

Puget Sound Gateway Program

SR 167

Steering Committee
June 28, 2016

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TOM SLIMAK, PE SR 167 ASST. PROJECT MANAGER

Agenda

- Welcome & Introductions
- Program Overview
- Scenario Review
- Review Essential Performance Metrics and Ratings
- Review Contextual Performance Metrics and Ratings
- Review Cost Estimates
- Refine Scenarios
- Conclusion and Next Steps

Puget Sound Gateway Program Update

- Gateway Program Management Office
- SR 167 General Engineering Consultant
- SR 509 Project Activities
- Coordination with WSDOT Secretary

SR 167 Steering Committee 2016 Work Plan



Legislative Direction

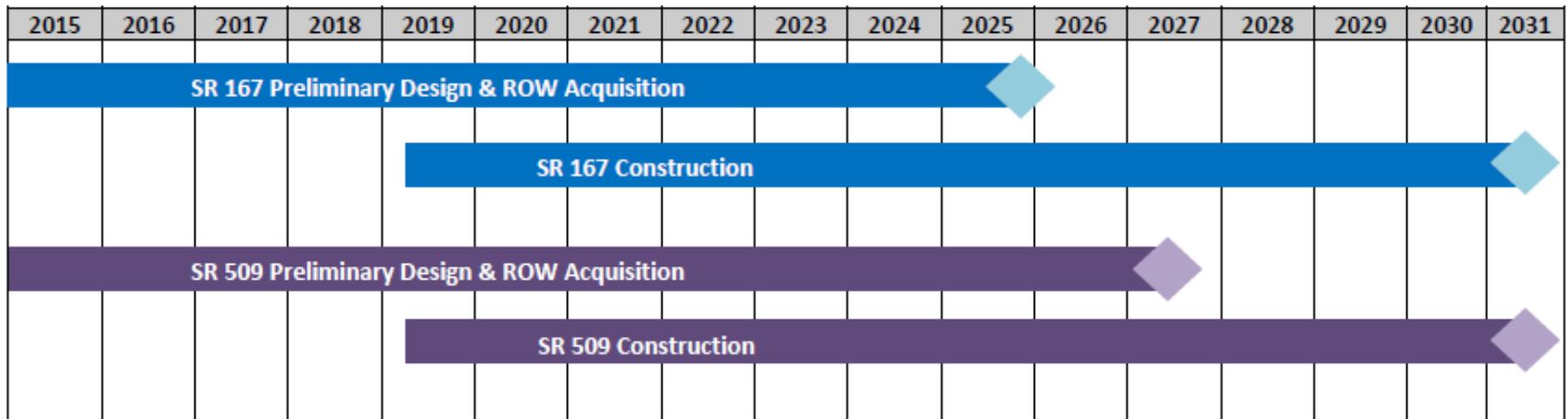
*In making budget allocations to the Puget Sound Gateway project, **the department shall implement the project's construction as a single corridor investment. The department shall develop a coordinated corridor construction and implementation plan for SR 167 and SR 509 in collaboration with affected stakeholders.***

Specific funding allocations must be based on where and when specific project segments are ready for construction to move forward and investments can be best optimized for timely project completion. Emphasis must be placed on avoiding gaps in fund expenditures for either project.

Puget Sound Gateway Program

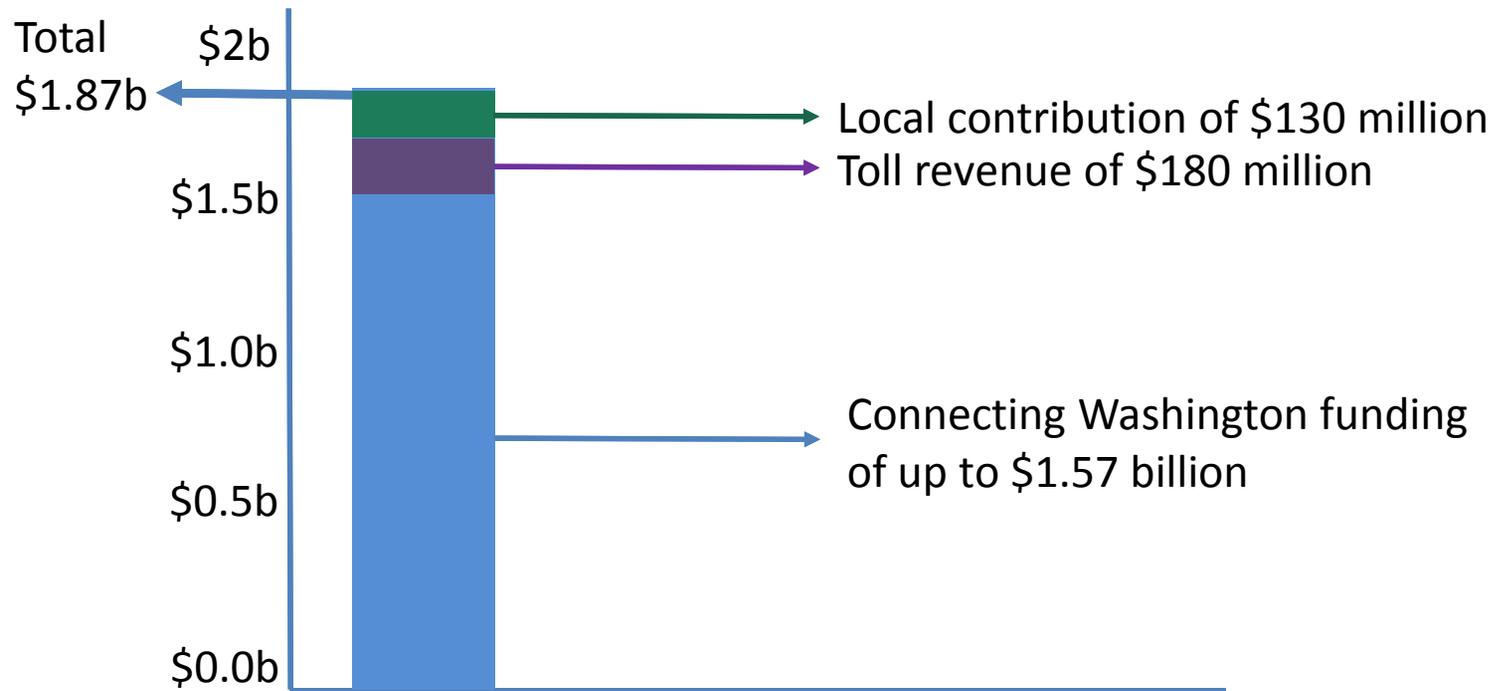
Puget Sound Gateway projects (SR 167 and SR 509) are funded on the same 16-year timeline

- Total funding is \$1.87 billion; this amount assumes \$310 million local match and tolling revenue



Puget Sound Gateway Program

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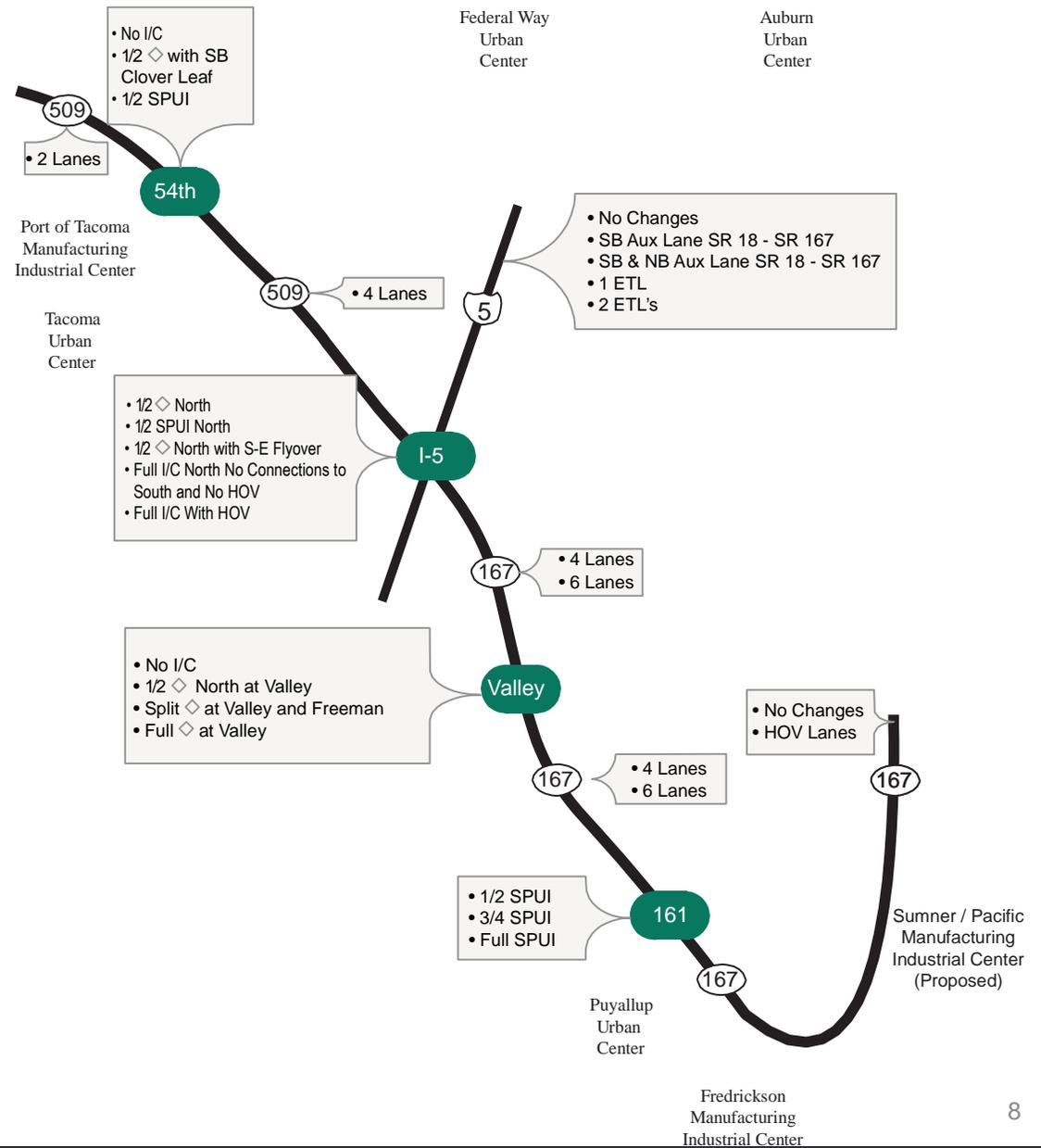


Key Questions for Consideration

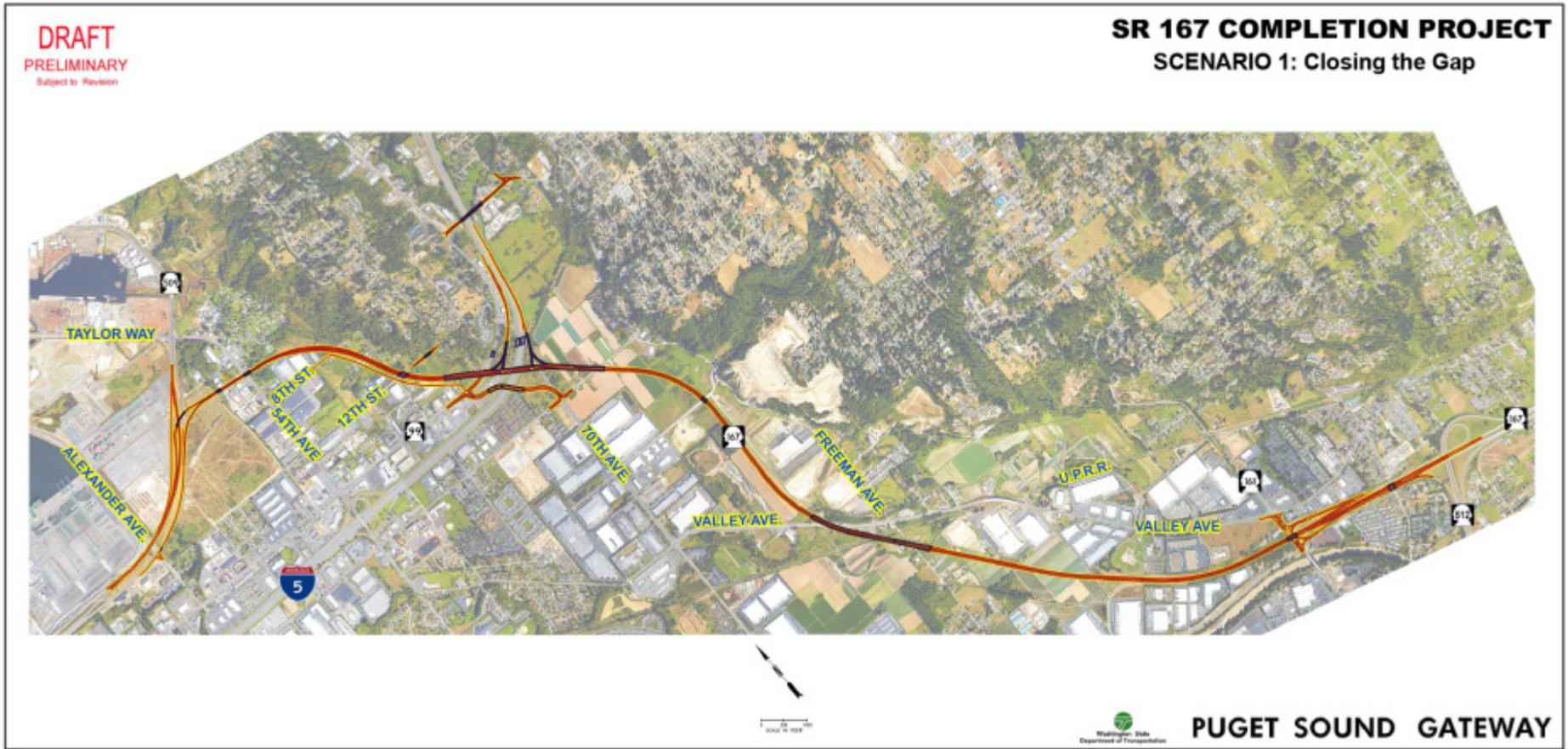
- SR 167 mainline prism
- Tolls
- Managed lanes
- Forward compatibility
- Effects to I-5
- Connectivity
- Port of Tacoma Access

Scenarios

- Range from “Closing the Gap” to “Full-Build Out +”



Scenario Vicinity Maps:



Essential Performance Targets

- Maintain or improve SR 167 operations between SR 161 and I-5
- Maintain or improve SR 509 Spur operations between I-5 and SR 509
- Maintain or improve I-5 operations between I-705 and SR 18
- Reduce travel time between Urban Centers and Manufacturing Industrial Centers in Pierce and South King County
- Improve travel time reliability between Urban Centers and Manufacturing Industrial Centers in Pierce and South King County
- Complete the freeway network and provide system redundancy
- Reduce hours of delay in the project subarea network
- Improve economic vitality
- Support local and regional comprehensive land use planning and development
- Reduce number of serious injury and fatal crashes (I-5, SR 167, and SR 509)

Performance Evaluation Results

Scenario Comparison Table - SR 167 Completion Project

Date: 6/27/16

Performance Category	Baseline Performance Metrics												Contextual Performance Metrics					Cost				
	Mobility										Economic Vitality	Safety	Safety	Active Mobility		Env't	Other					
Mode	Auto / Freight	HOV / Bus	Auto / Freight	HOV/Bus	Auto / Freight	HOV / Bus	Auto / Freight	HOV / Bus	Auto / Freight	HOV / Bus					Pod	Bike	Pod	Else				
Performance METRIC	SR 167 Performance Maintain or improve SR 167 Operations between SR 161 and I-5		SR 509 Spur Performance Maintain or improve SR 509 Spur Operations between I-5 and SR 509		I-5 Performance Maintain or improve I-5 Operations between I-705 and SR 18		Travel Time Reduce travel time between Urban Centers, and Manufacturing Industrial Centers in Pierce & S. King County		Travel Time Reliability Improve travel time reliability between Urban Centers, and Manufacturing Industrial Centers in Pierce & S. King County		Complete Freeway Network / Redundancy Achieved		Delay Reduce hours of delay in subarea network	Economic Benefit Improve economic vitality	Local and Regional Comprehensive Plan Support local and regional comprehensive land use planning and development	Safety # of Serious Injury and Fatal Crashes (I-5 & SR 167 & SR 509)	Safety # of Serious Injury and fatal crashes on local arterials	Number and location of Crossings Reduce Pedestrian vehicle exposure by reducing traffic volumes	Continuity and Consistency of Pedestrian facility Improve Pedestrian & Bicycle continuity along new corridor	Sensitive Area Impact Reduce area of impact to sensitive areas	Forward Compatibility Blight of Way Impact Reduce Blight of Way Impact	Compatibility With Transit/Long Range Plans
SCENARIO																						
No Build																						
Scenario 1 - Closing the Gap																						
Scenario 2 - Limited Connectivity																						
Scenario 3 - Gateway																						
Scenario 4 - Moderate Connectivity																						
Scenario 5 - Full Build Out +																						

Performance Trade-Offs Discussion and Recommended Preferred Scenario

Performance Metrics Evaluation Results

- Scenarios were evaluated using our previously reviewed performance metrics
- Performance metrics are based on our essential and contextual needs
- Each scenario is rated in each category via the following:

 **Very Good**

 **Good**

 **Moderate**

 **Fair**

 **Poor**

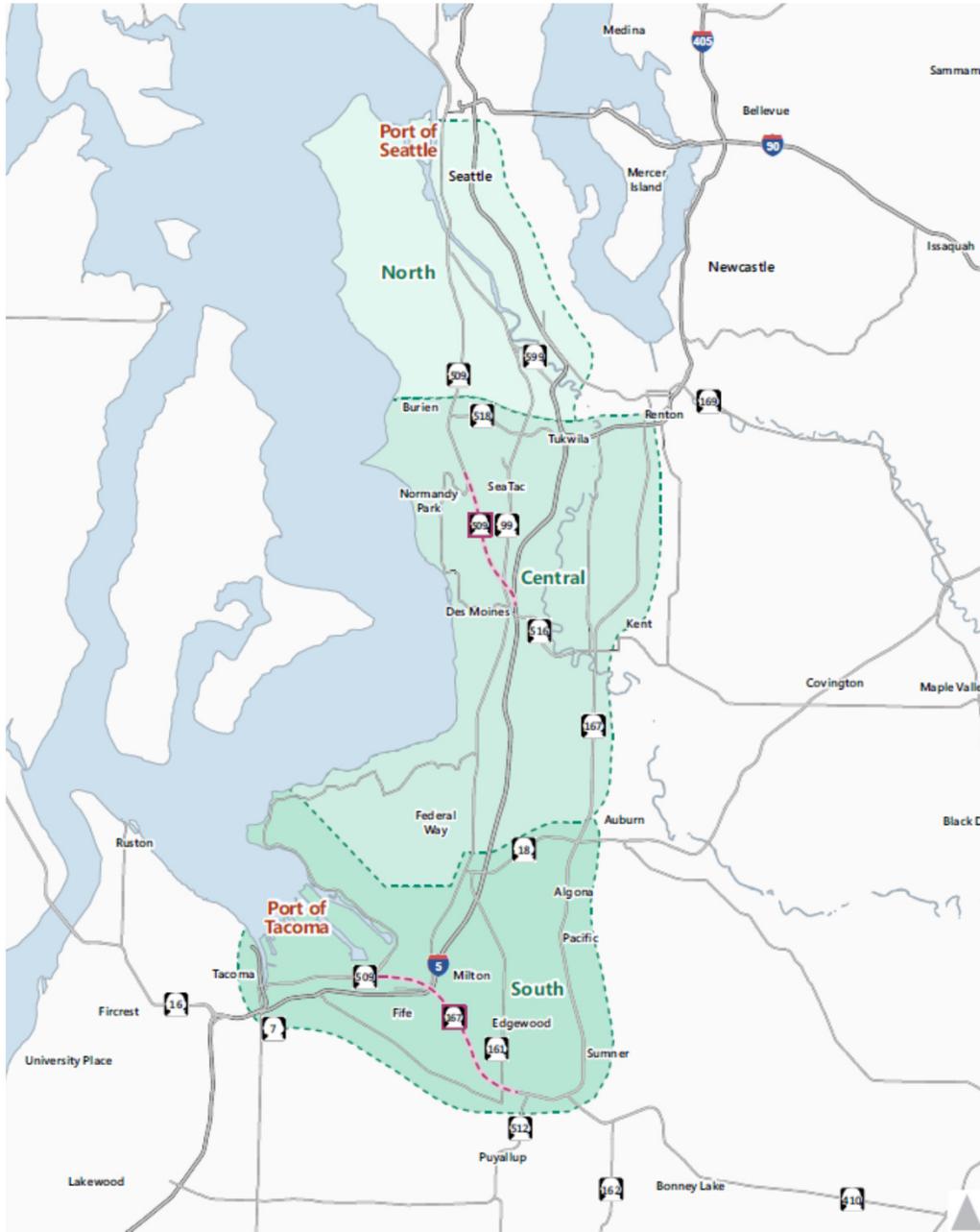
Evaluation results are relative between the scenarios.

Performance Metrics Results

General Observations

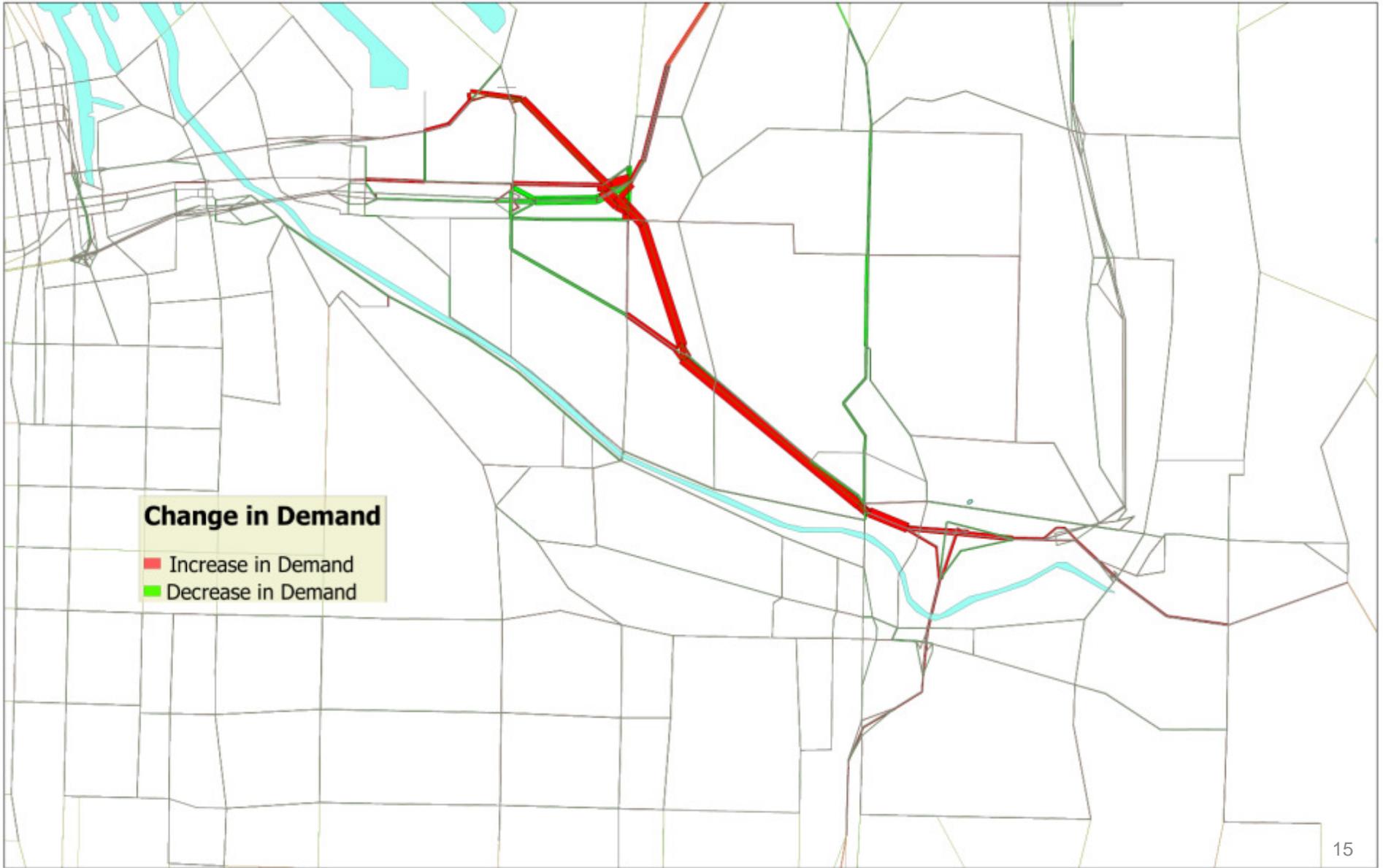
- The proposed SR 509 Spur & SR 167 Scenarios all perform well in a tolled scenario;
- I-5 operations generally improve between the I-5/SR 167 interchange and Port of Tacoma Road;
- General travel time savings across the Scenarios, some impacts;
- Adding the missing SR 509 Spur & SR 167 connection shifts trips towards the SR 167 corridor;

Updated Project Subarea



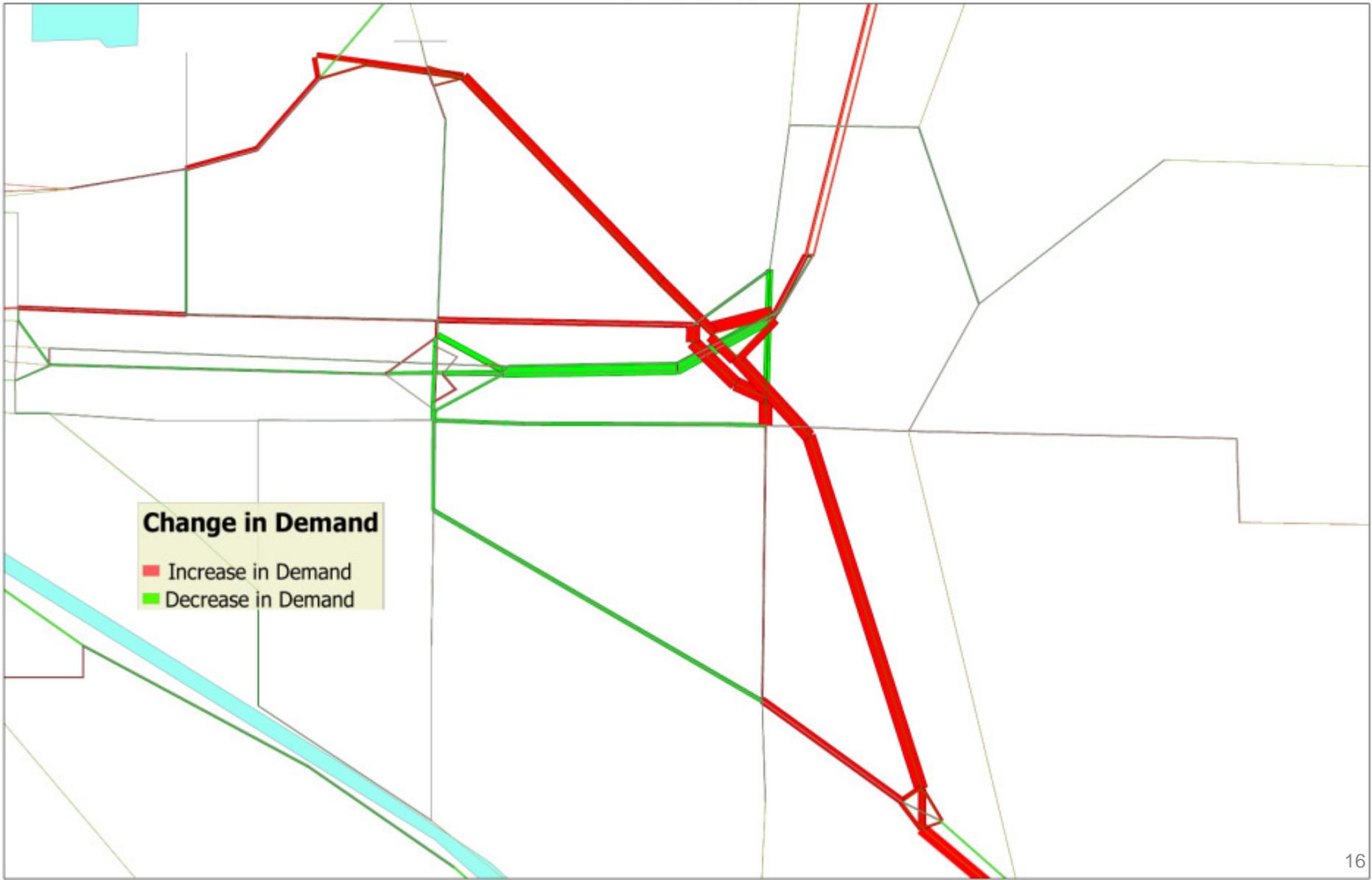
Travel Pattern Changes

2045 Scenario 3 PM



Travel Pattern Changes

2045 Scenario 3 PM

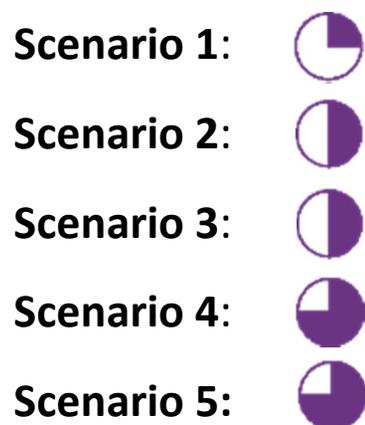


Mobility- SR 509 Spur/SR 167 Performance

Throughput potential and congestion were evaluated for 2025 southbound PM Conditions

SR 509 Spur & 167 Performance 2025 PM Southbound	SR 509 Spur	SR 167		
	GP	GP	HOV	Total
S1	260	800	0	800
S2	370	1130	0	1130
S3	360	1030	0	1030
S4	620	1840	0	2210
S5	620	1830	760	2570
S5 Free	1740	3350	650	4000

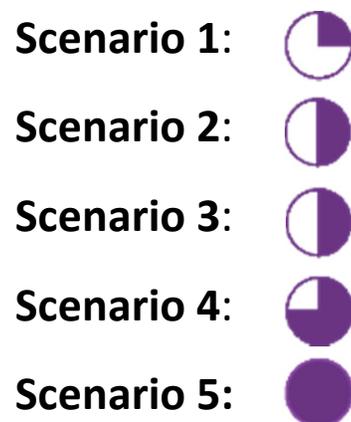
SR 167: Auto/Freight



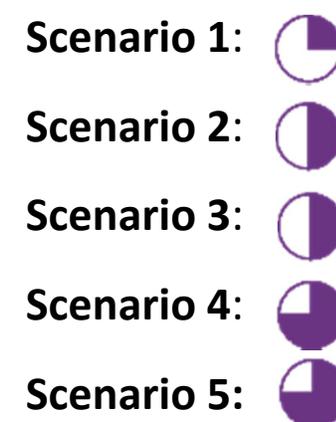
SR 509: Spur Auto/Freight



SR 167: HOV/Bus



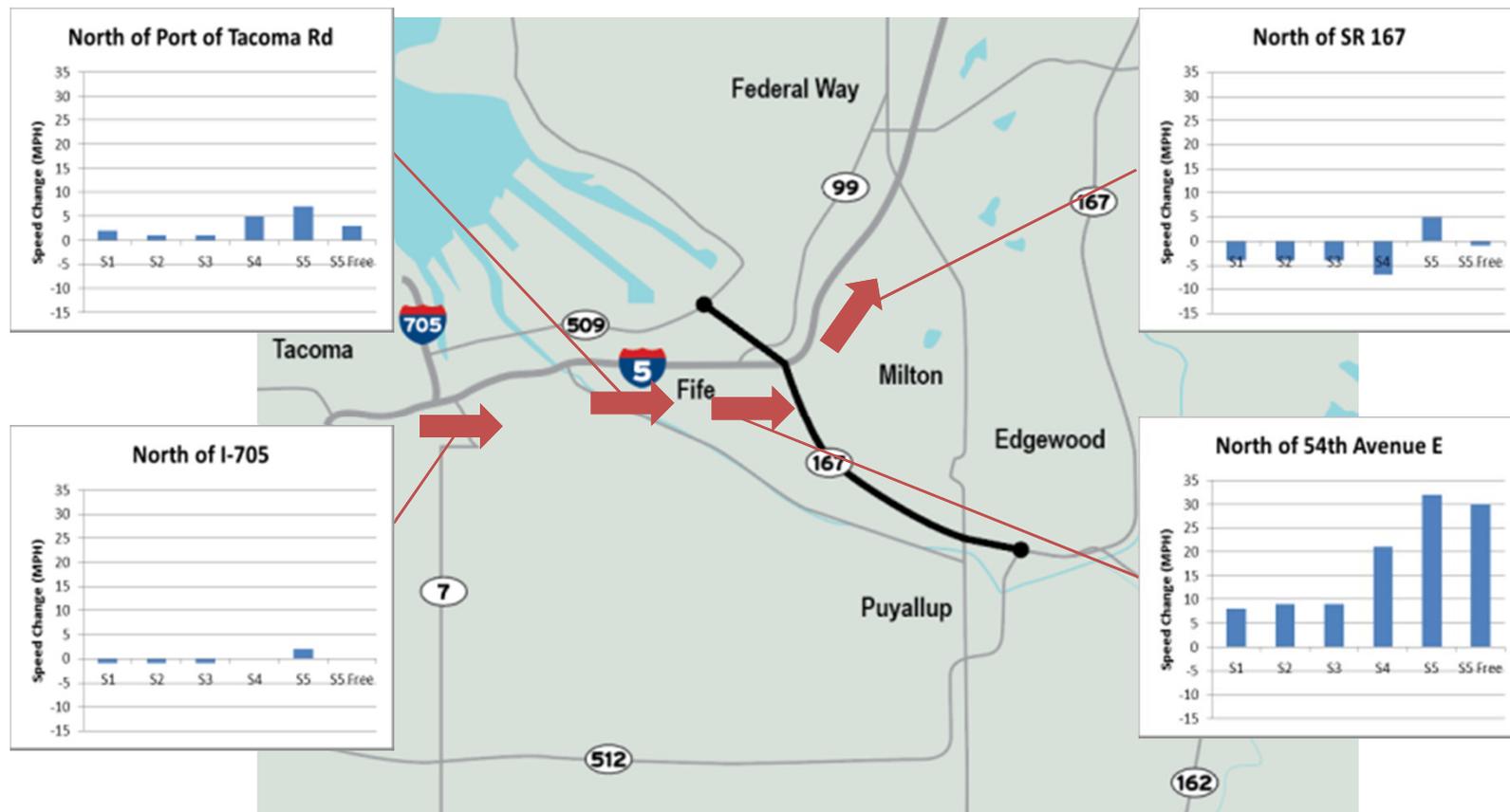
SR 509 Spur: HOV/Bus



Mobility: I-5 Performance

I-5 Performance Northbound AM, 2025

I-5 model projected speeds were evaluated at several screenline locations



Mobility: I-5 Performance

I-5 Performance Southbound PM, 2025

I-5 model projected speeds were evaluated at several screenline locations

I-5 Auto/Freight

Scenario 1:

Scenario 2:

Scenario 3:

Scenario 4:

Scenario 5:

I-5 HOV/Bus

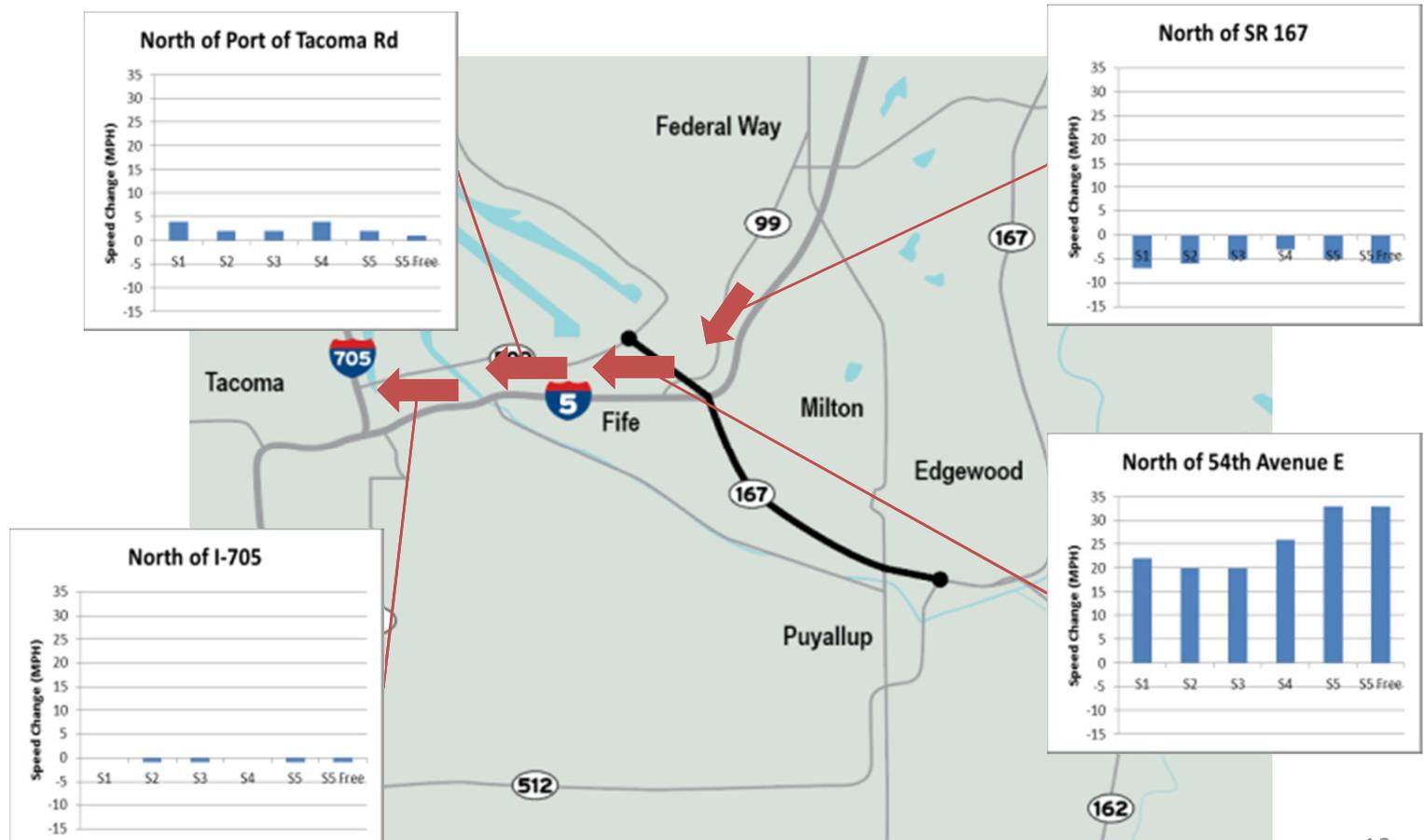
Scenario 1:

Scenario 2:

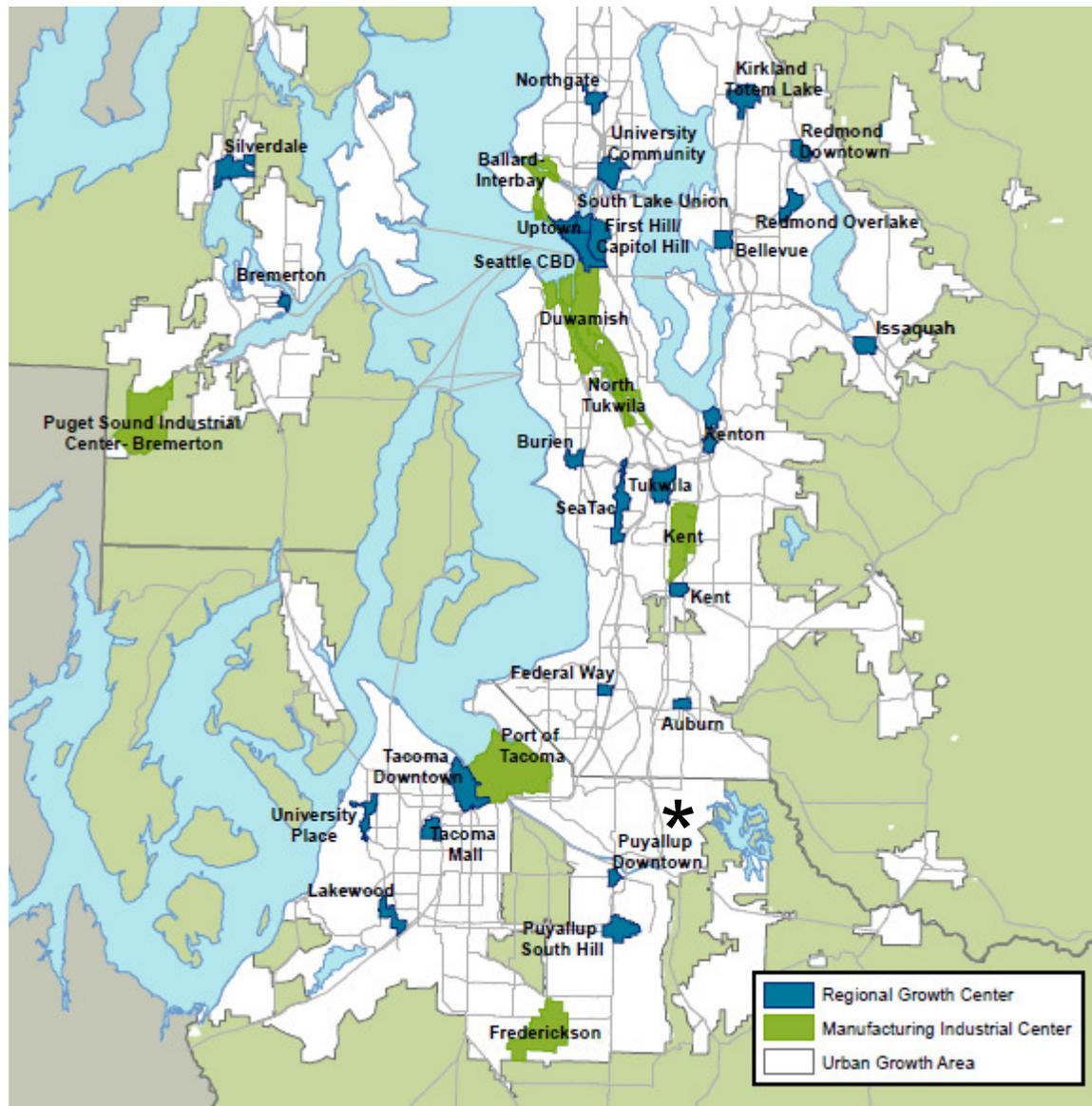
Scenario 3:

Scenario 4:

Scenario 5:



Travel Time Between Centers



- Federal Way
- Auburn
- Sumner/Pacific*
- Puyallup Downtown
- Puyallup South Hill
- Frederickson
- Port of Tacoma
- Tacoma

Mobility: Travel Time Between Centers

Each trip between the 8 centers were evaluated for each scenario, for AM & PM and for 2025 and 2045 to determine where changes occurred compared to no build. Two example charts of time savings in minutes are shown:

2025 S1 PM

2025 PM Scenario 1

	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Frederickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	0.5	1.5	1.5	1.5	1	1.5
Auburn	0		0.5	1	0.5	0	1	1.5
Sumner / Pacific - Proposed	0	0		0	0	0	0.5	0.5
Puyallup Downtown	0	0	0		0	0	0.5	0
Puyallup South Hill	0.5	0	0	0		0	0.5	0
Frederickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	0	0.5	0		+0.5
Tacoma Downtown	0	0	0	0	0	0	0	

2025 S5 PM

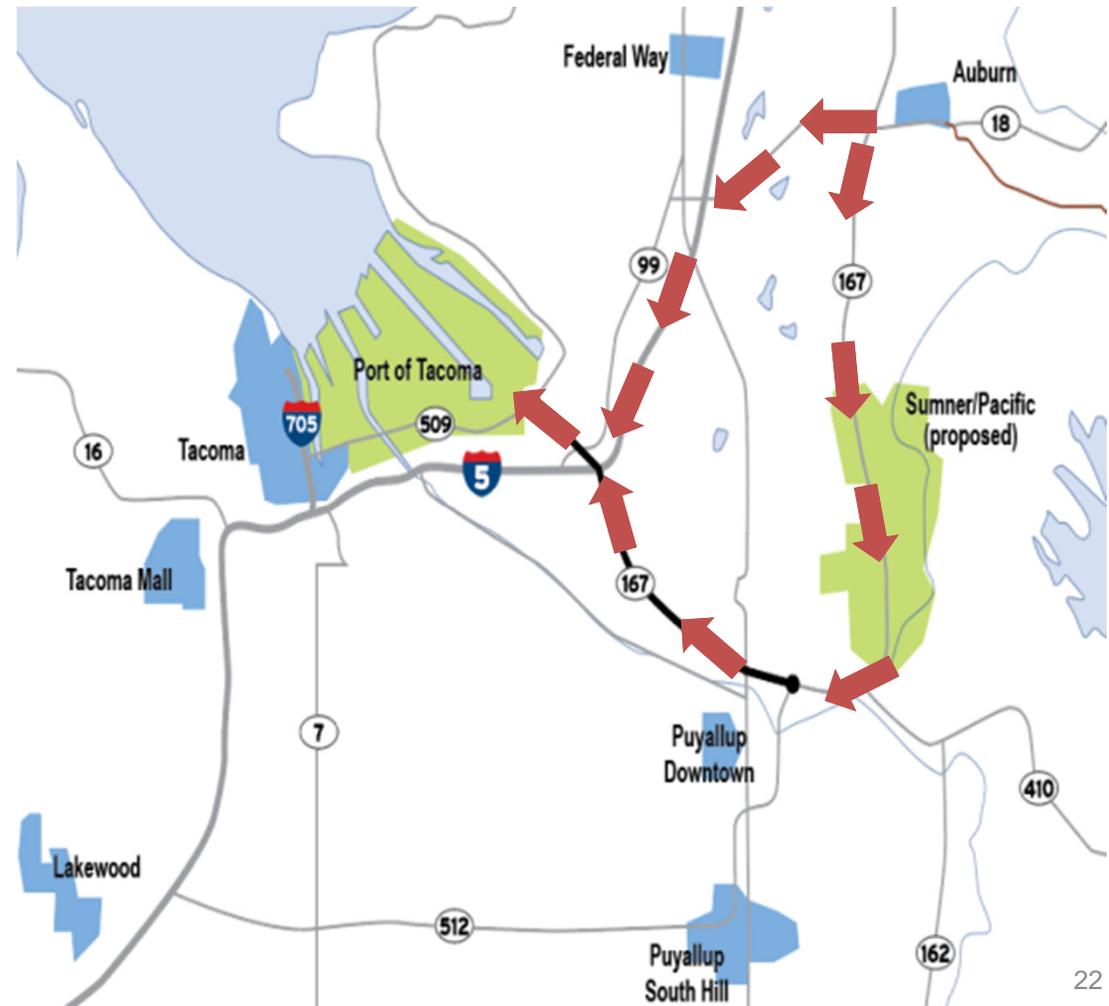
2025 PM Scenario 5

	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Frederickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	1	2.5	2.5	2	1.5	2
Auburn	0		1	2	1.5	0	2	2
Sumner / Pacific - Proposed	0	0		0.5	0.5	0	1	0.5
Puyallup Downtown	1	0	0		0	+0.5	0.5	0
Puyallup South Hill	1	0	0	0		+0.5	0.5	0
Frederickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	1	1.5	0		+0.5
Tacoma Downtown	0	0	0	0.5	0	0	0	

Mobility- Travel Time Between Centers

PM travel time changes between Auburn and the Port of Tacoma versus the No Build condition

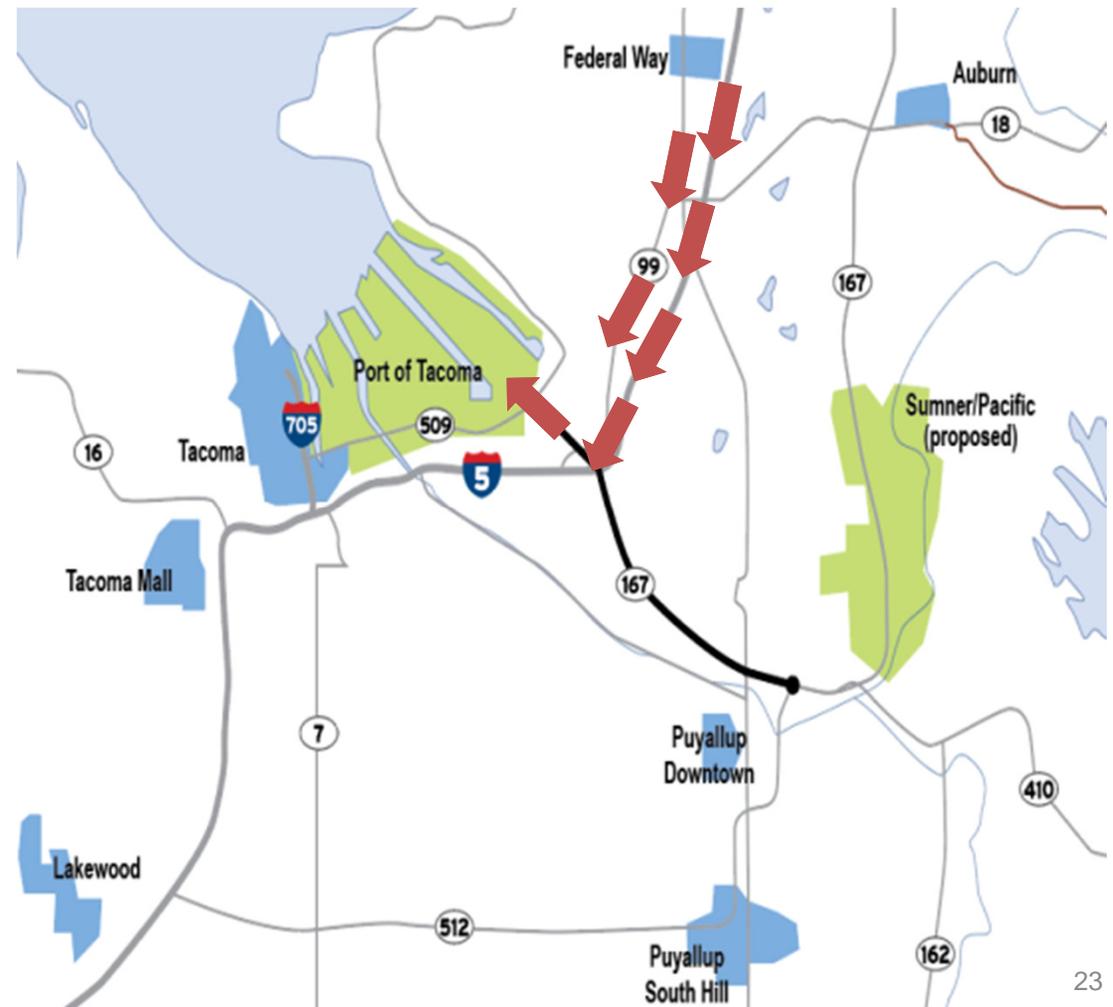
Auburn to Port of Tacoma Travel Time Savings (minutes)		
	2025 PM	2045 PM
S1	↓ 1	↑ 0.5
S2	↓ 1	↑ 0.5
S3	↓ 1	↑ 0.5
S4	↓ 2.5	0
S5	↓ 2	↓ 1
S5 Free	↓ 2	0



Mobility: Travel Time Between Centers

PM Travel time changes between Federal Way and the Port of Tacoma versus the No Build condition

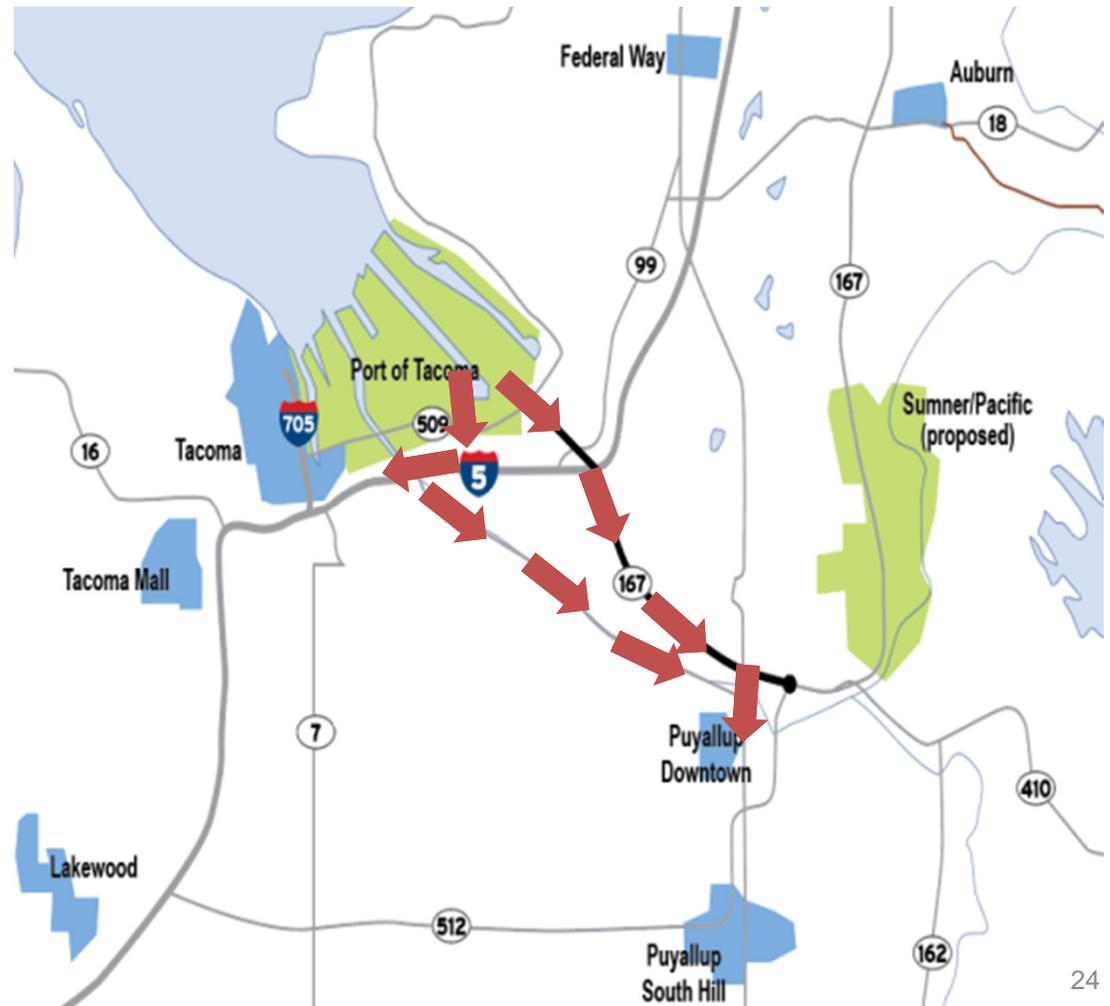
Federal Way to Port of Tacoma Travel Time Savings (minutes)		
	2025 PM	2045 PM
S1	↓ 1	0
S2	↓ 1	↑ 0.5
S3	↓ 1	↑ 0.5
S4	↓ 3	0
S5	↓ 1.5	0
S5 Free	↓ 1.5	↑ 1



Mobility: Travel Time Between Centers

PM Travel time changes between the Port of Tacoma and Puyallup Downtown versus the No Build condition

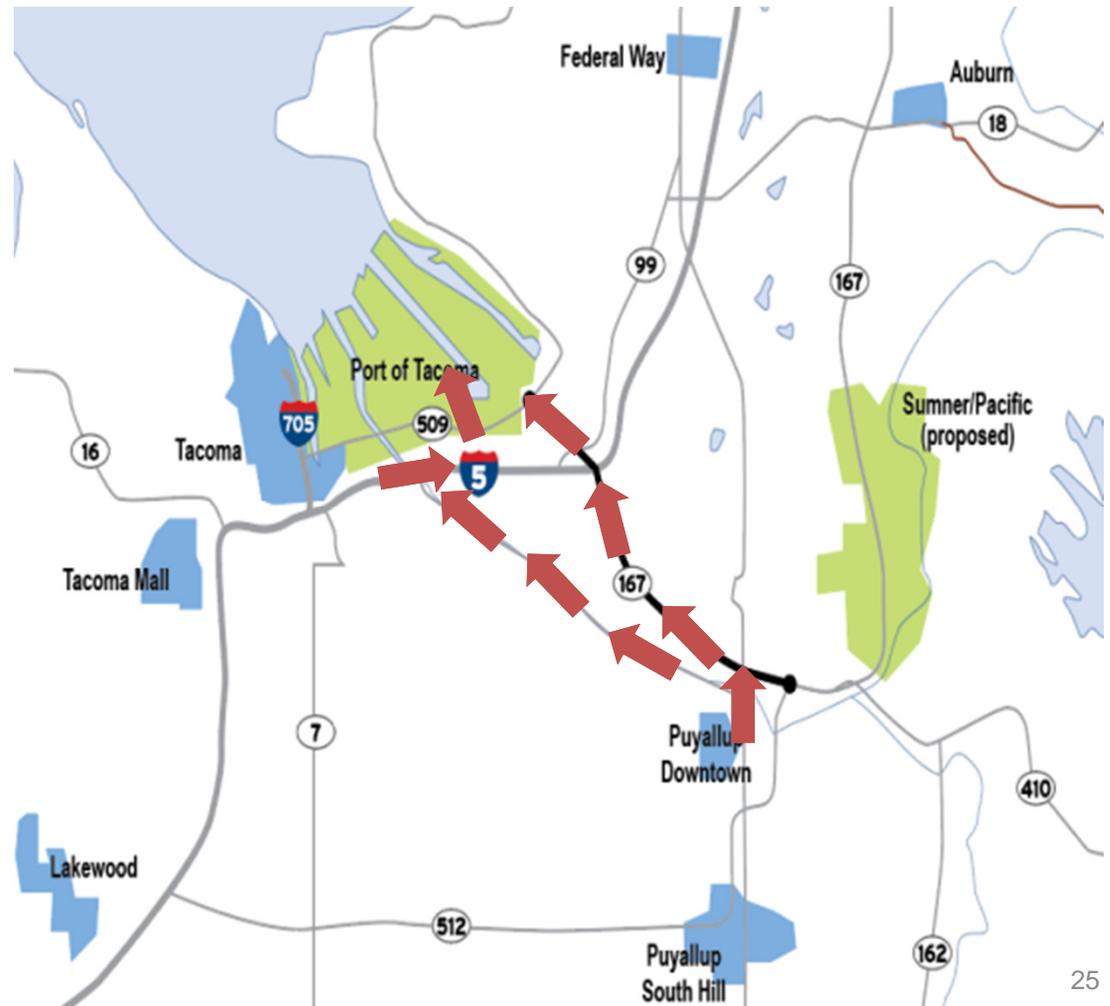
Port of Tacoma to Puyallup Downtown Travel Time Savings (minutes)		
	2025 PM	2045 PM
S1	0	↓ 0.5
S2	↓ 0.5	↓ 2
S3	↓ 1	↓ 2
S4	↓ 1	↓ 3
S5	↓ 1	↓ 2.5
S5 Free	↓ 2.5	↓ 4



Mobility: Travel Time Between Centers

AM Travel time changes between Puyallup Downtown and the Port of Tacoma versus the No Build condition

Puyallup Downtown to the Port of Tacoma Travel Time Savings (minutes)		
	2025 AM	2045 AM
S1	0	↓ 1
S2	↓ 0.5	↓ 0.5
S3	↓ 0.5	↓ 0.5
S4	↓ 0.5	↓ 1
S5	↓ 1	↓ 1
S5 Free	↓ 2	↓ 2



Mobility: Travel Time Between Centers

Each trip between the 8 centers were evaluated for each scenario, for AM & PM and for 2025 and 2045 to determine where changes occurred compared to no build. Two example charts of time savings in minutes are shown:

2025 S1 PM

2025 PM Scenario 1

	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Frederickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	0.5	1.5	1.5	1.5	1	1.5
Auburn	0		0.5	1	0.5	0	1	1.5
Sumner / Pacific - Proposed	0	0		0	0	0	0.5	0.5
Puyallup Downtown	0	0	0		0	0	0.5	0
Puyallup South Hill	0.5	0	0	0		0	0.5	0
Frederickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	0	0.5	0		+0.5
Tacoma Downtown	0	0	0	0	0	0	0	

2025 S5 PM

2025 PM Scenario 5

	Federal Way	Auburn	Sumner / Pacific - Proposed	Puyallup Downtown	Puyallup South Hill	Frederickson	Port of Tacoma	Tacoma Downtown
Federal Way		0	1	2.5	2.5	2	1.5	2
Auburn	0		1	2	1.5	0	2	2
Sumner / Pacific - Proposed	0	0		0.5	0.5	0	1	0.5
Puyallup Downtown	1	0	0		0	+0.5	0.5	0
Puyallup South Hill	1	0	0	0		+0.5	0.5	0
Frederickson	1	0	0	0	0		0.5	0
Port of Tacoma	0	0	0	1	1.5	0		+0.5
Tacoma Downtown	0	0	0	0.5	0	0	0	

Auto/Freight

Scenario 1:

Scenario 2:

Scenario 3:

Scenario 4:

Scenario 5:

HOV/Bus

Scenario 1:

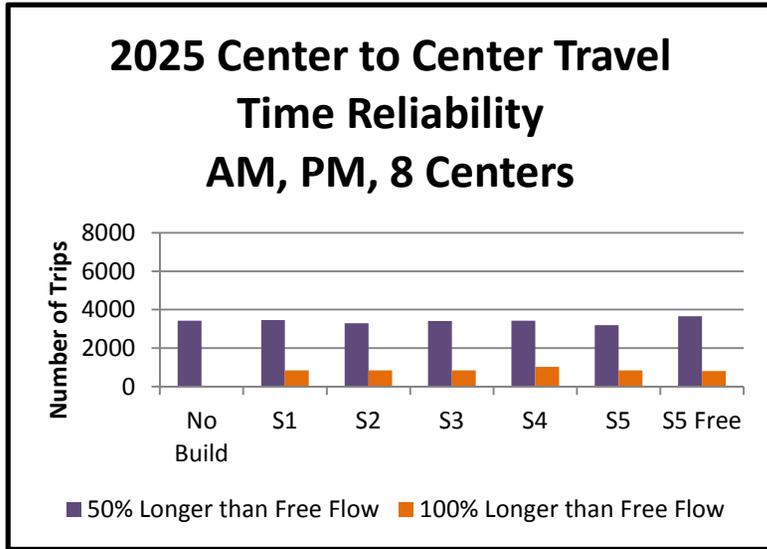
Scenario 2:

Scenario 3:

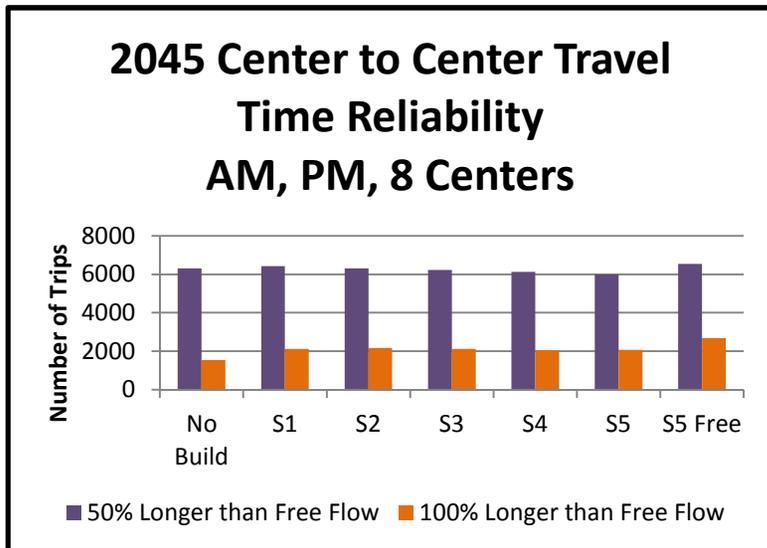
Scenario 4:

Scenario 5:

Mobility: Reliability Between Centers



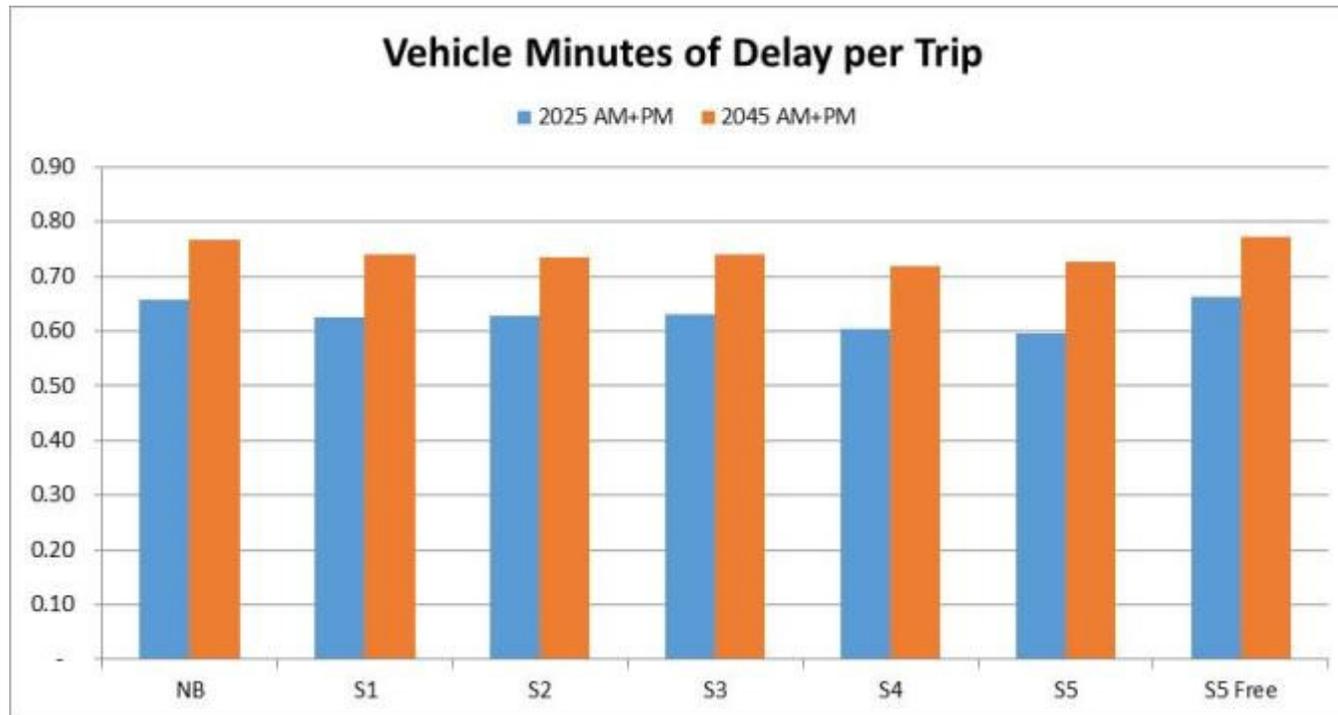
- Travel time 50% longer than free flow and twice as long as free flow were evaluated
- Results of all trip pairs



- Scenario 1: Moderate
- Scenario 2: Moderate
- Scenario 3: Moderate
- Scenario 4: Moderate
- Scenario 5: Moderate

Mobility: Subarea Delay

Total vehicle hours of delay (VHD) were evaluated for the South subarea



Auto/Freight

Scenario 1:

Scenario 2:

Scenario 3:

Scenario 4:

Scenario 5:

HOV/Bus

Scenario 1:

Scenario 2:

Scenario 3:

Scenario 4:

Scenario 5:

Economic Vitality – Economic Benefit

We conducted a qualitative comparison of model benefits and consideration of costs. Scenarios were evaluated compared to each other.

A quantitative benefit/cost analysis will be conducted later.

Scenario 1: Fair 

Scenario 2: Fair 

Scenario 3: Fair 

Scenario 4: Moderate 

Scenario 5: Fair 

Economic Vitality: Comprehensive Land Use Planning and Development

How did we measure how scenarios support local and regional comprehensive land use planning and development?

Evaluated each alternative based on connections between the Urban and Manufacturing Industrial Centers and local land use.

Scenario 1: Fair 

Scenario 2: Moderate 

Scenario 3: Moderate 

Scenario 4: Good 

Scenario 5: Very Good 

Scenario 1 received a “fair” because it didn’t provide as many connections and opportunities.

Scenario 5 received rating of very good because it provided the maximum level connections, intersections and linkages.

Safety: Number of Serious and Fatal Crashes

Assessment of the changes in crashes on the highway sections.

Scenario 1: Fair 

Scenario 2: Fair 

Scenario 3: Fair 

Scenario 4: Good 

Scenario 5: Very Good 

The ability to reduce backups onto I-5 due to queueing off ramps will improve safety. New onramp connections to I-5 have the potential to increase crashes due to merging.

Essential Performance Metrics

Scenario Comparison Table - SR 167 Completion Project

Performance Category 	Baseline Performance Metrics																	
	Mobility												Economic Vitality	Safety				
Mode 	Auto / Freight HOV / Bus	Auto / Freight HOV/Bus	Auto / Freight HOV/Bus	Auto / Freight HOV/Bus	Auto / Freight HOV/Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus	Auto / Freight HOV / Bus			
Performance METRIC 	SR 167 Performance Maintain or Improve SR 167 Operations between SR 161 and I-5		SR 509 Spur Performance Maintain or Improve SR 509 Spur Operations between I-5 and SR 509		I-5 Performance Maintain or Improve I-5 Operations between I-705 and SR 18		Travel Time Reduce travel time between Urban Centers, and Manufacturing Industrial Centers in Pierce & S. King County		Travel Time Reliability Improve travel time reliability between Urban Centers, and Manufacturing Industrial Centers in Pierce & S. King County		Complete Freeway Network / Redundancy Achieved	Delay Reduce hours of delay in subarea network	Economic Benefit Improve economic vitality	Local and Regional Comprehensive Plan Support local and regional comprehensive land use planning and development	Safety # of Serious Injury and Fatal Crashes (I-5 & SR 167 & SR 509)			
SCENARIO																		
No Build																		
Scenario 1 - Closing the Gap																		
Scenario 2 - Limited Connectivity																		
Scenario 3 - Gateway Connectivity																		
Scenario 4 - Moderate Connectivity																		
Scenario 5 - Full Build Out +																		

Contextual Performance Metrics

- Reduce the number of serious injury and fatal crashes on local arterials
- Reduce pedestrian vehicle exposure
- Improve continuity and consistency of pedestrian and bicycle facilities
- Reduce area of impact to sensitive areas
- Maintains forward compatibility with future highway widening
- Reduce right of way impact
- Compatibility with Transit Long Range Plans

Safety – Serious and Fatal Crashes on Local Arterials

How did we measure “Number of serious injury and fatal crashes on local arterials”?

The relative shift of trips off the local street system was viewed favorably as the decrease in volumes yield a decrease in crash frequency.

- Scenario 1: Fair 
- Scenario 2: Moderate 
- Scenario 3: Good 
- Scenario 4: Very Good 
- Scenario 5: Very Good 

Active Mobility – Reduce Pedestrian/Vehicle Exposure

How did we measure how scenarios “Reduce pedestrian vehicle exposure”?

We evaluated improvements made to pedestrian crossings at interchanges along the corridor with the relative shift in volumes from the local system onto the proposed Scenario.

Scenario 1: Fair 

Scenario 2: Moderate 

Scenario 3: Good 

Scenario 4: Very Good 

Scenario 5: Very Good 

Mobility – Improve Pedestrian & Bicycle Facilities

How did we measure how scenarios “Improve continuity and consistency of pedestrian and bicycle facilities”?

We looked at the number of ramp crossings that pedestrians and bicyclists need to make to navigate across an interchange.

Scenario 1: Good 

Scenario 2: Moderate 

Scenario 3: Moderate 

Scenario 4: Good 

Scenario 5: Good 

Environment – Reduce Impact to Sensitive Areas

How did we measure “Reduce area of impact to sensitive areas”?

We evaluated the proposed Scenario footprint against the Wetlands within the project area on whether their design minimized potential impacts.

Scenario 1: Good 

Scenario 2: Moderate 

Scenario 3: Fair 

Scenario 4: Fair 

Scenario 5: Poor 

Other – Forward Compatibility

How did we measure “Forward Compatibility”?

For Forward Compatibility, we looked at right of way, structure width, and compatibility with future highway widening.

Scenario 1: Good 

Scenario 2: Moderate 

Scenario 3: Moderate 

Scenario 4: Good 

Scenario 5: Very Good 

Other – Right of Way Impacts

How did we measure how scenarios “Reduce right of way impacts”?

Reducing right of way impacts reduces impacts on the community and reserves more property for economic development and housing in an important urban area. Generally narrower footprint scored better.

Scenario 1: Good 

Scenario 2: Moderate 

Scenario 3: Moderate 

Scenario 4: Fair 

Scenario 5: Poor 

Other – Compatibility with Transit Long Range Plans

How did we measure “Compatibility with Transit Long Range Plans”?

We reviewed how the scenarios interact with the proposed Sound Transit ST 3 package and Pierce Transits Designation 2040 Long Range Plan. Scenarios that provided greater connectivity to the local system generally scored higher.

Scenario 1: Fair 

Scenario 2: Moderate 

Scenario 3: Moderate 

Scenario 4: Good 

Scenario 5: Very Good 

Contextual Performance Metrics

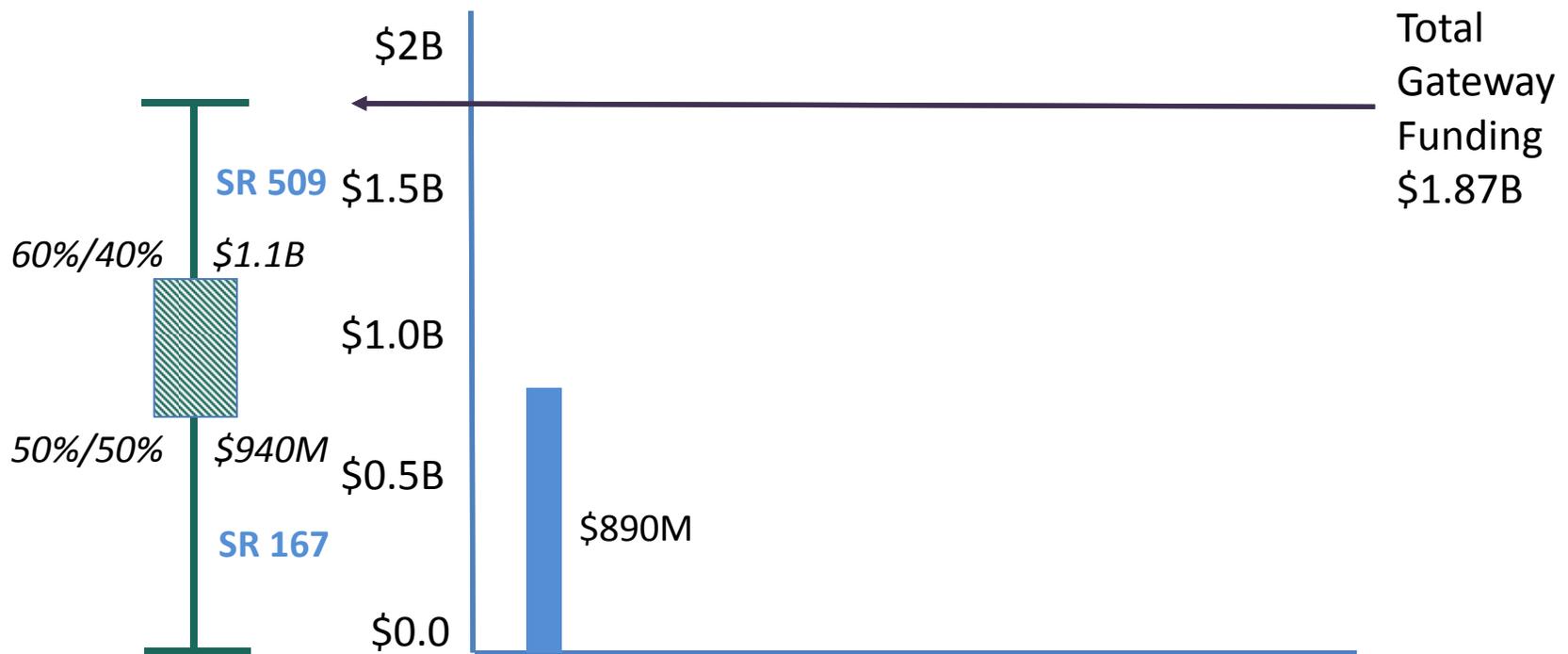
Date: 6/13/16

Contextual Performance Metrics								
Safety	Active Mobility				Env't	Other		
	Ped	Biike	Ped	Biike				
Safety # of Serious injury and fatal crashes on local arterials								
Number and location of Crossings Reduce Pedestrian vehicle exposure by reducing traffic volumes								
Continuity and Consistency of Pedestrian facility Improve Pedestrian & Bicyclda continuity along new comdor								
Sensitive Area Impact Reduce area of impact to sensitive areas								
Forward Compatibility								
Right of Way Impact Reduce Right of Way Impact								
Compatibility With Transit Long Range Plans								

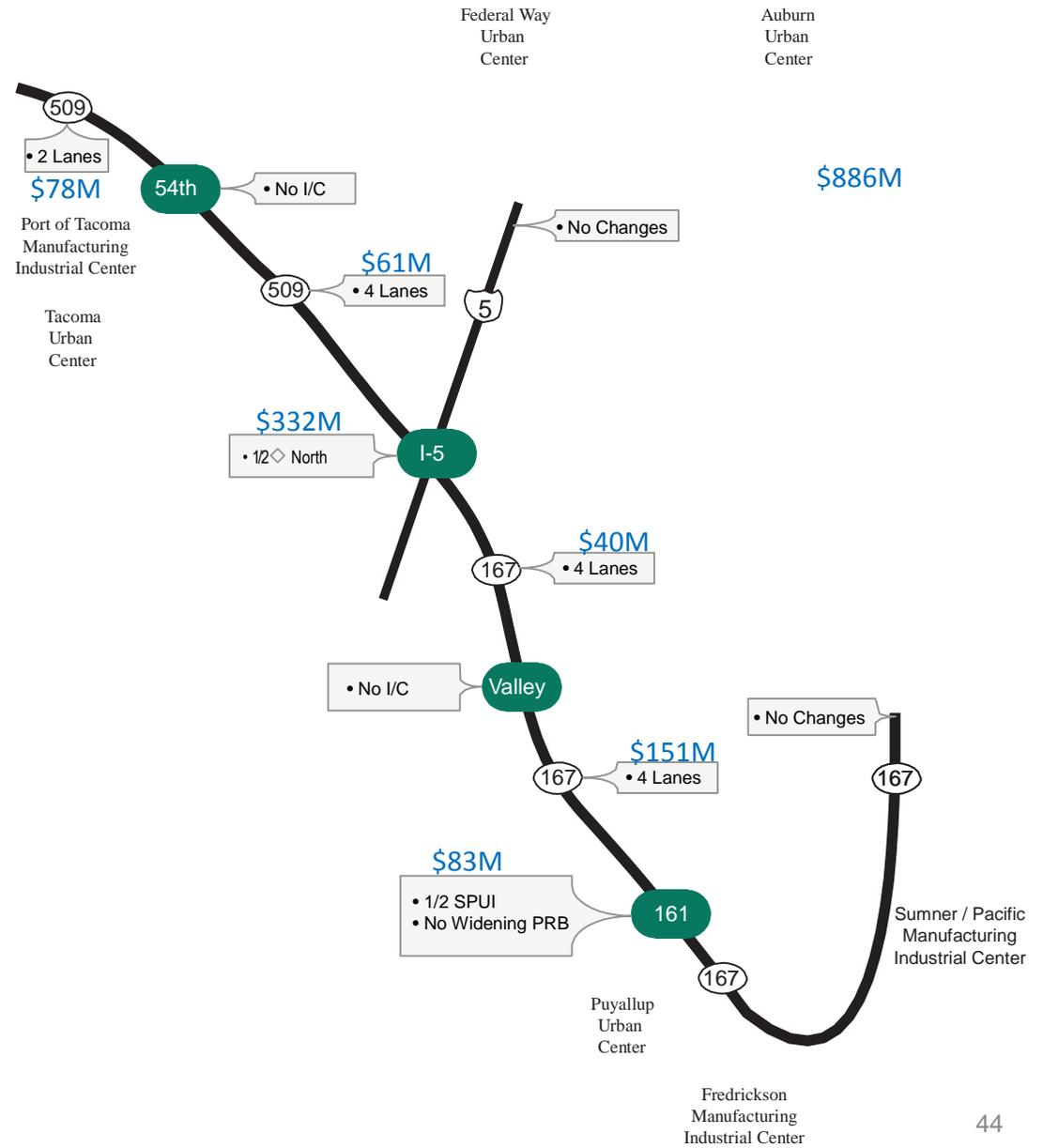
Preliminary Cost Review

- Costs are developed based on major items (bridges, earthwork, drainage, pavement, ITS) that can be estimated directly.
- Programmatic costs are consistent across all scenarios.
- Project development costs are based on a percentage of the scenario construction cost estimate.
- Assumptions included using a base year of 2016
 - PE estimates inflated to December 2019
 - Right of Way estimates inflated to July 2021
 - Construction estimates inflated to October 2025
- 7% risk applied to address events and project unknowns.

Scenario 1: Closing the Gap



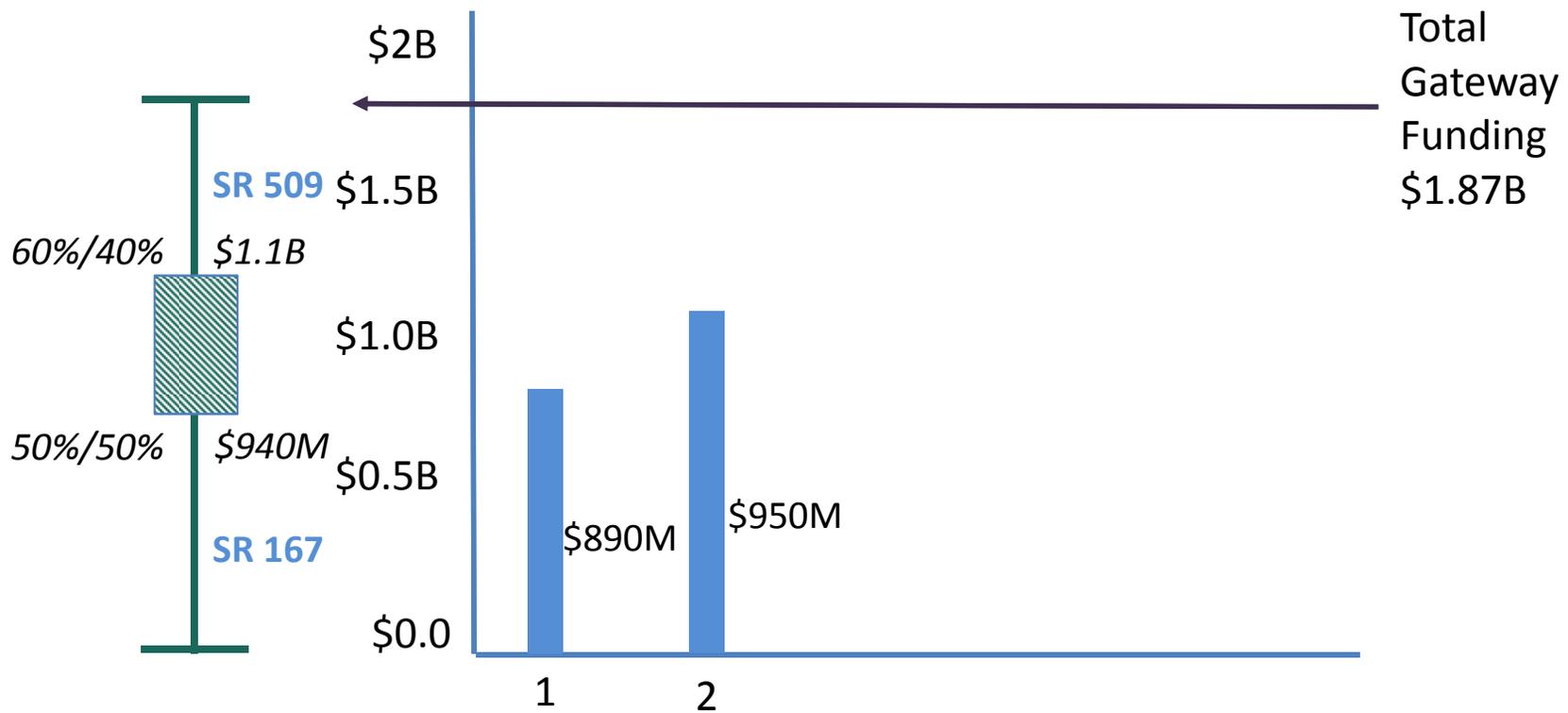
Scenario 1: Closing the Gap



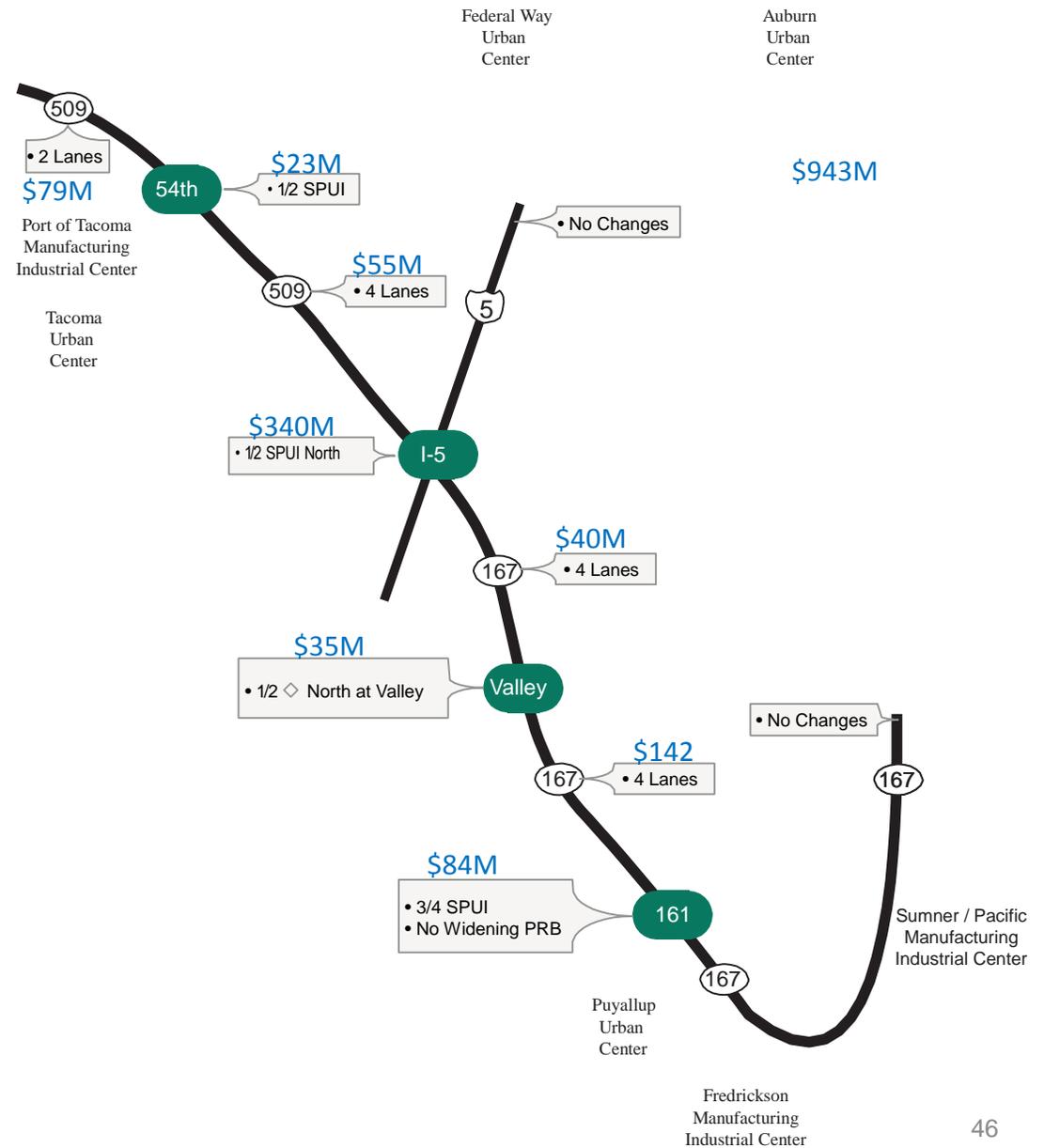
Other Items Total \$141M

- Interurban Trail
- Early Mitigation Phase 1
- Early Mitigation Phase 2
- Toll System

Scenario 2: Limited Connectivity



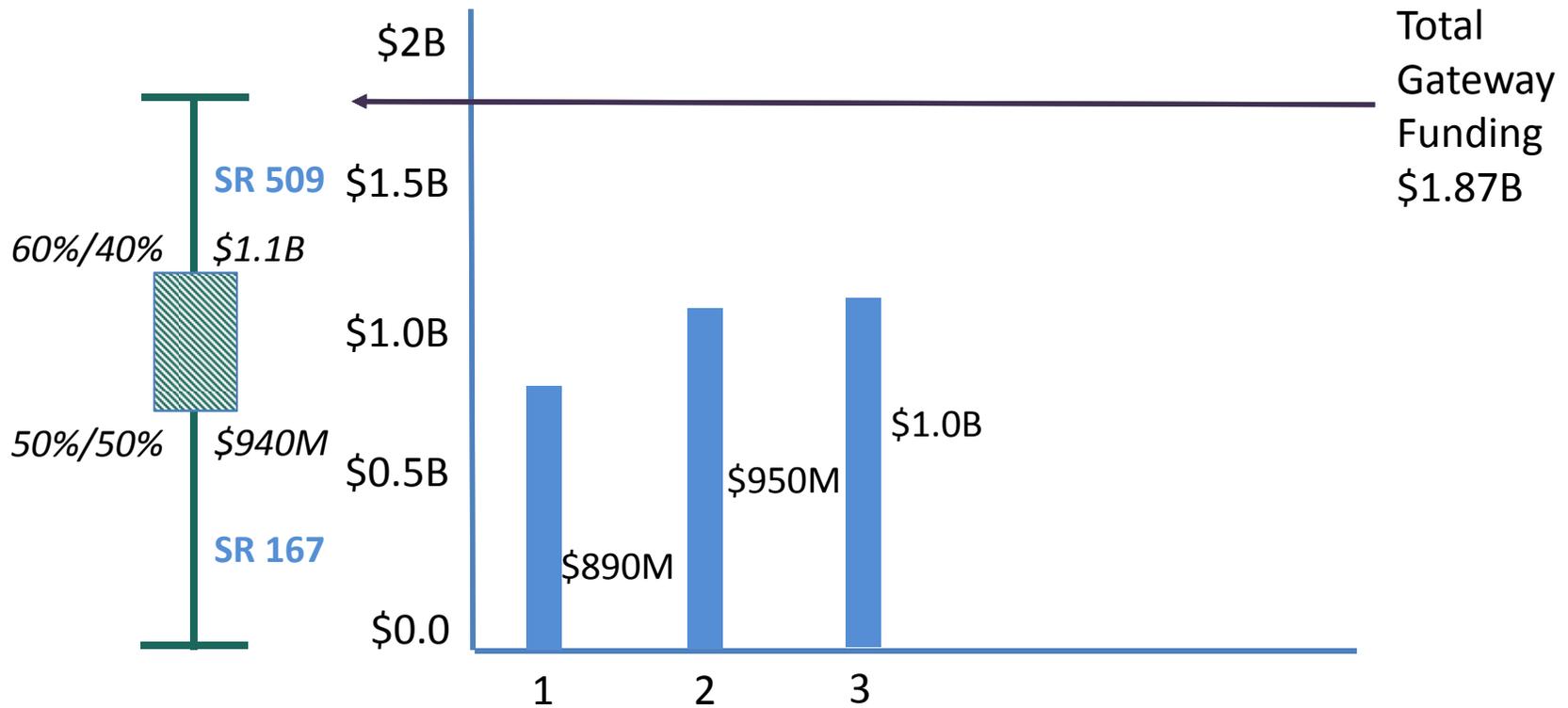
Scenario 2: Limited Connectivity



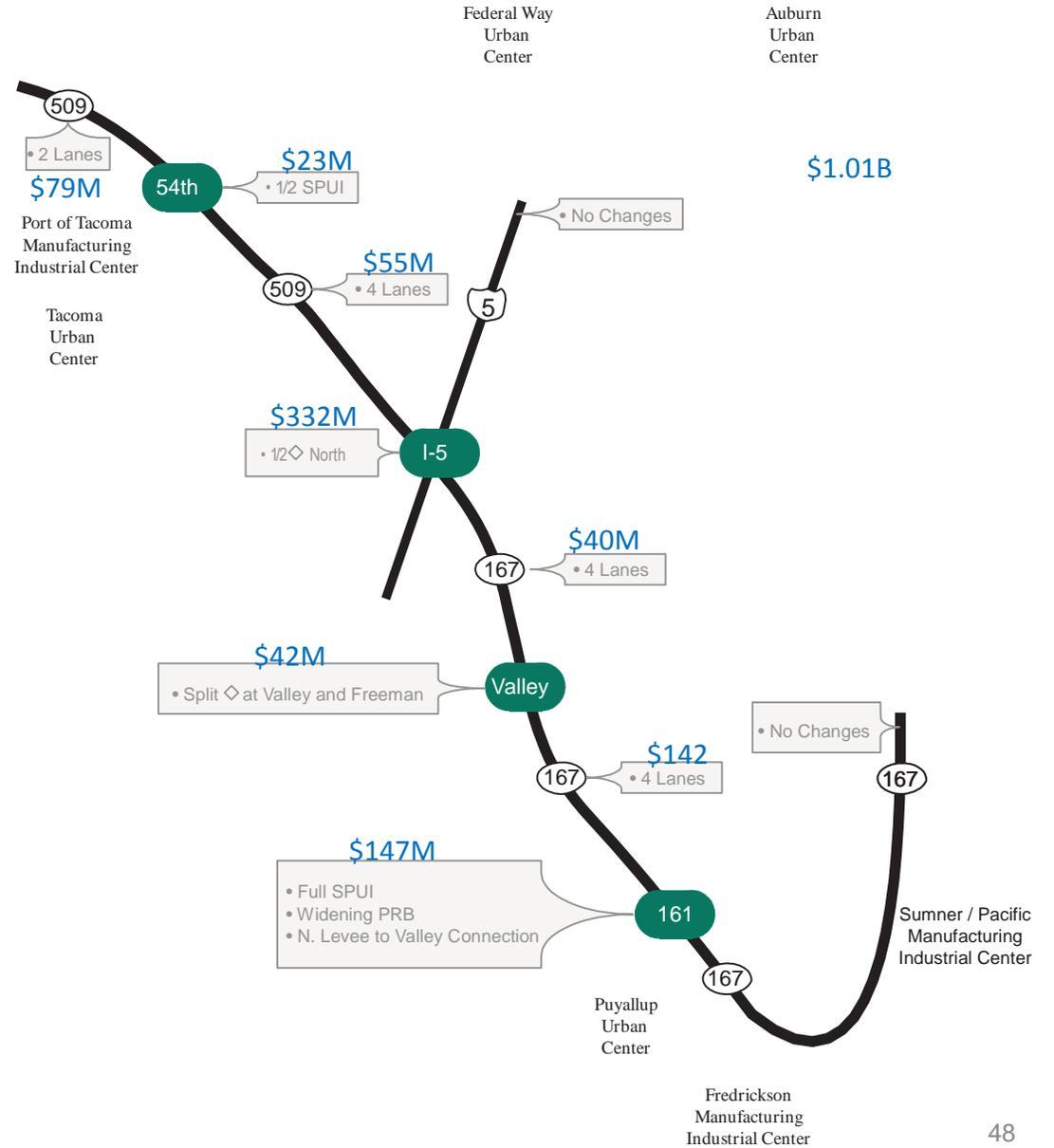
Other Items Total **\$145M**

- Interurban Trail
- Early Mitigation Phase 1
- Early Mitigation Phase 2
- Toll System

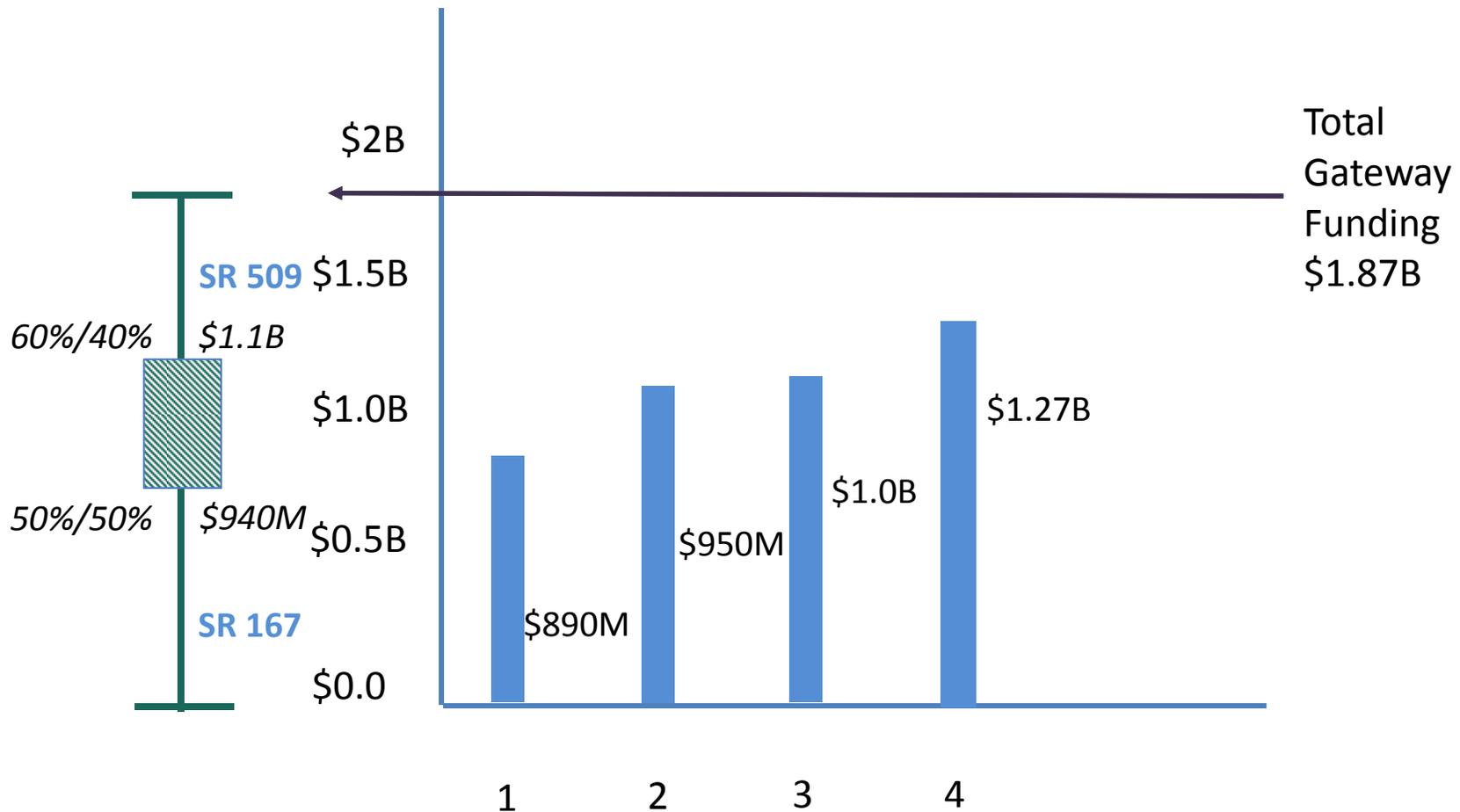
Scenario 3: Gateway Connectivity



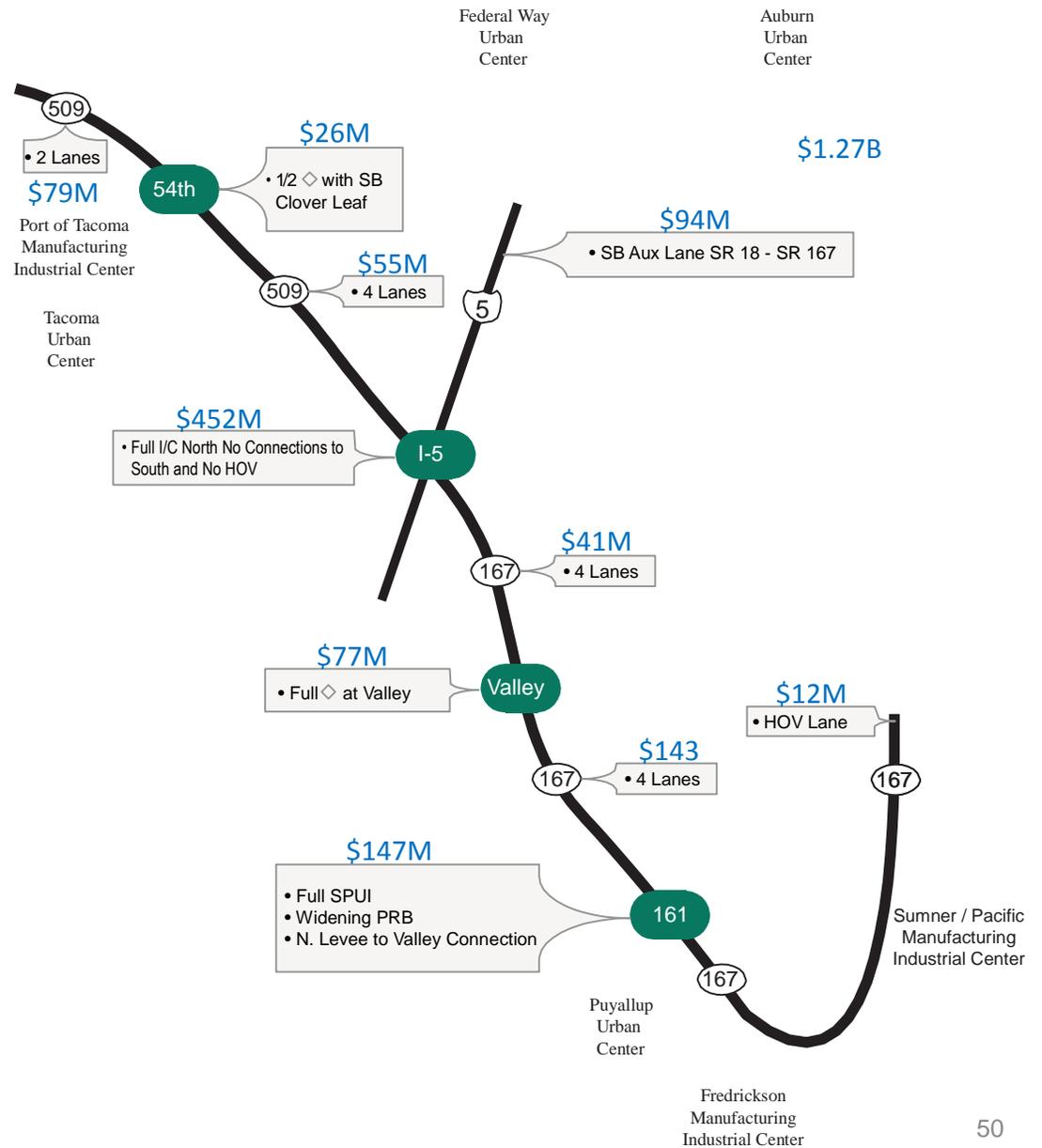
Scenario 3: Gateway Connectivity



Scenario 4: Moderate Connectivity



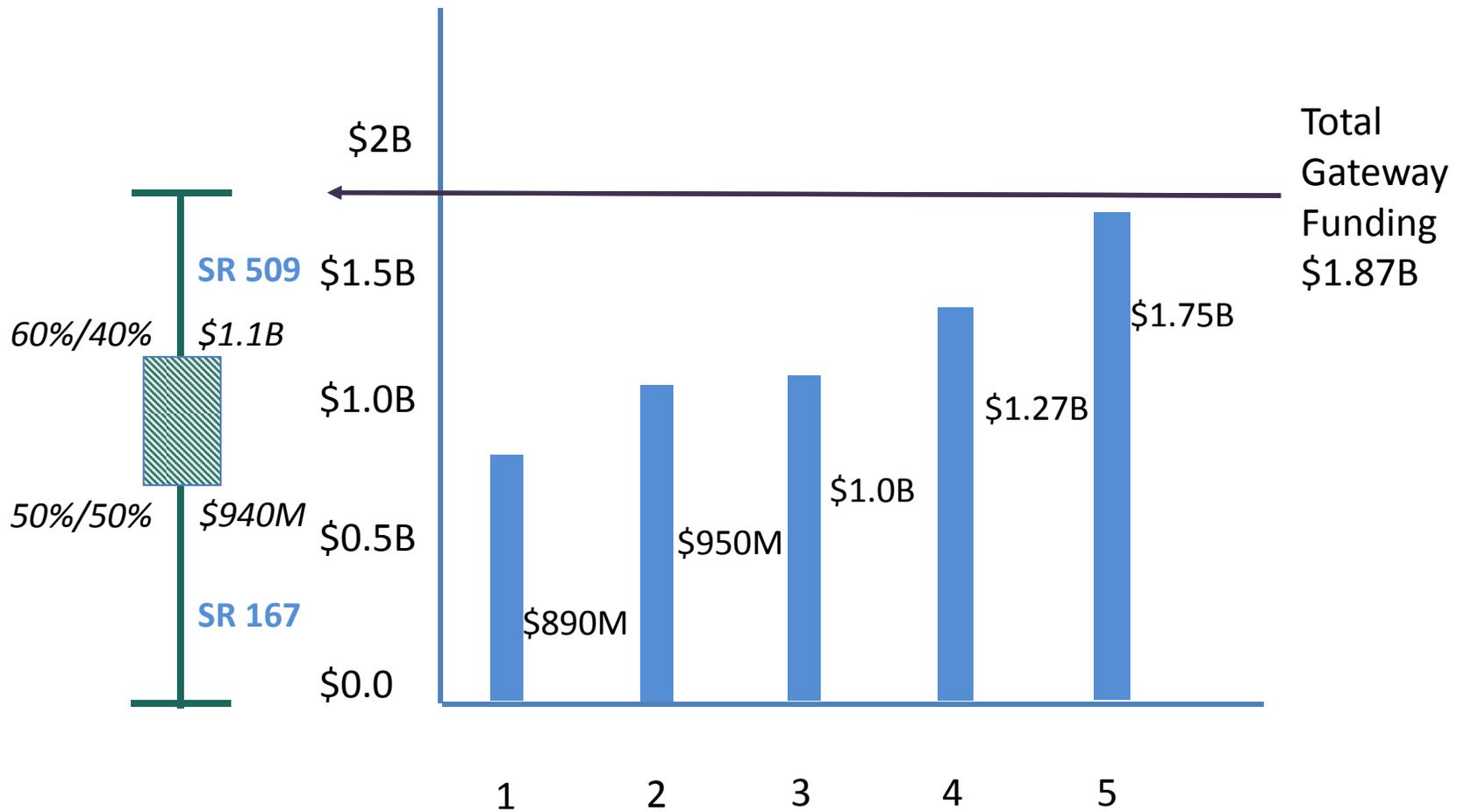
Scenario 4: Moderate Connectivity



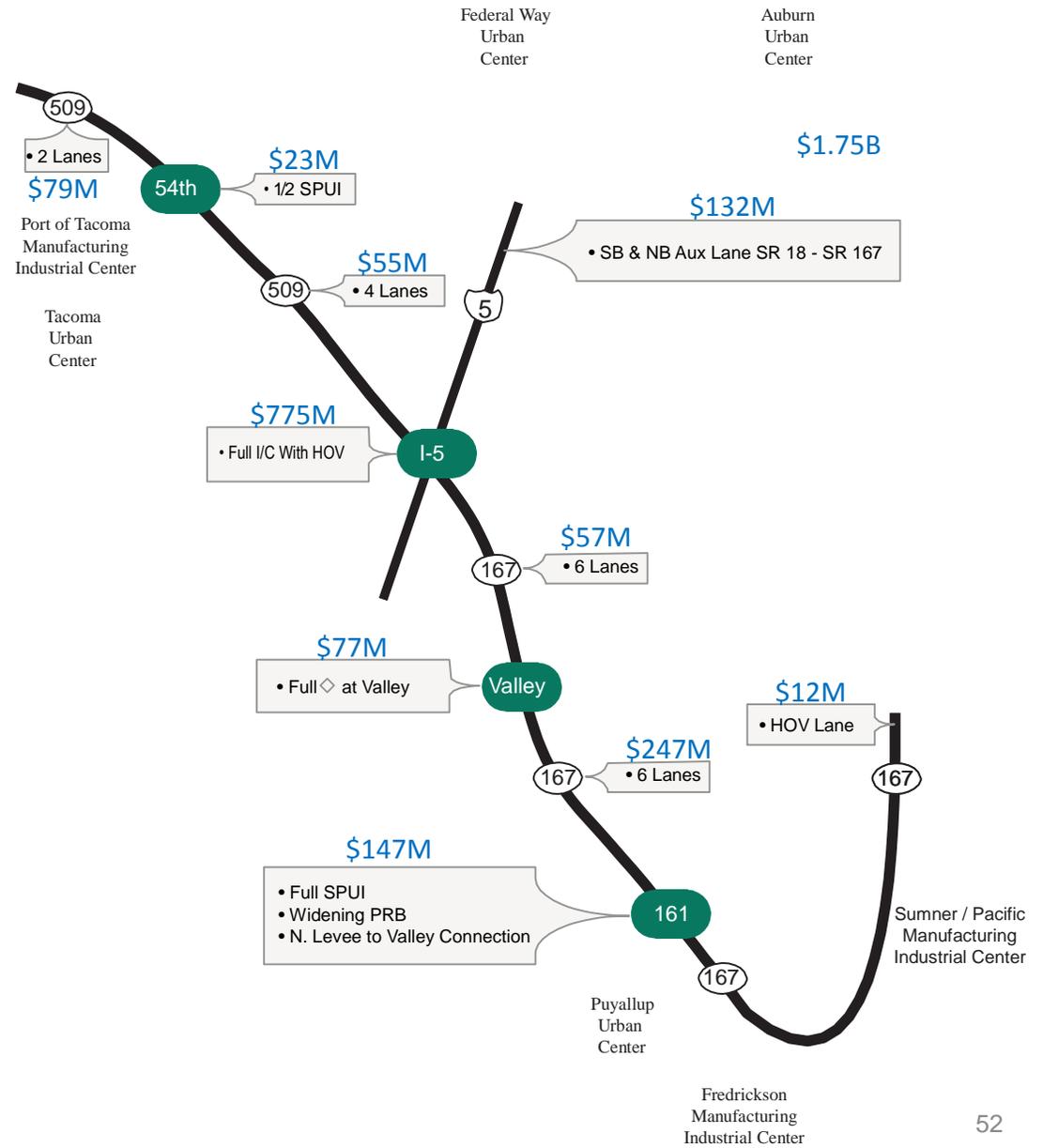
Other Items Total **\$145M**

- Interurban Trail
- Early Mitigation Phase 1
- Early Mitigation Phase 2
- Toll System

Scenario 5: Full Build Out +



Scenario 5: Full Build Out +



Other Items Total \$145M

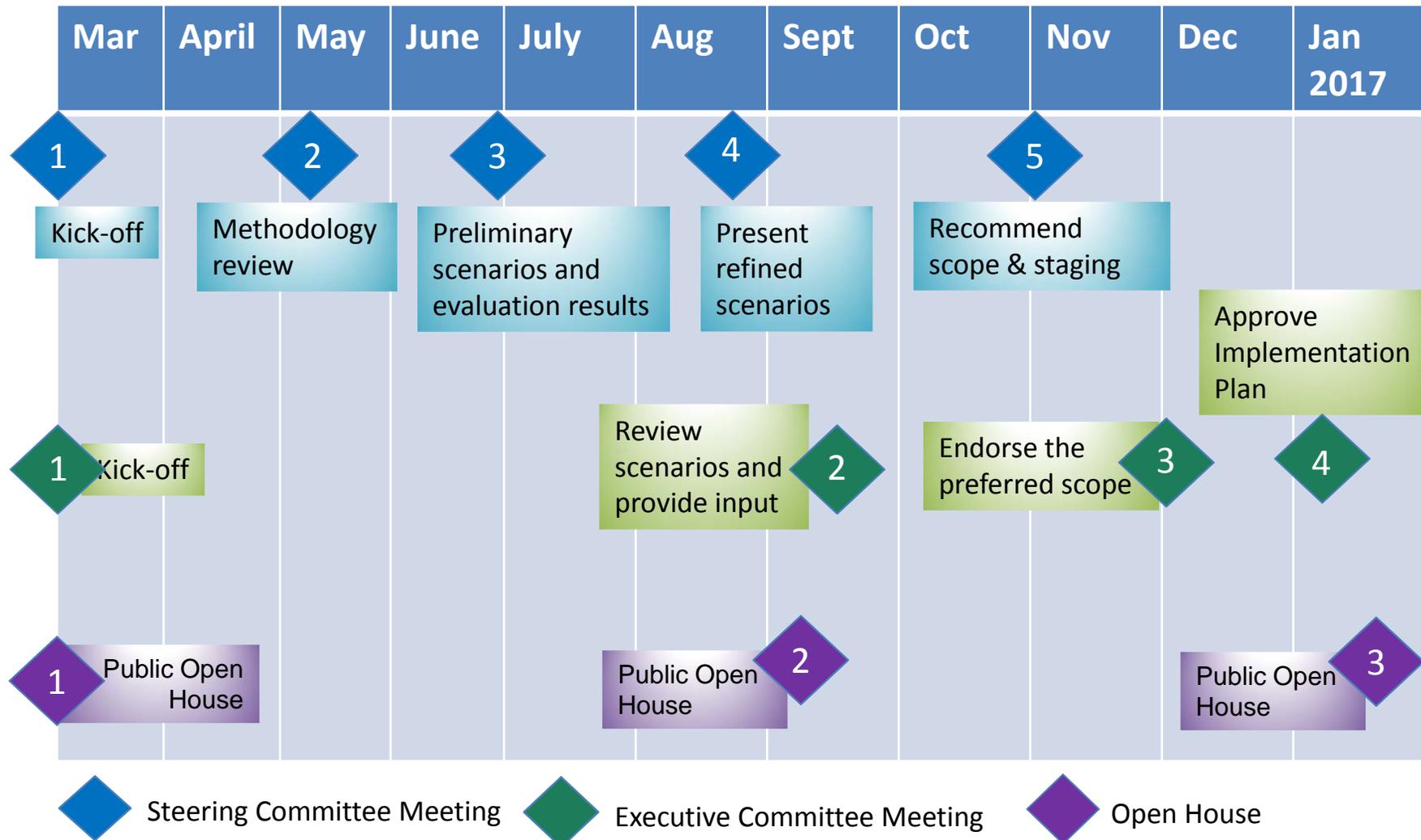
- Interurban Trail
- Early Mitigation Phase 1
- Early Mitigation Phase 2
- Toll System

Performance Evaluation Results – Key Takeaways

Key areas where scenarios differed in performance:

- Scenarios 1, 2 & 3 do not perform as well 4 & 5
- Traffic performance of Scenarios 2 and 3 are similar
- Traffic performance of Scenarios 4 and 5 are similar
- Scenario 4 is nearly 70% of Gateway Program budget while Scenario 5 accounts for over 90%
- Travel demand macro model will be supplemented with a more detailed model to evaluate the refined Scenarios.

Project Schedule (SR 167)



Key Questions for Refinement

- SR 167 mainline prism
- Tolls
- Managed lanes
- Forward compatibility
- Effects to I-5
- Connectivity
- Port of Tacoma Access

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