Alaskan Way Viaduct
REPLACEMENT
PROGRAM

NW Construction Consumer Council Seminar

Sept. 24, 2014

U.S. Department of Transportation
Federal Highway Administration

WSDOT

King County

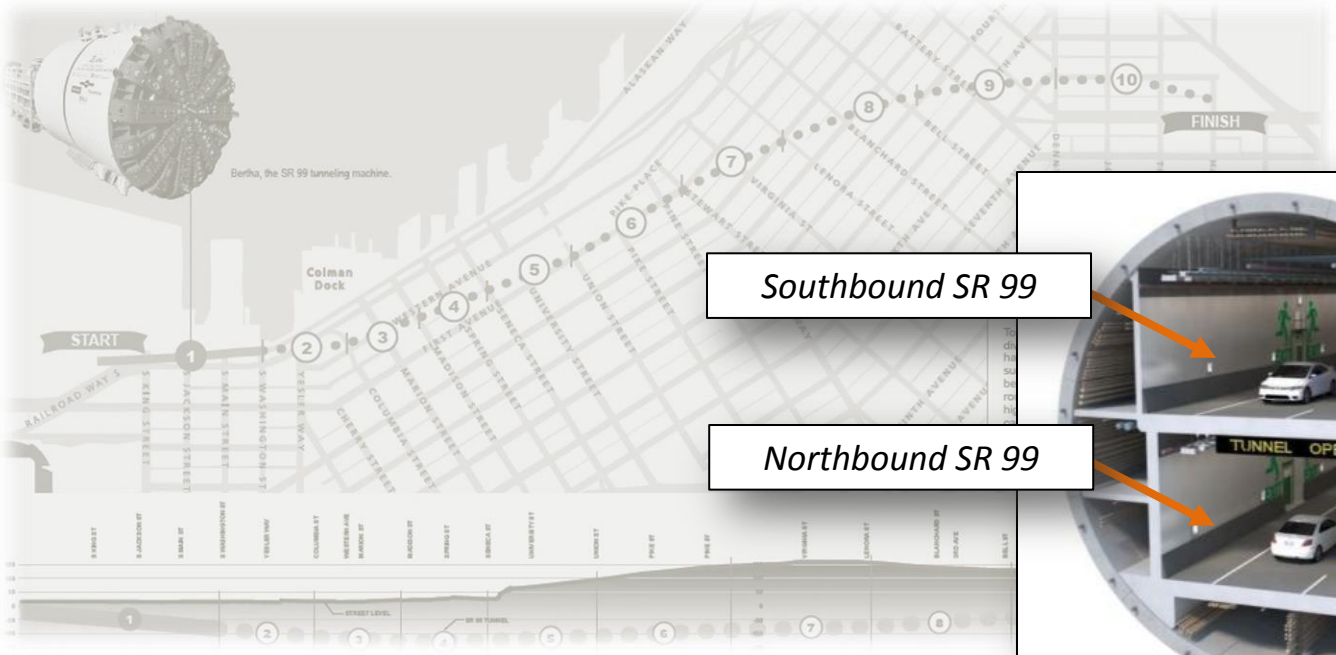
Port of Seattle

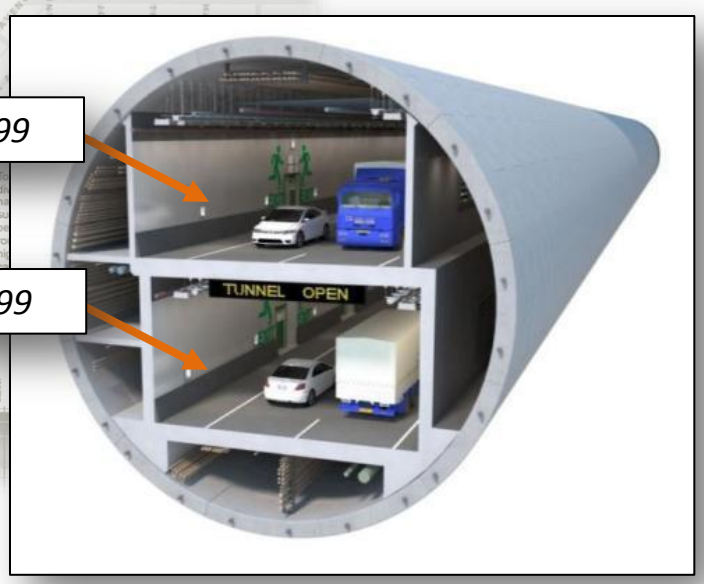
City of Seattle

Today's FOCUS

- **The big picture**
- Why it matters
- Continuing progress
- Understanding Bertha
- Tunnel contract
- Managing risk
- The path forward

The machine's 2-mile journey





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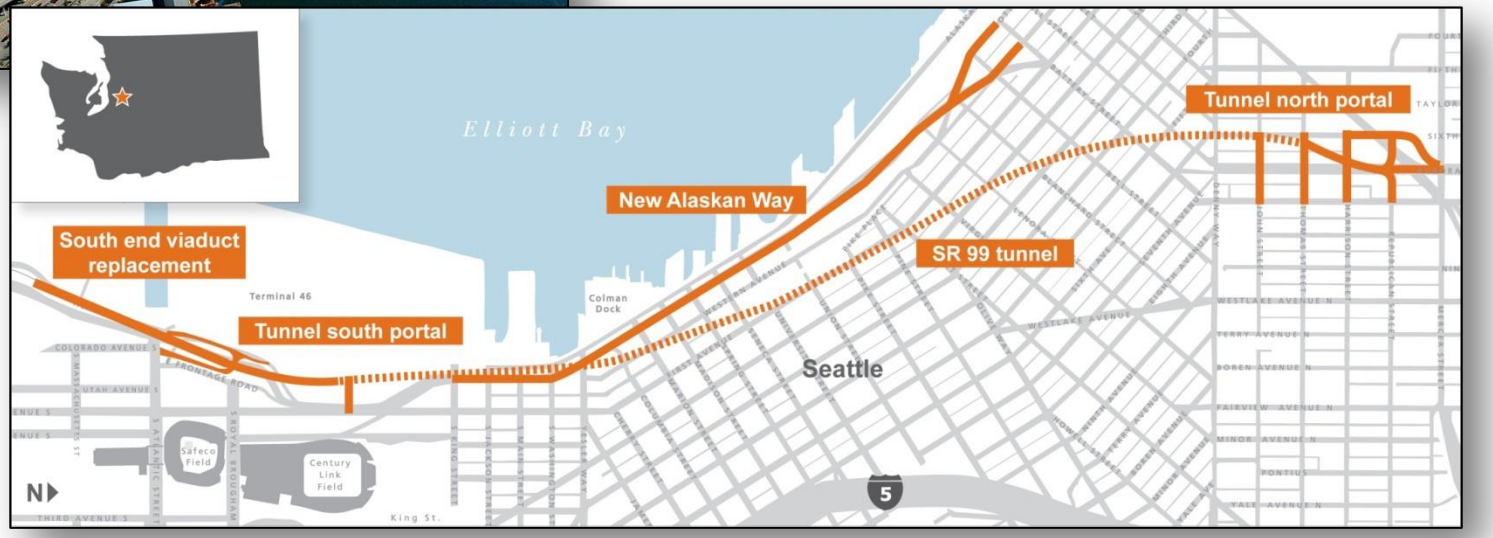
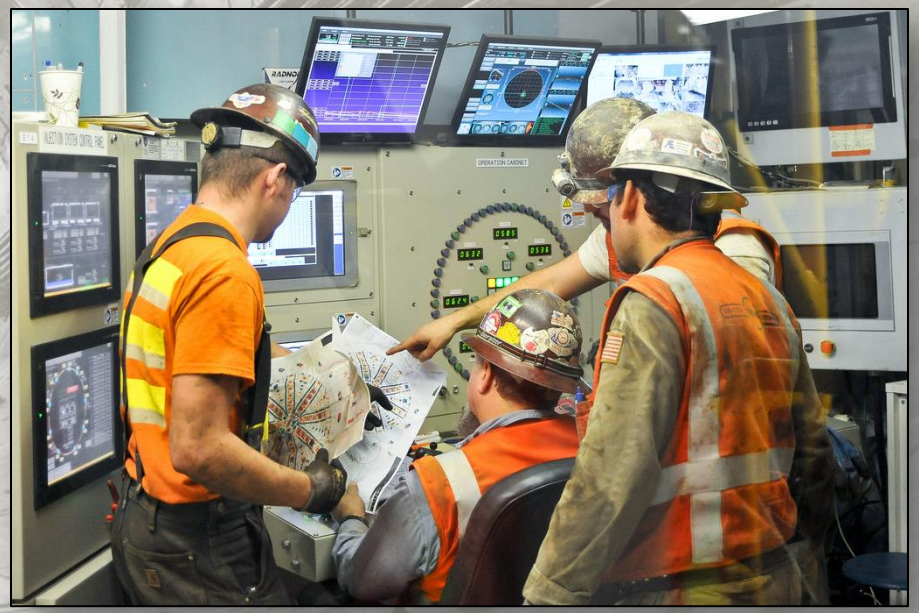
Building a new SR 99 Corridor



On Dec. 6, 2013,

just hours after the machine passed the 1,000 foot mark …



Crews stopped tunneling after measuring increased temperatures in the machine

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Seattle Tunnel Partners

is building a circular pit to access and repair the machine and resume tunneling by the end of March 2015.

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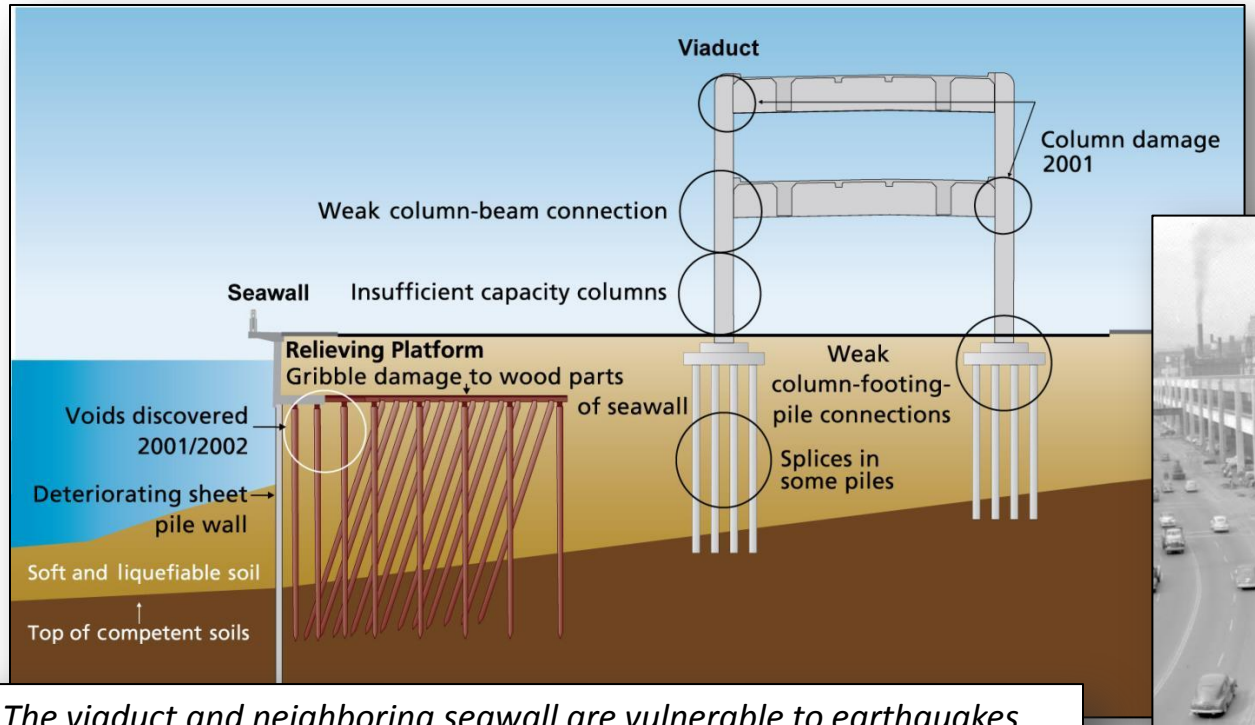
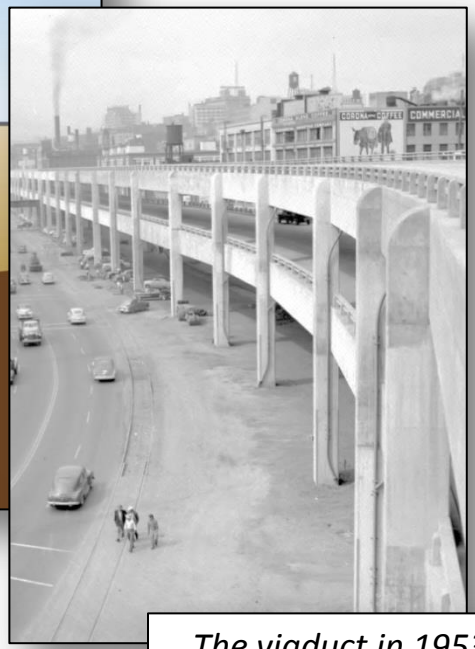
This is a SAFETY *project*



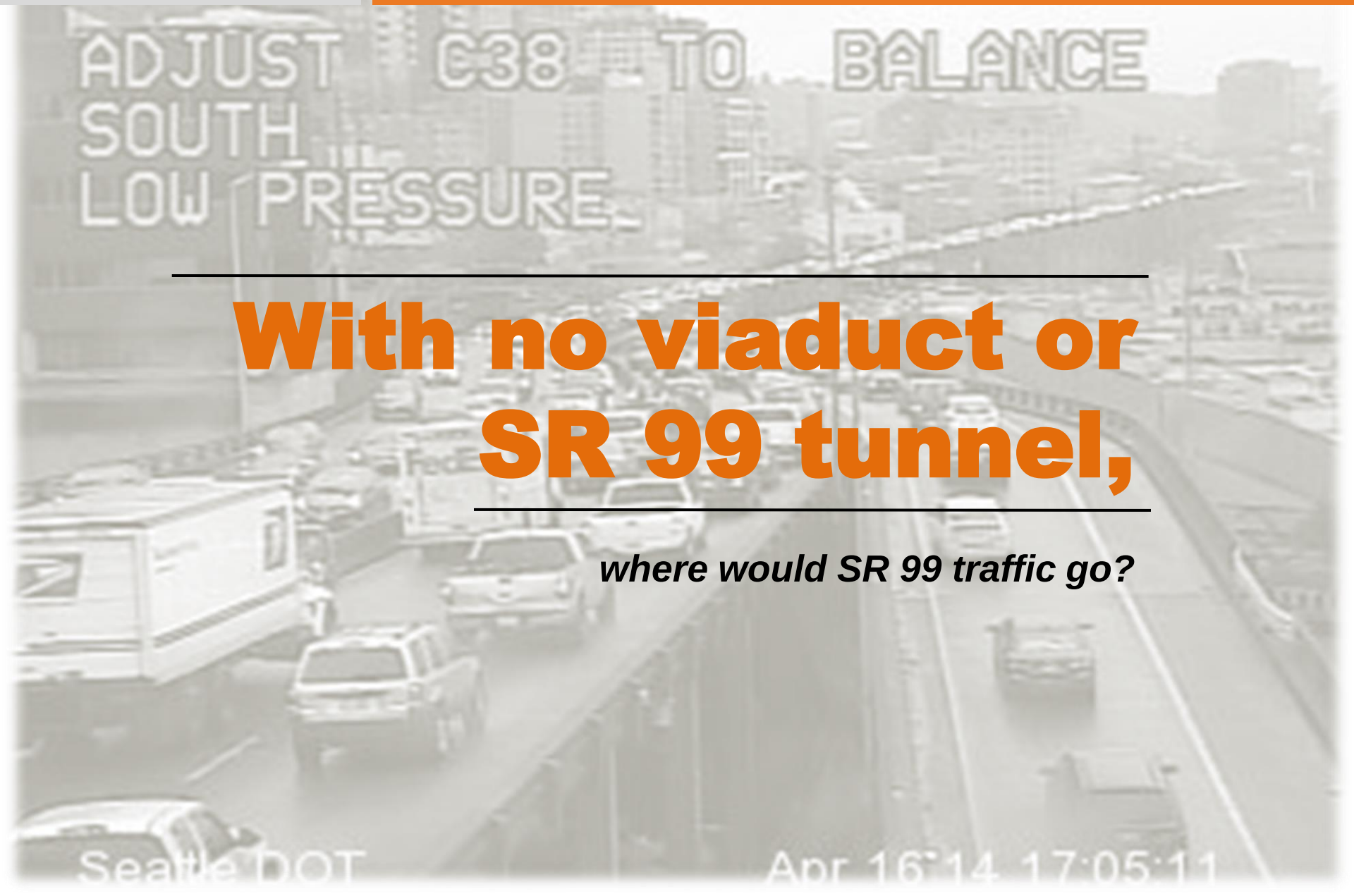
The viaduct and neighboring seawall are vulnerable to earthquakes



The viaduct in 1953

Geography

vs. **drivers**



With no viaduct or SR 99 tunnel,

where would SR 99 traffic go?

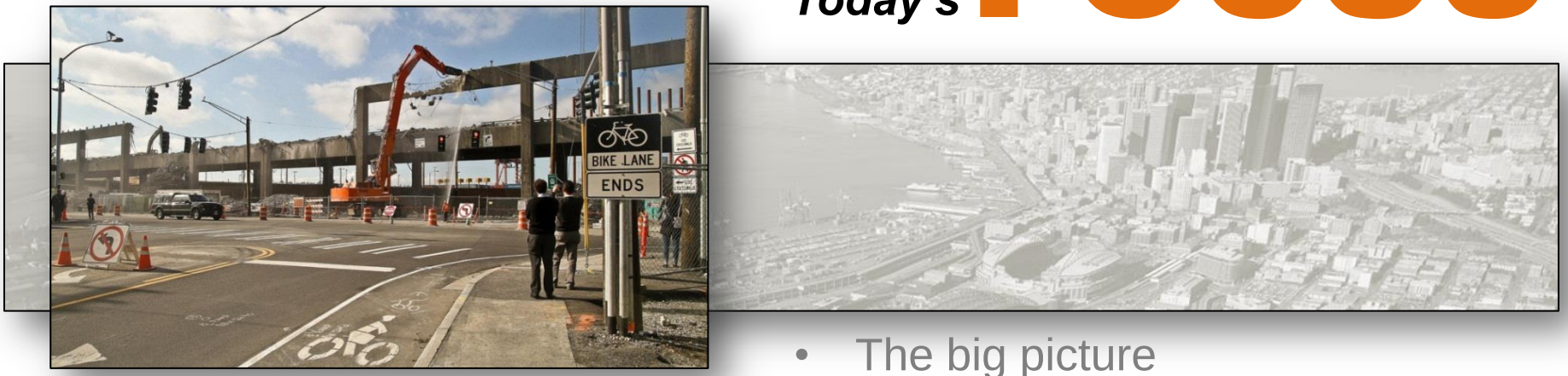
THE TUNNEL

will carry drivers through downtown

Drivers will enter and exit downtown at the

TUNNEL PORTALS

Today's FOCUS



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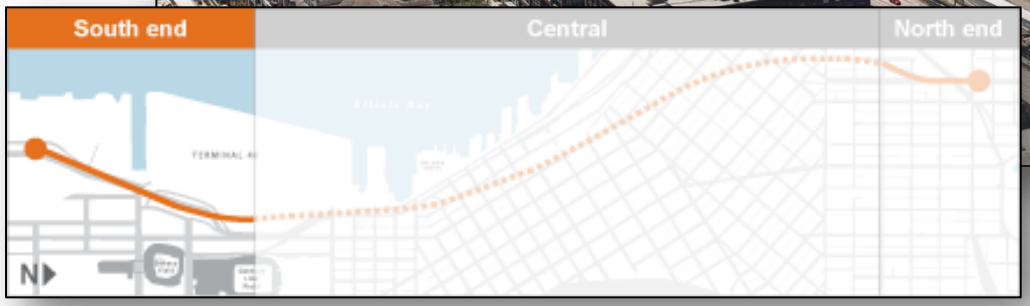
The south portal work zone in July 2014



Building the SOUTH PORTAL

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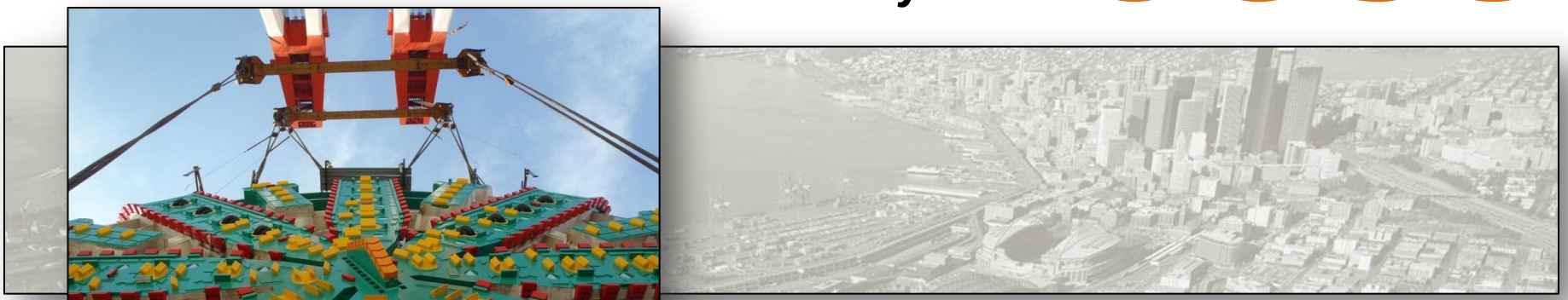
The north portal work zone in August 2014

Building the NORTH PORTAL

Today's FOCUS



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Alaskan Way Viaduct
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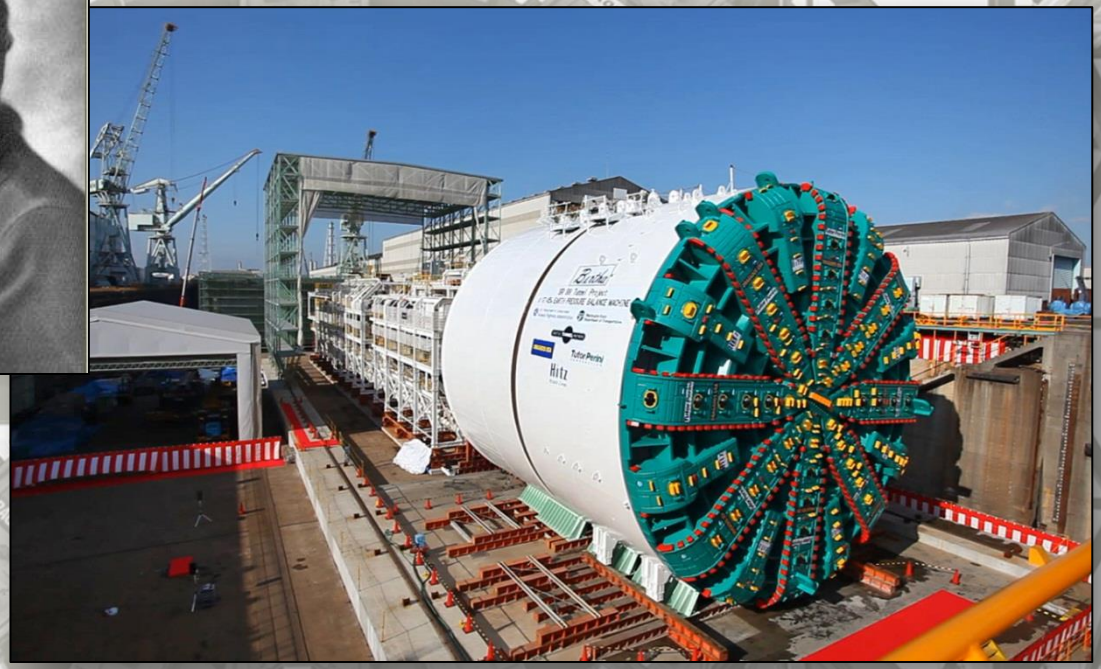
About Bertha



Vital stats:

- 57.5 feet in diameter
- 326 feet long
- Nearly 7,000 tons

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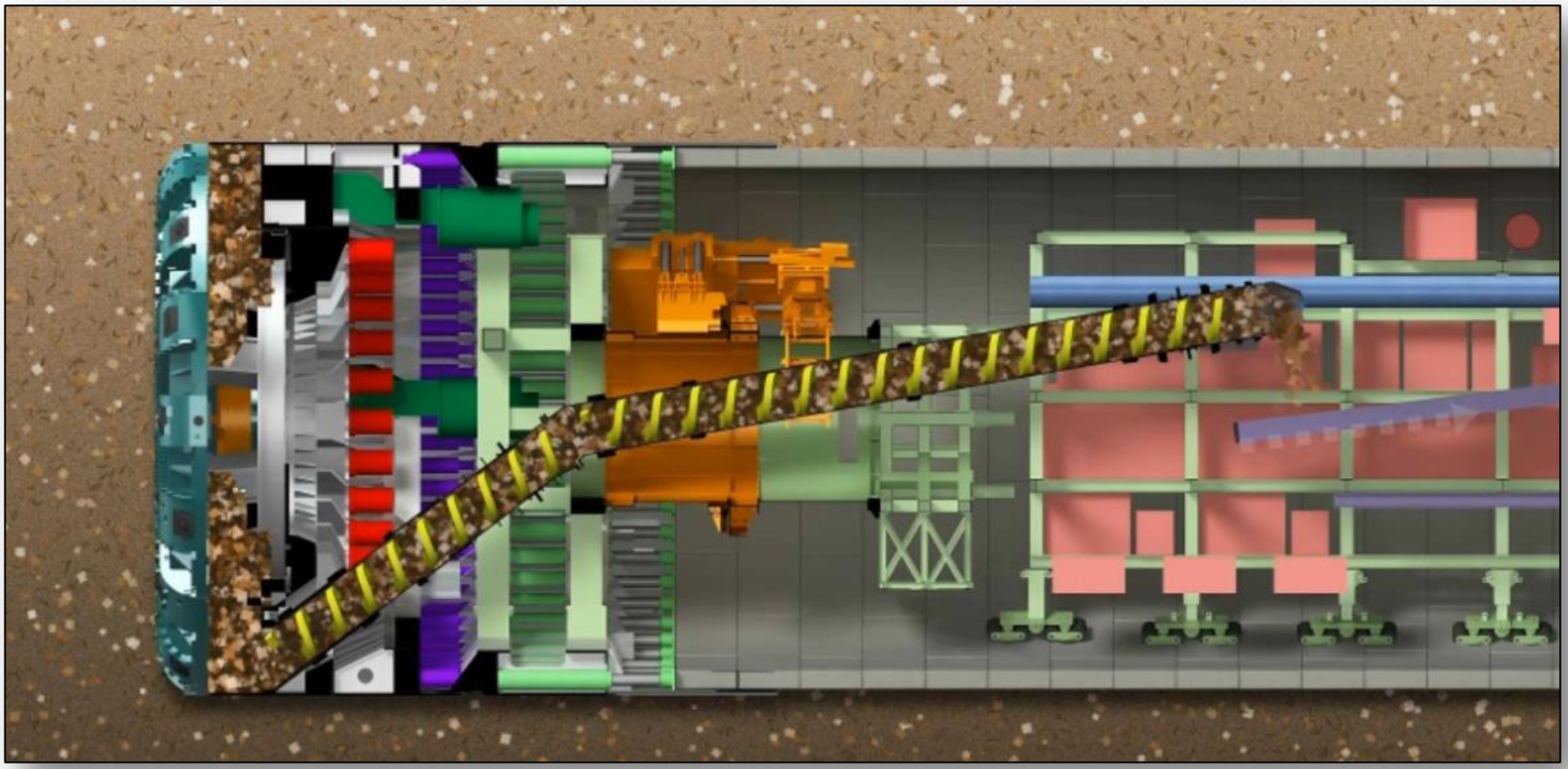

Understanding

BERTHA

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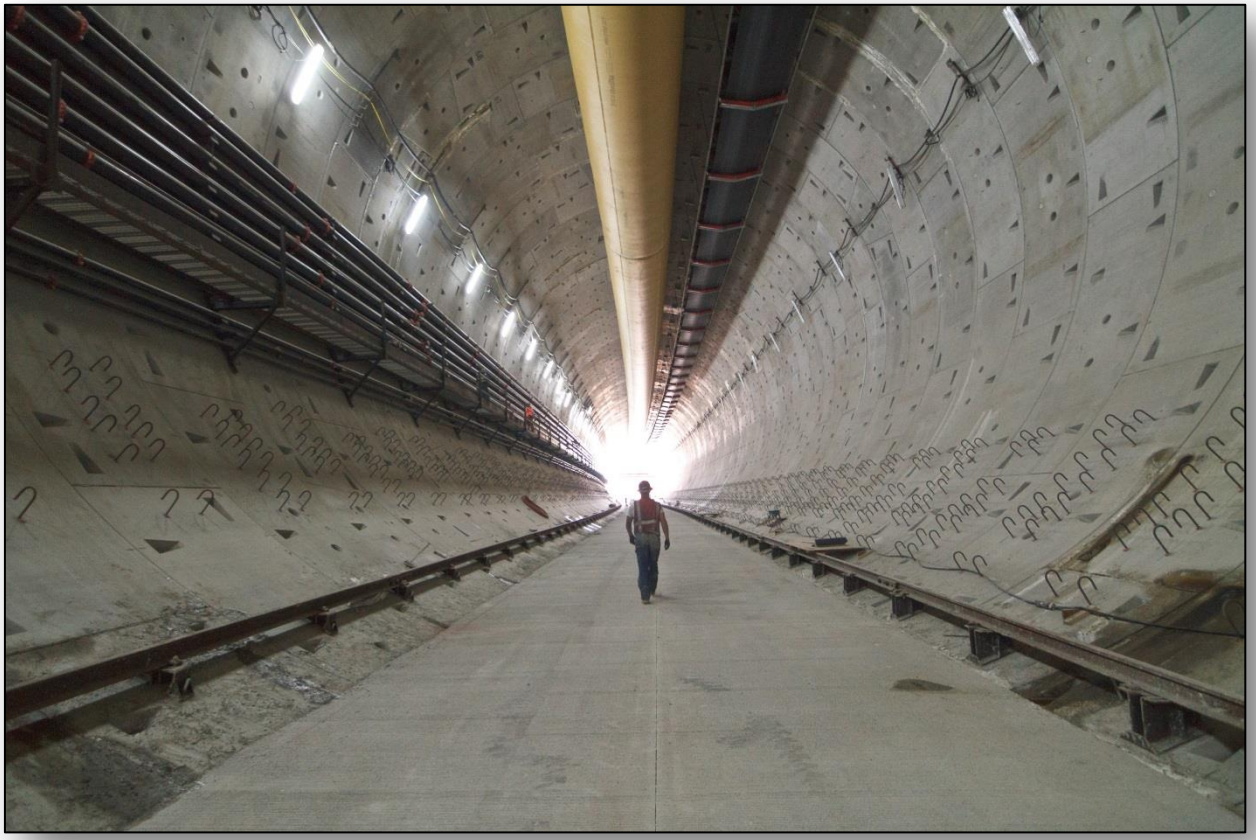
At Bertha's

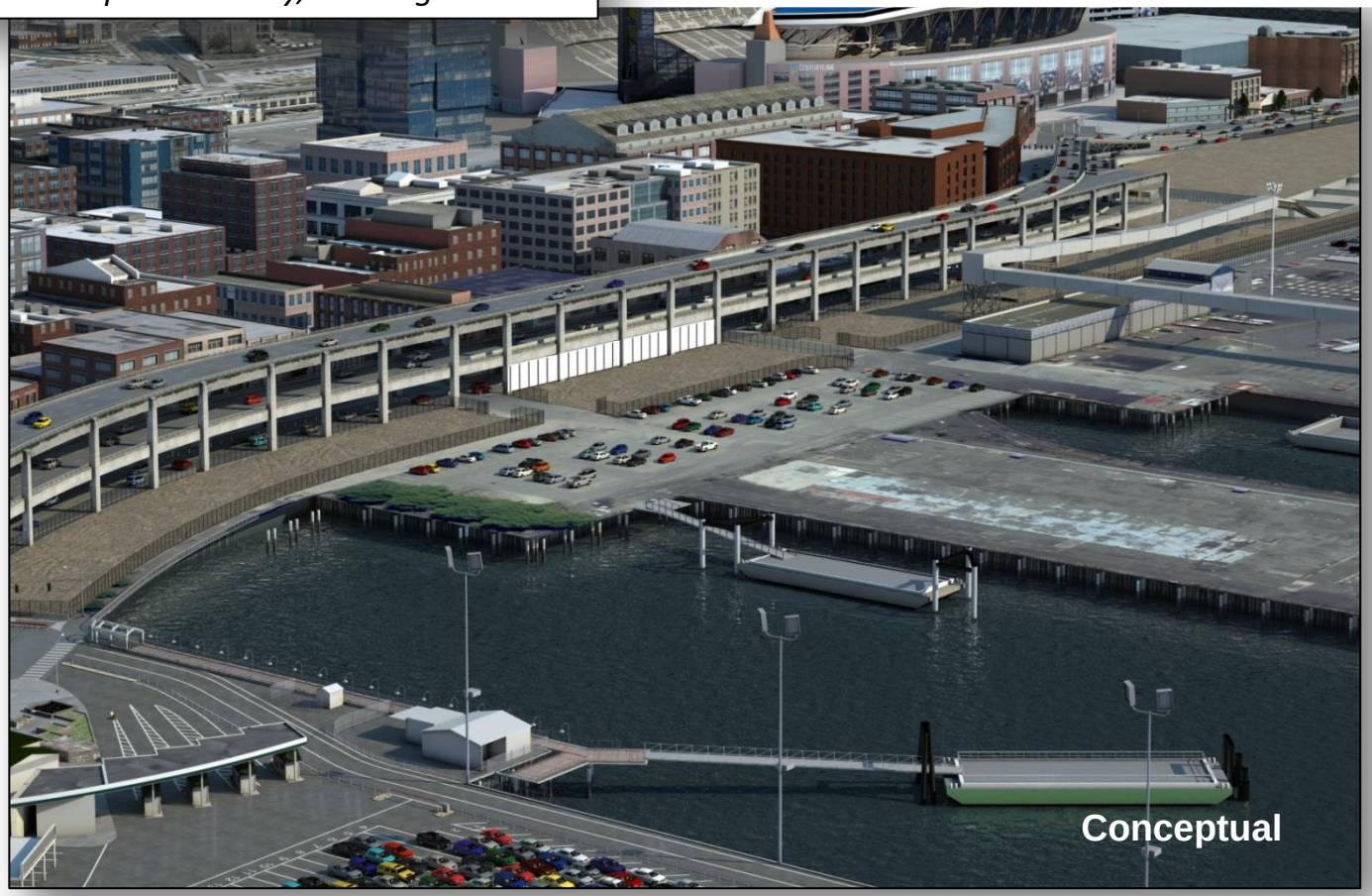
CONTROLS



Inside the

TUNNEL

Access pit site today, above ground



Repairing

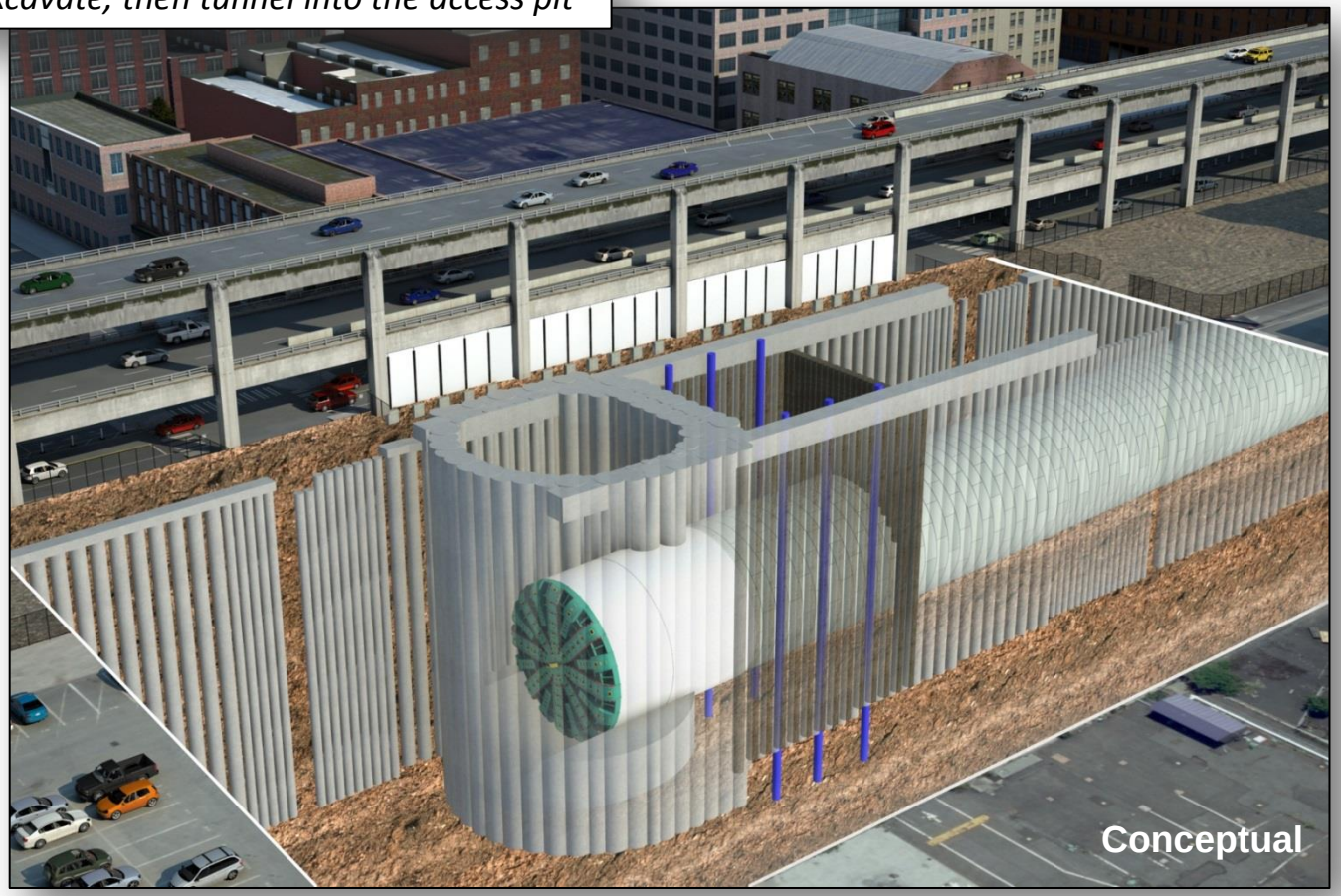
BERTHA

Lower groundwater, tunnel into wall

Repairing

BERTHA

Excavate, then tunnel into the access pit



Repairing

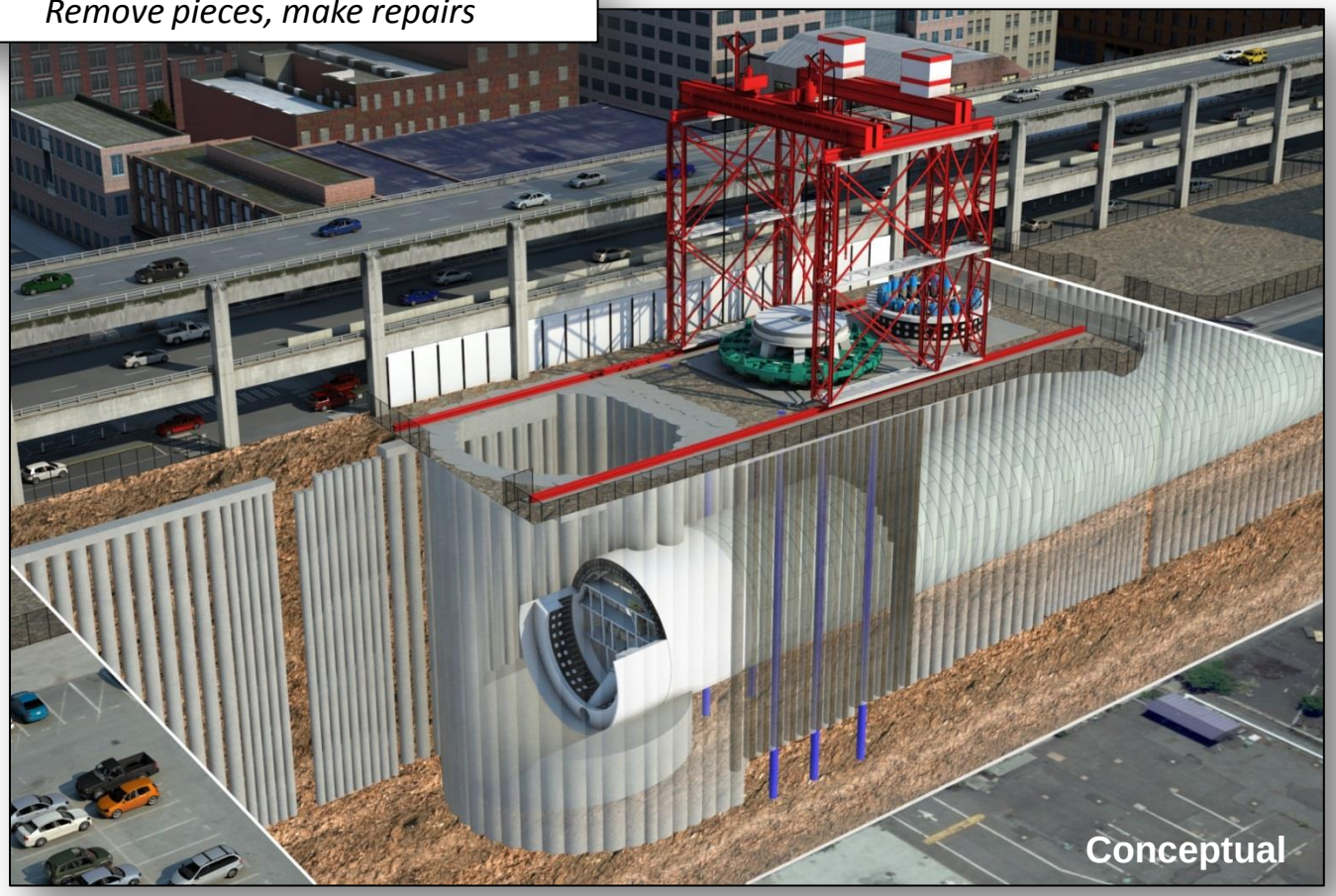
BERTHA

Install a crane above the access pit

Repairing

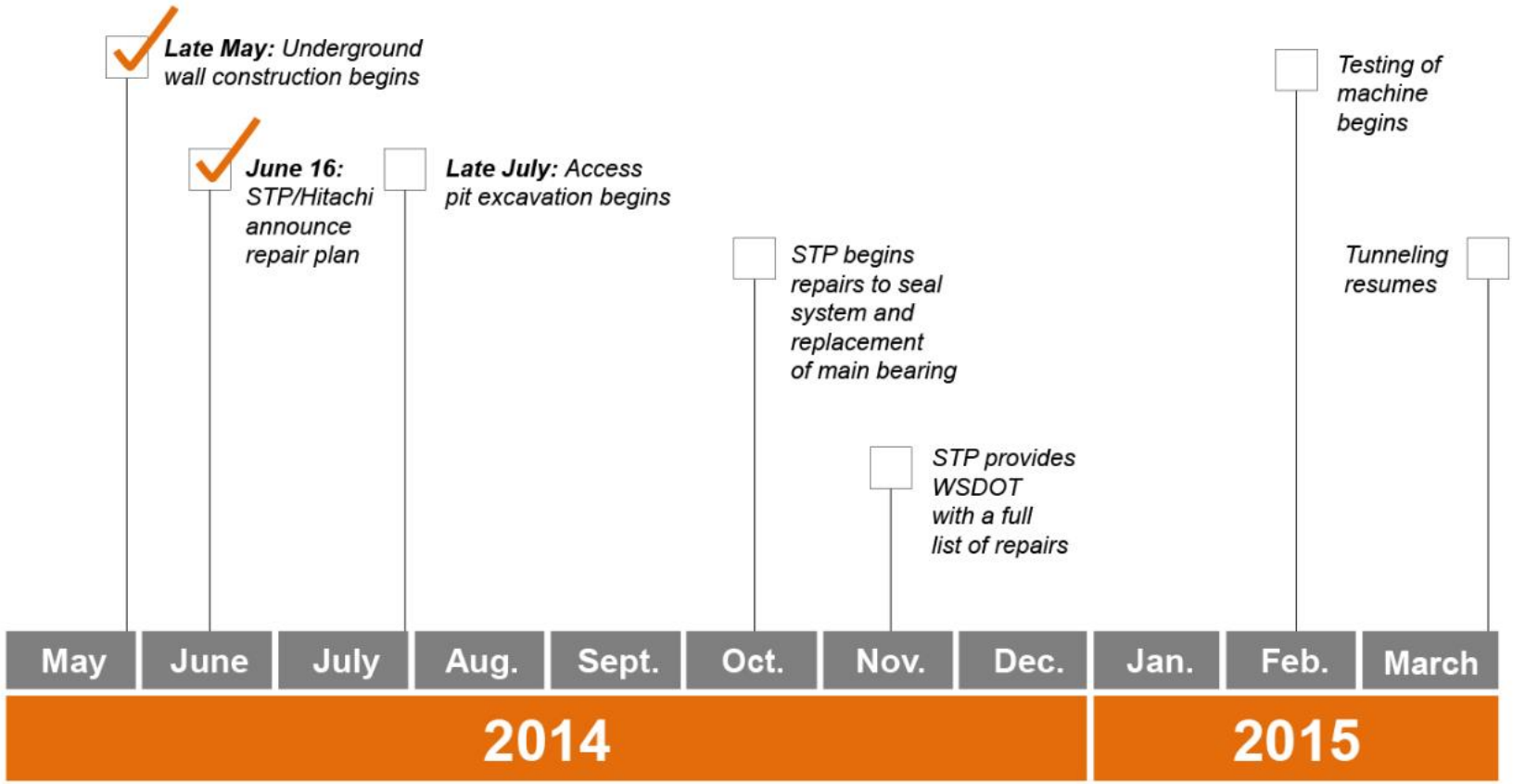
BERTHA

Remove pieces, make repairs



Repairing
BERTHA

STP's schedule



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South Access Project

North Surface Street Connections

SR 99 Tunnel Project

North Access Project

SR 99 tunnel construction

CONTRACTS

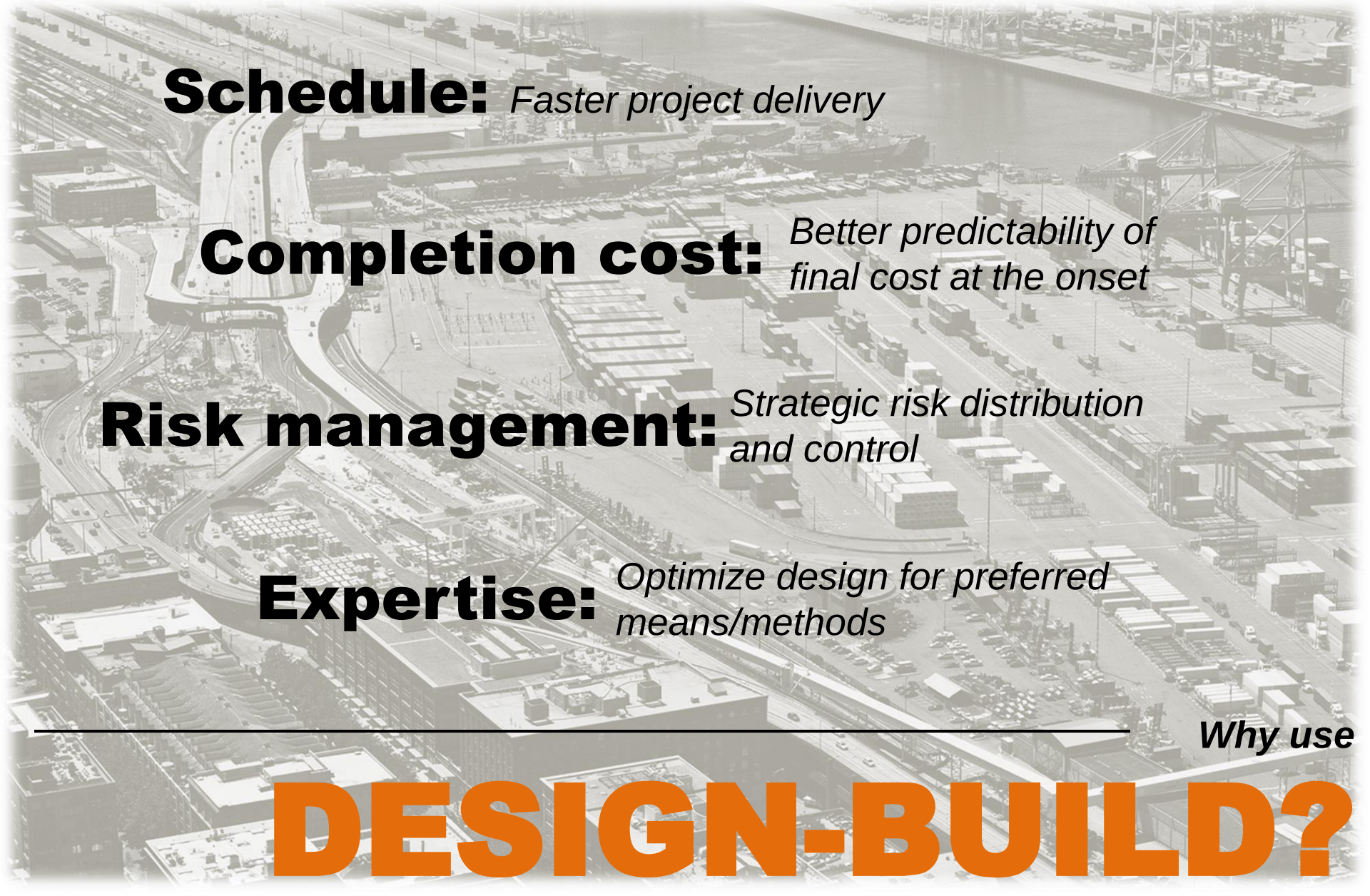
Design-Build – a method of project delivery in which the owner executes a single contract with one entity (the Design-Builder) for design and construction services to provide a finished product.

VS.

Design-Bid-Build – traditional approach for delivery of transportation projects where the owner completes the design and accepts the lowest responsive bid for construction from qualified contractors.

What Is

DESIGN-BUILD?



Schedule: *Faster project delivery*

Completion cost: *Better predictability of final cost at the onset*

Risk management: *Strategic risk distribution and control*

Expertise: *Optimize design for preferred means/methods*

Why use

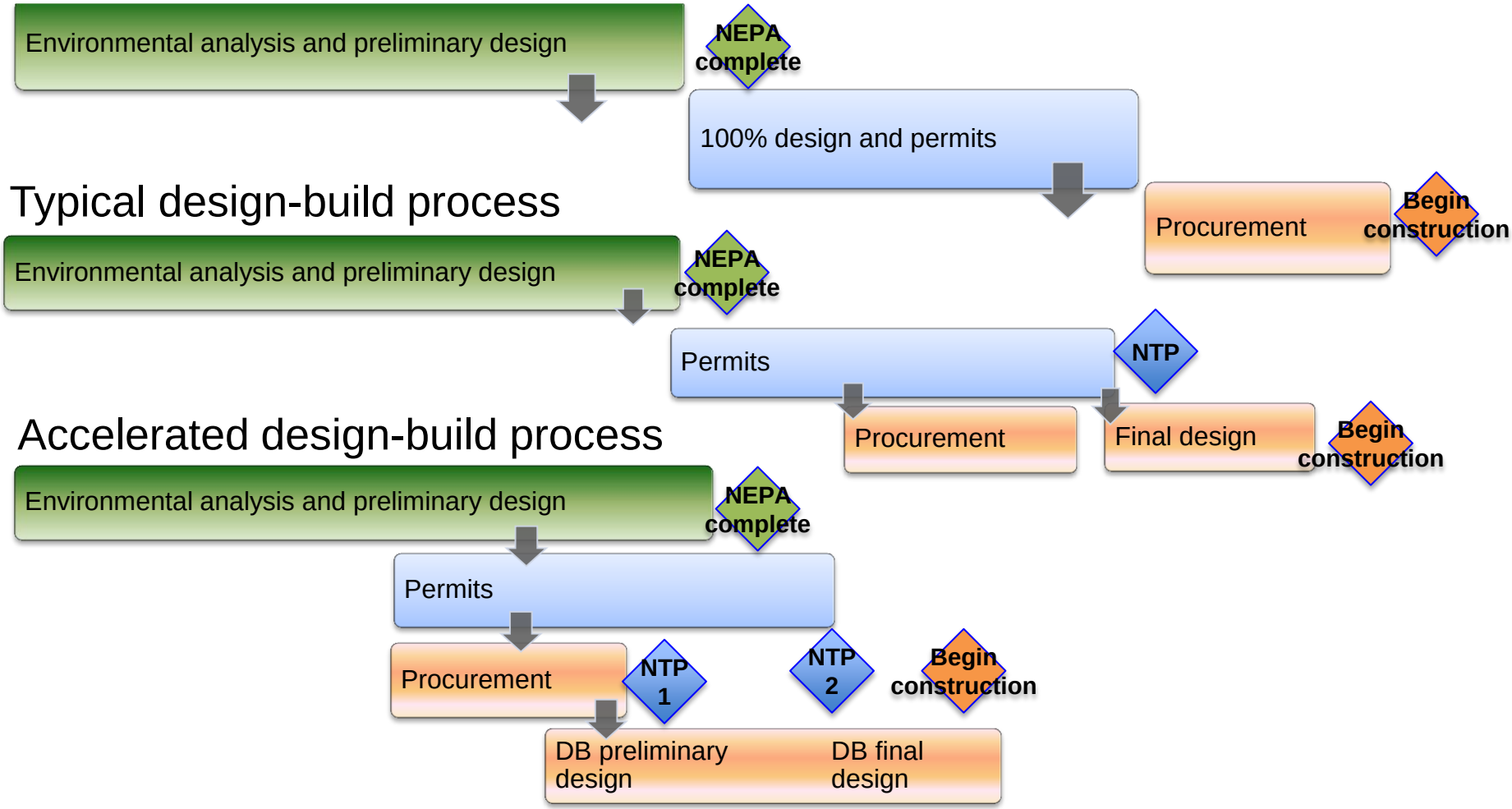
DESIGN-BUILD?

- 20 years using design-build contracting.
- Primarily used on large projects.
- Dozens of completed projects.
- Provide stipends to unsuccessful proposers.
- Most reports, plans and specifications prepared by Design-Builder. WSDOT reviews and provides comments.
- Provide a detailed Quality Management Plan outline for proposers use.
- Quality Management Plan is one of the few documents WSDOT approves.
- Geotechnical Baseline Reports are including in most design-build projects.

WSDOT

DESIGN-BUILD

Typical design-bid-build process



Comparison of contracting

APPROACHES

The SR 99 tunnel contract ensures that:

- Majority of work will be completed for a fixed cost.
- Better predictability of final cost at the onset.
- Limits WSDOT's liability.
- Design or quantity changes are the contractor's responsibility.

A tool that's better than

BERTHA

- Schedule incentives and disincentives for:
  - Final completion dates.
  - Milestone completion dates.
  - Open to traffic hours.
- Level playing field:
  - Upset price for design-build contract.
  - Contract terms – bonding, limits of liability, insurance.
- Shared risk funds:
  - Owner controlled.
  - Contractor incentives.

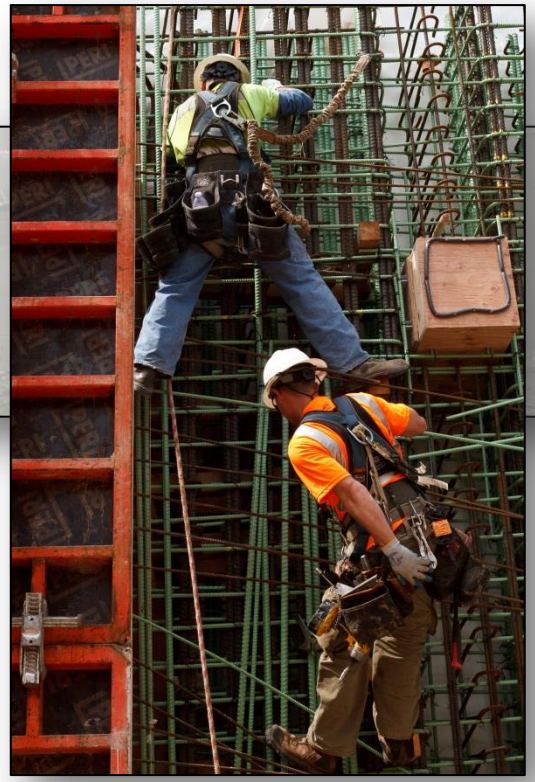
The design-build

CONTRACT

Disputes Review Board

- Assist in the resolution of disputes between WSDOT and the design-builder.
- Three person board of independent experts.
- Utilize when standard dispute resolution is unsuccessful and prior to the filing of a claim.
- Provide nonbinding recommendations designed to expose the disputing parties to an independent view.

Today's FOCUS



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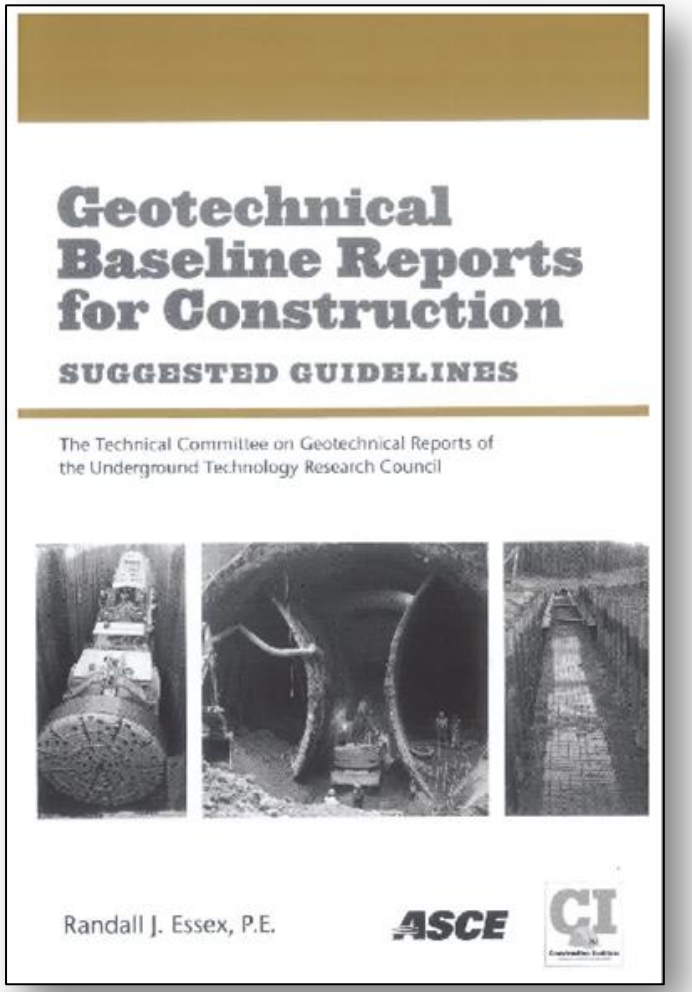
- The path forward

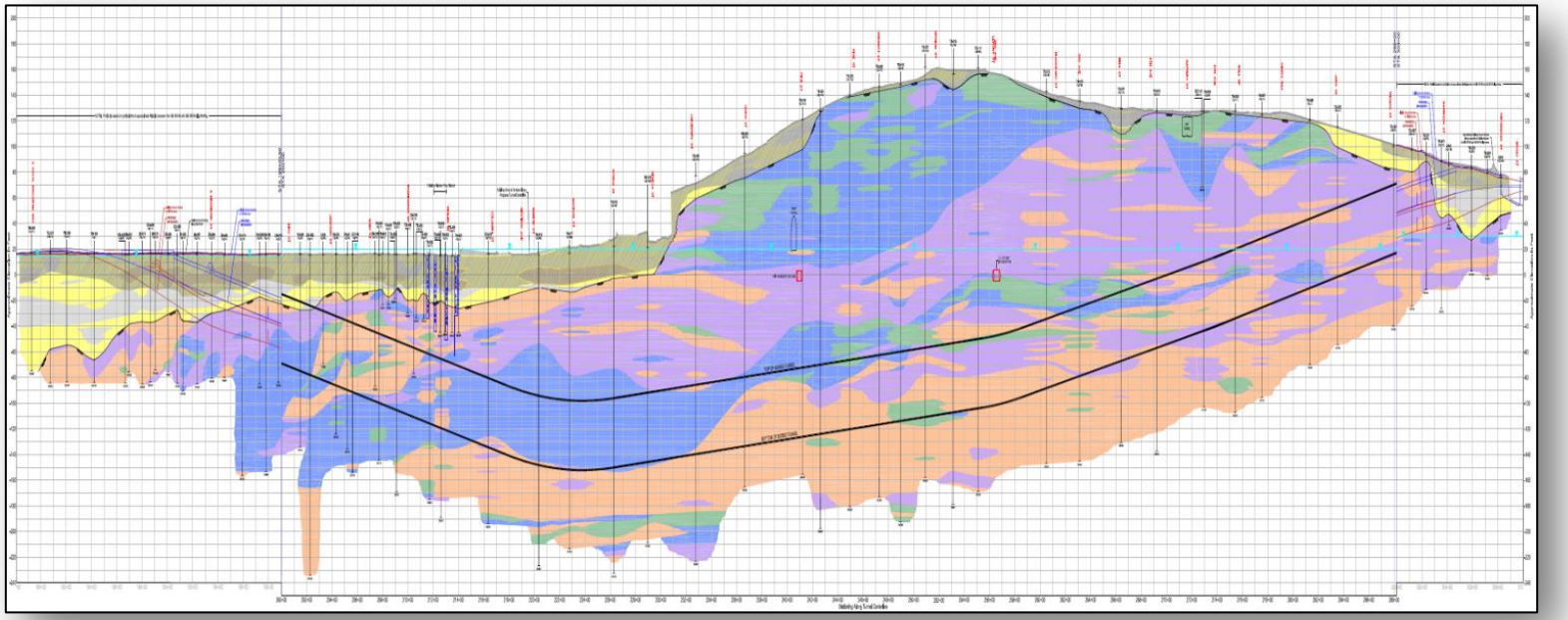
- Manage project as a “strong” owner:
  - Experienced, well-trained core leadership and technical staff.
  - Augment with specific technical and management expertise.
  - Clear understanding and ownership of risk allocation.
- Identify project risks early and develop risk management strategy.
- Engage experts with national and international tunneling experience in urban environments.
- Develop contracting structure and risk allocation.
- Conduct extensive soil exploration program.
- Evaluate and identify potential construction impacts.
- Employ advances in tunneling machine and monitoring technology where appropriate.



- Used to baseline subsurface conditions along tunnel alignment.
- Factual field and laboratory data in Geotechnical Data Report (GDR) in contract documents.
- Requires clear, concise and measurable baselines for assessing differing site conditions (DSC) – NOT a geotechnical design report.
- Included along with Geotechnical Data Report as part of the contract documents.

Geotechnical baseline

REPORT



RECENT GRANULAR DEPOSITS:
Loose to dense SILT and SAND with gravel; includes normally consolidated alluvium, granular fill, beach deposits, reworked glacial deposits, and recessional ice-contact deposits.

RECENT CLAY AND SILT:
Soft to very stiff CLAY and SILT with fine sand beds; includes normally consolidated cohesive fill, estuarine deposits, and recessional lacustrine deposits.

PEAT AND WOOD:
Very soft to hard PEAT, silty PEAT, organic SILT and WOOD; includes fill, normally consolidated peat and overconsolidated peat and buried soil deposits.

TILL:
Dense to very dense, silty SAND and GRAVEL, and hard, silty CLAY with sand and gravel; cobbles and boulders are common in these deposits; includes glacially overconsolidated till and glaciomarine drift.

TILL-LIKE DEPOSITS:
Dense to very dense, silty SAND and GRAVEL, and hard, silty CLAY with sand and gravel, interbedded and intermixed with cohesionless sand and gravel; cobbles and boulders are common in these deposits; includes lenses and layers of glacially overconsolidated till and glaciomarine drift.

COHESIONLESS SAND AND GRAVEL:
Very dense SAND and GRAVEL to SAND with variable silt; cobbles can be found in these deposits; includes glacially overconsolidated fluvial and glacial outwash deposits.

COHESIONLESS SILT AND FINE SAND: Very dense SILT, silty fine SAND, and fine sandy SILT with trace of clay; predominantly cohesionless; includes glacially overconsoidated lacustrine deposits.

COHESIVE CLAY AND SILT:
Very stiff to hard, silty CLAY and clayey SILT with trace of sand and gravel; scattered cobbles and boulders can be found in these deposits; includes glacially overconsolidated lacustrine, peat, and paleosol deposits.

Baseline geologic

PROFILE

For tunneling/subsurface risk…

$40 Million Covers:

- Extraordinary interventions over 1,440 hours
- Differing site conditions

Fund Exceeded:

- WSDOT cost

Funds Remaining:

- Shared 75%/25%

Shared contingency

FUND

Category A – Mandatory mitigation (1/2” settlement limits)

Category B – All other buildings within zone of influence (1” settlement)

WSDOT defined building categories A & B

DMS – Deformation Mitigation Submission

Modified by design-builder

Deformation Mitigation and Repair Fund – $20M to be shared for Category B mitigation or repairs to property owners

Accepted in contract

Fund exceeded – Split based on performance

Funds Remaining - Shared 75%/25%

Risk sharing

Settlement mitigation

APPROACH

Alaskan Way Viaduct
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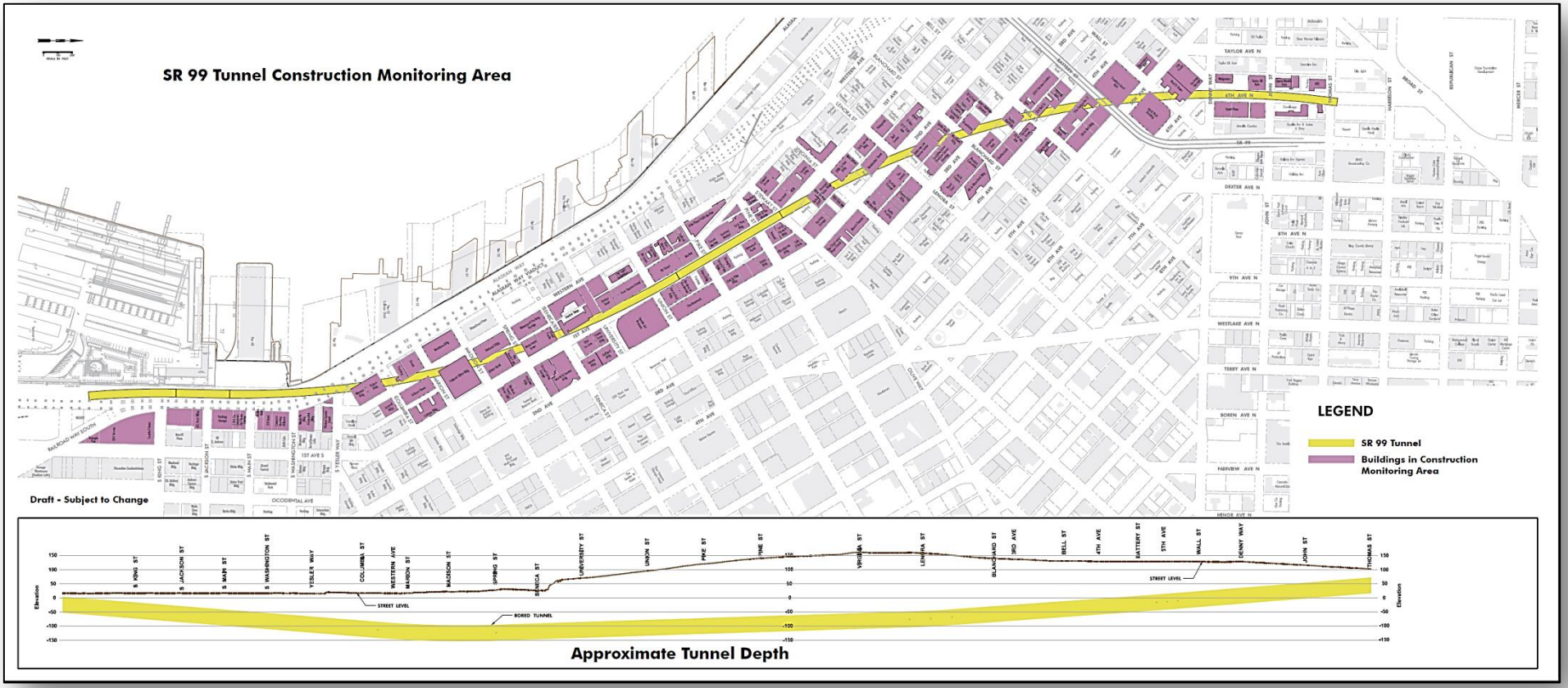
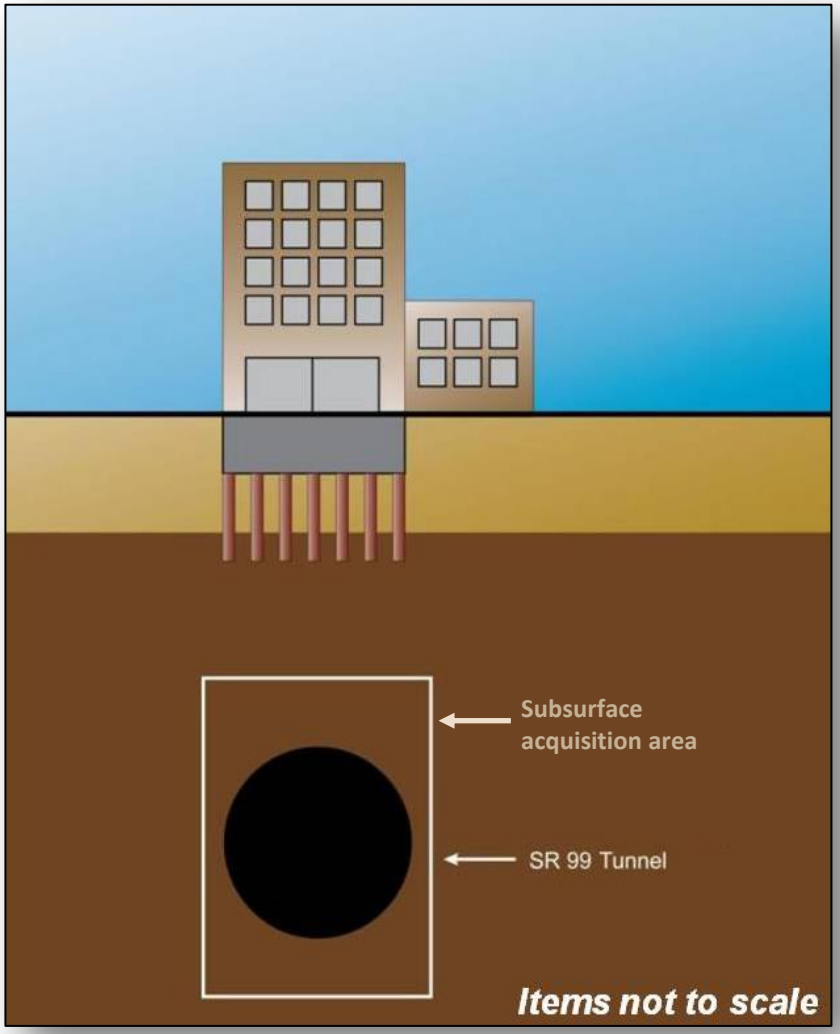


Construction monitoring

AREA



WSDOT purchased subsurface parcels for the SR 99 tunnel.

Purchase process:

- Appraise change in property's fair market value.
- Present offer to purchase with copy of appraisal report.
- Negotiate purchase agreements.

Subsurface property

RIGHTS

Alaskan Way Viaduct Replacement Program

Partner agencies:

- Federal Highway Administration
- Port of Seattle
- King County
- City of Seattle

WSDOT Consultants:

- Parsons Brinckerhoff
- Hatch Mott McDonald
- Shannon and Wilson
- Jacobs and Associates
- Strategic Technical Advisory Team

Seattle Tunnel Partners, D-B contractor:

- Dragados-USA and Tutor Perini
- HNTB
- Intecsa-Inarsa
- Hart Crowser
- Malcom Drilling
- Frank Coluccio Construction
- Hitachi Zosen (TBM manufacturing)

Program

ORGANIZATION

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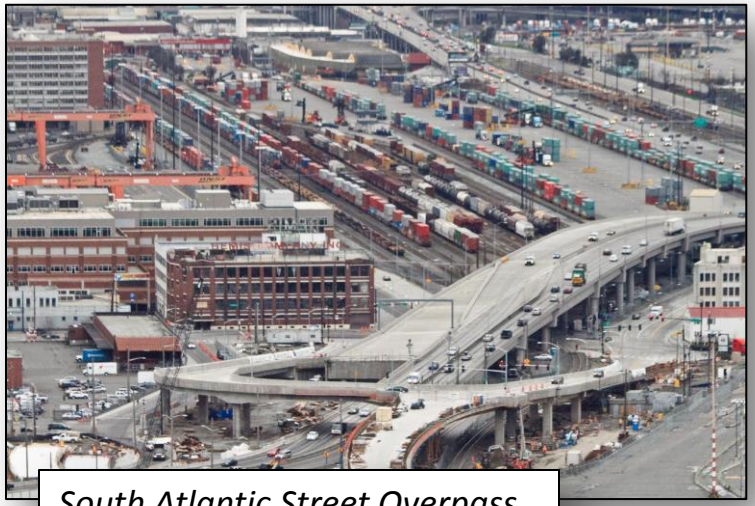
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017



South Atlantic Street Overpass

Building on- and off-ramps near the north portal

The path

FORWARD

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017

Building the new roadway inside the tunnel

Building on- and off-ramps near the south portal

The path

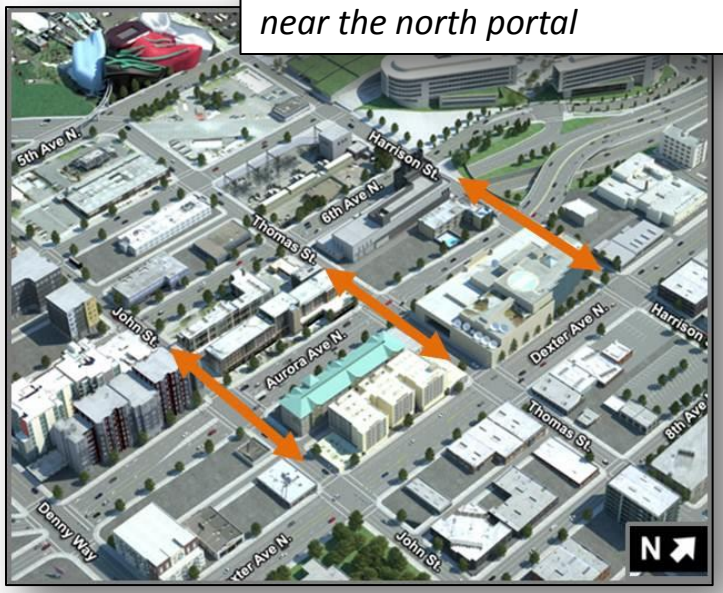
FORWARD

Alaskan Way Viaduct
REPLACEMENT
PROGRAM

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017

Tunnel scheduled to open to drivers

Reconnecting surface streets near the north portal



The path

FORWARD

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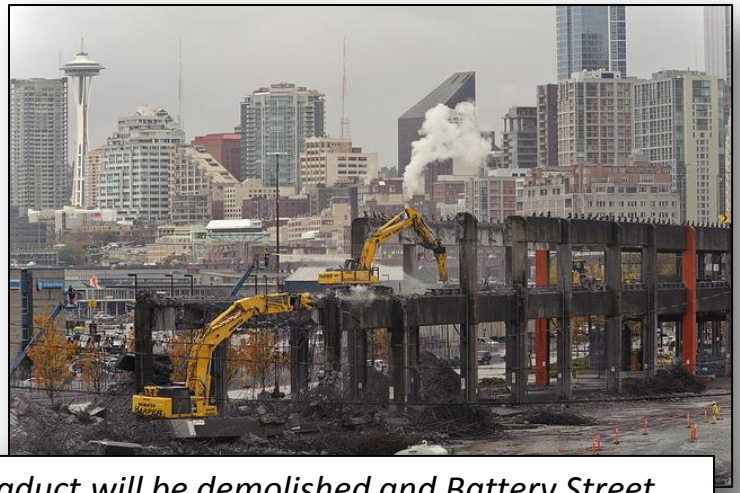
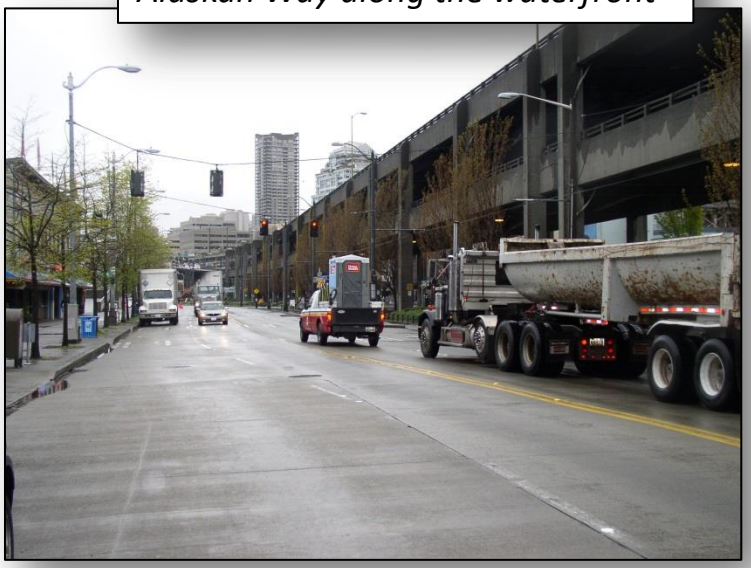


Viaduct will be demolished and Battery Street Tunnel will be decommissioned and filled in

City of Seattle begins to rebuild Alaskan Way along the waterfront



The path

FORWARD

A waterfront **FOR ALL**

Alaskan Way Viaduct
REPLACEMENT
PROGRAM

How to REACH US

Milepost Thirty-One

Our information center, Milepost 31, is located at 211 First Ave. S. in Seattle's Pioneer Square neighborhood.

Website:
www.AlaskanWayViaduct.org

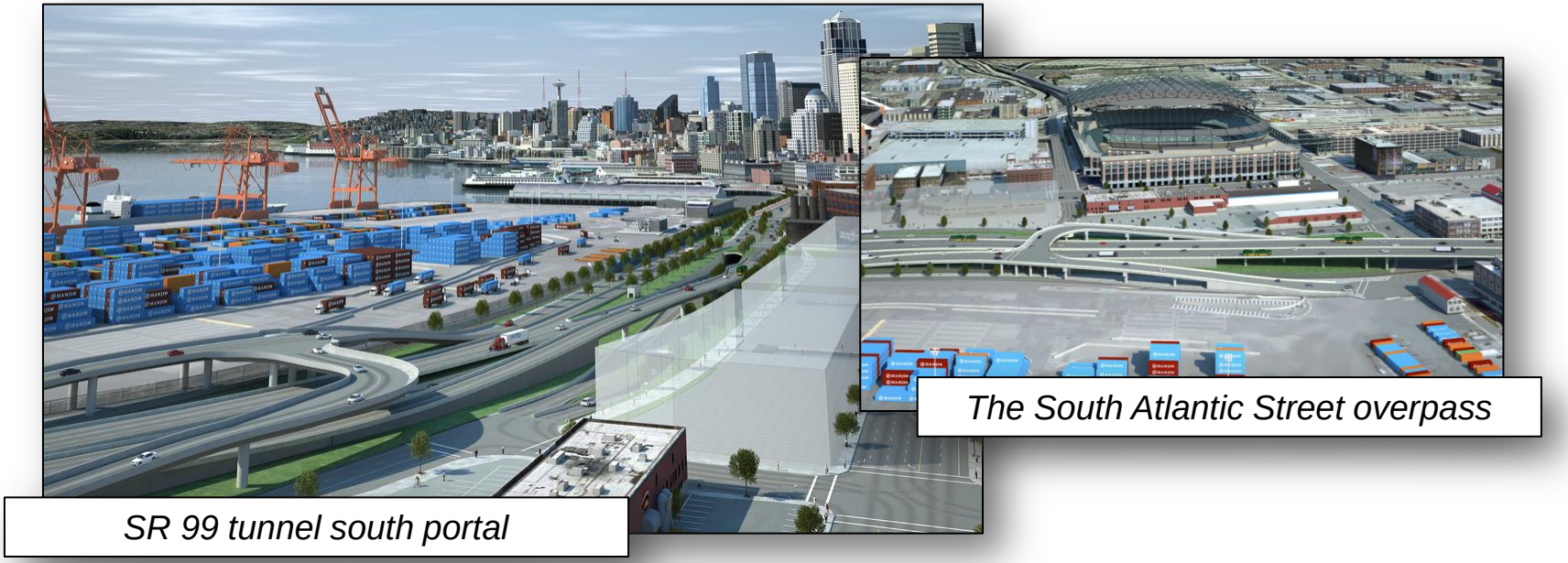
Twitter:
@BerthaDigsSR99

Email:
viaduct@wsdot.wa.gov

Hotline:
1-888-AWV-LINE

Features include:

- Improved access for all modes
- New on- and off-ramps in both directions
- New overpass reduces congestion near port terminal



SR 99 tunnel south portal

The South Atlantic Street overpass

Meet Bertha, the SR 99 Tunneling Machine

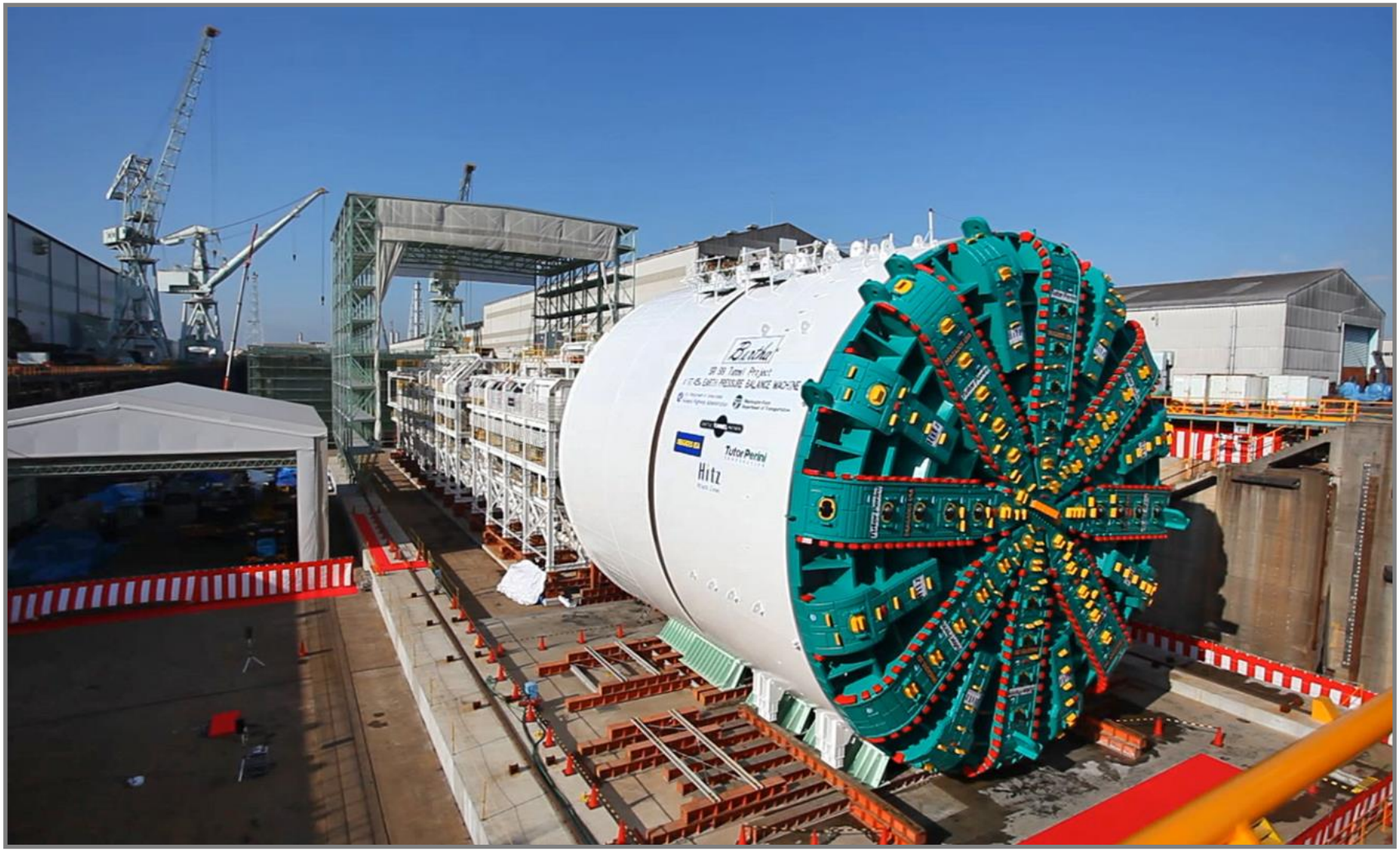


Photo from spring 2013.

Access pit site today, below ground

Repairing

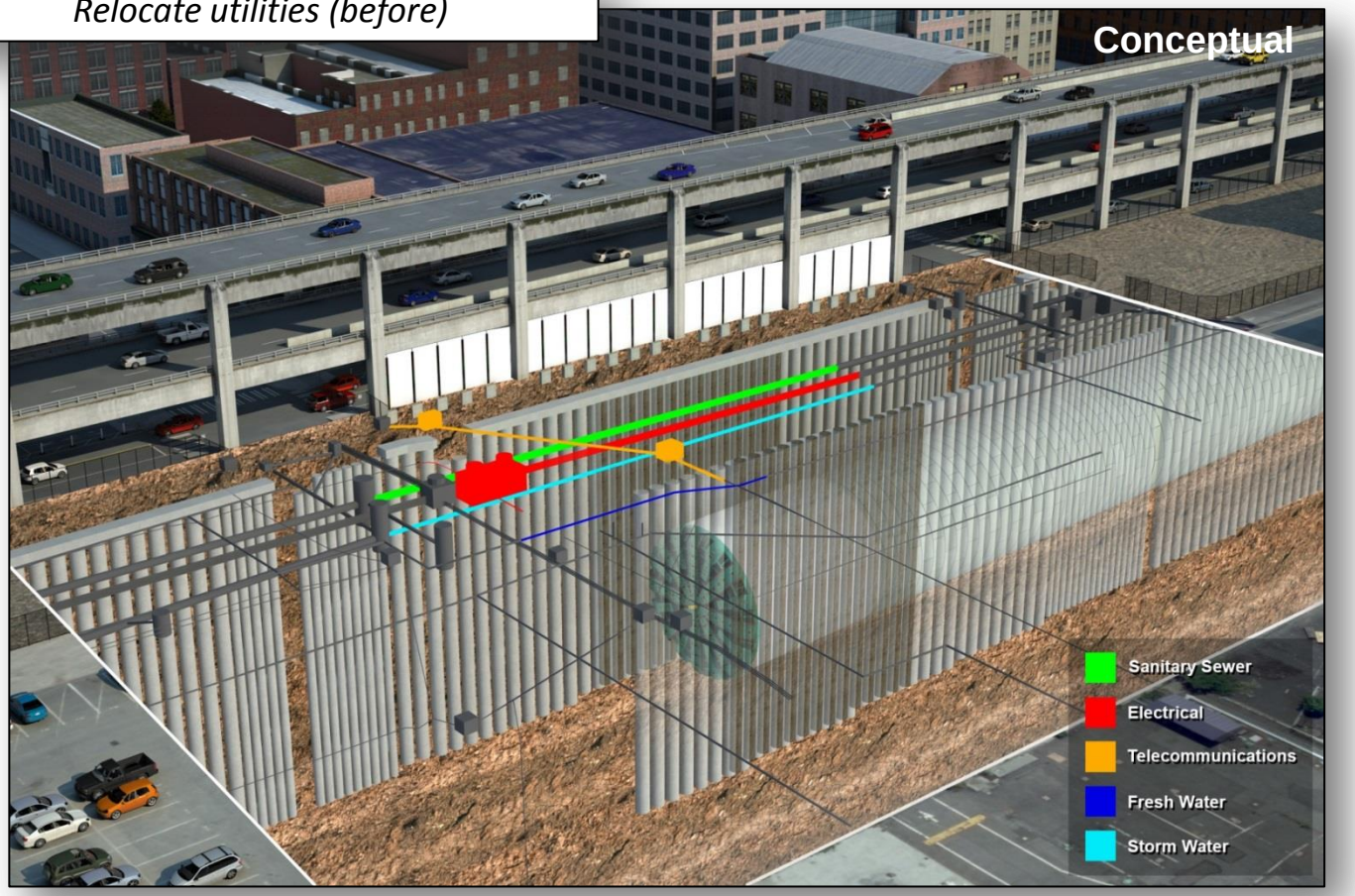
BERTHA

Inject grout between existing piles

Repairing

BERTHA

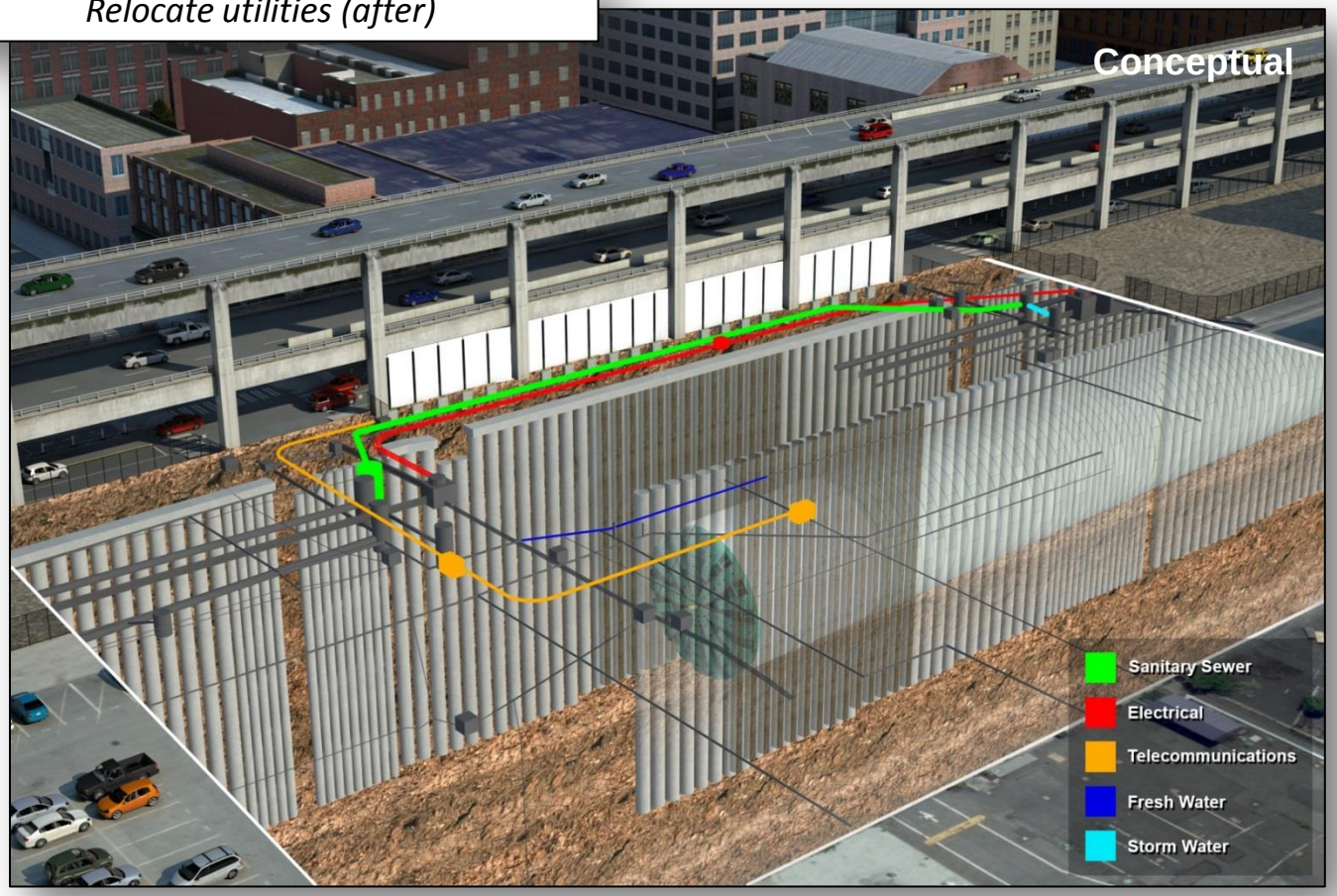
Relocate utilities (before)



Repairing

BERTHA

Relocate utilities (after)



Repairing

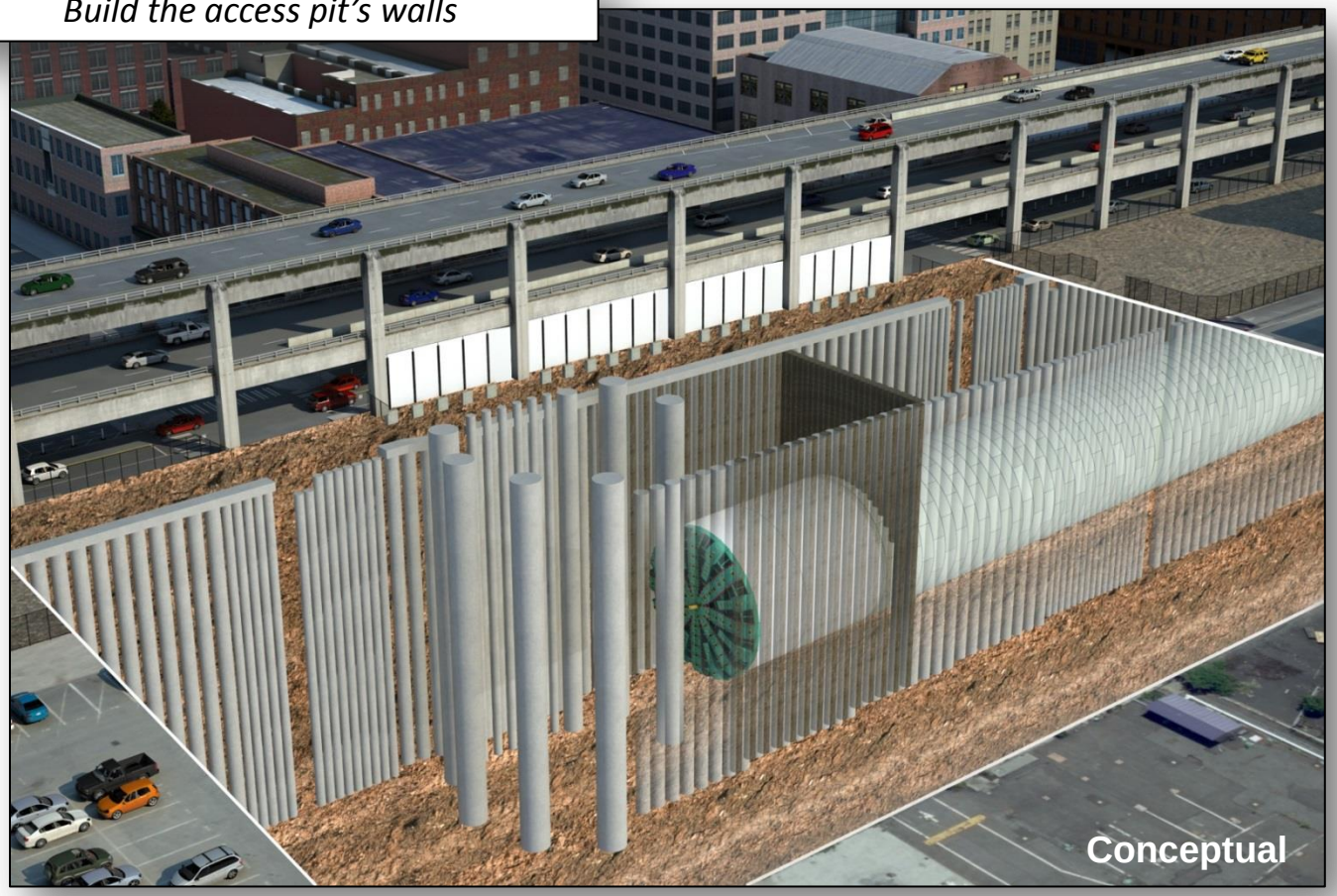
BERTHA

Inject grout behind the machine

Repairing

BERTHA

Build the access pit's walls



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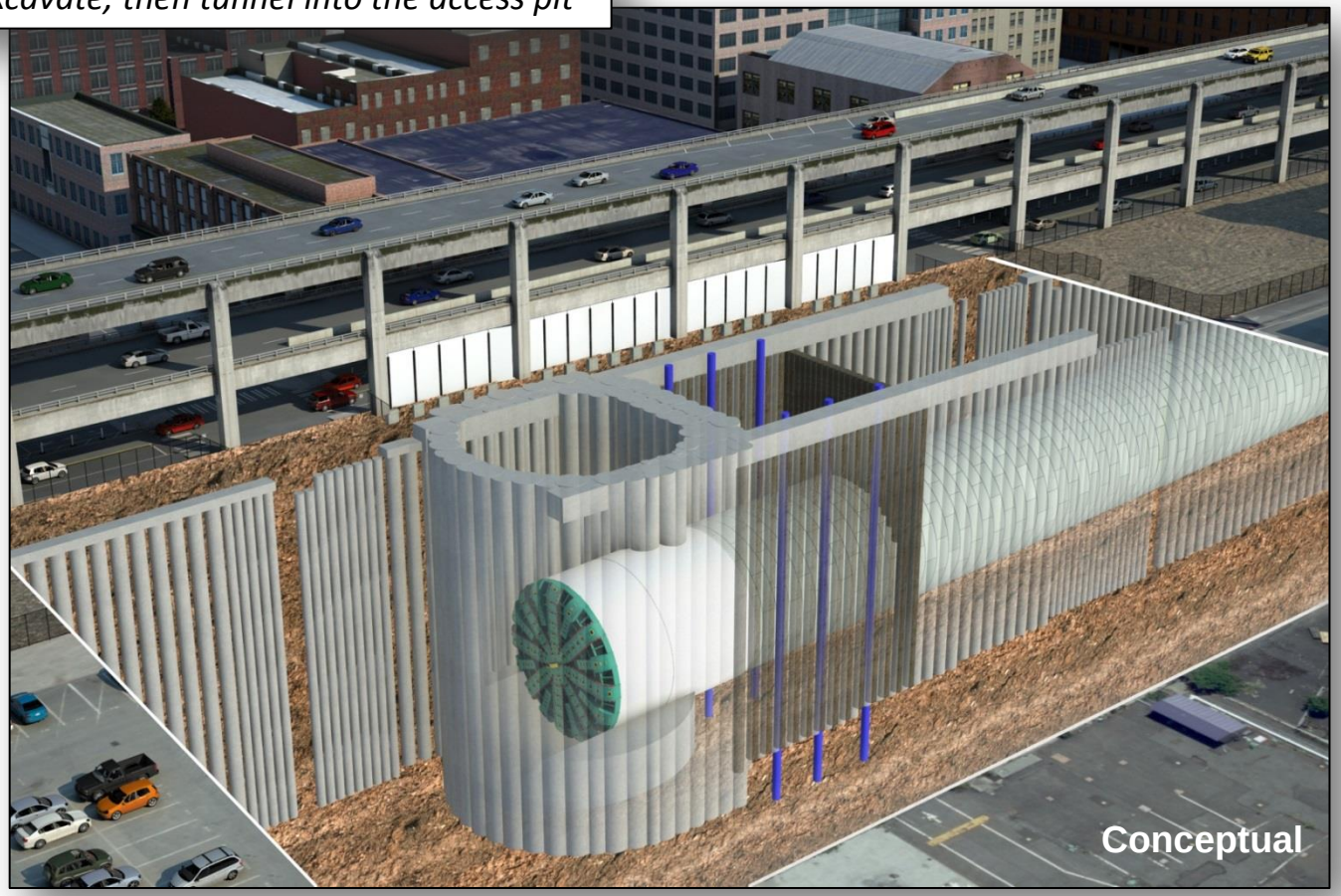

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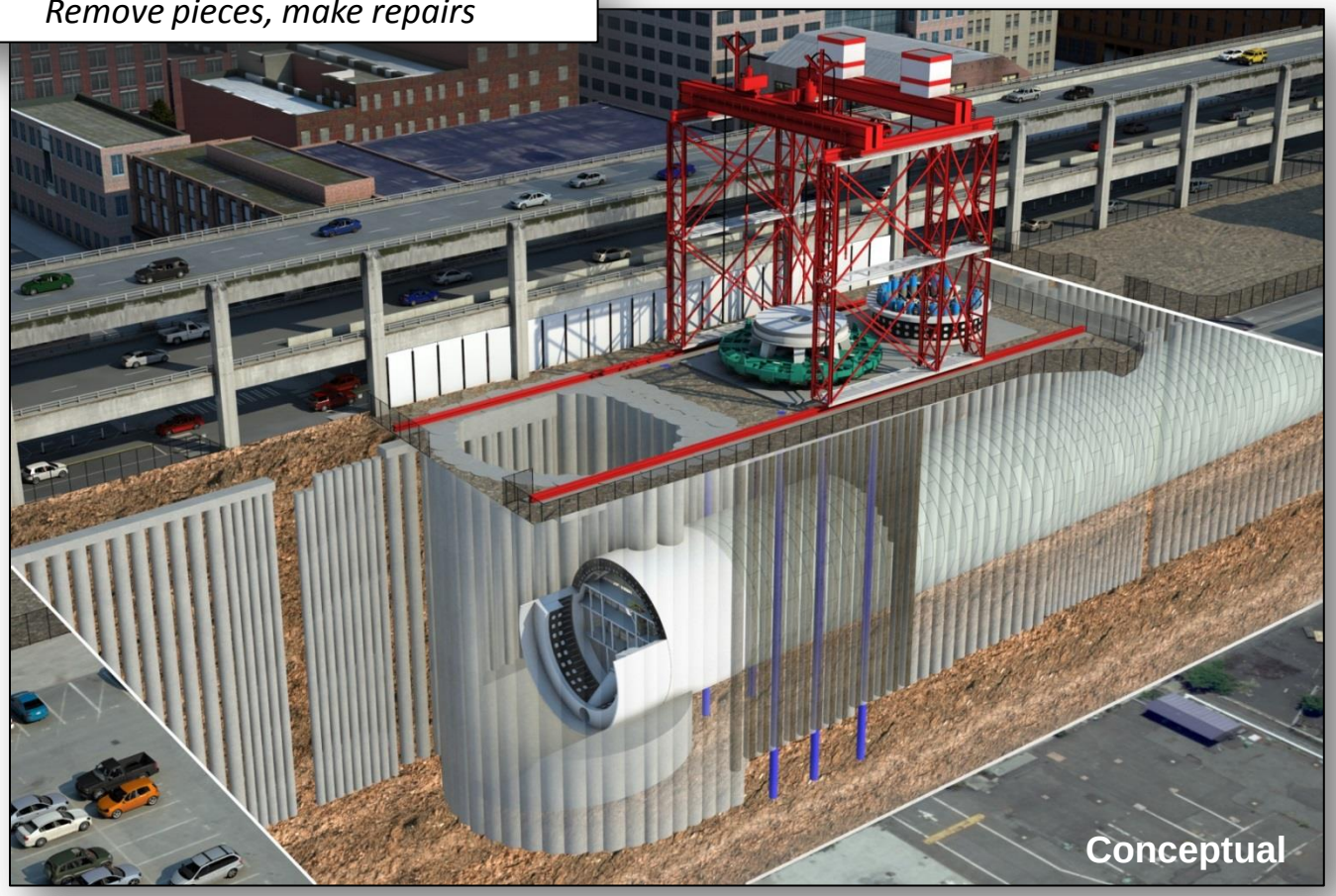
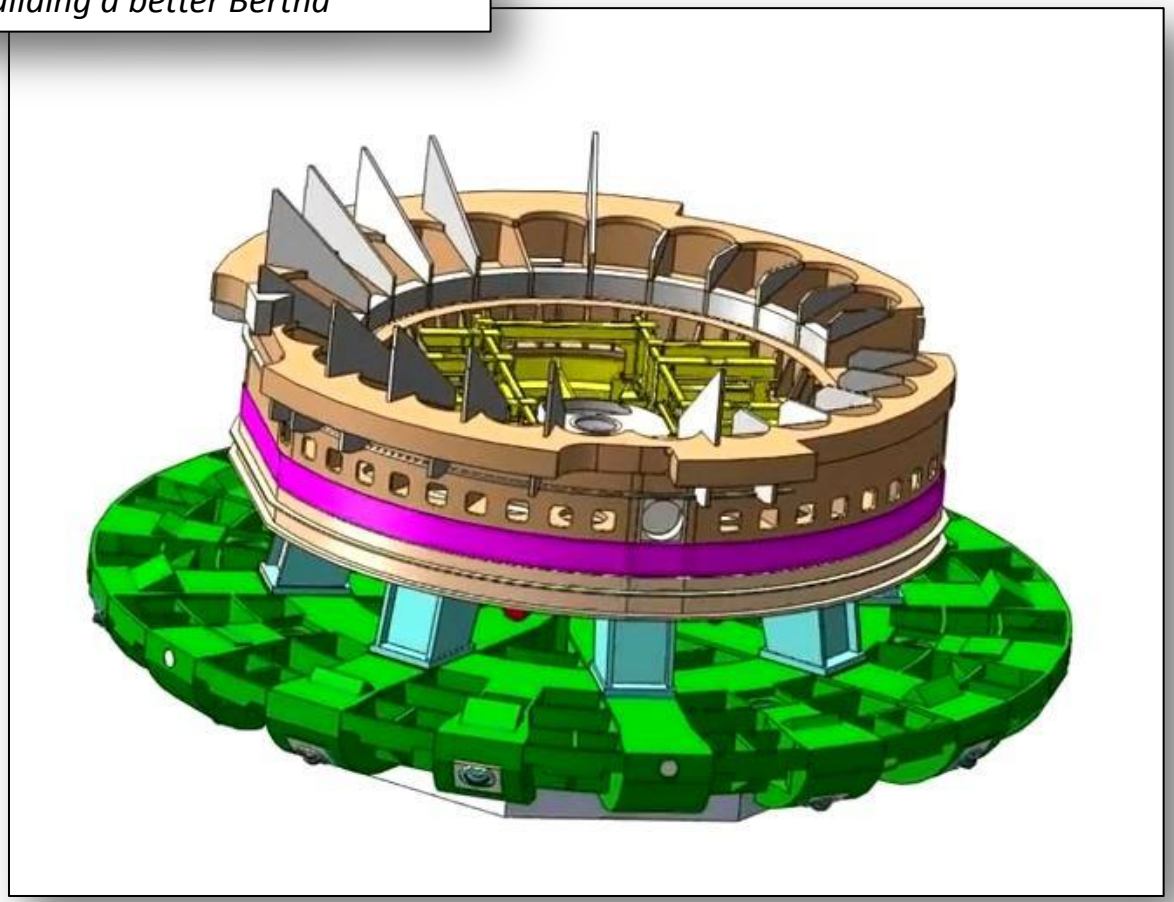


Repairing
BERTHA

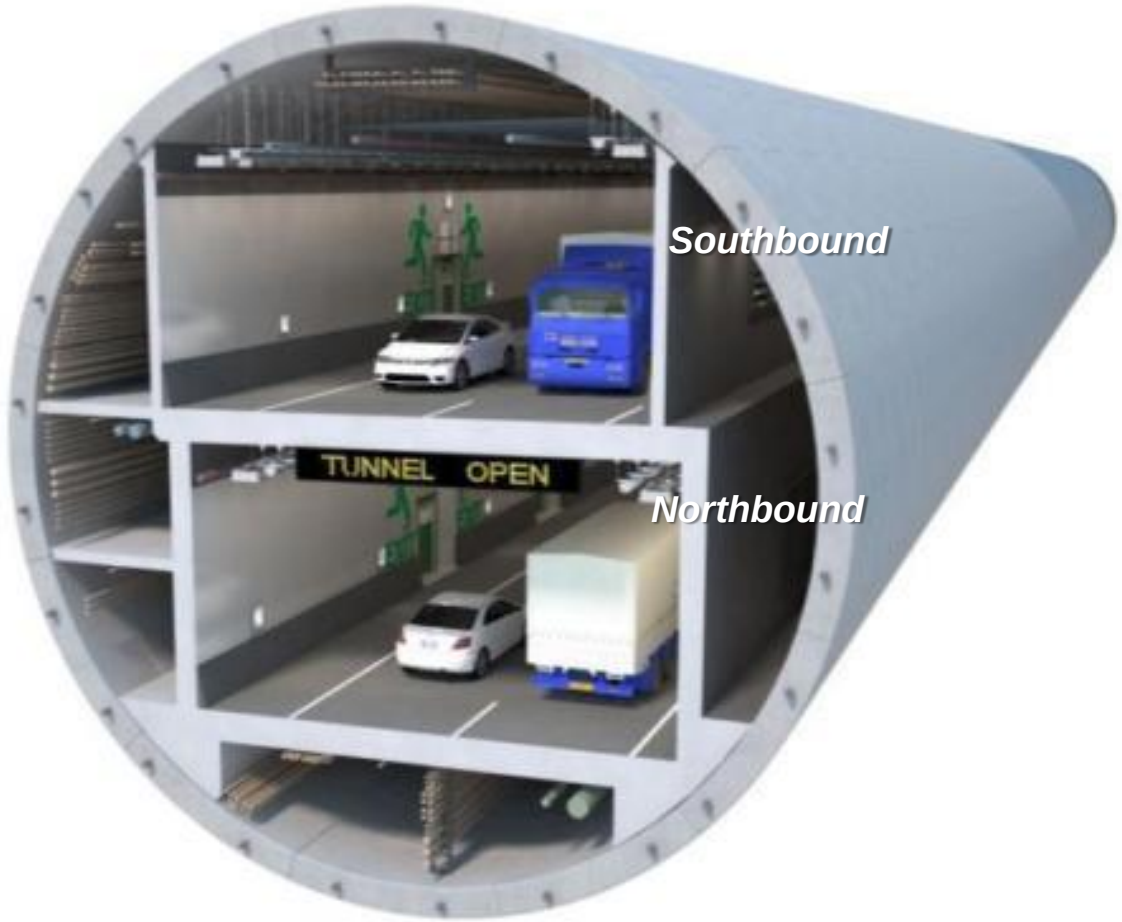
Building a better Bertha



Repairing

BERTHA

SR 99 Tunnel Design Concept



Completed Projects in the AWV Program

- Column stabilization near Yesler Way *(2008).*
- I-5 travel time signs (*2009).*
- SR 519 Phase 2 (*2010).*
- Spokane Street Viaduct Fourth Avenue off-ramp *(2010).*
- I-5 active traffic management (*2010).*
- City street intelligent transportation systems (*2010).*
- Automated viaduct closures gates system *(2011).*
- SR 99 intelligent transportation systems (*2011).*
- South Holgate to South King Street viaduct replacement – *Stages 1, 2 and viaduct demolition.*

SR 519 Intermodal Access Project.