

# Columbia River **CROSSING**

## Preliminary Results of Alternatives Analysis

Task Force  

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October 25, 2006



# Task Force Meetings and Topics

## October 2006 – March 2007

	October	November	December	January	February	March
	25	29	13	23	27	27
<b>Topics:</b>						
1.	Preliminary evaluation results	Preliminary evaluation results	Review staff recommendations	Tolling and finance discussion	Review public comments	Refinement discussions on alternatives (interchange options, transit alignment options, etc.)
2.		Draft staff recommendations for transit modes and river crossing	Draft Task Force recommendations for DEIS alternatives (transit and river crossing)	Economic importance of corridor	Task Force recommendations for DEIS alternatives (transit and river crossing)	

## Basic Steps in Alternatives Evaluation

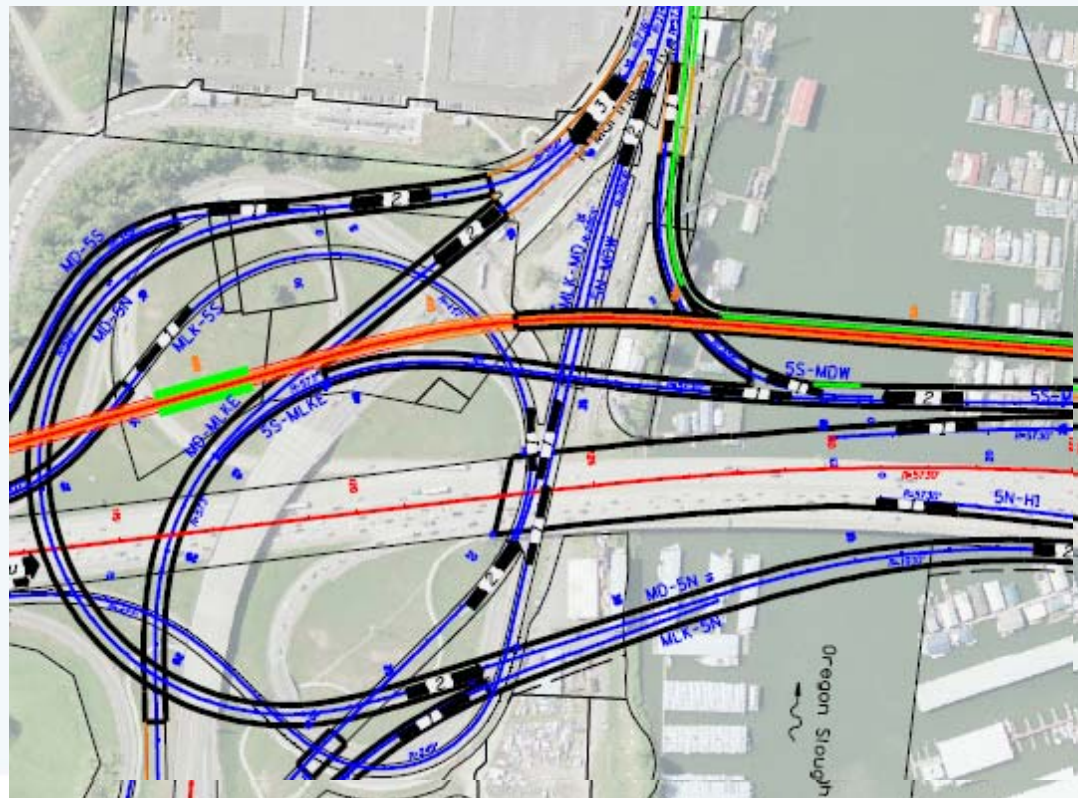
- Measure how well the components and packages meet the adopted Vision and Values
  - Criteria and Measures
  - Other considerations as appropriate
- Shortlist the components – best-performing, and regulation-consistent
  - Narrow the River Crossing options
  - Narrow the Transit options
- Assemble the shortlist of River Crossing and Transit options into packages for the Draft EIS
  - Refine the designs and optimize performance

# Current project definitions

- Based on Conceptual Design
  - 1 to 2% design
  - Results are accurate but approximate
  - Site specific impacts will evolve as designs evolve
- BRT and LRT are “Representative Alignments”
  - Current impacts and performance based on this alignment
  - Performance is relatively transferable to similar alignments
  - Specific impacts will differ
  - Additional alignments will be evaluated

# Assigning Impacts and Performance Variation

- Separate the impacts due to Interchange Options and Ramp configurations
  - Marine Drive
  - Hayden Island
  - Ramp options
  - SR 14 options



## Values and Criteria

1. Community Livability and Human Resources (12 of 19)
2. Mobility, Reliability, Accessibility, Congestion Reduction
3. Modal Choice
4. Safety (6 of 6)
5. Regional Economy, Freight Mobility (1 of 8)
6. Stewardship of Natural Resources (10 of 11)
7. Distribution of Impacts and Benefits
8. Cost Effectiveness and Financial Resources
9. Growth Management, Land Use (2 of 2)
10. Constructability

# Reporting of Results

- Performance for each criterion
  - Which option(s) perform best on this criterion?
    - Why?
  - Is this a differentiator?
    - No, Minor, Moderate or Major
- Summary of performance for each Value

(Note: Comparisons do not include No-build (alt 1) because we already know it will advance to the DEIS)

# Columbia River **CROSSING**

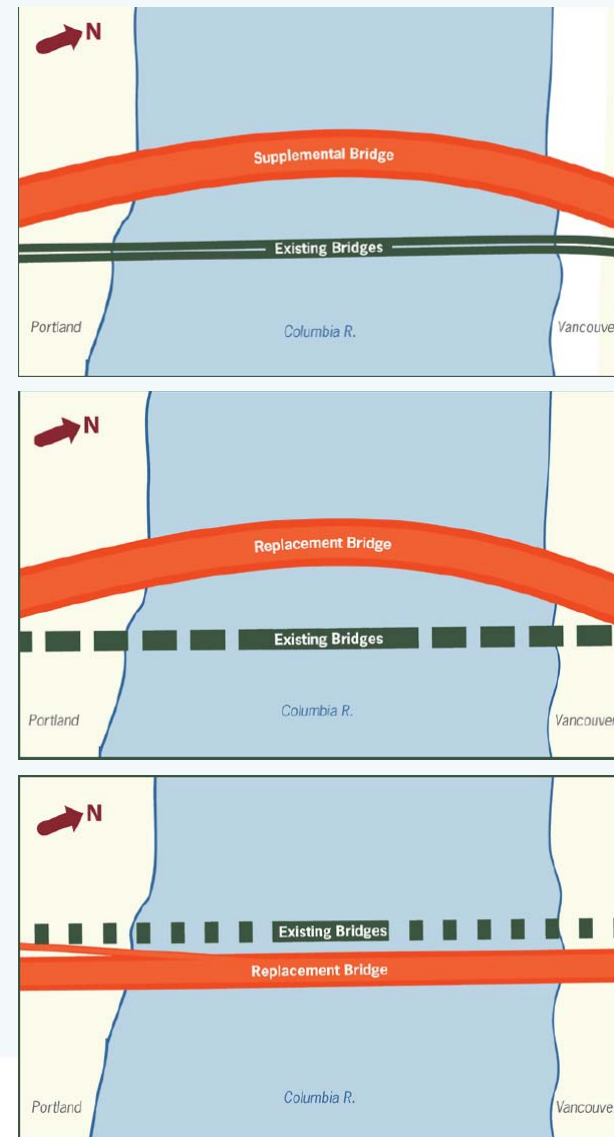
## River Crossing Options





# River Crossing Options

- New Arterial (Supplemental) (I-5 on existing bridge) (3)
- Supplemental Downstream (I-5 on new bridge) (4-7)
- Replacement Downstream (8, 9, 11)
- Replacement Upstream (10, 12)



# **VALUE 1. COMMUNITY LIVABILITY AND HUMAN RESOURCES**

## **River Crossing Options**

# Preliminary results – RIVER CROSSING

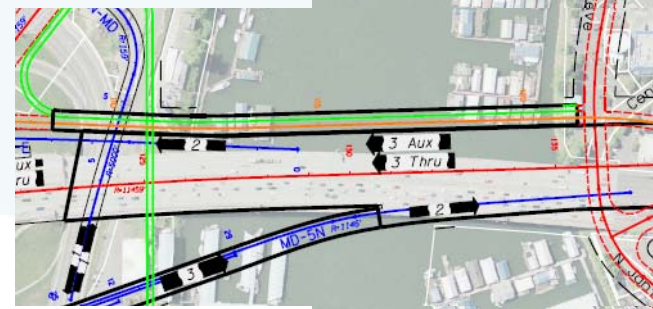
## 1.2: Neighborhood Cohesion

- Downstream Replacement bridges perform best
  - No alternative would bisect neighborhoods
  - No alternative would acquire a large portion of neighborhoods
  - Supplemental bridges significantly increase cut-through traffic
  - Upstream replacement bridges eliminate the only supermarket on Hayden Island. All other river crossings can avoid it
- Is this a differentiator?
  - Moderate: Downstream Replacement better than Upstream Replacement; All Replacement better than all Supplemental

# Preliminary results – RIVER CROSSING

## 1.4: Residential Displacements

- New Arterial bridge has fewest residential displacements
  - Displaces 0-10 floating homes
  - Others displace 5-15 floating homes
  - Number of displacements varies with Interchange options and transit mode
- Is this a differentiator?
  - Minor: River crossing options similar



# Preliminary results – RIVER CROSSING

## 1.5: Business Displacements

- Replacement alternatives impact less commercial land than Supplemental alternatives
  - Build alternatives range from about 20 to 30 parcels
  - See different location of impacts
- Is this a differentiator?
  - Moderate: Replacement bridges allow smaller interchange footprint

# Preliminary results – RIVER CROSSING

## 1.5: Business Displacements – Hayden Island

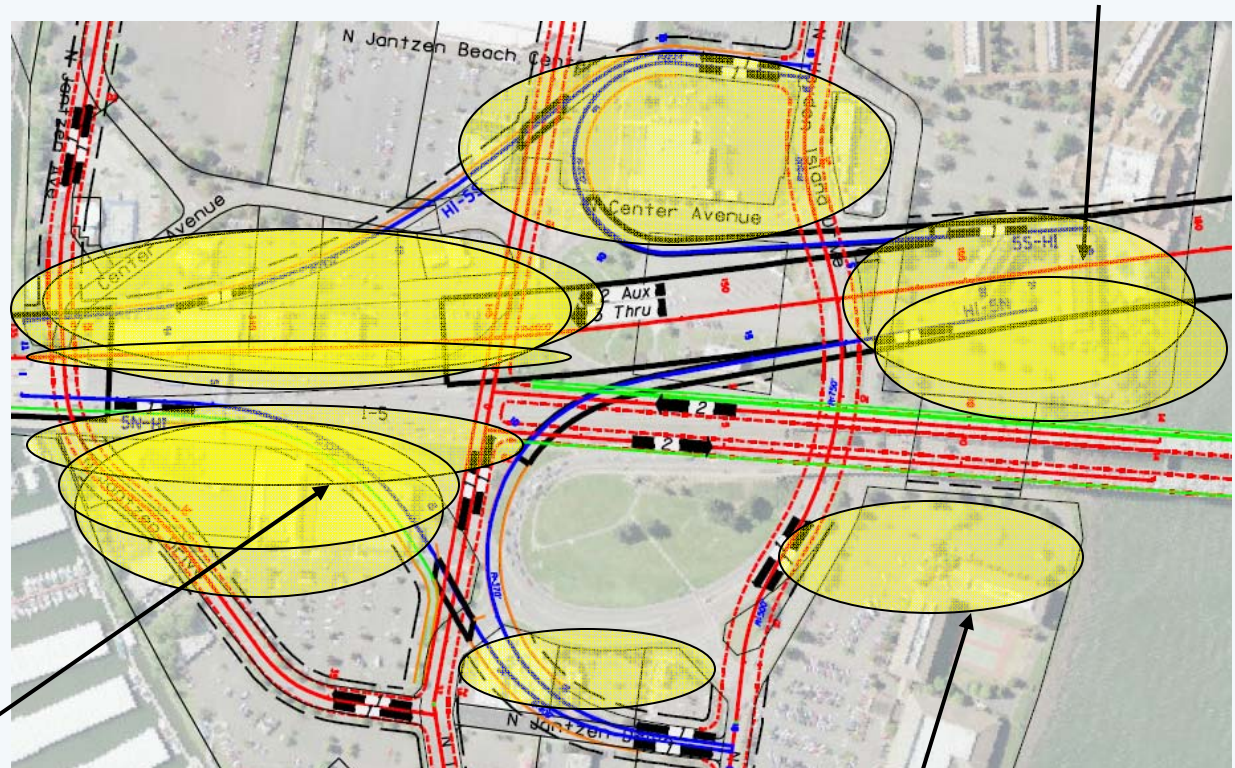
**Thunderbird**

### Upstream Repl (10):

- Avoids Thunderbird and west of I-5
- Hits east of I-5
- Hits Red Lion
- Takes Safeway

### Downstream Repl:

- Hits Thunderbird, N. Center Ave to partial Safeway
- Longer and narrower



**Safeway**

### Downstream Supp:

- More of Thunderbird
- Both sides of I-5
- Partial Safeway
- Wider and shorter

**Red Lion**

# Preliminary results – RIVER CROSSING

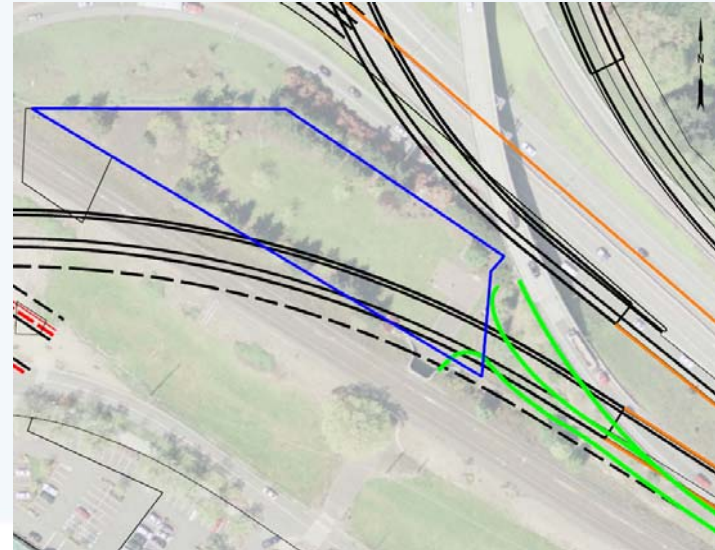
## 1.6: Historic & Prehistoric Cultural Resources

- The Supplemental Alternatives have lower potential impacts than the Replacement Alternatives
  - All Bridge build alternatives
    - Impact corner and edge of Reserve
    - No known archaeological sites but potential is high
  - Replacement alternatives
    - Greater impact to historic bridge (removal vs character change)
    - Upstream Replacement could encroach more on Reserve
  
- Is this a differentiator?
  - Moderate: Replacements remove the existing bridges

# Preliminary results – RIVER CROSSING

## 1.7: Park and Recreation Resources

- New Arterial Option would have the lowest impact
  - Avoids impact on new pedestrian “landbridge” over SR14
  - Avoids potential impacts on Apple Tree park (impacts vary with interchange options)
  
- Is this a differentiator?
  - Moderate: New Arterial better
  - Minor difference among the viable build alternatives



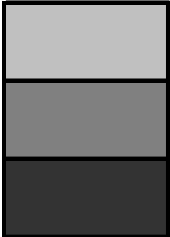


# Preliminary results – RIVER CROSSING

## 1.8: Local Comprehensive Plan Compliance

- Replacement bridges perform better than Supplemental
  - All build options are consistent with local plans (VCCV)
  - Supplemental Bridges:
    - Consume more total developable and redevelopable land
    - Significant cut-through traffic
  - Replacement Bridges:
    - Downstream affects Inn at the Quay; Upstream does not
    - New bridge provides better HCT service
- Is this a differentiator?
  - Moderate: Replacement better than Supplemental

# Summary of results for RIVER CROSSING – *Community Livability and Human Resources*

	TDM/TSM Only	Supplemental Arterial	Supplemental Interstate	Replacement Downstream	Replacement Upstream	
1.2 Neighborhoods	Medium Gray	Dark Gray	Dark Gray	Light Gray	Medium Gray	 <p>Better</p> <p>Worse</p>
1.4 Residential Impacts	Light Gray	Light Gray	Medium Gray	Medium Gray	Medium Gray	
1.5 Commercial impacts	Light Gray	Light Gray	Medium Gray	Light Gray	Light Gray	
1.6 Historic and Archae Resources	Light Gray	Light Gray	Light Gray	Medium Gray	Medium Gray	
1.7 Parks	Light Gray	Light Gray	Medium Gray	Medium Gray	Medium Gray	
1.8 Local Plans	Dark Gray	Medium Gray	Medium Gray	Light Gray	Light Gray	

**VALUE 4.  
SAFETY**

**VALUE 5.  
REGIONAL ECONOMY AND FREIGHT MOBILITY  
(Only Marine Navigation Efficiency)**

**River Crossing Options**

# Preliminary results – RIVER CROSSING

## 4.1 Vehicle and Freight Safety

- Replacement bridges provide greater safety improvements than supplemental bridges:
  - Eliminate bridge lift hazards
  - Significantly less downtown Vancouver cut through traffic
  - (All replacement and most supplemental options bring I-5 up to current safety design standards)
- Is this a differentiator?
  - Moderate: Replacement safer than Supplemental; New Arterial is the worst (does not meet purpose and need)

## Preliminary results – RIVER CROSSING

### 4.2: Bike/Pedestrian Safety

- All river crossing options can provide safe bike/ped facility
- Is this an important difference?
  - No

# Preliminary results – RIVER CROSSING

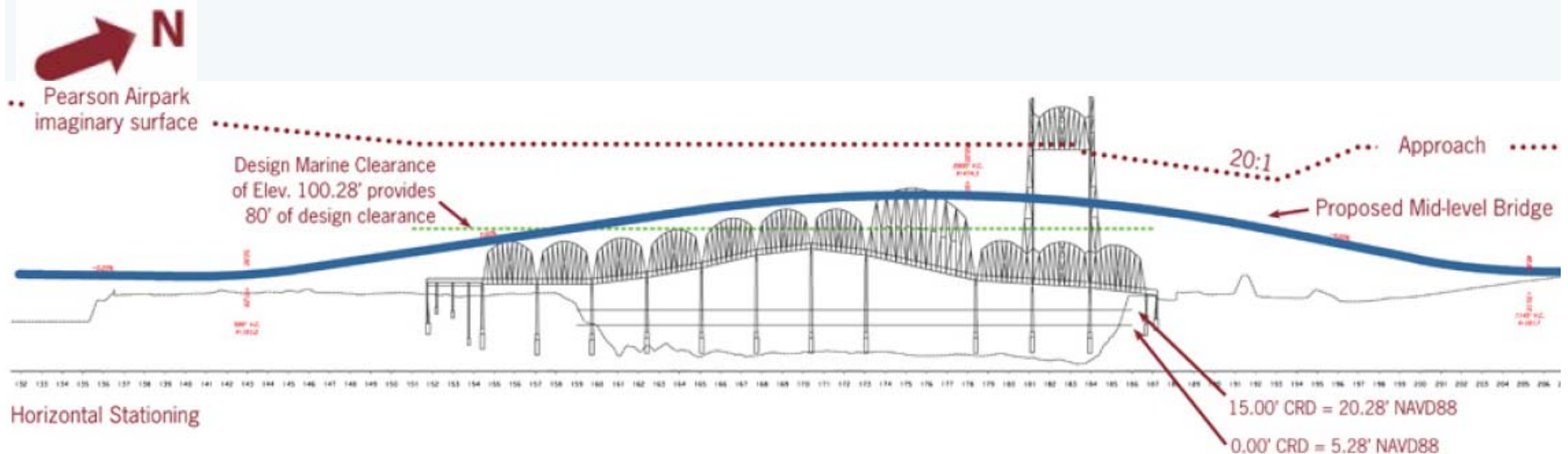
## 4.3: Marine Safety

- Replacement bridges provide greater marine safety than supplemental bridges:
  - Eliminate bridge lifts
  - Fewer piers in the water
  - Simplify vessel maneuvers
- Is this a differentiator?
  - Major: Replacement safer than Supplemental

# Preliminary results – RIVER CROSSING

## 4.4: Aviation Safety

- Replacement bridges provide greater aviation safety improvements than supplemental bridges:
  - Eliminate existing bridge lift towers from approach airspace
- Is this a differentiator?
- Moderate: Replacement safer than Supplemental



## Preliminary results – RIVER CROSSING

### 4.5: Sustained Lifeline Connectivity

- Replacement bridges provide more comprehensive lifeline than supplemental bridges:
  - Locate all transportation modes on new bridge
- Is this a differentiator?
  - Minor: Replacement better than Supplemental



## Preliminary results – RIVER CROSSING

### 4.6: I-5 Incident/emergency response

- Replacement bridges and Supplemental bridges that locate I-5 traffic on a new bridge perform best:
  - Provide full standard shoulders and lanes
  - New arterial bridge fails this criterion
- Is this a differentiator?
  - Major: Replacement and Supplemental significantly better than New Arterial

## Preliminary results – RIVER CROSSING

### 5.3: Marine Navigation Efficiency

- Replacement Bridges best for navigation
  - They remove the lift span, include fewer piers and simplify navigation routes
  - New Arterial with I-5 on the existing bridges is the worst
    - Maintains and possibly extends restrictions on bridge lifts
    - Increases complex navigation maneuvers
  - Supplemental with other modes on the existing bridges could improve conditions
    - May reduce or remove restrictions on bridge lifts
- Is this a differentiator?
  - Major: Replacement better than Supplemental; New Arterial worse than all others

## Summary of results for RIVER CROSSING – *Safety and Marine Navigation Efficiency*

	TDM/TSM Only	Supplemental Arterial	Supplemental Interstate	Replacement Downstream	Replacement Upstream	
4.1 Vehicle/Freight Safety	Worse	Worse	Worse	Better	Better	
4.2 Bike/Ped Safety	Worse	Better	Better	Better	Better	
4.3 Marine Safety	Worse	Worse	Worse	Better	Better	
4.4 Aviation Safety	Worse	Worse	Worse	Better	Better	
4.5 Life-line connectivity	Worse	Worse	Worse	Better	Better	
4.6 I-5 Incident Response	Worse	Worse	Better	Better	Better	
5.3 Efficient Marine Navigation	Worse	Worse	Worse	Better	Better	

Better

Worse

# **VALUE 6. STEWARDSHIP OF NATURAL RESOURCES**

## **River Crossing Options**

## Preliminary results – RIVER CROSSING

### 6.1: Threatened and Endangered Species & Habitat

### 6.2 Other Fish and Wildlife Habitat

- Replacement options perform best
  - Fewer piers in water (10-20% smaller deck area)
  - 1 bridge (5 pier sets) vs 2 bridges (14 pier sets)
  - Greater opportunity to reduce storm water pollutants
  - Less in-water work (deconstruct vs upgrade existing piers)
  - However, permanent vs temp removal of peregrine habitat on existing bridge (can be replaced on new bridge)
    - Lower potential salmonid and other fish impacts
    - Higher potential peregrine impacts
  - Is this a differentiator?
    - Moderate: Replacement options better than Supplemental

# Preliminary results – RIVER CROSSING

## 6.4 Wetlands

- River Crossing
  - No impacts to wetlands
- Is this a differentiator?
  - No

# Preliminary results – RIVER CROSSING

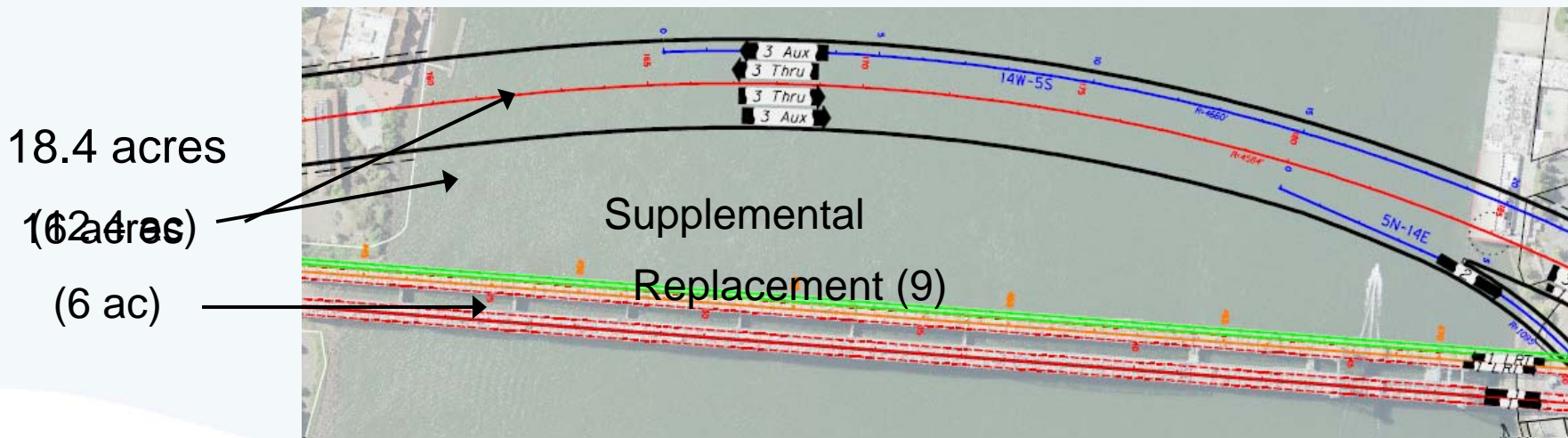
## 6.5 Water Quality

- Replacement options perform better
  - Smaller surface area (10-20% smaller deck area)
  - Less in-water work (deconstruct/remove existing piers vs. retrofit/augment existing piers)
  - Greater opportunity to reduce storm water pollutants
  
- Is this a differentiator?
  - Moderate: Replacement options can perform better

# Preliminary results – RIVER CROSSING

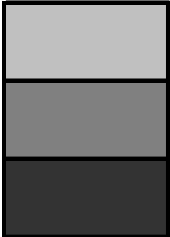
## 6.7 Waterways

- Replacement options perform slightly better
  - Expect less fill (10-20% smaller bridge deck area)
  - 1 bridge (6 pier sets) vs 2 bridges (14 pier sets)
  - Existing bridge piers removed
- Is this a differentiator?
  - Minor: Replacement options perform better than Supplemental





# Summary of results for RIVER CROSSINGS – *Natural Environment*

	TDM/TSM Only	Supplemental Arterial	Supplemental Interstate	Replacement Downstream	Replacement Upstream	
6.1 T&E Fish and Wildlife						 <p>Better</p> <p>Worse</p>
6.2 Other Fish and Wildlife						
6.3 Rare, T&E plants						
6.3 Wetlands						
6.5 Water quality						
6.6 Waterways						

**VALUE 9.  
GROWTH MANAGEMENT, LAND USE**

**VALUE 10.  
CONSTRUCTABILITY**

**River Crossing Options**

## Preliminary results – RIVER CROSSING Value 9: Growth Management/Land Use

- Replacement Bridges and New Arterial Bridge perform best
  - LRT or BRT on a new bridge is more reliable and has faster travel times than on existing bridge
  - Alternatives that require less property better support regional economic development goals
- Is this a differentiator?
  - Minor: Replacement and New Arterial better than other Supplemental options

## Preliminary results – RIVER CROSSING

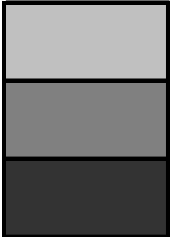
### Value 10: Constructability

- Looks only at construction impacts (too early to evaluate other constructability issues)
- New Arterial would have least I-5 traffic disruption
  - Does not require shifting I-5 traffic onto a new bridge
  - All other alternatives relatively equal
- Is this a differentiator?
  - Minor

# Summary of results for RIVER CROSSING – *Growth Management and Land Use & Constructability*

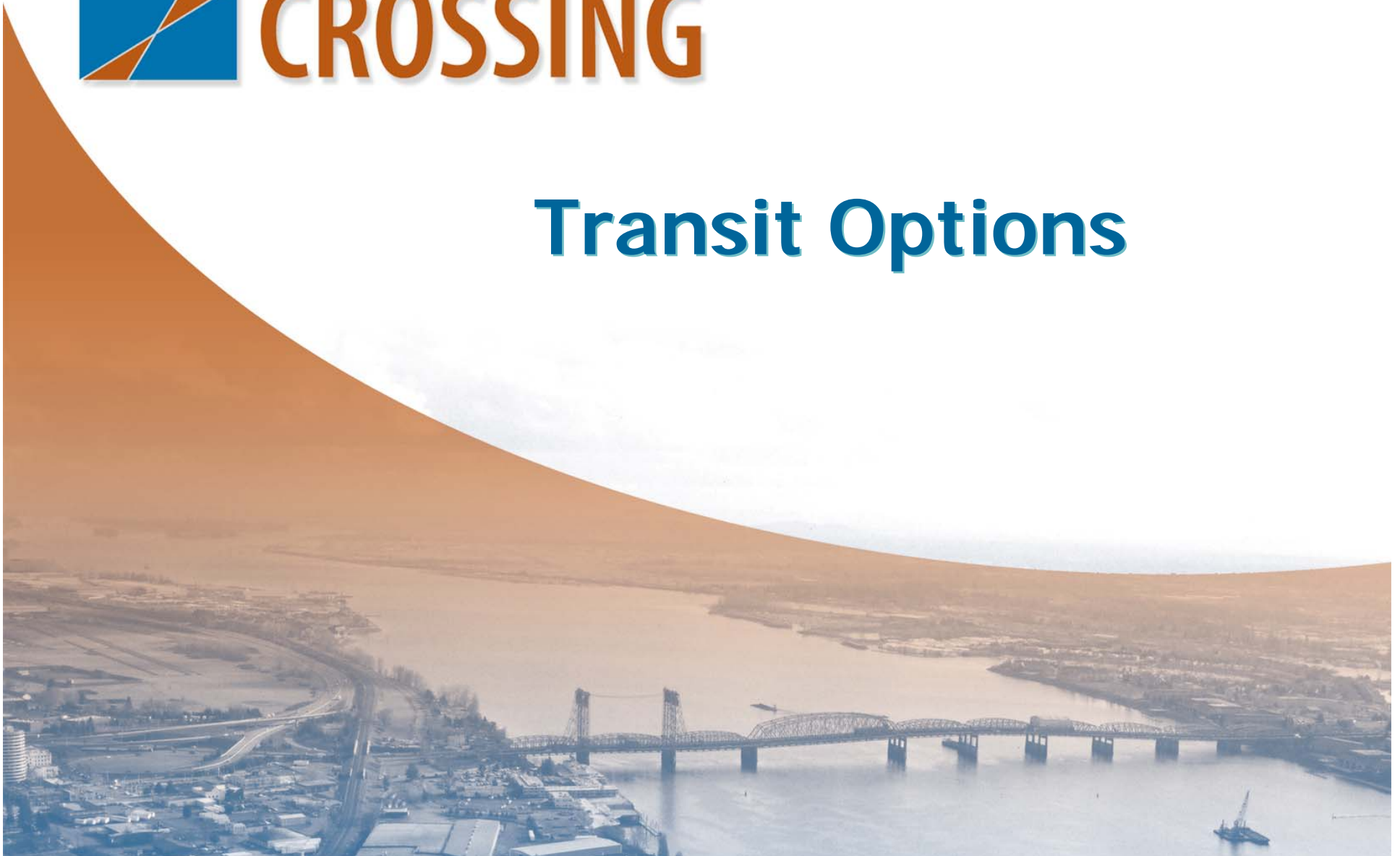
	TDM/TSM Only	Supplemental Arterial	Supplemental Interstate	Replacement Downstream	Replacement Upstream		
<b>9 Growth Management and Land Use</b>							<b>Better</b>
<b>10 Constructability</b>							
							<b>Worse</b>

# Summary of results for RIVER CROSSINGS

	TDM/TSM Only	Supplemental Arterial	Supplemental Interstate	Replacement Downstream	Replacement Upstream	
1 Community Livability and Human Resources						 <p>Better</p> <p>Worse</p>
4 Safety						
5 Marine Navigation Efficiency						
6 Natural Environment						
9 Growth Management and Land Use						
10 Constructability						

# Columbia River **CROSSING**

## Transit Options



# Transit Options

- Express Bus Only (2, 7, 12)
- Bus Rapid Transit-lite (BRT-Lite) (w/ Local Bus) (6, 11)
- Bus Rapid Transit (BRT) (w/ Local Bus) (5, 10)
- Light Rail Transit (LRT) (w/ or w/o Express Bus) (3, 4, 8, 9)





# **VALUE 1. COMMUNITY LIVABILITY AND HUMAN RESOURCES**

## **Transit Options**

# Preliminary results – TRANSIT

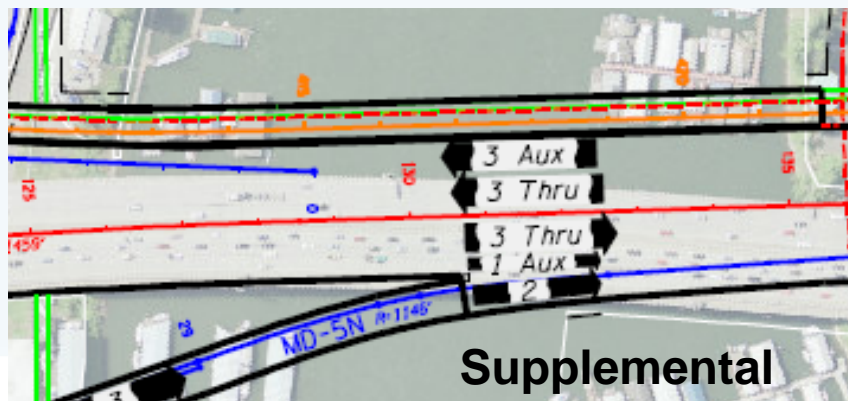
## 1.2: Neighborhood Cohesion

- No clear best performer
  - None of the alternatives will bisect neighborhoods
  - None will acquire large portions of neighborhoods
  - LRT, BRT Benefit: Improve neighborhood access to the region and support pedestrian-friendly development
  - Express Bus, BRT-Lite Benefit: Impact fewer properties
- Is this a differentiator?  
No

# Preliminary results – TRANSIT

## 1.4: Residential Displacements

- Express Bus and BRT-Lite have no residential displacements
  - LRT/BRT displaces 5-10 floating homes
  - LRT/BRT affects up to 10 other residential properties (mostly partial acquisitions)
- Is this a differentiator?
  - Moderate: Express Bus or BRT-Lite have no displacements



# Preliminary results – TRANSIT

## 1.5: Business Displacements

- Express Bus Only has no commercial acquisitions
  - BRT-Lite could have a few partial acquisitions
  - LRT and BRT affect 10 to 30, mostly partial acquisitions
    - Hayden Island, Washington Street and McLoughlin Boulevard
- Is this a Differentiator?
  - Moderate: Express Bus Only and BRT-Lite affect fewer than LRT or BRT

## Preliminary results – TRANSIT

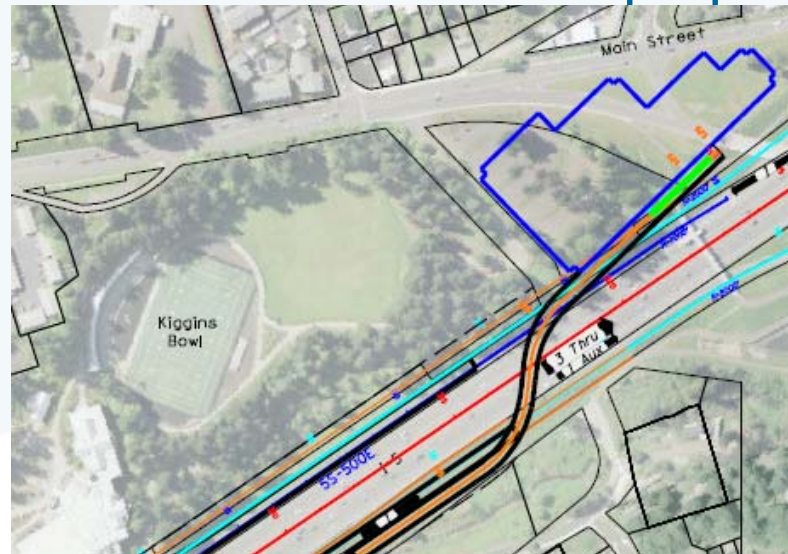
### 1.6: Historic & Prehistoric Cultural Resources

- Express Bus and BRT-Lite have lowest potential for impacts
- LRT and BRT
  - No direct effect on historic resources
  - Potential historic context and archaeology impacts in downtown and north of McLoughlin
- Is this a differentiator?
  - Moderate: Express Bus and BRT-Lite have less potential than LRT or BRT

# Preliminary results – TRANSIT

## 1.7: Park and Recreation Resources

- Express Bus only and BRT-Lite have slightly fewer impacts
  - Every alternative affects Kiggins Bowl property
  - LRT and BRT also have minor impacts on City College Park, Leverich Park, Delta Park
- Is this a differentiator?
  - Minor: Express Bus and BRT-Lite affect fewer properties




# Preliminary results – TRANSIT

## 1.8: Local Comprehensive Plan Compliance

- LRT, followed by BRT, performs best
  - Greater support for multi-modalism
  - Consistent with Vancouver City Center Vision
  - Greater support for downtown development and redevelopment
  - Downside: Slightly greater use of developable lands
  
- Is this a differentiator?
  - Major: LRT or BRT more supportive than Express Bus Only

# Summary of results for TRANSIT – *Community Livability and Human Resources*

	Express Bus	BRT-Lite	BRT	LRT	
1.2 Neighborhoods	Worse	Worse	Worse	Worse	 <p>Better</p> <p>Worse</p>
1.4 Residential Impacts	Better	Better	Worse	Worse	
1.5 Commercial impacts	Better	Better	Worse	Worse	
1.6 Historic and Archae Resources	Better	Better	Worse	Worse	
1.7 Parks	Better	Better	Worse	Worse	
1.8 Local Plans	Worse	Worse	Worse	Better	



## **VALUE 4. SAFETY**

### **Transit Options**

## Preliminary results – TRANSIT

### Value 4: Safety

- LRT or BRT is safer
  - Transit on a separate guideway is safer than transit in general-purpose or managed lanes
  - Downside: at-grade crossings provide added potential for conflict
- Is this a differentiator?
  - Moderate: LRT or BRT safer than Express Bus Only and BRT-Lite

# **VALUE 6. STEWARDSHIP OF NATURAL RESOURCES**

## **Transit Options**

## Preliminary results – TRANSIT

### 6.1: T&E Habitat

### 6.2: Other Fish and Wildlife Habitat

- Express Bus Only would have lower adverse impacts
  - No physical impacts
- LRT and BRT
  - Larger footprint
  - Minor impacts on Burnt Bridge Creek riparian area
  - Upside: More supportive of growth management
- Is this a differentiator?
  - Moderate - Express Bus Only would have lower adverse impacts

## Preliminary results – TRANSIT

### 6.3: Rare and T&E Plants

- No impacts to rare plants or habitat from transit options

## Preliminary results – TRANSIT

### 6.4: Wetlands

- All options are similar
  - No direct impacts from any transit options
  - LRT and BRT
    - Downside: Within three feet of Burnt Bridge Creek wetland
    - Upside: More supportive of growth management goals
- Differentiator?
  - No

## Preliminary results – TRANSIT

### 6.5: Water Quality

- Express Bus only and BRT-Lite would have lower adverse impacts
  - Smallest footprint – less impervious surface area
  - LRT and BRT
    - Larger footprint
    - Upside: More consistent with growth management goals
- Is this a differentiator?
  - Minor: Express Bus has less impervious surface

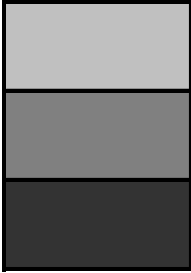
## Preliminary results – TRANSIT

### 6.7: Waterways

- Express Bus only and BRT-Lite would have lower adverse impacts
  - LRT and BRT
    - Generally require wider bridge across waterways
- Is this a differentiator?
  - Moderate: Express Bus only and BRT-Lite would have the lowest impacts.



## Summary of results for TRANSIT – *Natural Environment*

	Express Bus	BRT-Lite	BRT	LRT	
6.1 T&E Fish and Wildlife					 <p>Better</p> <p>Worse</p>
6.2 Other Fish and Wildlife					
6.3 Rare, T&E plants					
6.3 Wetlands					
6.5 Water quality					
6.6 Waterways					

## **VALUE 9. GROWTH MANAGEMENT, LAND USE**

## **VALUE 10. CONSTRUCTABILITY**

## **Transit Options**

## Preliminary results – TRANSIT

### Value 9: Growth Management, Land Use

- LRT is most supportive of regional policy
  - The I-5 Transportation and Trade Partnership Strategic Plan recommends LRT specifically
- Is this a differentiator?
  - Major: LRT, BRT better than BRT-Lite or Express Bus
  - Moderate: LRT better than BRT

## Preliminary results – TRANSIT

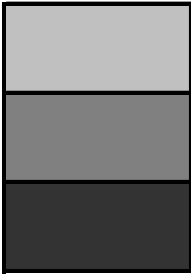
### Value 10: Constructability

- Express Bus Only would have the lowest construction impacts
- Too early to evaluate other constructability issues
- Is this a differentiator?
  - Minor

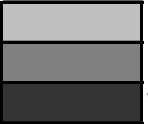
# Summary of results for TRANSIT – *Growth Management and Land Use & Constructability*

	Express Bus	BRT-Lite	BRT	LRT	
9 Growth Management and Land Use	Dark Gray	Dark Gray	Medium Gray	Light Gray	Better
10 Constructability	Light Gray	Light Gray	Medium Gray	Medium Gray	Worse

# Summary of results for TRANSIT

	Express Bus	BRT-Lite	BRT	LRT	
1 Community Livability and Human Resources					 <p>Better</p> <p>Worse</p>
4 Safety					
5 Marine Navigation Efficiency	N/A	N/A	N/A	N/A	
6 Natural Environment					
9 Growth Management and Land Use					
10 Constructability					

# Summary of results for River Crossing and Transit

	TDM/TSM Only	Supplemental Arterial	Supplemental Interstate	Replacement Downstream	Replacement Upstream	
1 Community Livability and Human Resources						 <p>Better</p> <p>Worse</p>
4 Safety						
5 Marine Navigation Efficiency						
6 Natural Environment						
9 Growth Management and Land Use						
10 Constructability						

	Express Bus	BRT-Lite	BRT	LRT
1 Community Livability and Human Resources				
4 Safety				
5 Marine Navigation Efficiency	N/A	N/A	N/A	N/A
6 Natural Environment				
9 Growth Management and Land Use				
10 Constructability				

Partial Results – More findings in November