



Alaskan Way Viaduct and Seawall Replacement Program

Matt Preedy & Linea Laird
Directors of South, Central and North Projects
Alaskan Way Viaduct and
Seawall Replacement Program

Northwest Region's 2010 Design-Construction Conference
Shoreline, WA
Feb. 23, 24, 2010



Exhibit D



Agenda

- 2008 / 2009 activities
 - Program overview – scope, schedule, budget
 - Importance of CEVP and VE processes
 - Construction coordination
 - Begin removing the southern mile of the viaduct – Holgate to King
- Advancing proposed bored tunnel design
- Risk management





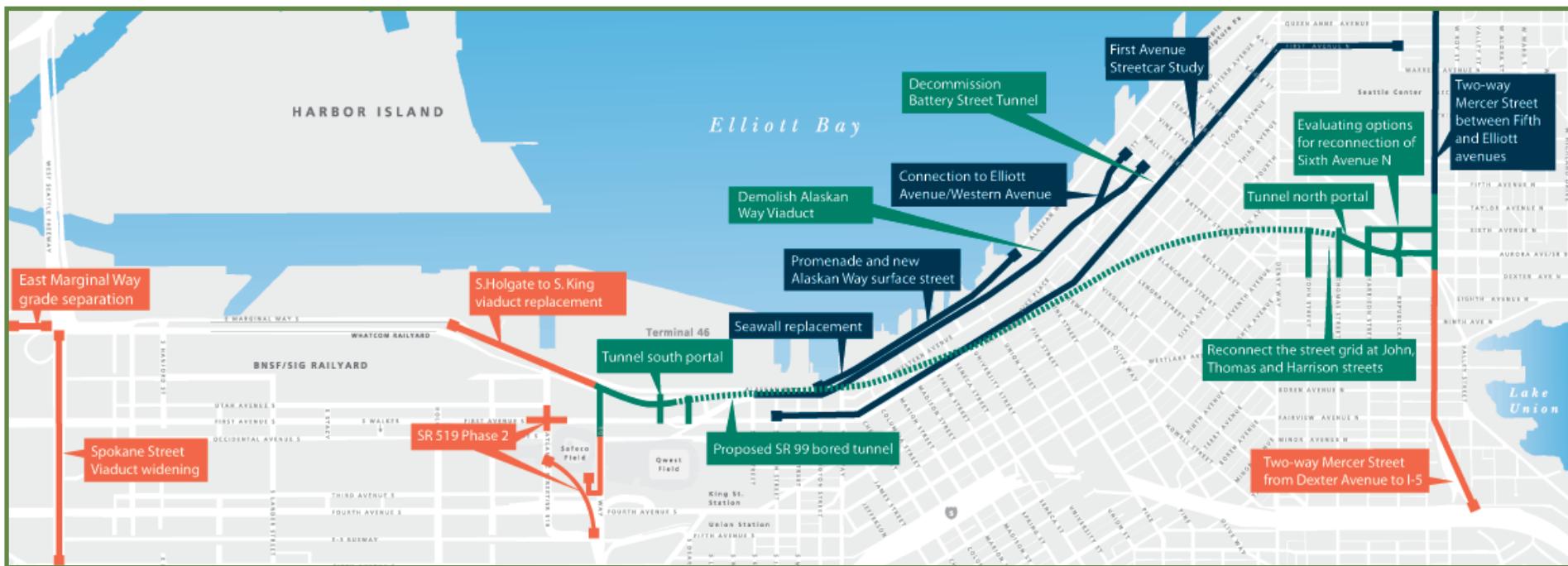
2009 - 2010 Milestones

- January 2009: Governor, County Executive Mayor and Port CEO recommended replacing viaduct with a bored tunnel.
- April 2009: Legislature passed a funding bill for the bored tunnel.
- June 2009: Holgate to King Stage 1 began.
- October 2009: Governor and Seattle Mayor signed a Memorandum of Agreement endorsing the bored tunnel.
- December 2009: Completed Electrical Line Relocation Project.
- January 2010: Updated program cost estimates and released tolling report.





Bored Tunnel Alternative



Necessary environmental analysis

- Detailed environmental review underway (SDEIS)
- Further environmental review needed
- To be completed before replacing the S. King Street to Battery Street Tunnel section of the viaduct



Updated Program Cost Estimate

- WSDOT will be managing to the \$3.1 billion program budget, as well as reporting on each project budget.
- Estimate is based on extensive cost and risk workshops, value engineering and design changes.

Project	2009 Cost Estimate (millions)*	2010 Cost Estimate (millions)*
S. Holgate Street to S. King Street viaduct replacement	\$537	\$483
Other Moving Forward projects and prior expenditures	\$363	\$345
SR 99 bored tunnel and systems	\$1,900	\$1,960
Alaskan Way surface street and viaduct removal	\$290	\$290
Central waterfront construction mitigation	\$30	\$30
Total Cost Estimate	\$3,120	\$3,108

* Estimates reflect year of expenditure dollars.

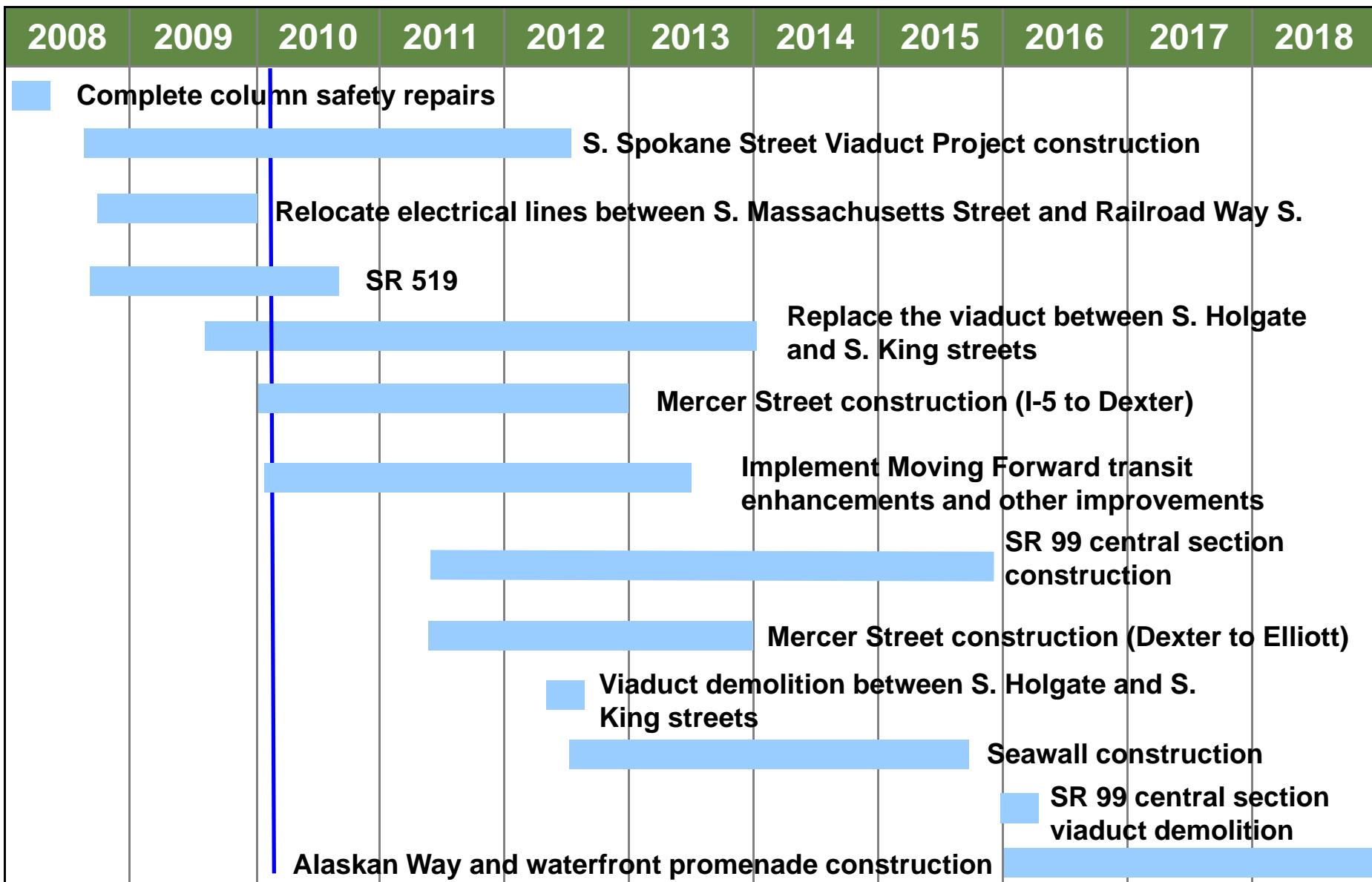


Cost Estimate Process

- Systematic process for updating project cost estimates and risks.
- WSDOT's Cost Estimate Validation Process (CEVP):
 - Extensive cost and risk workshops. Identified risks such as:
 - Settlement.
 - Building protection.
 - Right of way condemnation potential.
 - Number of contracts.
 - Managing interfaces between contracts
 - Value engineering:
 - North portal location
 - South portal location
 - Tunnel interior
 - Holgate to King simplification
- Checks and balances for program team:
 - Strategic Technical Advisory Team.
 - Independent Cost Estimate Review Team.



Timeline



Construction Coordination



Coordination Partners

- Public agencies working together.
- Identifying potential conflicts.
- Coordinating work to minimize impact to the public.
- Weekly meetings with agency partners and external stakeholders.



Seattle Department of Transportation



King County



**Washington State
Department of Transportation**



Long-Term Construction Coordination

- Construction coordination and planning for 6-8 years out.
- Include special events.
- Quarterly updates of project schedules.
- City/State have developed a GIS-based tool to help track and analyze data both geographically and across time.





Duwamish Area Construction Projects *

Note: Not all planned construction in this geographical area is shown on the map below.
This map shows data that is temporal in nature and is updated often to reflect current conditions.





Short-Term Construction Coordination

- Weekly coordination meetings:
WSDOT, SDOT, Seattle City Light
and others
- Working together daily to spot and
resolve conflicts
- Information feeds communication
tools

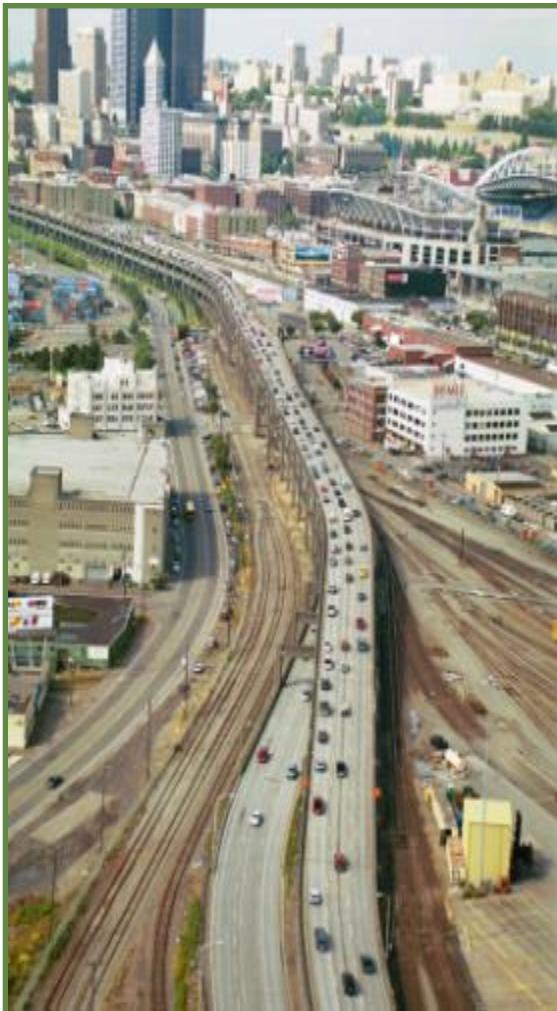


Replacing the South End of the Viaduct

S. Holgate Street to S. King Street Viaduct Replacement Project



S. Holgate to S. King Viaduct Replacement



Construction timeline

2009	2010	2011	2012	2013
Preliminary construction		Road and bridge construction		

- Replaces nearly half of the existing viaduct.
- Keeps SR 99 traffic moving during replacement of the waterfront section of the viaduct.
- Improves access to Port of Seattle's Terminal 46 and provides a grade-separated crossing.
- Maintains safe pedestrian and bicycle access.
- Provides new access in stadium area.



S. Holgate to S. King Viaduct Replacement Previous Proposal





S. Holgate to S. King Viaduct Replacement Current Proposal





SR 99 South End Detour



Existing structure demolished



New northbound SR 99 and on-ramp



New city street



Existing structure retained



New southbound SR 99 and off-ramp



Construction area to connect south and central viaduct replacements



Updated Proposed Holgate to King Cost Estimate

- Estimate is based on a higher level of engineering design, extensive cost and risk identification, value engineering and independent review of estimates.

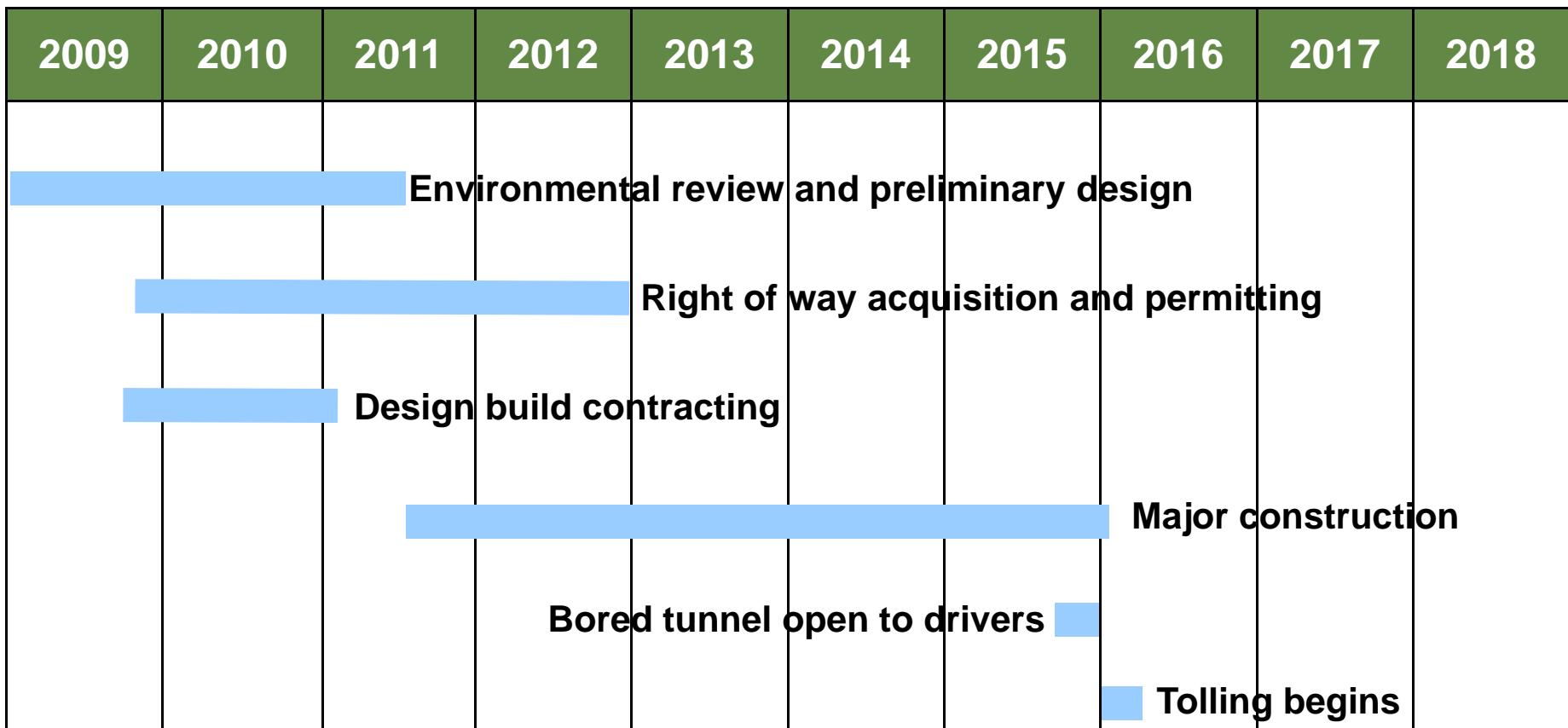
S. Holgate to S. King Viaduct Replacement Project	2009 Cost Estimate (millions)	2010 Updated Cost Estimate (millions)*
Construction	\$385	\$330
Right of way costs	\$75	\$63
Preliminary and final design	\$77	\$90
Total	\$537	\$483

* All costs are rounded in year of expenditure dollars.

Central Waterfront Update



Proposed Bored Tunnel Timeline



*Assumes Record of Decision (ROD) for the bored tunnel alternative is issued in 2011.



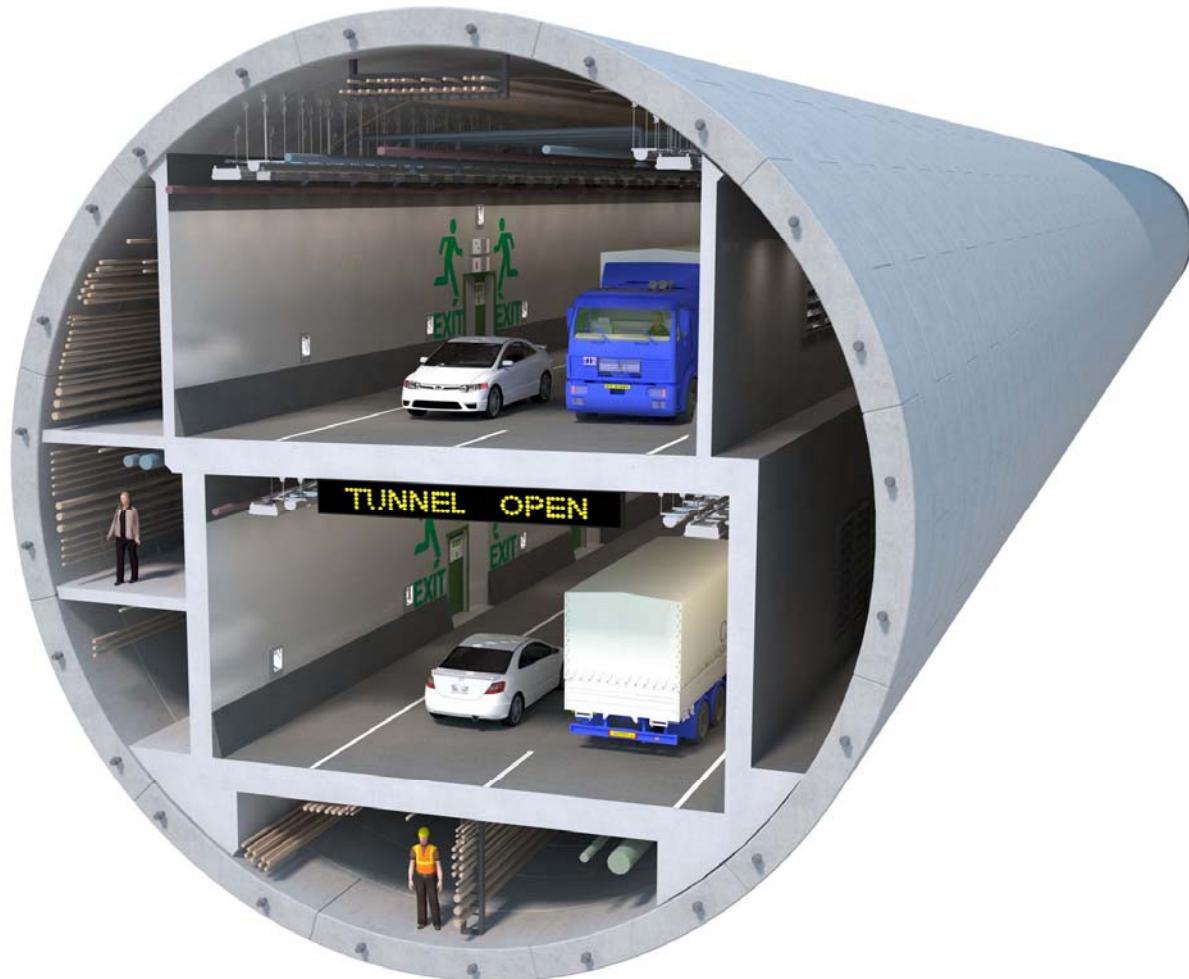
SR 99 Bored Tunnel Project

Contracting Schedule

Issue Request for Qualifications	September 15, 2009
Statement of Qualifications due	November 23, 2009
Notify short-listed submitters	December 23, 2009
Issue draft Request for Proposals	February 2010
Issue final Request for Proposals	May 2010
Proposals Due	Fall 2010
Announce apparent best value	January 2011

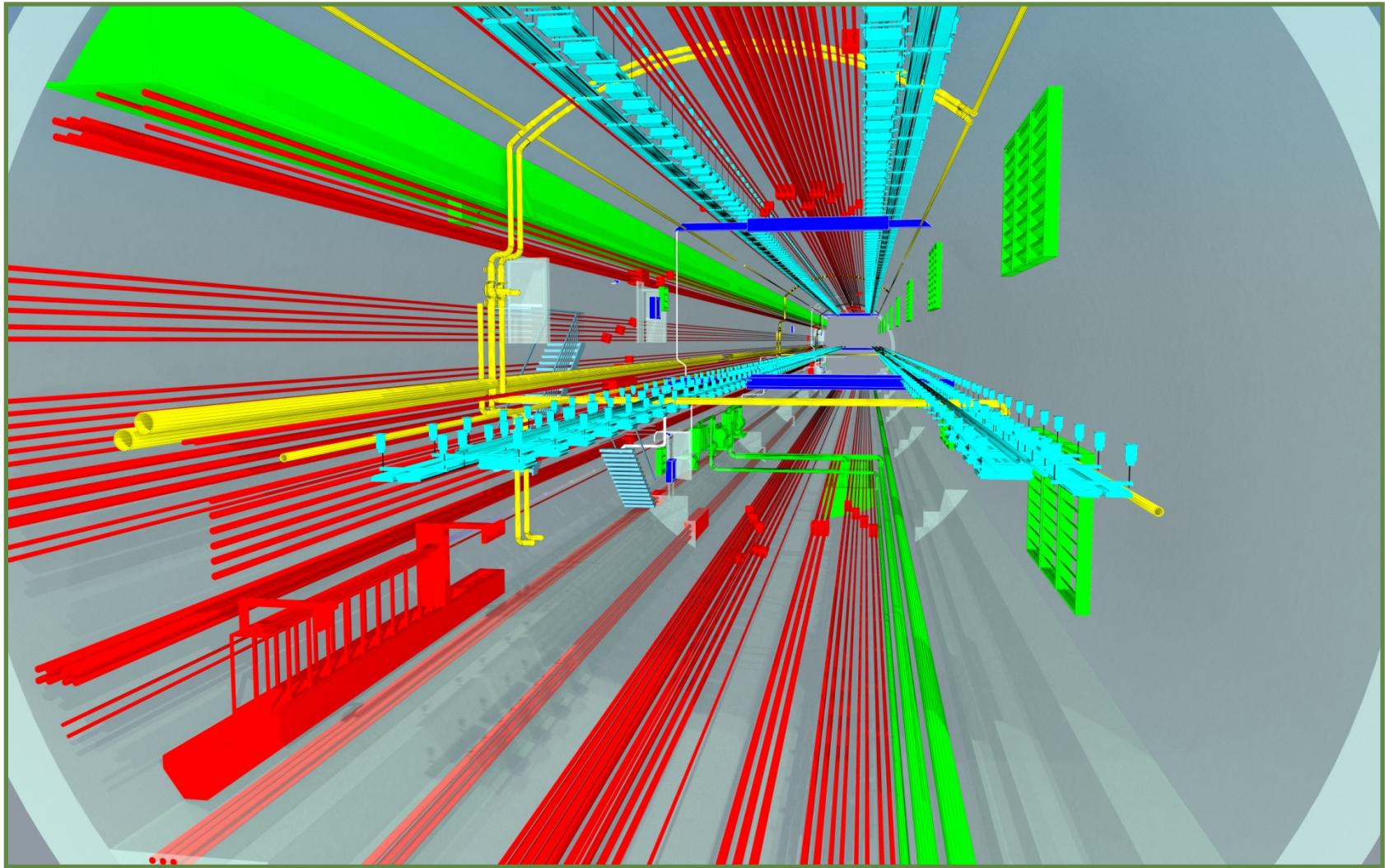


Tunnel Cross Section



Early design concept.

Tunnel Systems





Tunneling in Seattle Soils

More than 150 tunnels have been constructed in Seattle since 1890, mostly in glacial soils. Examples of local projects include:

- Sound Transit Beacon Hill
- Denny Way CSO
- King County Brightwater



Successful Delivery of Bored Tunnel Projects

Examples of Tunnel Excavation in Urban Areas

1. 4th Elbe River, Hamburg: Successfully excavated 1.6 miles at 46.6-ft-diameter.
2. 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.
3. 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).
4. 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.

Pending Record Holder

Moscow Road/Rail Tunnel: A 62-ft-diameter Mixshield has been ordered. This diameter is 11-ft larger than Shanghai TBM, the current record holder.

Elbe Tunnel Slurry Machine



Madrid Calle M30

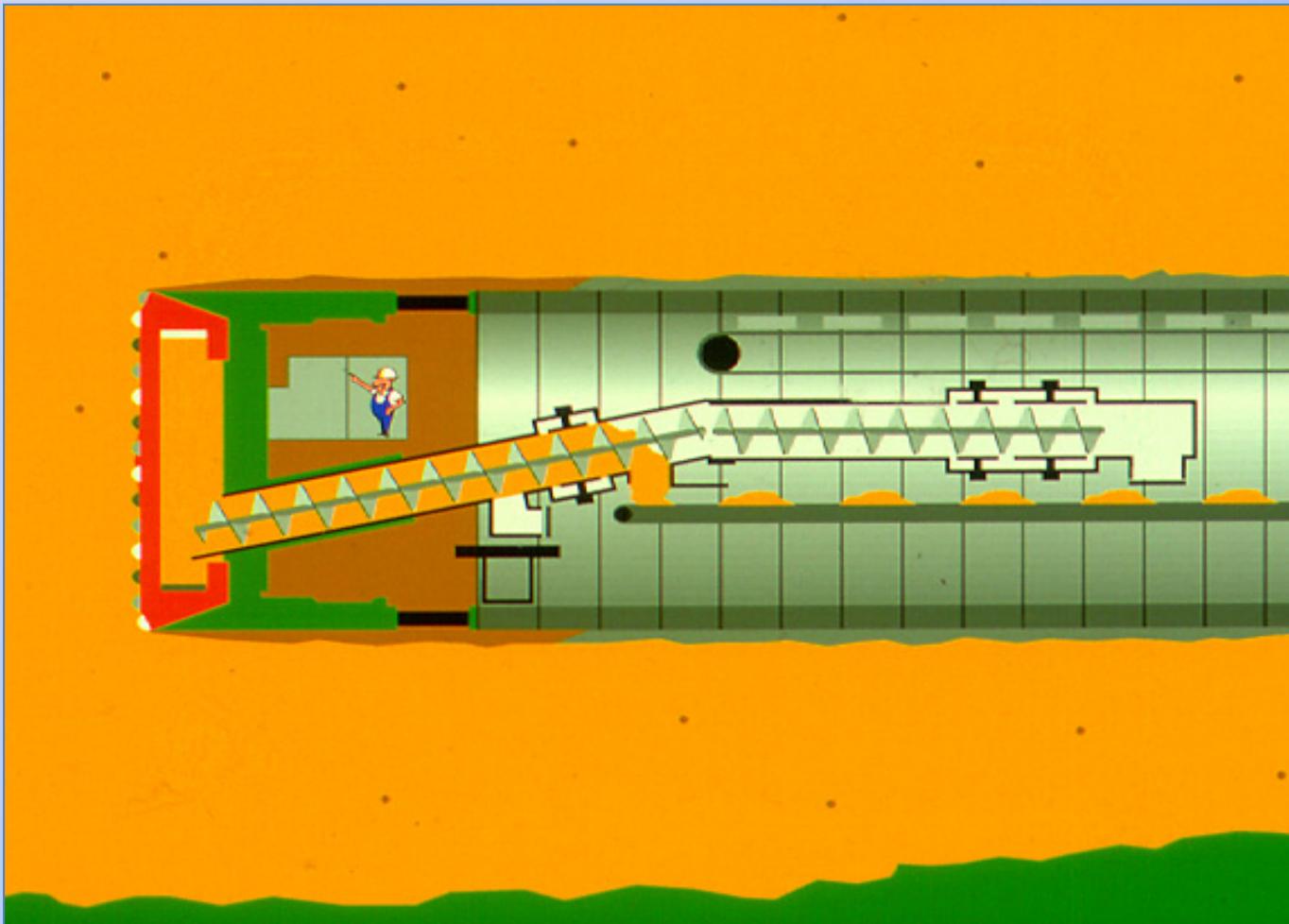


Seven tunnel boring machines will be used in the Madrid Calle 30 project

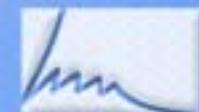
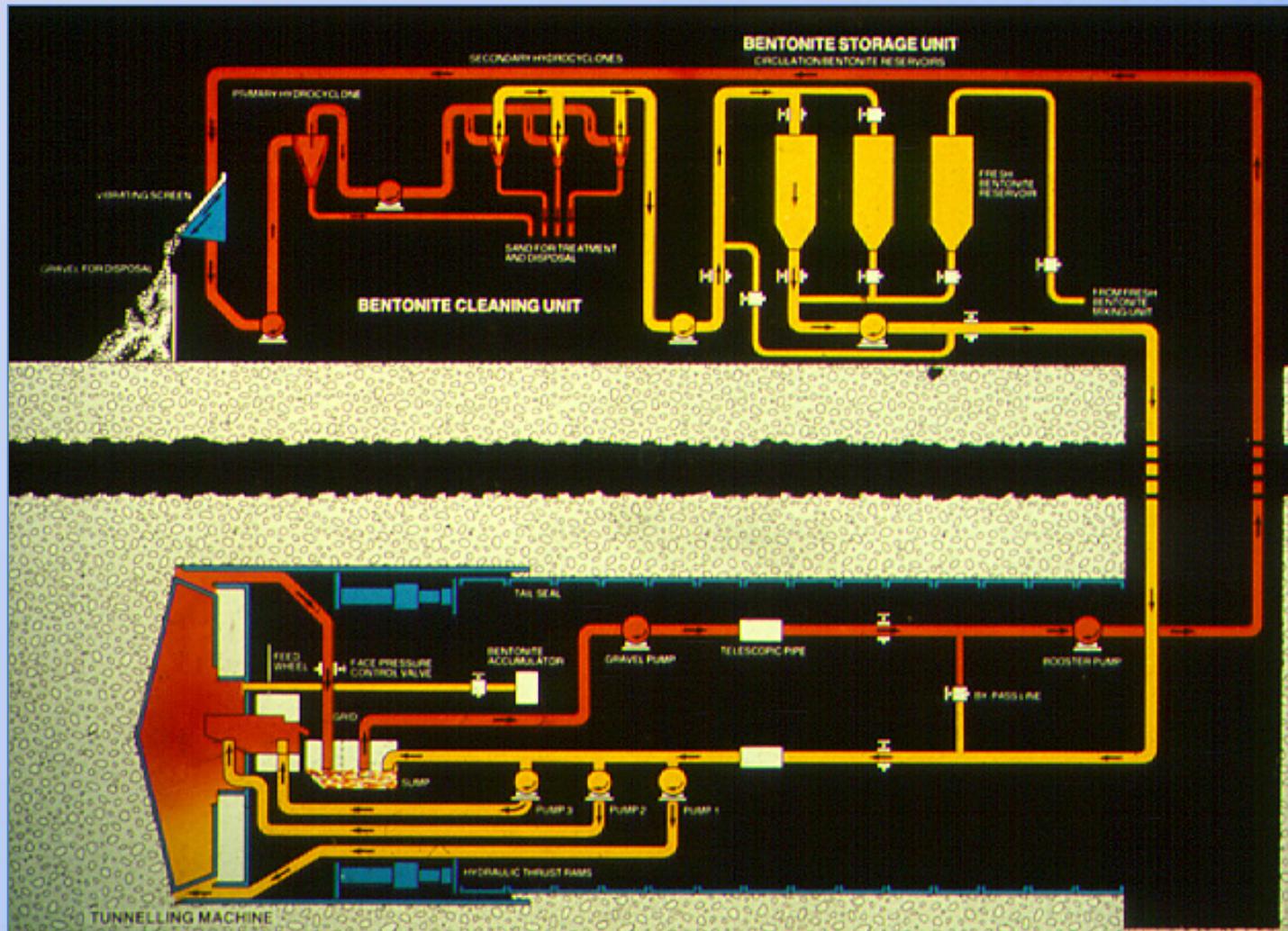
CLOSED FACE TBMs

- For use in poor ground conditions, sands, silts, soft clays below the water table
- Replaced the use of compressed air
- Controls the ground and protect the work force while installing the tunnel support.
- Two main types:
 - Slurry
 - Earth Pressure Balance

Diagram of EPBM



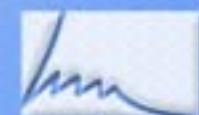
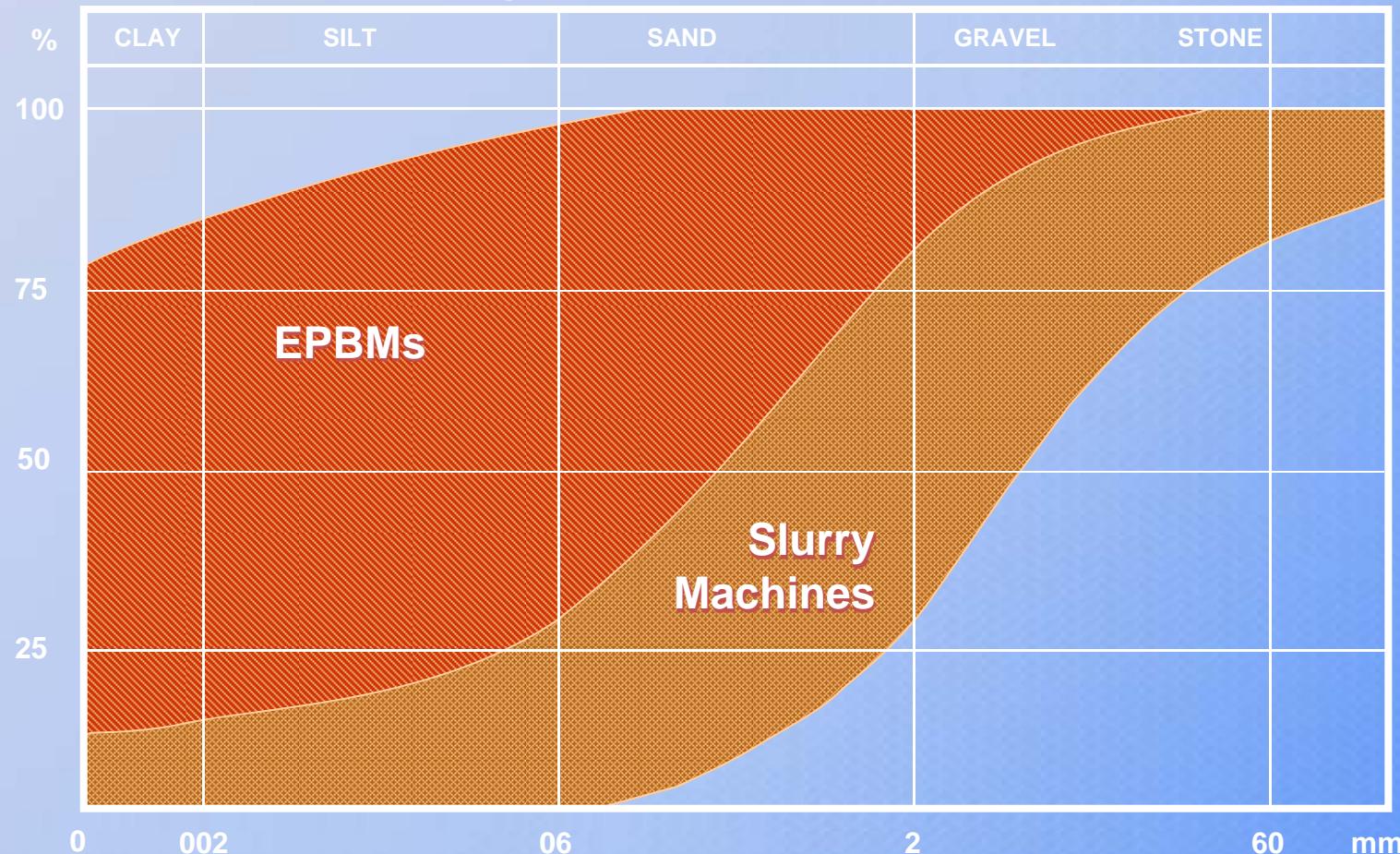
Slurry Machine Circuit



Hatch Mott
MacDonald

Soil Grading Curves

Range of Ground Conditions



Hatch Mott
MacDonald



EPBM with Backup at Herrenknecht Factory

