

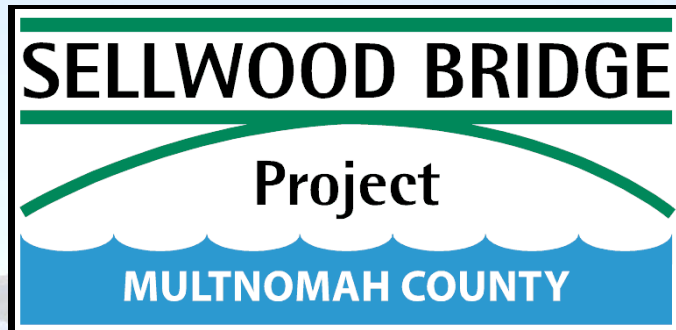


***Cost Risk Assessment  
&  
Value Engineering***



# ***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

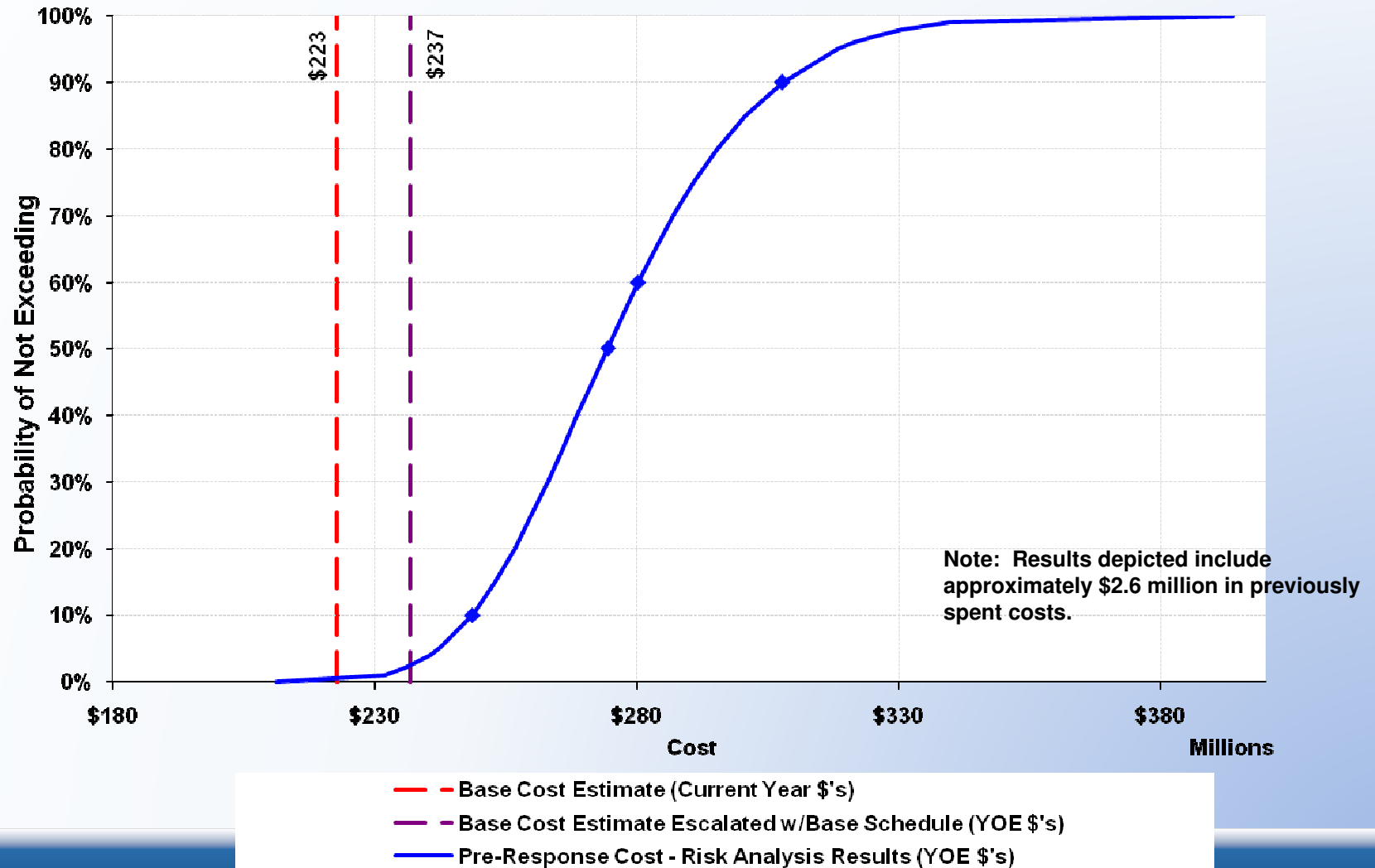
# ***Cost Risk Assessment***

- 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

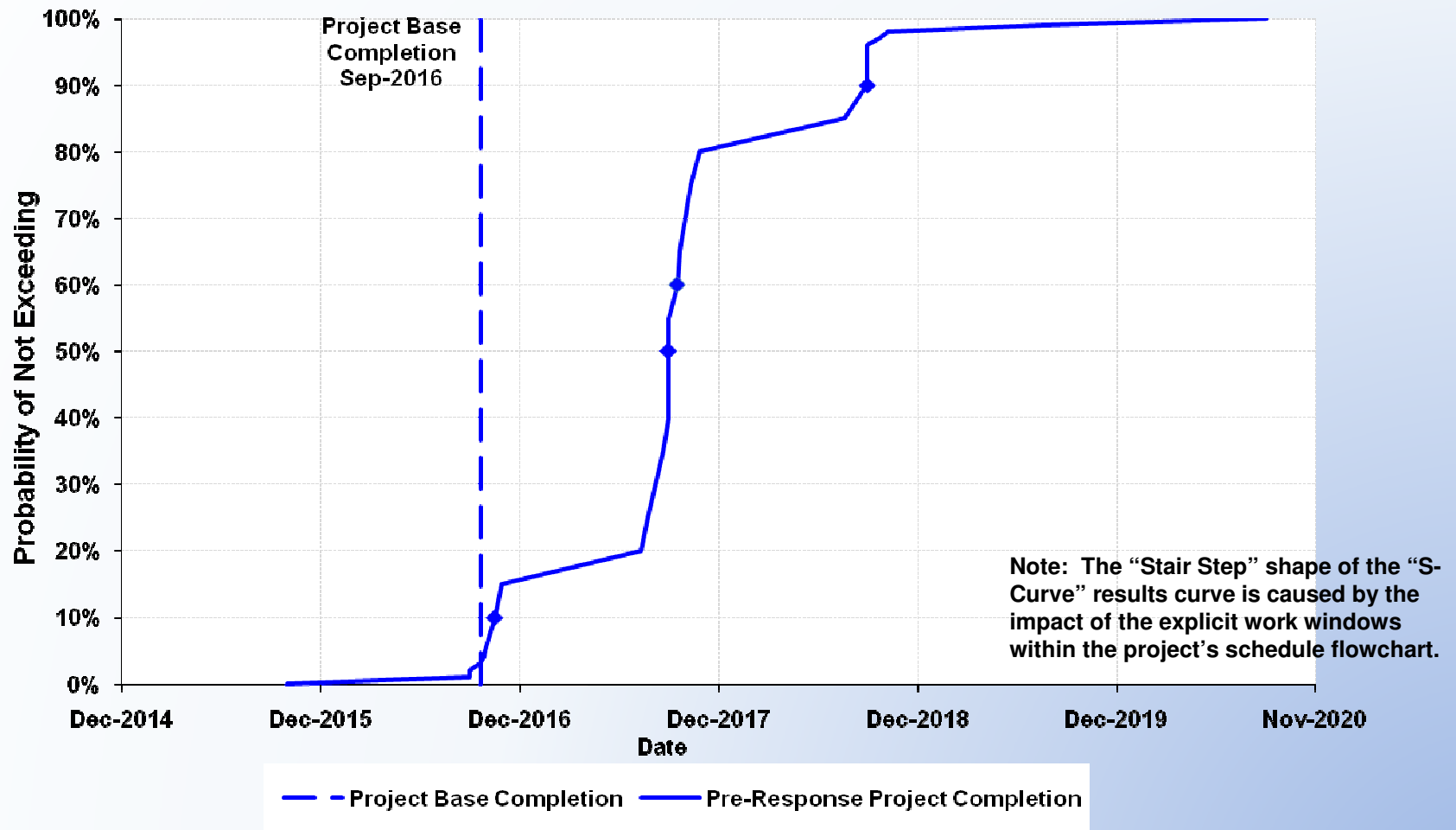
# ***Risk Register Summary***

<b>Risk Category</b>	<b>Total Number of Identified Risks</b>	<b>Total Number of Active Risks</b>
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
<b>Total</b>	<b>83</b>	<b>58</b>

# ***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

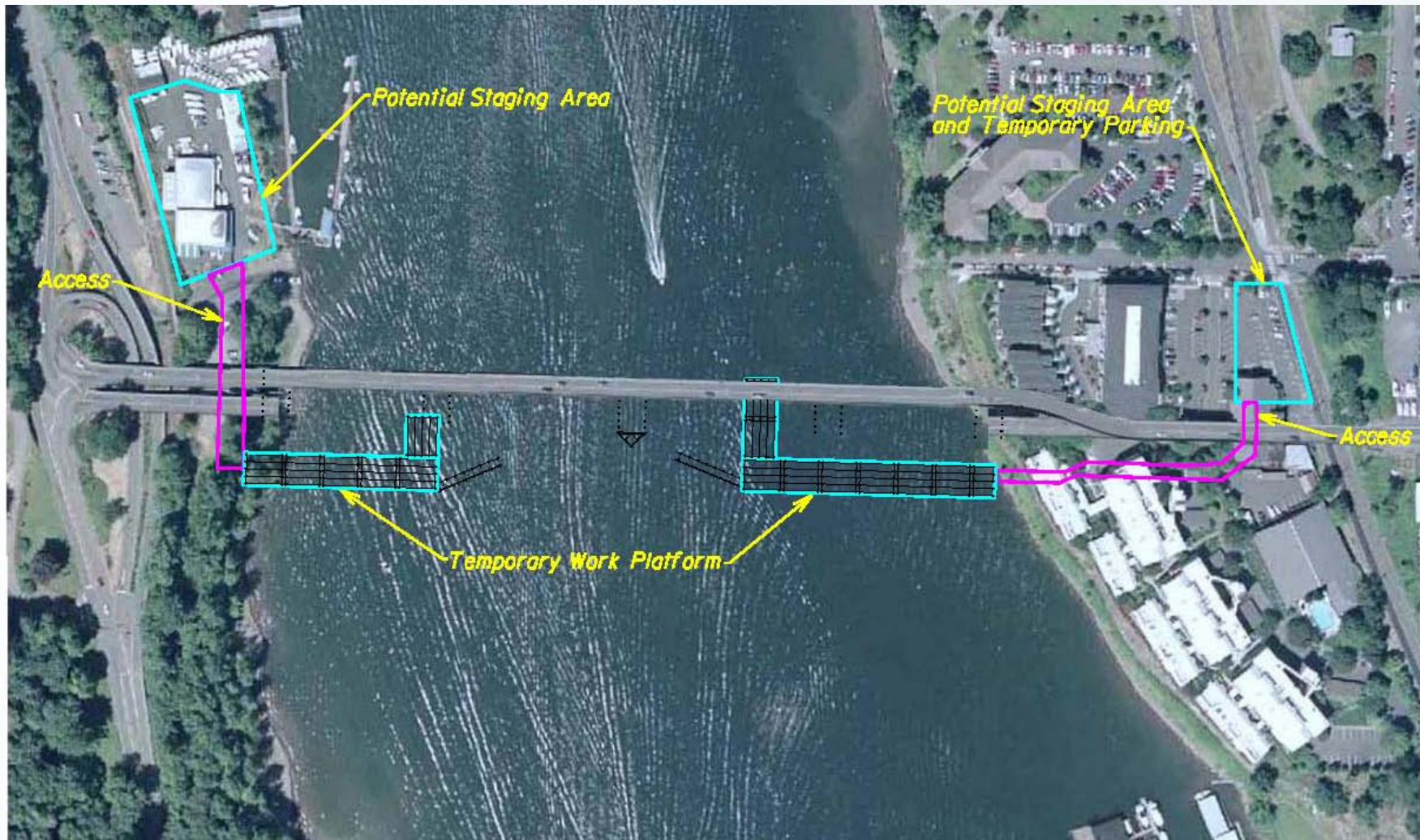
# Constraints/Controlling Decisions

- 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

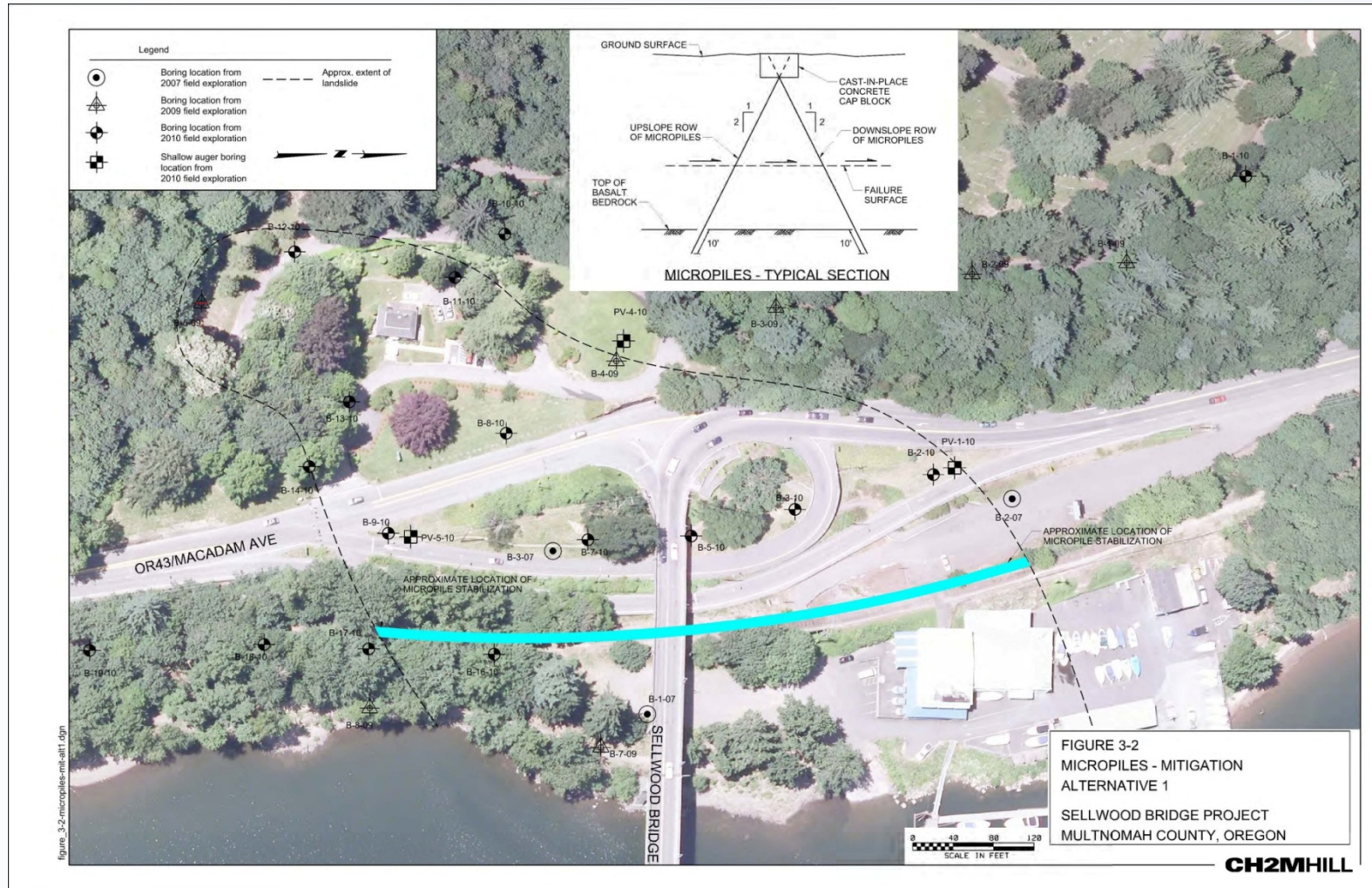
## ***Constraints/Controlling Decisions***

- 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

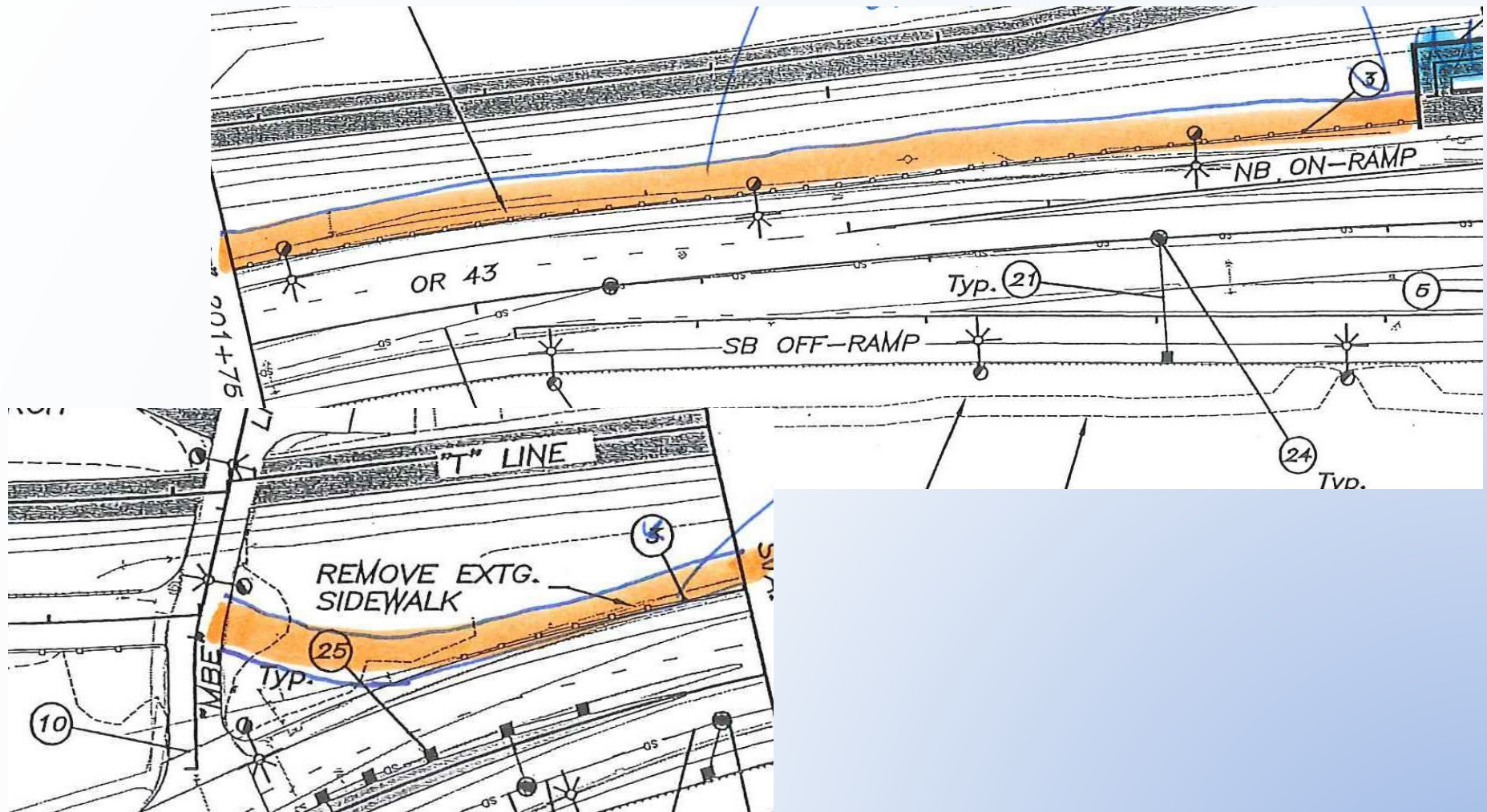
# Recommendation # 1 – Shoo-fly



# Recommendation # 2 – Landslide

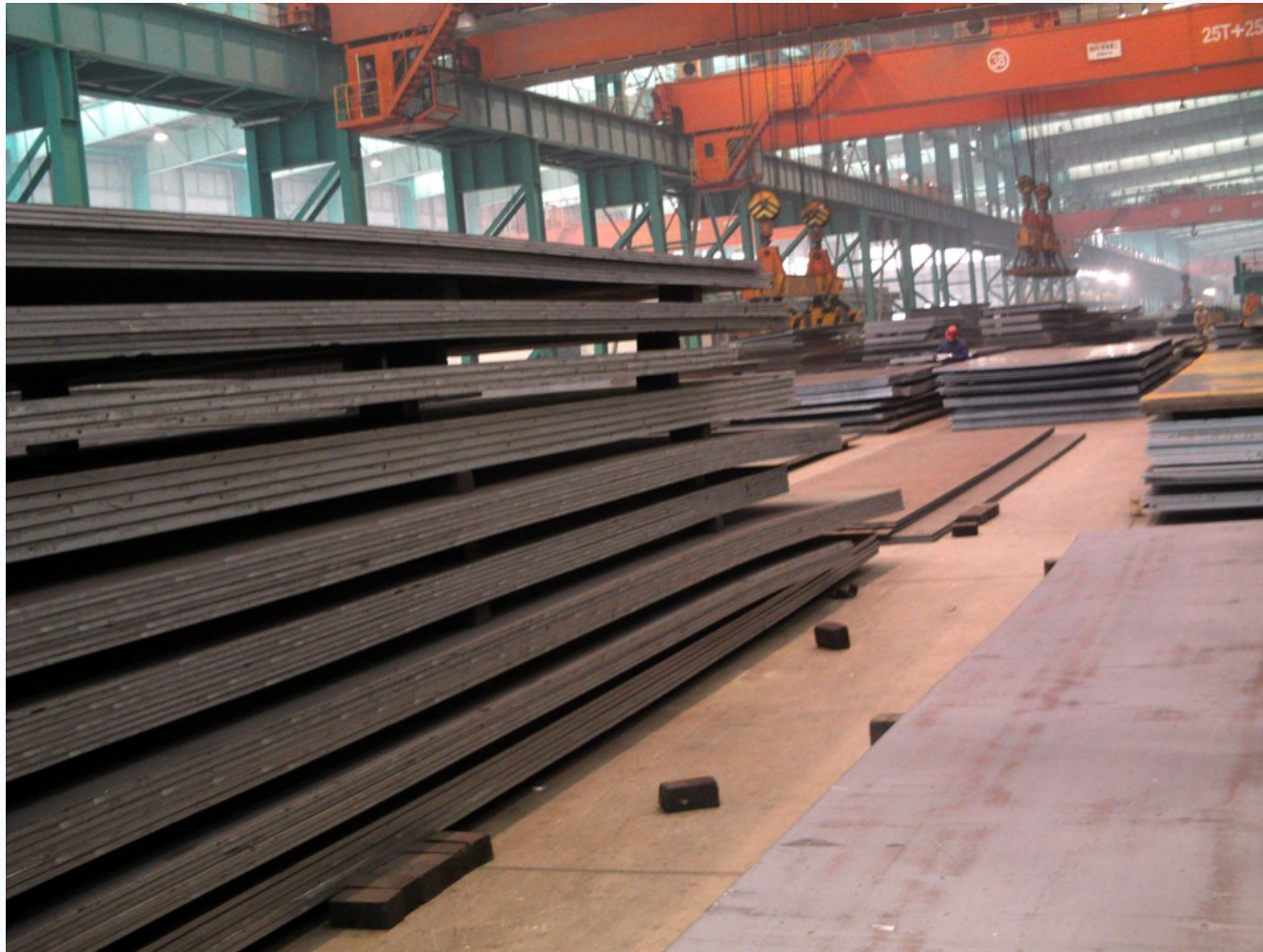


## Recommendation # 3 – Path Location

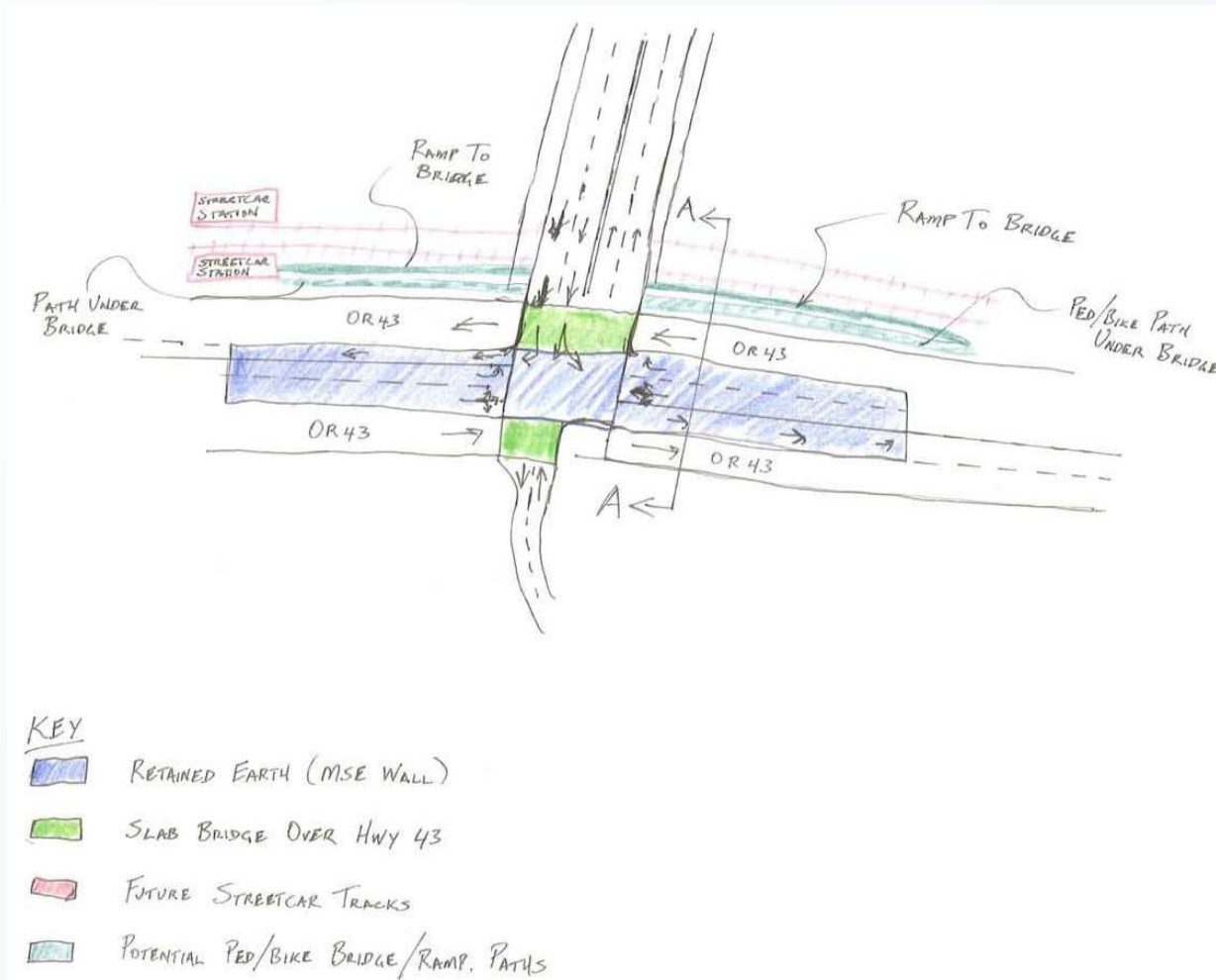




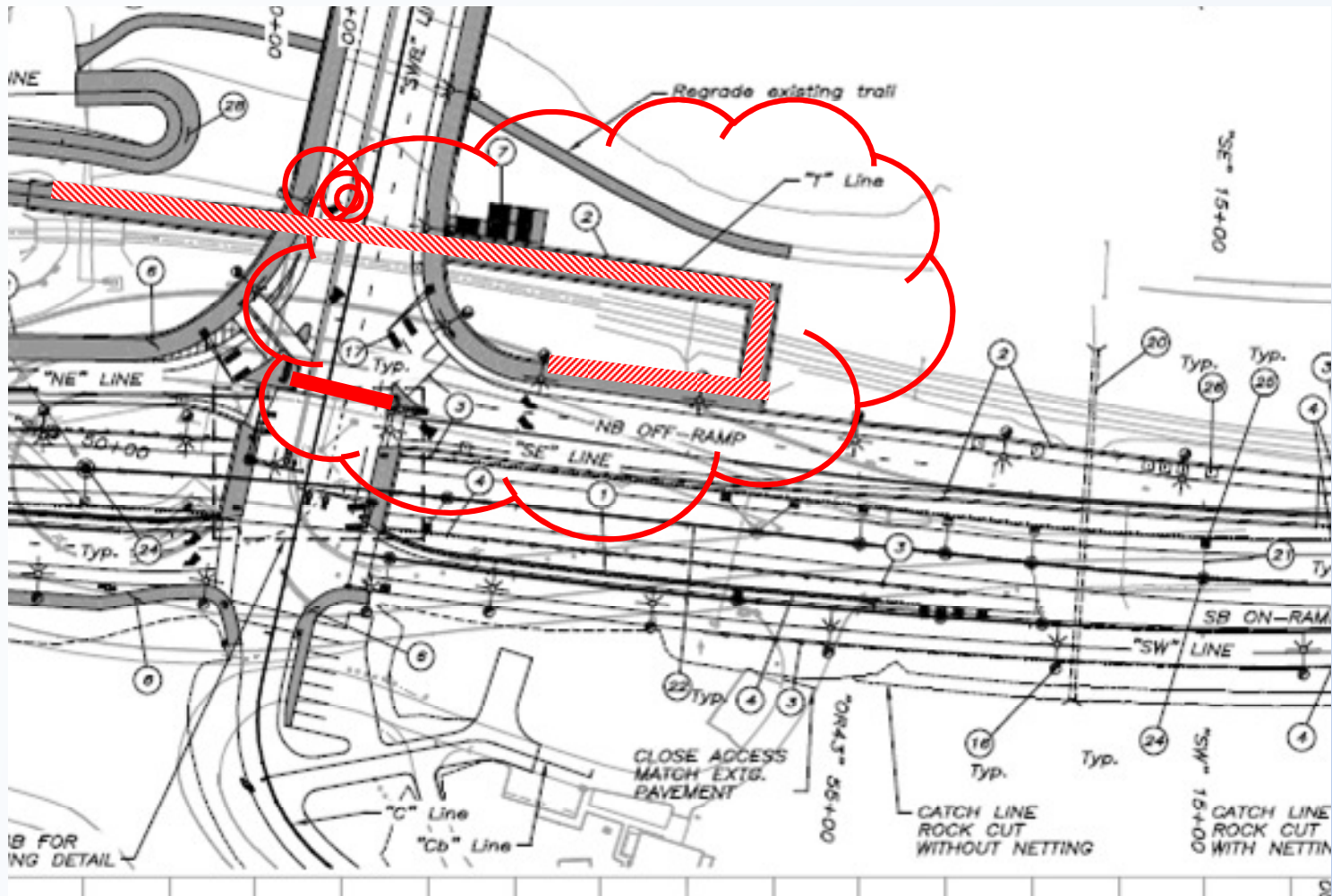
## ***Recommendation # 5 – Steel Fabricator***



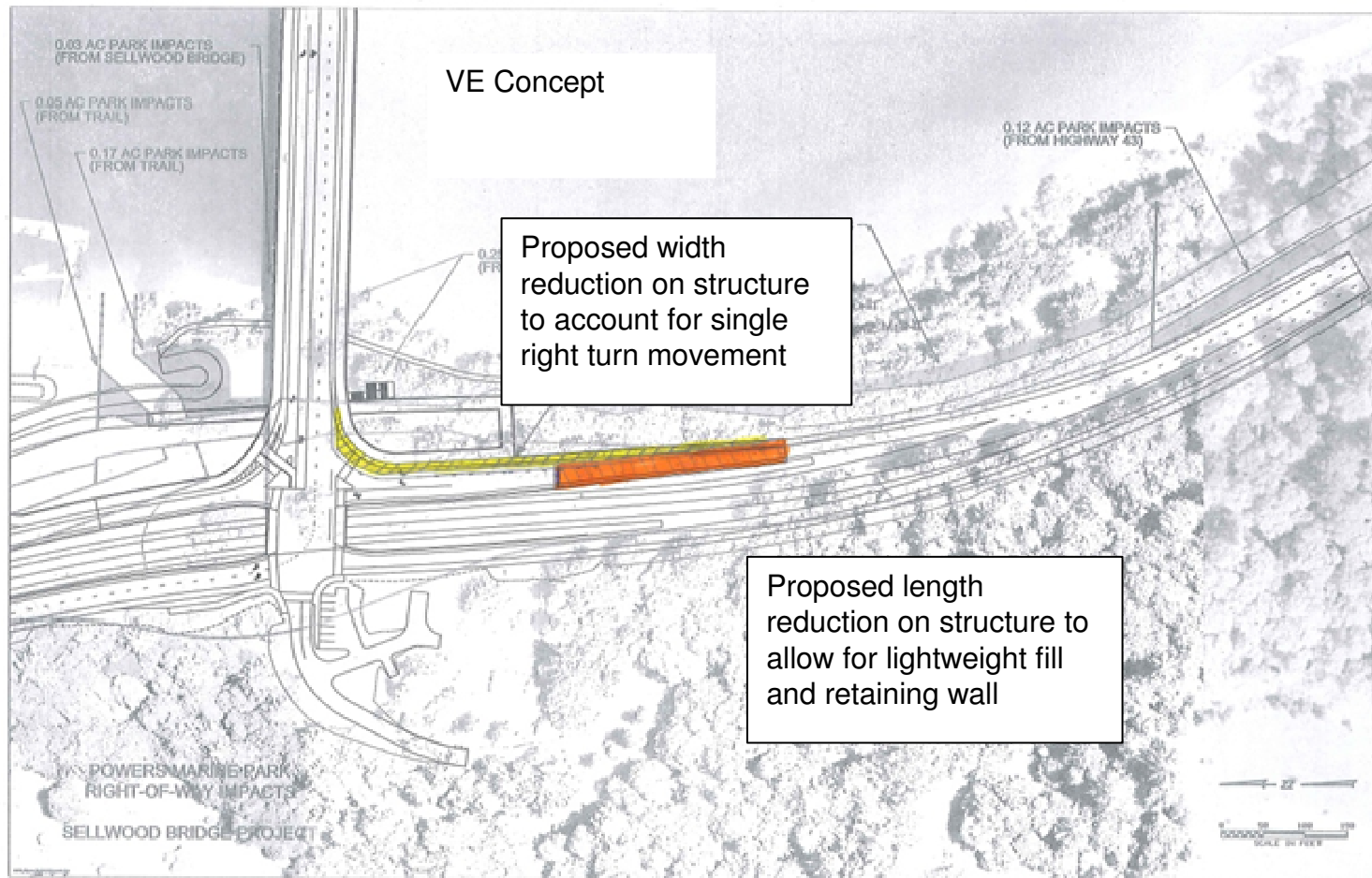
# Recommendation # 6– Flip Interchange



## 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



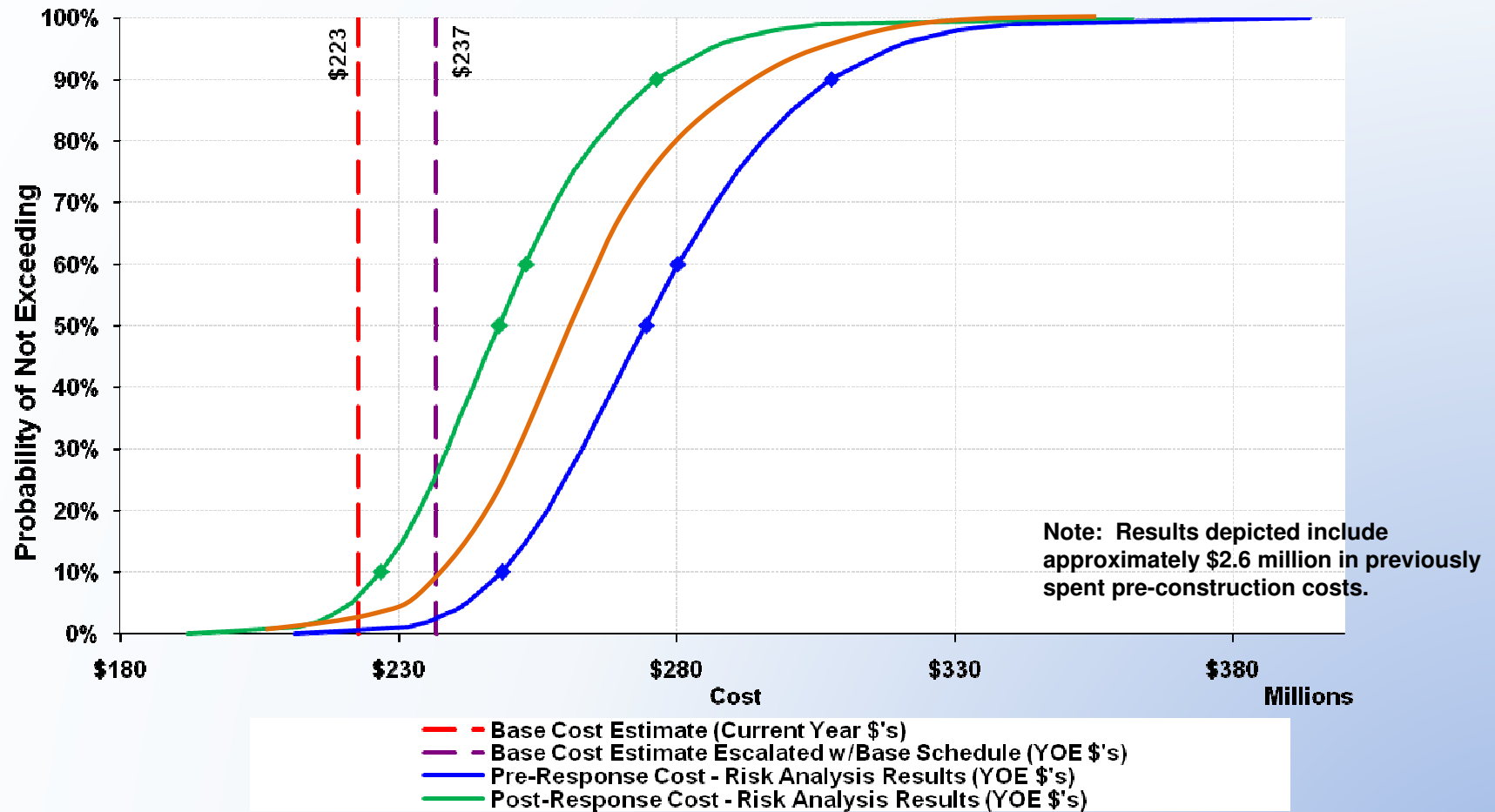
# **Post-VE Cost Risk Update**

## **May 3, 2011**

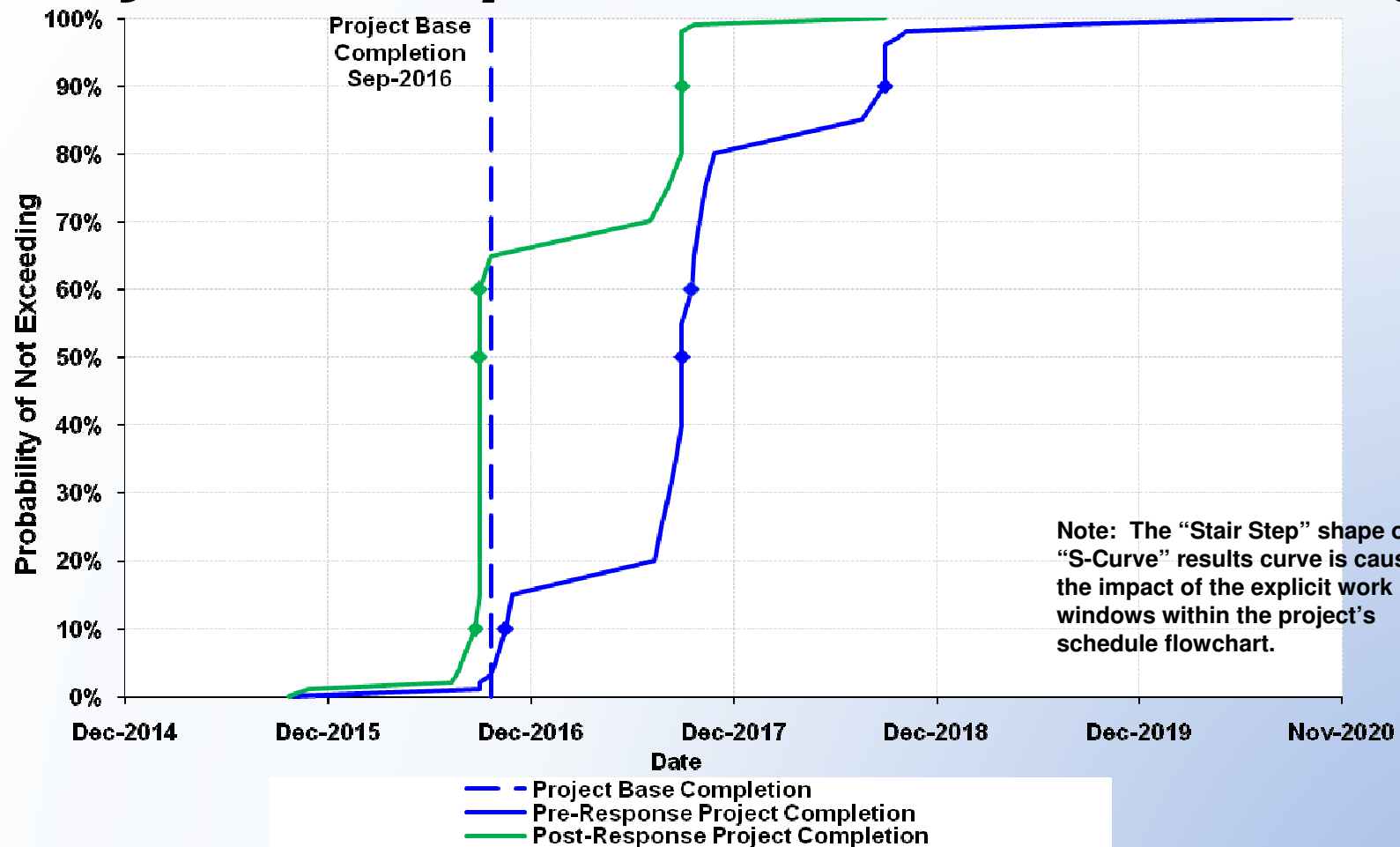
## ***Cost Risk Update***

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

# Probabilistic Cost Curves – Project Total Cost- 30% Design



# ***Probabilistic Schedule Curves – Project Completion Date- 30% Design***



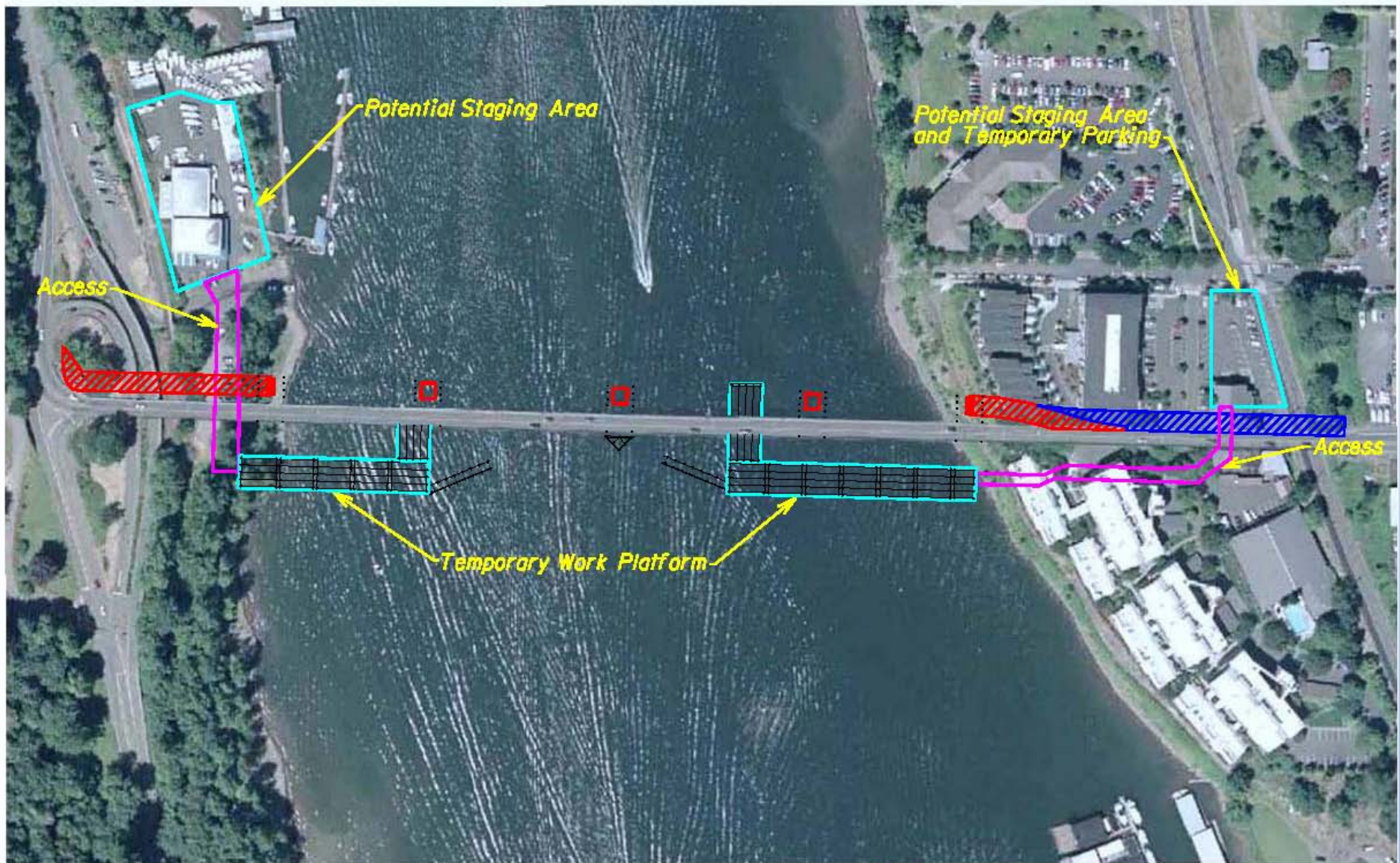
# ***Cost Risk Assessment and VE Going Forward***

- 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***

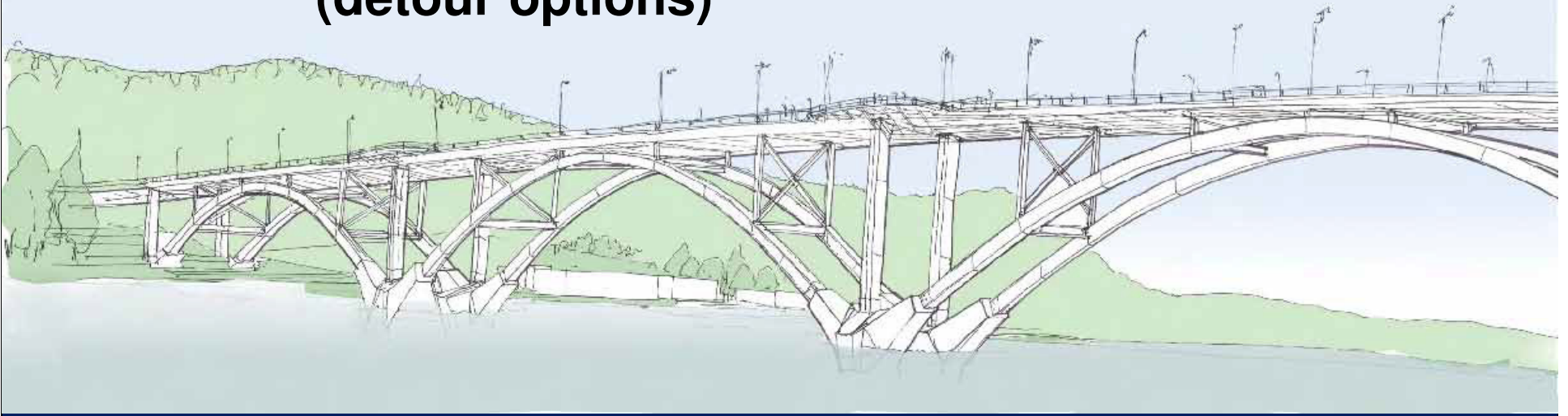
- High probability of meeting \$290m budget
- Further opportunities for cost savings
- Crucial that schedule not slip during pre-construction
- Major schedule risks include:
  - Contracting delays
  - Right-of-way acquisition
  - Environmental permitting

# Detour Construction: East Approach Options

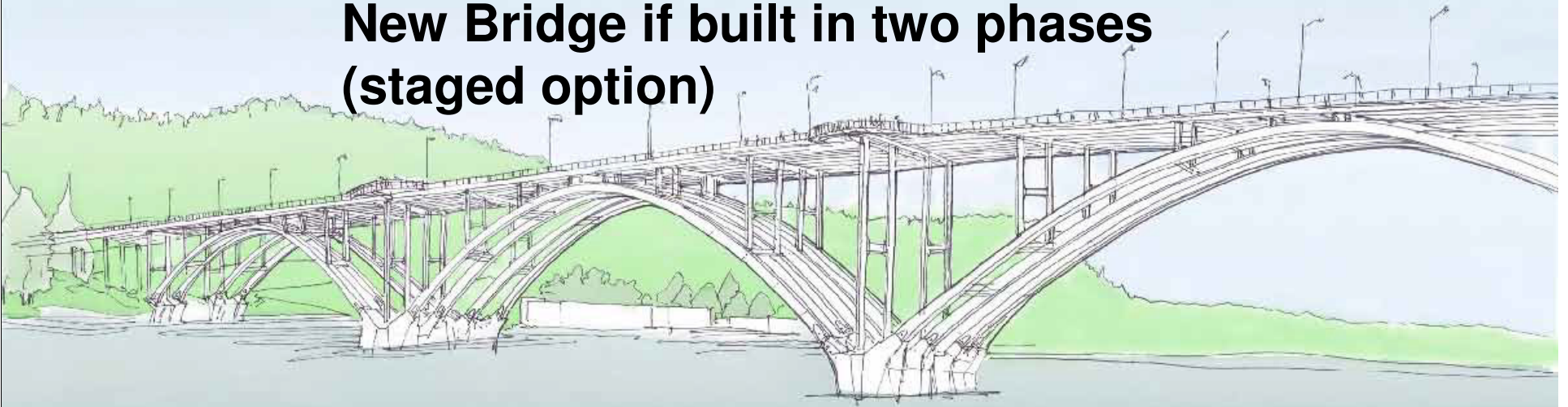


-  Detour Alignment Options 1 and 2
-  Detour Alignment Option 2 Only

**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 ?