

Ugles spends nearly every workday operating heavy lift equipment to move cargo containers around the port terminals in Seattle that are perched around the southern end of Elliott Bay.

But when it is time for Ugles to bring home the bacon, he stops by the Poulsbo Red Apple Supermarket.

His robust paychecks may come from Seattle, but Herald, his wife, and their two teenagers spend them mostly on the western shore of Puget Sound and when they need groceries, the Red Apple is where they usually shop.

Those paychecks also cover the mortgage and property tax payments for their home on Bainbridge Island, the clothes and other department store purchases that they make at the Silverdale Mall, the cars they shop for and buy at Bremerton Toyota, the meals and takeout that they get at places like Hakata's – their favorite place for sushi – and annual treks to Port Townsend to buy special stocking stuffers and other Christmas gifts.

“We're like everybody else,” Herald jokes. “We usually find a way to spend a penny more or a penny less than just about everything I make.”

And, like Herald, most members of Local 19 spend their paychecks in places far removed from the shadow of the Space Needle.

The extent of this trend was documented in a 2008 study of the regional economic impacts of the Port of Seattle. The study identified the hometowns of 12,456 people who are employed in some aspect of the marine cargo industry, ranging from lawyers and longshoremen to truck drivers and shipping agents.

Only 14% lived in Seattle. Thirty-six percent lived in the balance of King County. The other 50% lived outside King County.

They all rely on the SR 99-Interstate 5 corridor to reach their jobs in downtown office towers and the bayside terminals. They use it to move cargo containers between ships and rail yards. They use it to deliver equipment and supplies. The viaduct literally casts its shadow onto the port's biggest terminal, Terminal 46, where Ugles often works. Further

south, the viaduct soars above the dispatch hall where the longshoremen report each day to get their work assignments.

Ugles has a hard time imagining how he could do his job without the throughput provided by I-5, State Route 99, and the viaduct. At press time, Local 19 had not taken a position on the deep bore tunnel proposal, but Ugles was ready to cast his vote as soon as he heard there was a way to leave the viaduct standing while a deep bore is dug.

“That’s the biggest plus,” he said. “Leave the viaduct up and running. I know it’s a lot of money, but it’s a 100-year decision.”

The money generated in the corridor rolls like the tide. It does not just roll out of Seattle. It also rolls in.

About 10,000 Boeing employees live inside the City of Seattle. They are among the best-paid manufacturing workers in the world.

Most of them work at commercial aircraft production and support facilities located outside the city limits, and when they come home they bring their paychecks with them.

They rely on the corridor and a related spur along Interstate 405 to get to and from work, and to receive the parts and supplies necessary to build airplanes. And in the middle of the corridor there are hundreds of companies that provide aircraft parts, supplies, and services.

According to a Washington State survey, Boeing has more than 900 suppliers in the state. Seattle is home to 230 of them. That’s more than the combined total for the cities with the next largest numbers – 92 for Kent, 60 for Everett, and 51 for Redmond. For those Seattle-based companies, the corridor is not just a regional system, it’s a local one that moves workers and goods on related roads like Michigan, East Marginal Way, the Spokane Street Viaduct, ²Elliott Avenue West, and NW 85th Street.

Then there are the other supply and production threads that use the corridor and Seattle to connect with the state’s historic export markets throughout the greater Pacific Northwest.

The corridor carries watermelons grown near Yakima that are trucked to a company on the Duwamish River that barges the melons to grocery stores in Alaska. Custom diesel engines are rebuilt in Seattle and then shipped to diamond mines in Canada’s Northwest Territories and the vast oil fields in Alberta. Trees grown in eastern Washington become cardboard boxes at a factory in Bellevue. They are then trucked to Seattle and shipped to fish processors in Alaska that are owned by Seattle companies that are among the leading seafood companies in North America.

² Western Avenue, 15th West too?

Then there are the boats, nets, provisions, hardware, and electronic gear that are made in towns throughout Washington for the Ballard-based fishing fleet which, year in and year out, accounts for the largest single share of the Alaska seafood harvest, which accounts for two-thirds of all U.S. seafood exports and 100 percent of all hit cable TV shows about Ballard-based crab-boat captains with the first name “Sig.”

It is possible to partially monetize the argument for the deep bore option by examining private business revenues that are reported to the state and the City of Seattle for calculating corporate B&O tax liabilities.

According to these records, in 2006 Boeing commercial aircraft production generated sales revenues of \$33 billion. Nearly all of that revenue was created at assembly plants and support facilities in Renton³ as well as Boeing Field and Paine Field, which form a kind of golden triangle around the SR 99 and I-5 corridor.

In that same year, industrial firms based inside the City of Seattle reported an additional \$32 billion in revenue. This included none of the Boeing revenue, but it did include the 230 aerospace suppliers and more than a thousand other companies engaged in construction, metal fabricating, machine making, electronics, boatbuilding, fishing, food processing, wholesale distribution, trucking, and all other forms of land, air, and water transportation.

Combine the Boeing and Seattle industrial revenues and they equal \$65 billion. In 2006, that represented half the \$122 billion value of the state’s entire manufacturing output, and nearly every dime of it was supported in some way by the throughput capacity provided in the SR99 I-5 corridor and the I-405 spur to Renton.

Moreover, while it is valid for illustrative purposes, the \$65 billion figure does not come close to capturing the total value of the commerce that hinges on the corridor.

Sixteen billion in revenue was generated by Seattle retailers who depend on the corridor to bring in their customers and employees, while Seattle-based doctors, accountants, engineers, lawyers, and others in the service sector generated \$17 billion. Then there are the companies of all types in Tukwila and Shoreline. Toss in a Bainbridge Island grocer or two and shopkeepers in Port Townsend, and the annual dollar value probably comes close to \$100 billion.

Viaduct visionaries like to say we need to take a 50 year or even a 100 year view in deciding what to do about the viaduct because of what it will mean for Seattle’s central waterfront. That’s shortsighted.

Multiply \$65 billion or \$100 billion by 50 or 100 times and it doesn’t take long to understand the real value of the deep bore tunnel option to the people of the State of

³ Don’t they also have facilities in Everett or Edmonds?

Washington, and it's pretty clear it's about a lot more than a new landscape for an eight-block stretch of waterfront in a city blessed by 84 miles of shoreline.

Year in and year out, the U.S. Department of Commerce tracks US exports by a system that connects each export sale to the zip code of the company that collected the cash for it. Year in, year out, the survey shows the greater Seattle region is the fourth largest export production center in the United States, and the SR99 I-5 corridor runs like a river right through the heart of it.

In fact, the arguments for the deep bore option are so compelling, they beg the question: Why did it take so long for our elected leaders to come up with it?

Good question! A whole book could be written to answer it and in 2007, one was. For more about that, go to page XX..

The short answer is, the elected leaders didn't come up with it. The deep bore option was brought to them by members of a 30-person citizen advisory group that was appointed to study potential solutions to the viaduct quandary, and, amazingly enough, given the long, unproductive histories of most citizen advisory groups, that's just what they did.

In March 2007, the viaduct planning process came to a bitter turn that culminated in an **ill-fated** City of Seattle advisory ballot. City Hall asked residents to express their views regarding the cut-and-cover tunnel proposal and the idea of building a new elevated highway on the waterfront. Intentionally or not, cynically or not, the ballot provided the unofficial launch pad for the surface-transit proposal which was and is the viaduct replacement option preferred by some highly influential environmental groups and some elected leaders at Seattle City Hall.

The outcome of the advisory vote was utterly predictable. Tunnel haters and surface advocates voted against that option by a 70% margin. Elevated haters and surface advocates voted down that option by 57%.

Voila, city officials, environmentalists, art groups, and some downtown business representatives proclaimed that the double negative equaled a positive case for the surface option.

Meanwhile everyone seemed to forget that the viaduct is owned by the State of Washington, and some very influential state leaders viewed the surface option as an only-in-Seattle-style pipedream. Not surprisingly, many ordinary citizens in Seattle grew fed up with the whole viaduct process.

After the election was over, the Governor, Mayor, and County Executive took a deep breath and jointly announced a new road forward. The state would take down the viaduct in 2012. The Governor would pick a replacement option in collaboration with the Mayor and County Executive by the end of 2008. Their preferred alternative would then be

subject to a final round of environmental review and forwarded for funding approval by the Washington State Legislature, the Seattle City Council, and the King County Council.

A citizen stakeholder process would be convened to provide input, and, thus, the Alaskan Way Viaduct Replacement Stakeholder Advisory Group was born.

The viaduct stakeholders included freight haulers, bicycle advocates, urban designers, downtown and industrial business representatives, environmentalists, and representatives from organized labor, as well as advocates for the surface option, the elevated option, and die-hards for a tunnel.

They were told from the get-go they would not make recommendations. That was up to a senior government staff team. The stakeholders were charged instead with doing lots of homework, sorting through lots of information, attending lots of meetings, and asking lots of questions.

The stakeholder group met 16 times over 13 months and the shortest session lasted two hours. They heard 23 presentations about different aspects of the project and they received a collection of written reports that, for one stakeholder, stacked up 8 inches deep by the end of the process.

The stakeholders became the best-informed group of laypeople to ever study the viaduct, or, possibly, any major public works project in state history, and, in spite of their many differences and disagreements, they got along famously.

It was the first time in a long time that goodwill and optimism were parts of the viaduct planning process. One leading member of the group was Bob Donegan, from the Ivar's seafood chain. "We argued strongly but respectfully with each other and you don't often see that," he said.

Yet, for all the hard work and good will, as the planning process moved along, it began to wobble worse than the viaduct ever has.

At their last scheduled meeting on December 11, 2008, the stakeholders were told the government staff team had picked the final two options for consideration by the elected leaders. One was the surface-transit option. The other was a new elevated structure. The stakeholders were reminded they were not asked to make recommendations, but each was allowed to make a last statement.

A few supported the new elevated structure. A few supported the surface option.

The vast majority picked "neither."

During the process, a strong consensus had developed among many of the stakeholders that the surface and elevated options were both fatally flawed.

The surface option would neither provide adequate capacity nor fulfill the desires of those who wanted a prettier waterfront.

The elevated structure required permits that city officials said they would never issue, and there was the plain fact that, were it ever to be built, it would result in years of major traffic disruption.

The deep bore option had been rejected years earlier by the government staff as too expensive and requiring too much time to build, but nearly every stakeholder expressed some degree of support for that option, and asked that it be sent to the elected leaders for further consideration.

The staff team reminded them the deep bore option was out. The meeting ended awkwardly. Five weeks later, the Governor, Mayor, and the County Executive announced that their preference was to replace the viaduct with a deep bore tunnel.

Over those five weeks, many things happened to move the deep bore forward, but two things made the biggest difference – three, if you include the stakeholders who refused to accept the options picked by the government staff.

One agent of change was the Cascadia Center of the Discovery Institute, a Seattle-based think tank. A few years ago the staff at Cascadia began drilling into the subject of deep bore tunneling to learn if it might be a solution for the viaduct. They tapped into a surprising number of people and companies in the area with deep bore expertise, including Dick Robbins of the Robbins Company in Kent, which built the boring machines that dug the “Chunnel” under the English Channel.

Cascadia learned that deep bore tunneling was far cheaper than the viaduct staff team believed, and that a tunnel could be bored far more quickly than the viaduct staff team thought. They also found that many cities around the world were using deep bore tunneling in high-density urban environments to overcome construction disruption issues just like those posed by the viaduct.

The other change agent? Governor Chris Gregoire. After the December 11, 2008, meeting, the governor began placing what turned into dozens of personal telephone calls to members of the stakeholders to ask about their reasoning and their support for the deep bore option.⁴

She eventually agreed that consideration of the disruption costs meant that the deep bore option merited pursuit. She also agreed that, as long as it remained safe to do so, the viaduct would remain standing while the tunnel is being dug.

The press conference announcing the decision implied it’s all over but the shouting, but the shouting has just begun. The environmental review process will take about **two**

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⁴ That’s astonishing! And level-headed!

| **years** to complete and many issues remain unresolved. Others are still being identified. Many political barriers remain and the world economic outlook is, at best, uncertain.

Still, if we are not yet at the beginning of the end, as Churchill said after El Alamein, we are at least at the end of the beginning.

| **Eight** years after the Nisqually Quake rocked the viaduct, a citizen-based process identified the strategy that works best for SR 99 and I-5 and does the most good for the greatest number of people.

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Doug MacDonald thinks the Governor finally found the right approach. His reaction is particularly worth noting because, from 2001 through 2007, he worked for the Governor as the Washington State Secretary of Transportation. In that role, he opposed the deep bore option. Now he supports it.

He says his thinking began to change about a year ago when he moved to a house in north Seattle one block from Aurora, the name for SR 99 in that stretch of town.

“Living with Aurora helped me understand how many different things SR 99 does and how all of them have to be accommodated by the viaduct replacement project.”

“If you don’t have north-south movement on Aurora, you get east-west problems on every street between Mercer and 85th, at a minimum. Those east-west streets are jammed up now with traffic that can’t get over to I-5. Initially, I was not that sensitive to this. It’s not just about moving 110,000 cars on the central waterfront.”

It won’t come cheap, but neither do husbands, wives, kids, homes, or Port Townsend stocking stuffers.

“People will always say we can’t afford to build things like a deep bore tunnel,” MacDonald said. “Actually, we can’t afford not to.”

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