

Cost Risk Assessment
&
Value Engineering



Purpose

- Forward look at potential project risks
- Focus team on highest leverage items
- On-going active risk management
- Challenge ourselves to accelerate schedule and maximize value



Cost Risk Assessment

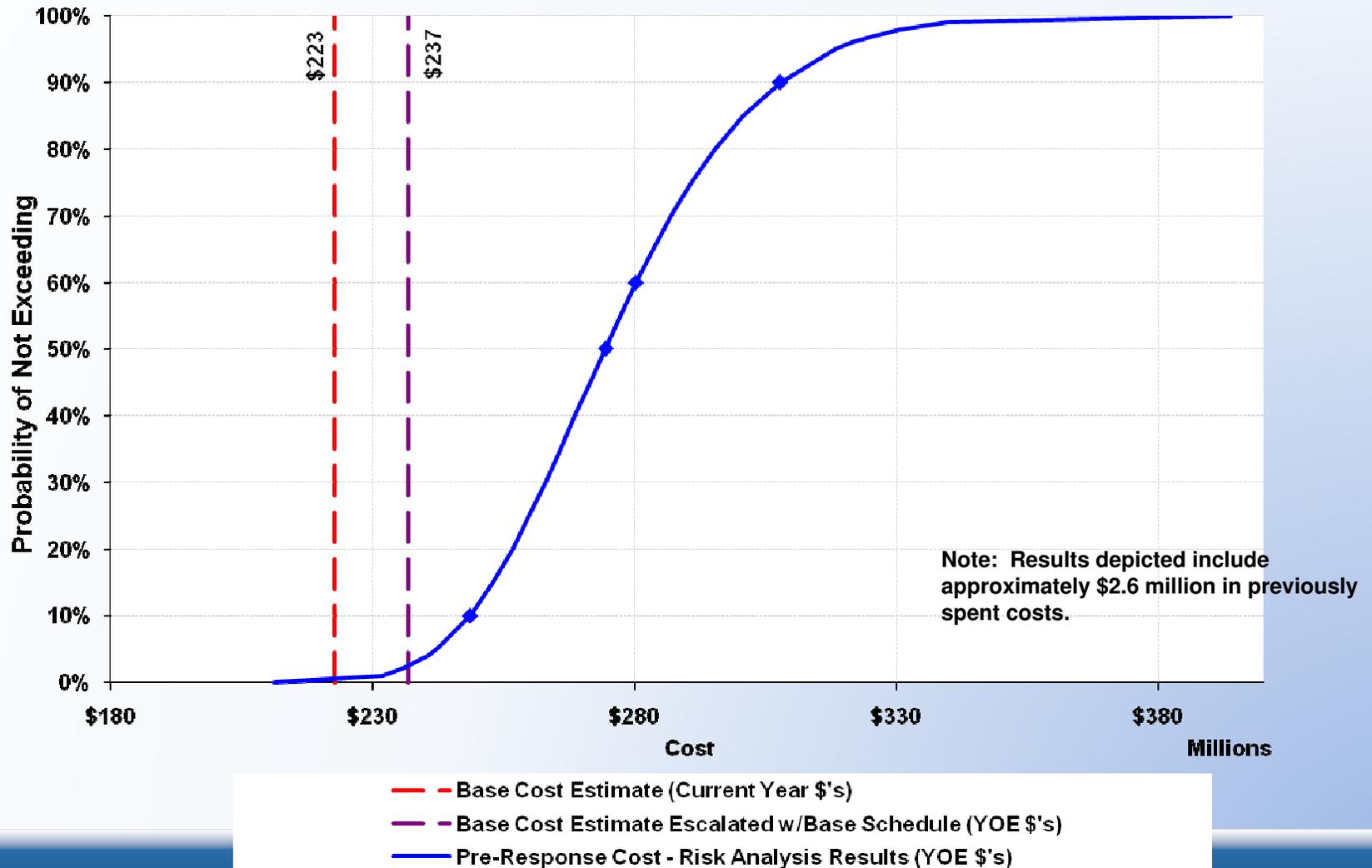
Cost Risk Assessment

- Workshop occurred March 8-10, 2011
- Attended by key staff from County, owner representative, and design firm
- Considered cost and schedule risks among technical, political, funding, and public involvement
- Established risk impact range and probabilities
- Conducted monte-carlo simulation (10,000 runs) to assess probabilities of delivering project within cost and schedule
- Established risk responses and mitigation

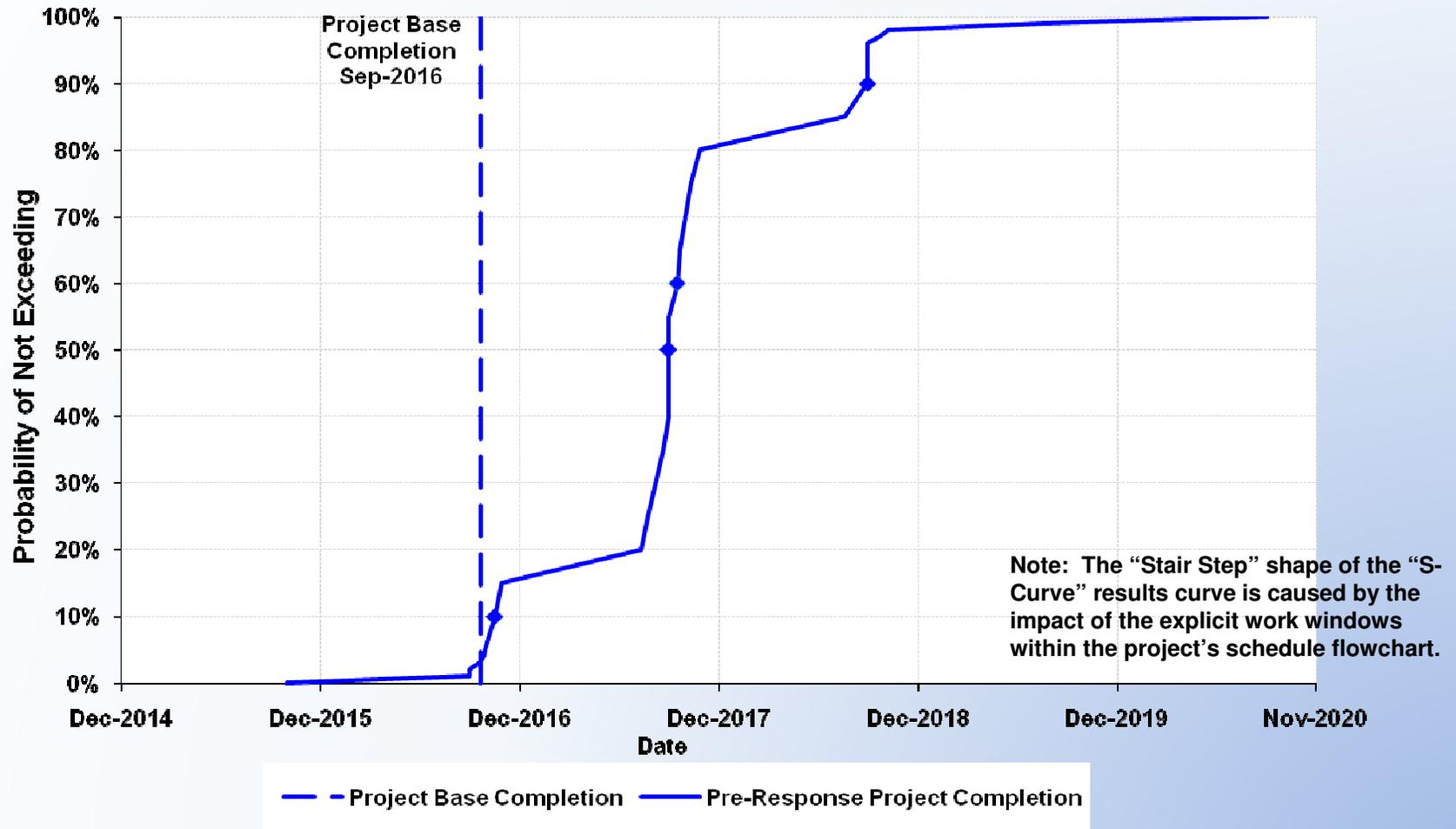
Risk Register Summary

Risk Category	Total Number of Identified Risks	Total Number of Active Risks
Construction	25	16
Contracting & Procurement	2	2
Design	12	8
Environmental	9	6
Management	1	1
Partnerships & Stakeholders	3	0
Right-of-Way	7	4
Shoo-Fly	10	7
Structures & Geotech	9	9
Utilities	5	5
Total	83	58

Probabilistic Cost Curves – Total Project Cost- 30% Design



Probabilistic Schedule Curves – Project Completion Date- 30% Design



Top Risks Impacting Project Costs

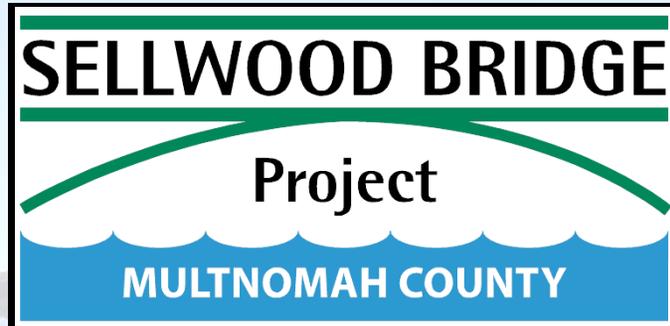
- **Opportunity of a shoo-fly alignment**
- **Extraordinary steel price escalation**
- **Shortage of DMWESB (all construction activities)**
- **Landslide triggered during excavation in interchange area**
- **Add scope to the project for North-South streetcar project**

Top Risks Impacting the Project Schedule

- **Opportunity of a shoo-fly alignment**
- **Delays in ROW acquisition due to availability of appraisers due to appraisal work demand**
- **Aggressive project development schedule**
- **Portland Water Bureau water line design**
- **PGE relocation of aerial lines**

Snapshot of Responses

- Conducting weekly right-of-way meetings
- Weekly project management meetings w/:
 - Right-of-way team
 - Environmental permit team
 - Design team
- Conducting contract streamlining meeting with FHWA and ODOT
- Seeking a phased permit approval process
- Implementing certain value engineering ideas



Value Engineering

Objectives of the VE Study

The objective of the VE team is to verify or improve on the various concepts for the Sellwood Bridge project by:

- Conducting a thorough review and analysis of the key project issues using a multidiscipline, cross-functional team.
- Reviewing and improving the proposed design by focusing on high cost items, specific areas and high risk items.
- Applying the principles and practices of the VE job plan.
- Engaging an independent team that has not developed the design to date

Value Engineering (VE) Workshop

- Workshop occurred April 12-14, 2011
- Attended by key staff from County, FHWA, ODOT, owner representative, and CM/GC
- Design firm provided orientation only
 - Design progression to date
 - Limiting constraints and decisions
- Satisfies FHWA requirement for workshop

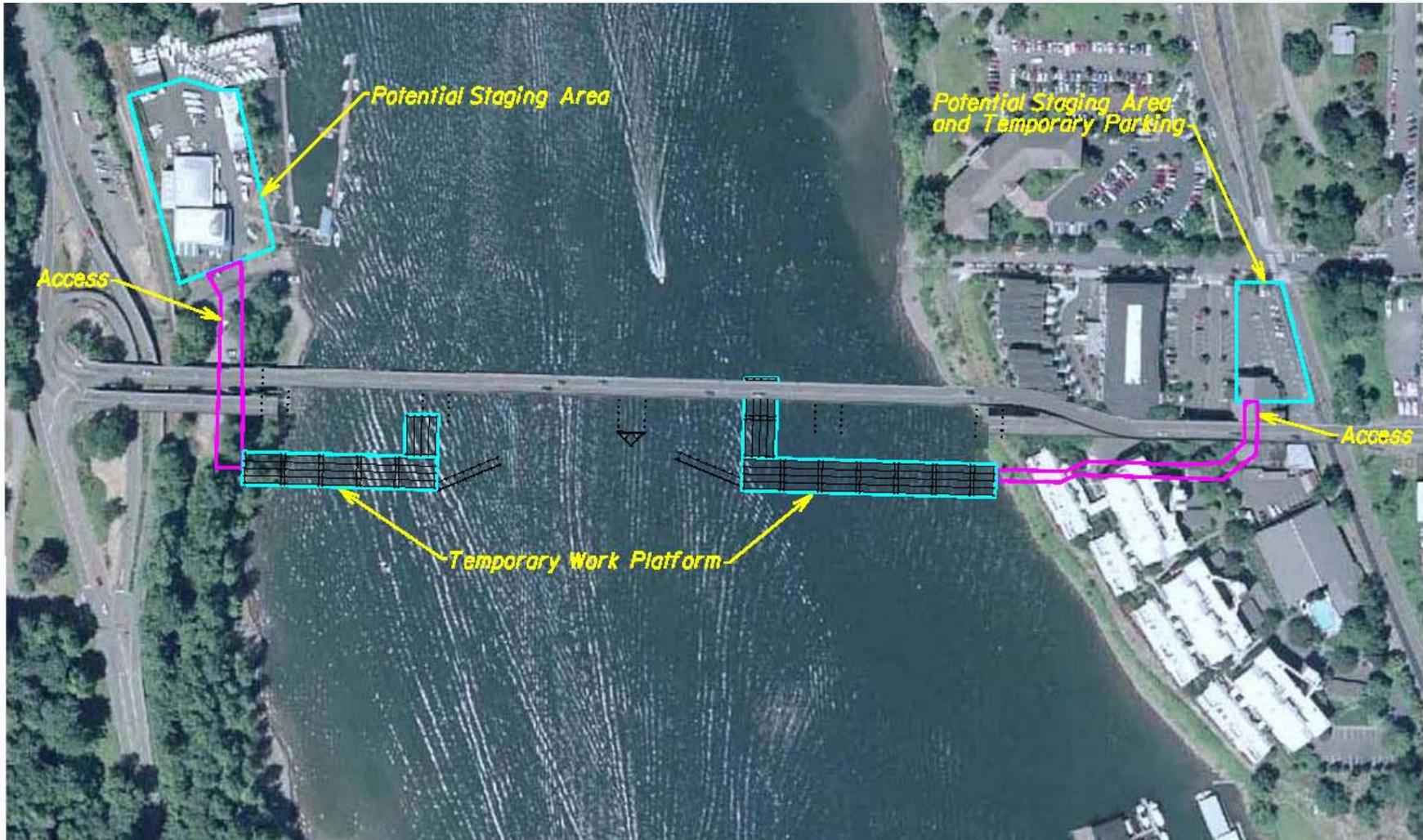
Constraints/Controlling Decisions

- Interchange must be reconstructed as part of the project
- \$30M of funding dedicated to only the interchange
- Need to maintain local access (cemetery/funeral home, condos, etc.)
- Face of the rock cut will be covered with netting
- Need to provide street car envelope (26 feet) and room for station at Staff Jennings

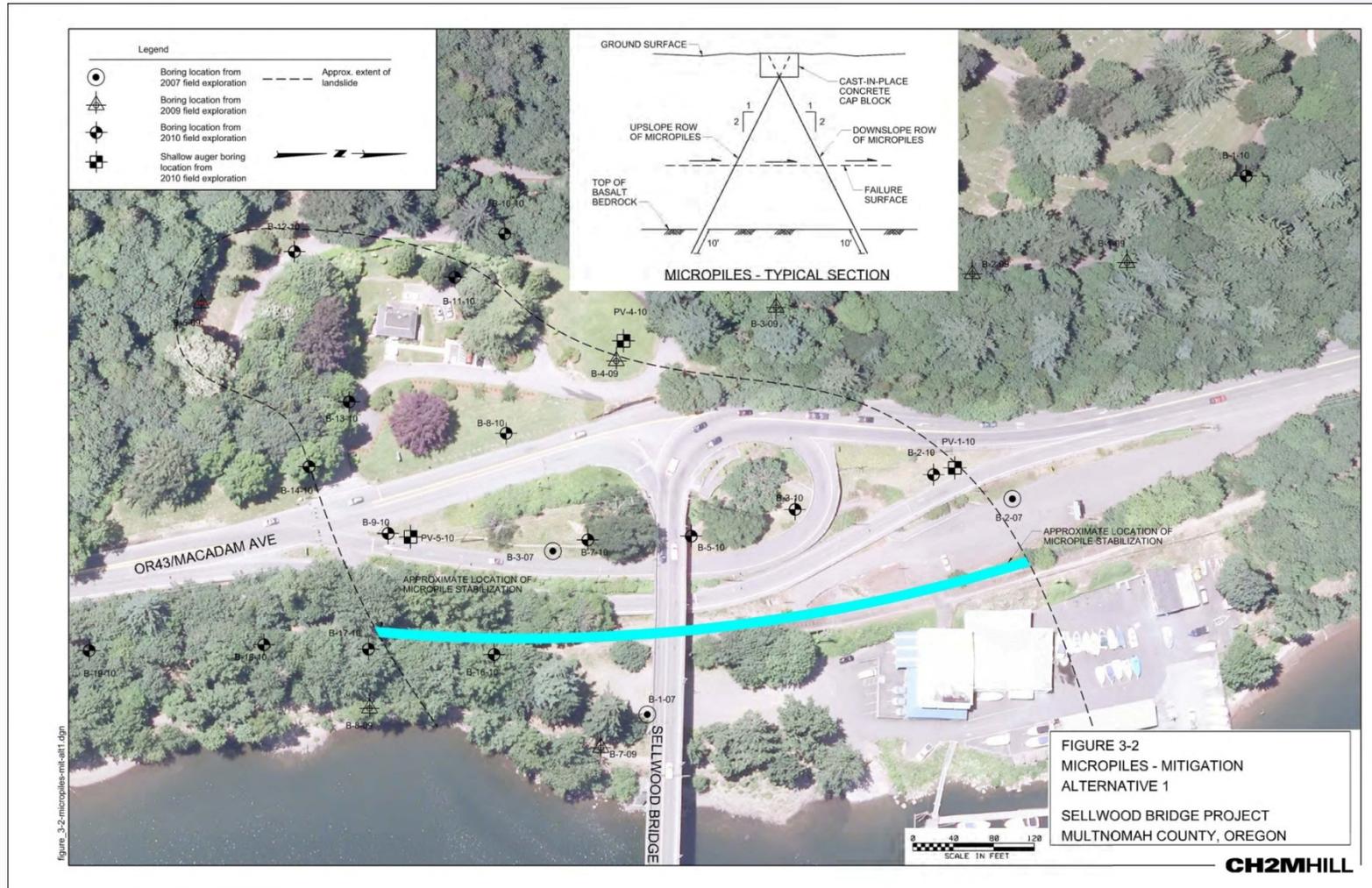
Constraints/Controlling Decisions

- Bridge type and final alignment are fixed.
- Bridge configuration and width is fixed.
- Bridge and interchange to remain open to traffic during construction.
- Bridge must be ready for street car use
- In-water work window 7/1-10/31
- 65-foot height restriction
- Cumulative total of 30 days of bridge closure

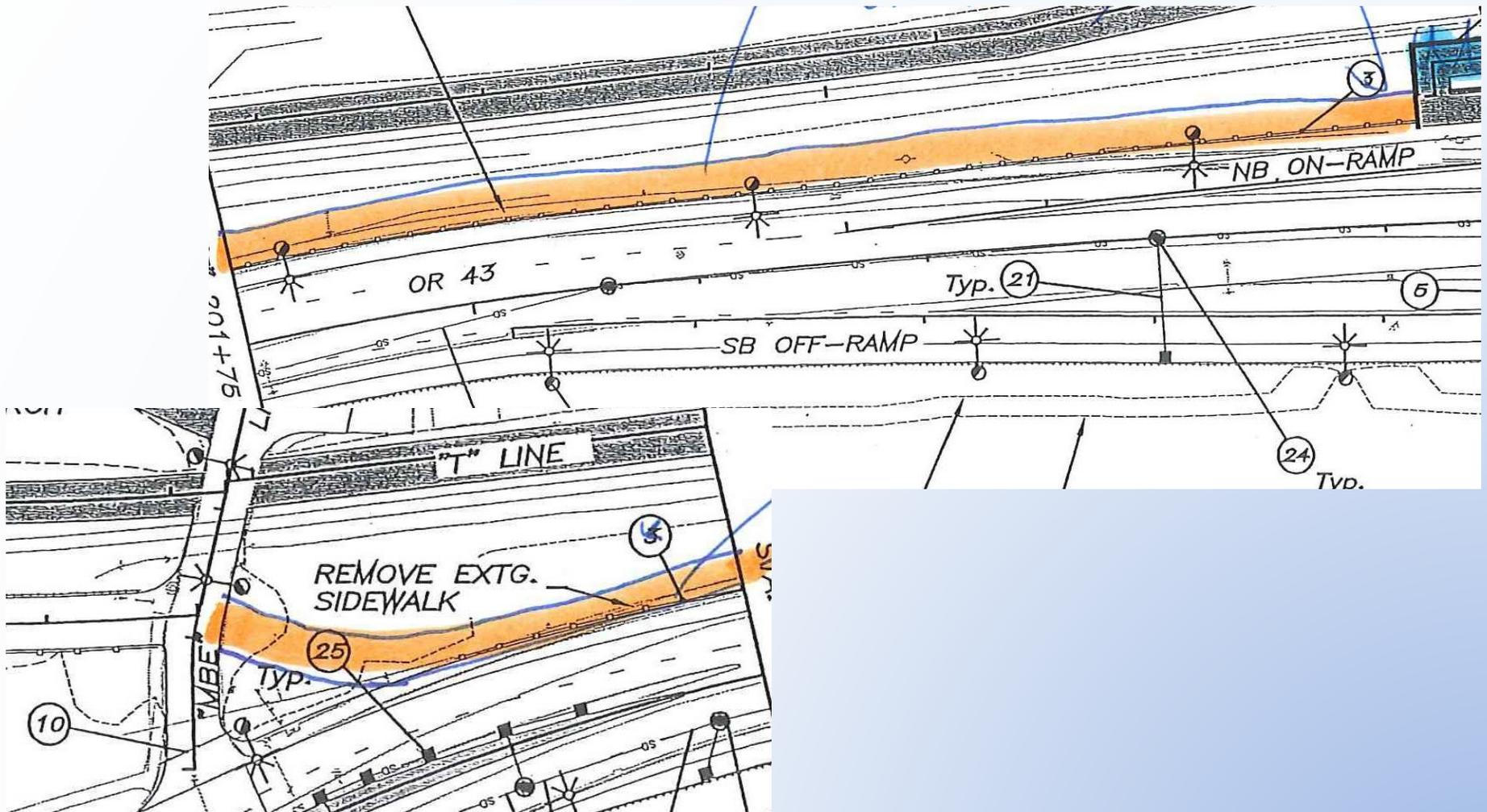
Recommendation # 1 – Shoo-fly



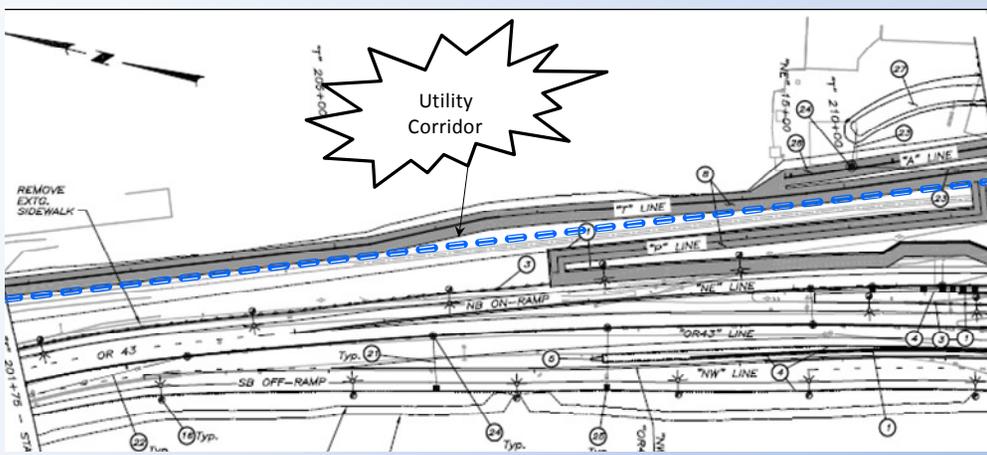
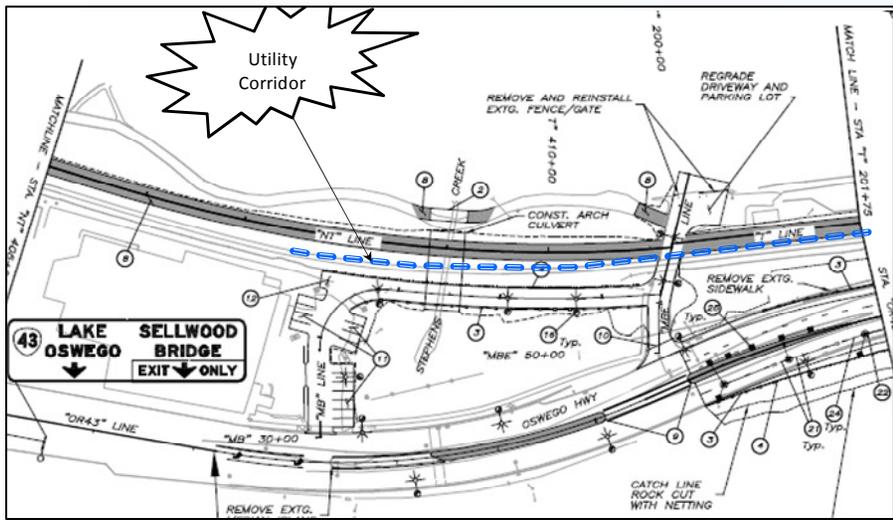
Recommendation # 2 – Landslide



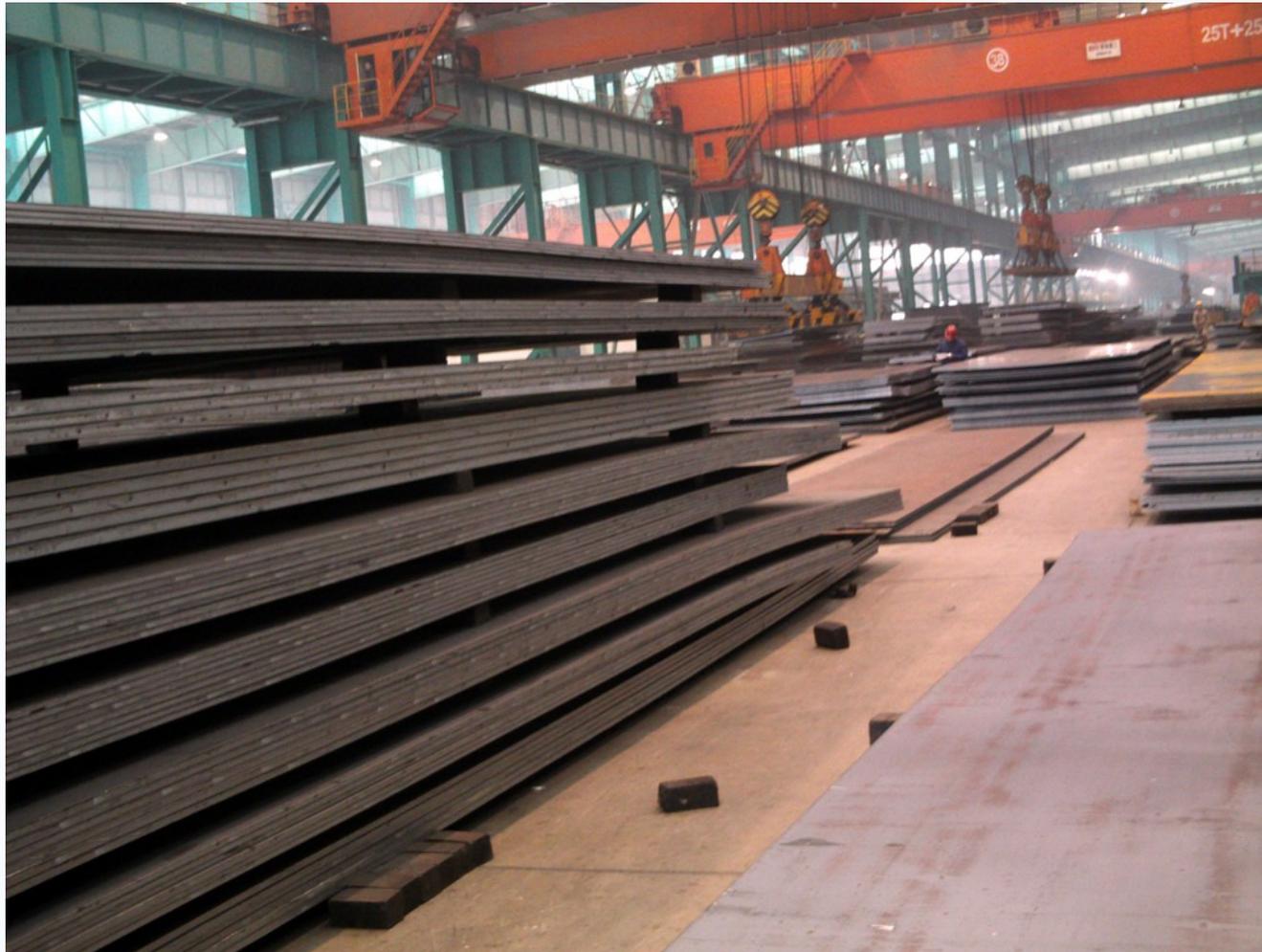
Recommendation # 3 – Path Location



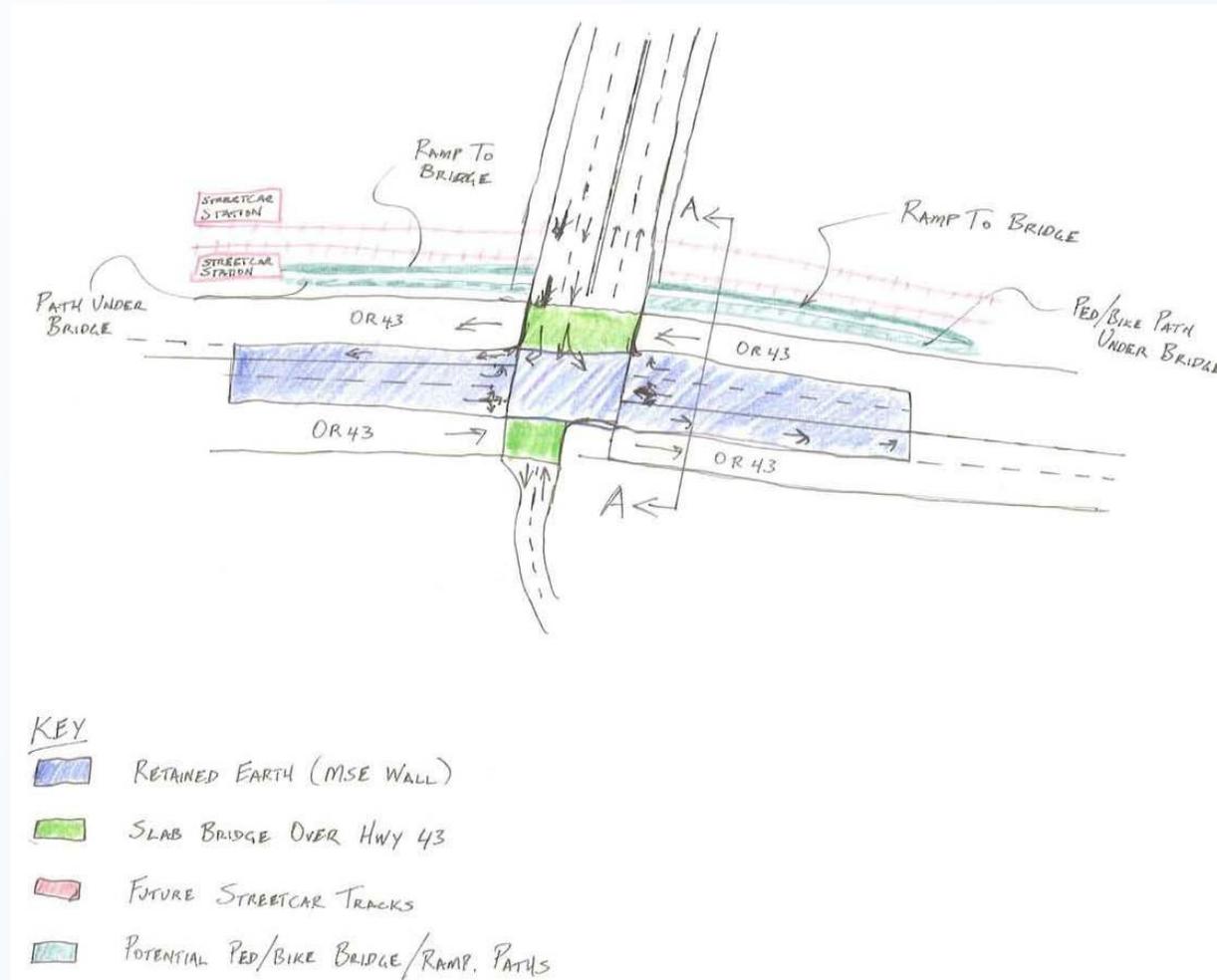
Recommendation # 4 – Utility Corridor



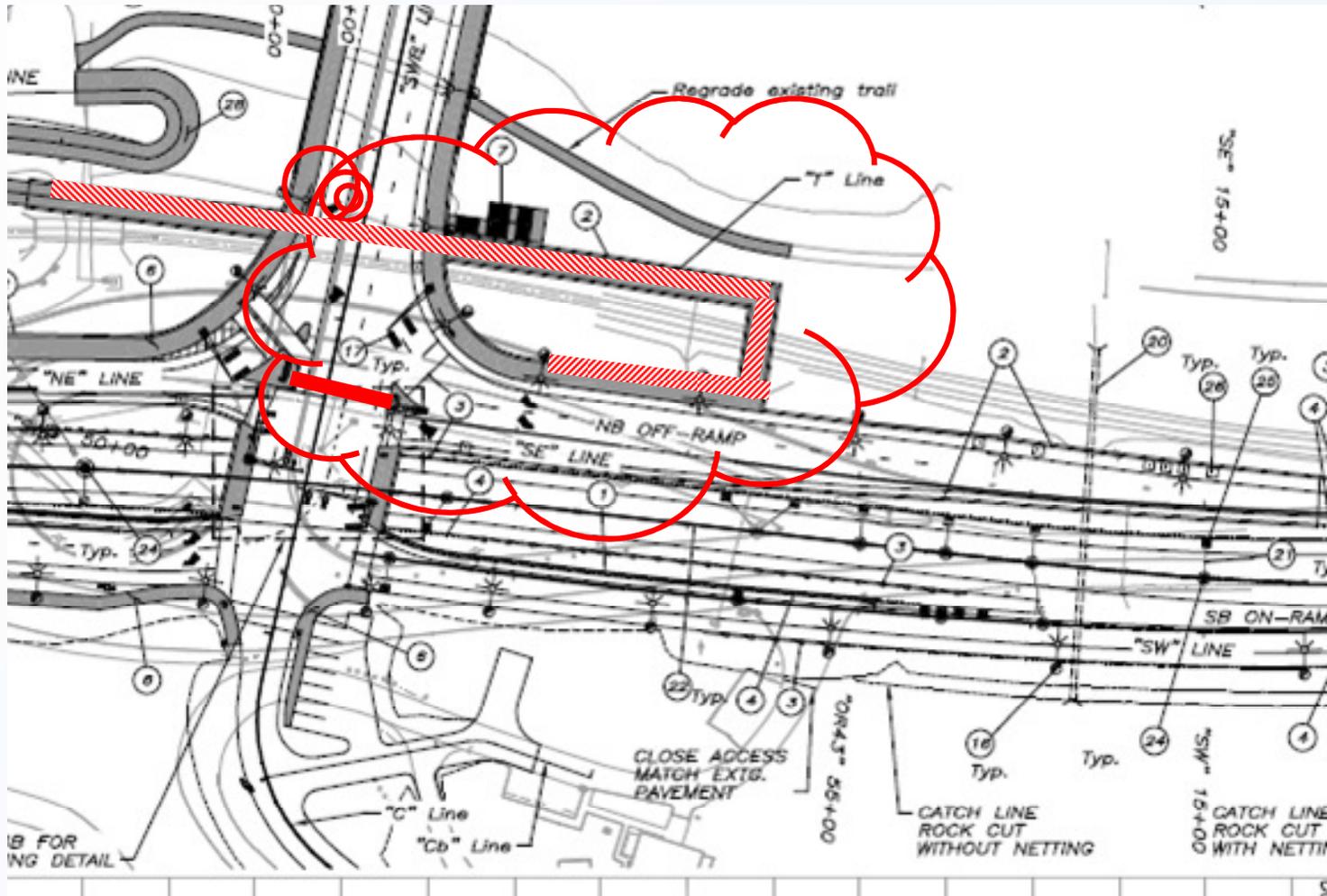
Recommendation # 5 – Steel Fabricator



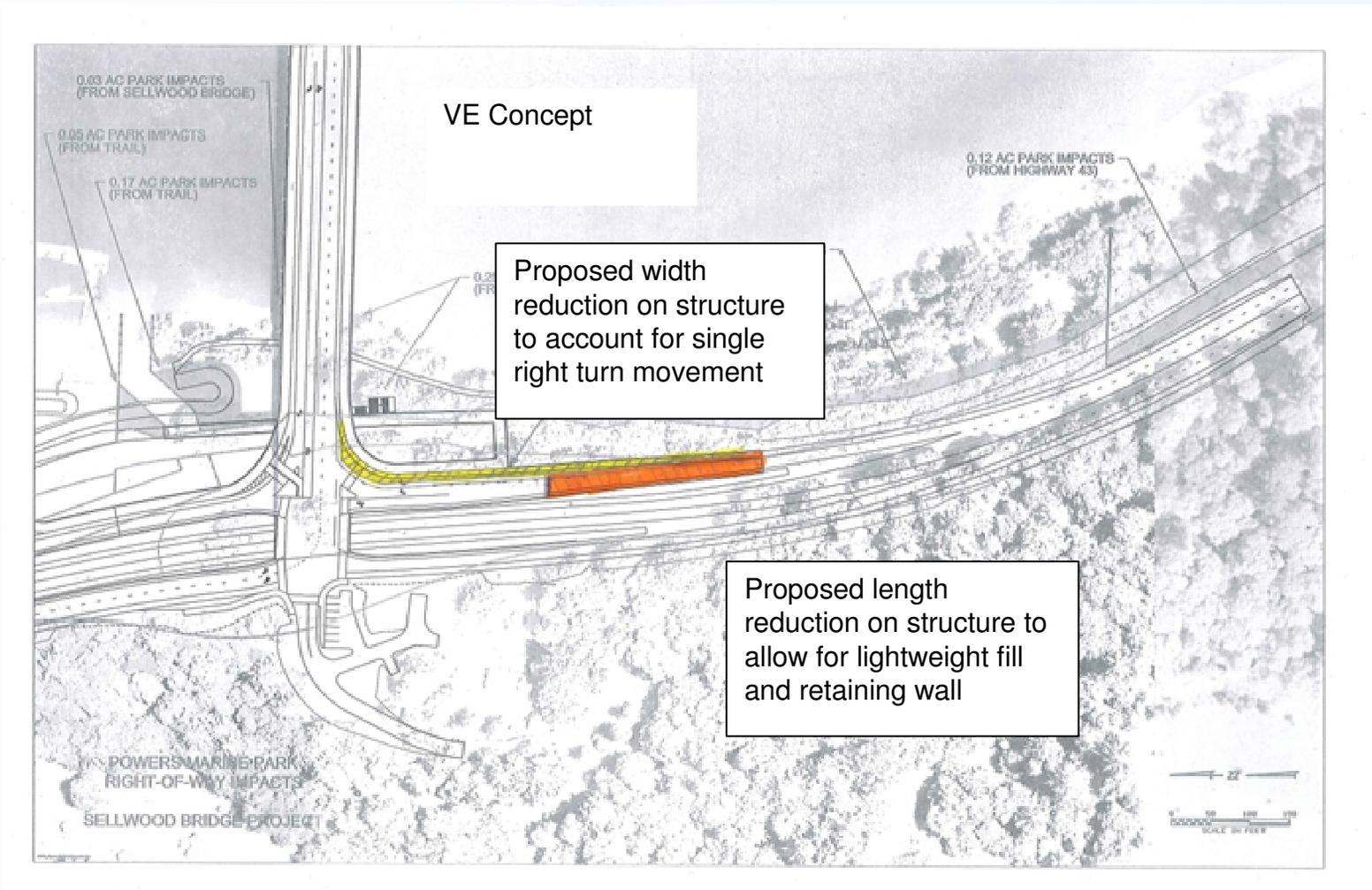
Recommendation # 6– Flip Interchange



Recommendation # 7 – South Path

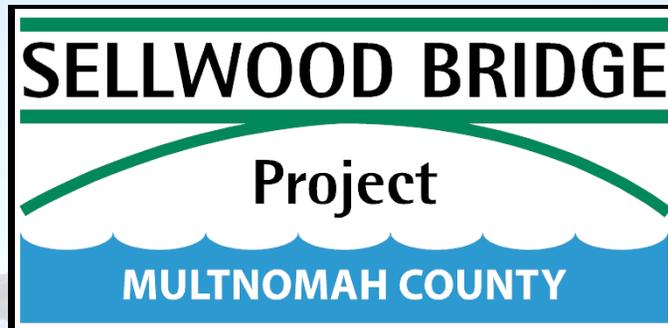


Recommendation # 8 – Right Turn Lane ❌



Recommendation Summary

Summary of Recommendations		
No.	Description	Advance (Yes/No)
1	Shoo-fly	Yes
2	Landslide stabilization	Yes
3	Pedestrian path location	No
4	Utility Corridor	Yes
5	Steel Fabrication	Yes
6	Flip interchange	No
7	South path	No
8	Northbound Hwy 43- single right-turn lane	No



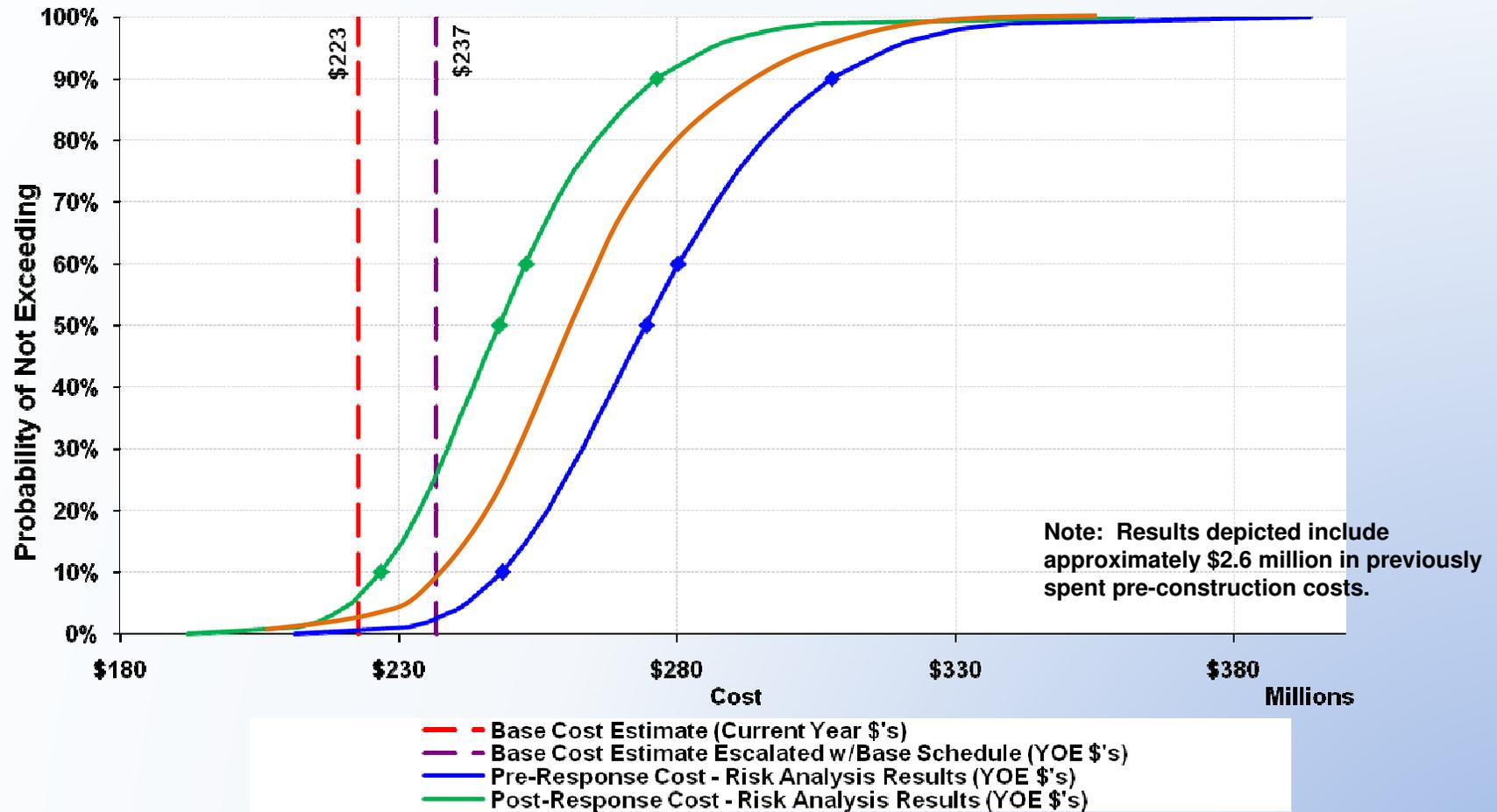
Post-VE Cost Risk Update

May 3, 2011

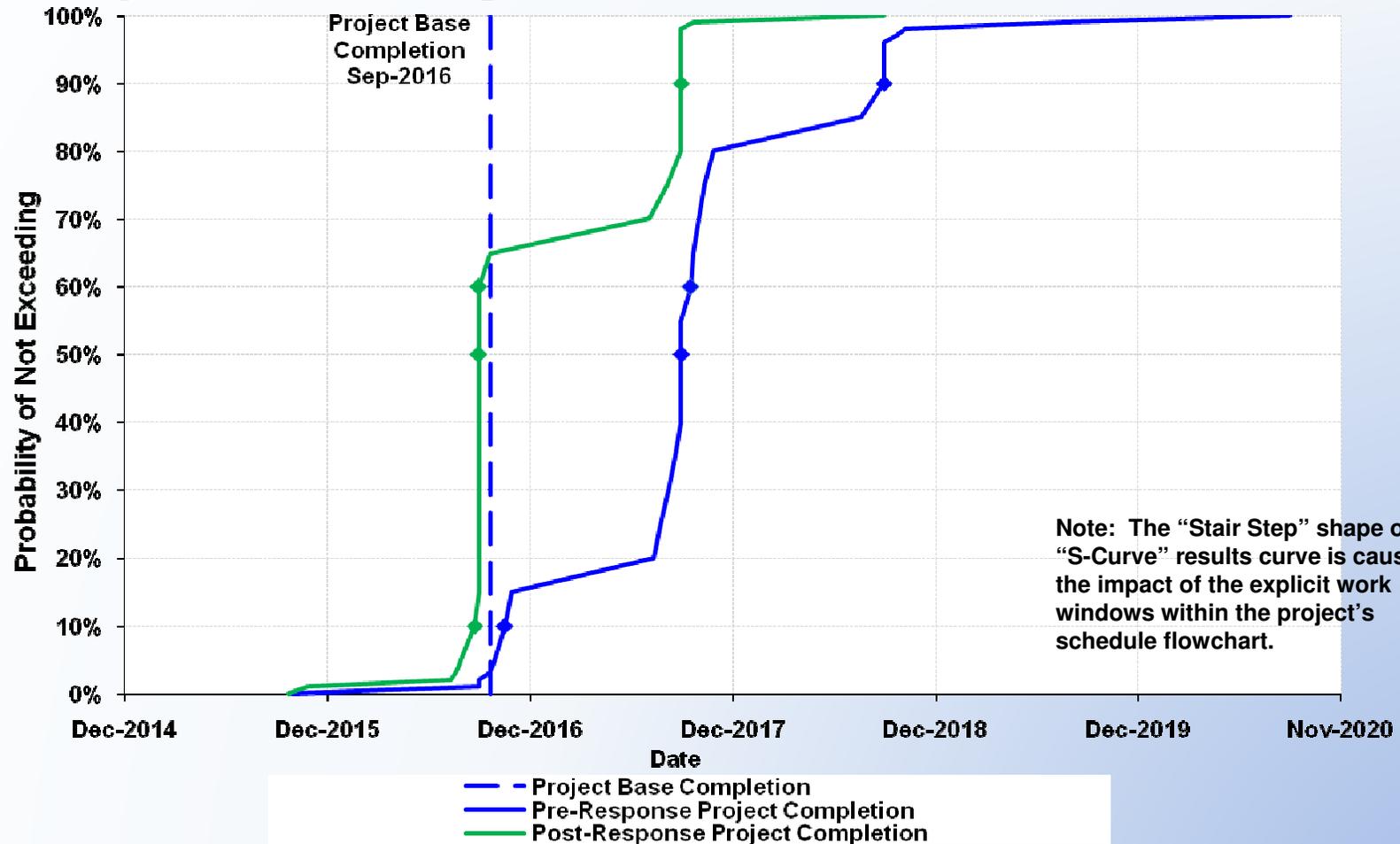
Cost Risk Update

- Assess potential impact of implementing VE recommendations
- New monte-carlo simulation
- Compare before/after results
- Reflect on-going risk managment activities and effects

Probabilistic Cost Curves – Project Total Cost- 30% Design



Probabilistic Schedule Curves – Project Completion Date- 30% Design



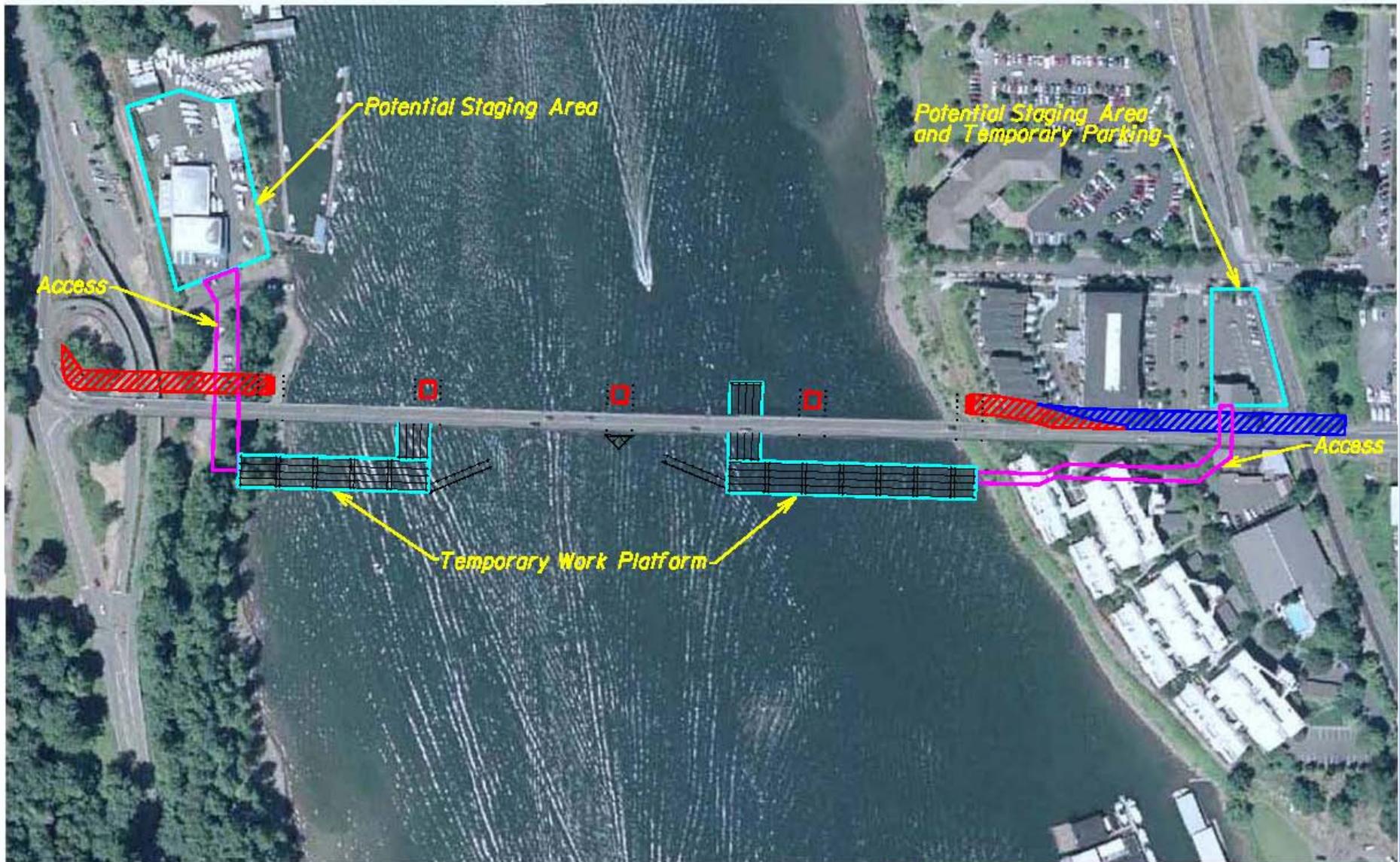
Cost Risk Assessment and VE Going Forward

- Update cost risk at 60% and 90% design milestones
- Compare costs with independent cost estimates and CM/GC cost estimates
- Inform guaranteed maximum price negotiations
- Additional VE sessions limited to specific topics with high potential to save time and money

Major Takeaways

- High probability of meeting \$290m budget
- Further opportunities for cost savings
- Crucial that schedule not slip during pre-construction
- Major schedule risks include:
 - Contracting delays
 - Right-of-way acquisition
 - Environmental permitting

Detour Construction: East Approach Options

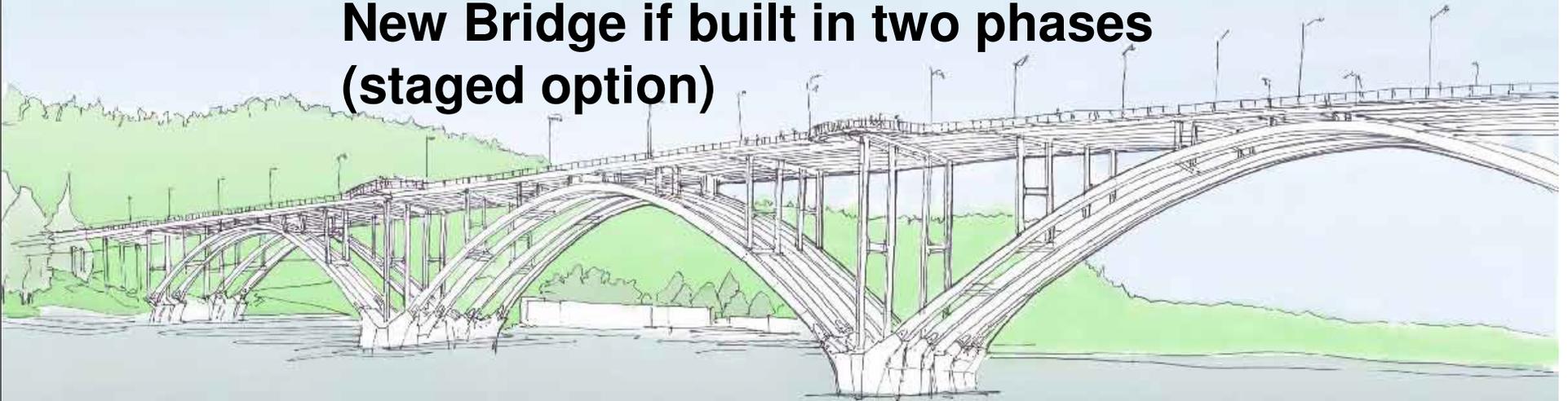


-  Detour Alignment Options 1 and 2
-  Detour Alignment Option 2 Only

**New Bridge if built in one phase
(detour options)**



**New Bridge if built in two phases
(staged option)**



RiverPark residential issues

Temporary issues for Staged Construction or Detour Bridge Options:

- **Air Quality**
- **Emergency Access**
- **Garbage Service**
- **Noise**
- **Parking**
- **Right of Way**
- **Security**
- **Sunlight**
- **Vibration**

Questions ?