PORT OF TACOMA BRIDGE AND ROAD PRIORITIES TECHNICAL APPENDIX

DATE: November 2, 2022

TO: Port Commission

SUBJECT: Port of Tacoma Bridge and Road Priorities Technical Appendix

A. SYNOPSIS

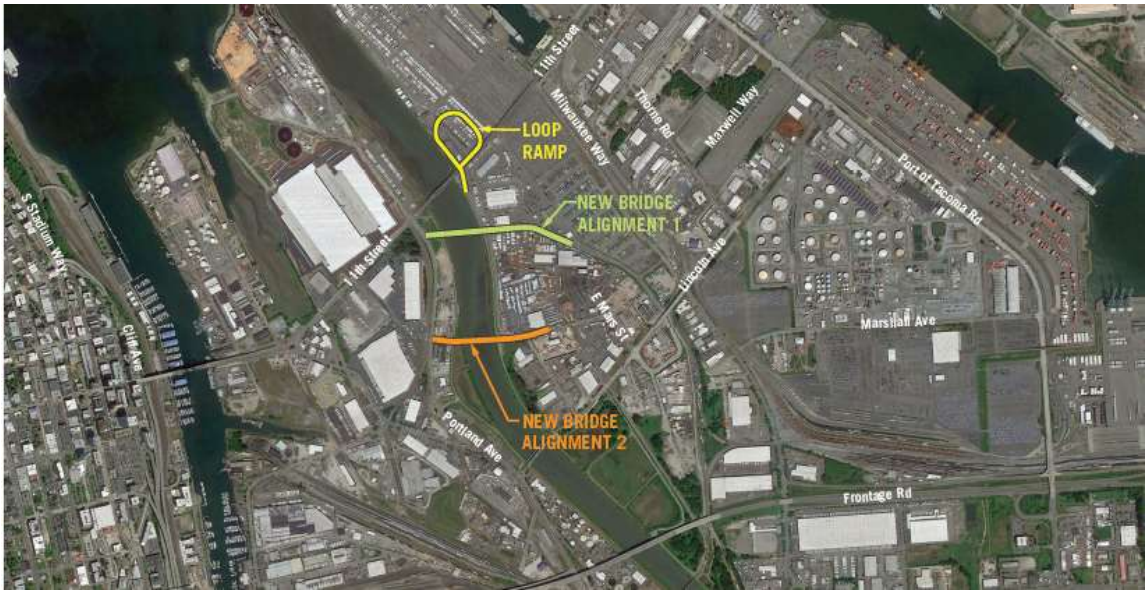
This appendix provides additional information intended to support the Commission's discussion of the proposed Port of Tacoma Bridge and Road Priorities.

B. PREVIOUSLY PROVIDED INFORMATION

East 11th Street Bridge Corridor Study

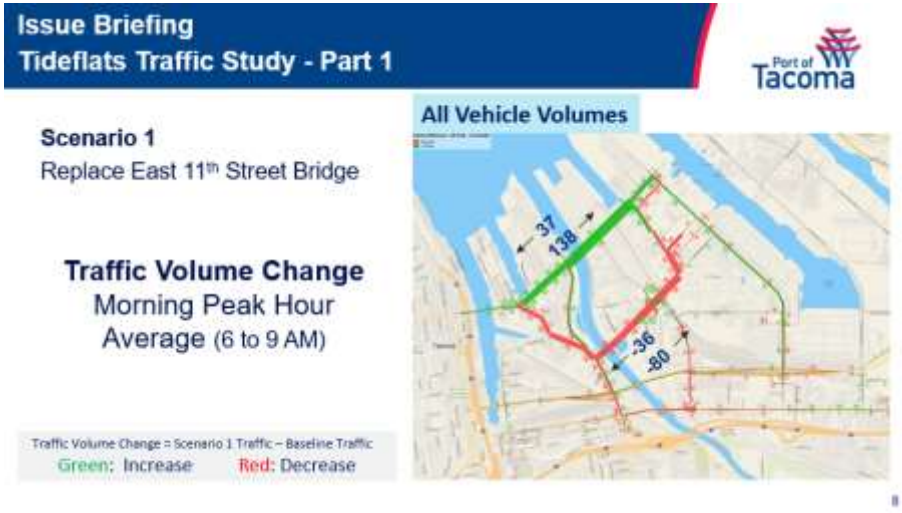
The analysis of the 11th Street Bridge project was designed to build on the results of a previous study carried out by the City of Tacoma, with a POT $25,000 contribution and staff participation. Staff briefed the Commission on September 17, 2020 and September 24, 2020.

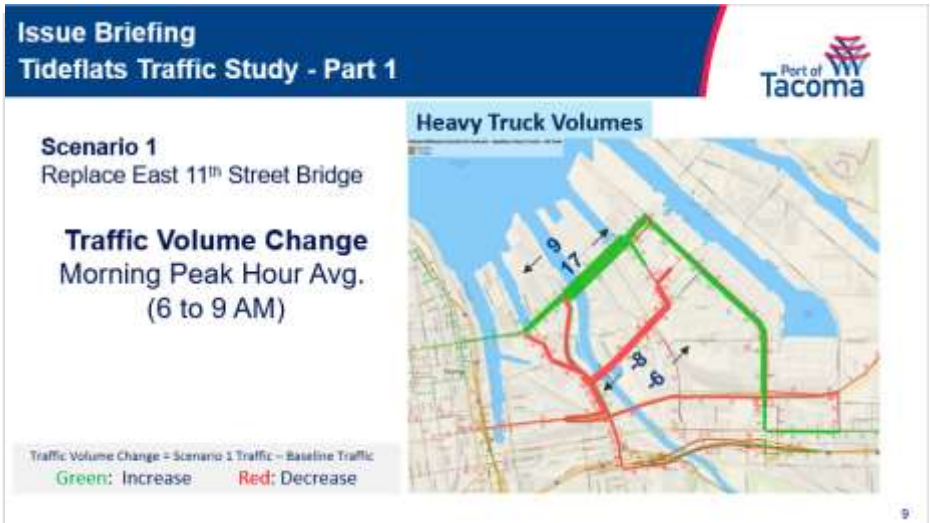
A quick recap of the East 11th Street Bridge Corridor Study: It evaluated 10 different replacement options for the bridge, resulting in the decision that a replacement of the bridge and viaduct in their existing locations, with an increase in the Viaduct to achieve a 40-foot clearance to enable top picks to cross under the viaduct, was the best option. A design option that would have kept the bridge in its existing location but avoided a new viaduct crossing WST was discarded due to the size of the loop ramp that would be required to accommodate truck turning radii and grade requirements to make the connection between the ground and the bridge deck. The loop ramp would need to be located on Port property.



Modeling Efforts

Both the July 21 and September 15, 2022, slide presentations provided results of a modeling effort designed to evaluate the impact of replacing the East 11th Street Bridge and Viaduct in place. The analysis of both current and future conditions indicated that demand for the bridge to support Port/NWSA related truck movements, and well as general purpose traffic was limited—although our analysis showed clearly that it would draw additional commuter traffic to the north-end of the GCP. This is illustrated by the slides provided during the July 21, 2022 presentation, which included trip numbers for 2018, and a more aggregate depiction of future demand on the bridges and transportation system in the Tideflats shown on September 15th.


Issue Briefing
Tideflats Traffic Study - Part 1
Port of Tacoma
Scenario 1
Replace East 11th Street Bridge
Traffic Volume Change
Morning Peak Hour
Average (6 to 9 AM)
All Vehicle Volumes
37
138
36
80
Traffic Volume Change = Scenario 1 Traffic – Baseline Traffic
Green: Increase
Red: Decrease
8


Issue Briefing
Tideflats Traffic Study - Part 1
Port of Tacoma
Scenario 1
Replace East 11th Street Bridge
Traffic Volume Change
Morning Peak Hour Avg.
(6 to 9 AM)
Heavy Truck Volumes
9
17
-8
-6
Traffic Volume Change = Scenario 1 Traffic – Baseline Traffic
Green: Increase
Red: Decrease
9

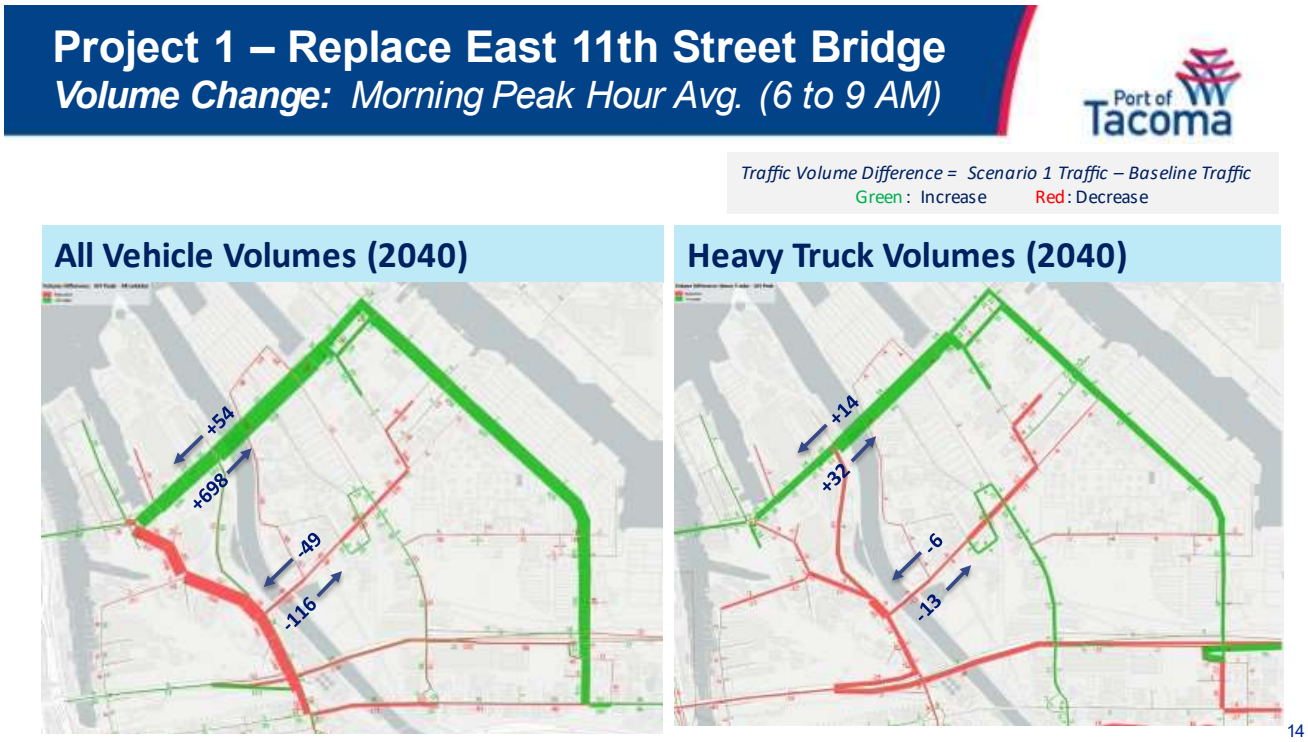

Project 1 – Replace East 11th Street Bridge
AM Congestion (6 to 9 AM) as Volume to Capacity Ratio
Port of Tacoma
Future (2040)
with Funded Network Improvements
LEGEND
167% capacity
Future (2040)
with East 11th Street Bridge
140% capacity
Comparison of AM Congestion with Bridge Replacement
10


Project 1 – Replace East 11th Street Bridge
Mid-day Congestion (9 AM to 3 PM) as Volume to Capacity Ratio
Port of Tacoma
Future (2040)
with Funded Network Improvements
LEGEND
123% capacity
Future (2040)
With East 11th Street Bridge
102% capacity
Comparison of Mid-day Congestion with Bridge Replacement
11

C. ADDITIONAL MODELING INFORMATION

The following slides provide additional information on future personal vehicle and truck volumes that would be attracted by a new East 11th Street bridge, or a widened Lincoln Avenue bridge. The analysis results presented during the September 17, 2022, meeting where based on this data, although the slides were omitted from the presentation for brevity's sake. Commuter traffic rerouting to either of these bridges would see notable reductions in travel time.

This is particularly true for the East 11th Street bridge, which would attract significant additional commuter, but only a small number of trucks per hour. Most of the commuters and trucks would otherwise use Portland Ave, with some trips, including truck trips destined for Lot F, switching from the Lincoln Ave corridor to the E 11th Street corridor. E 11th Street would also attract a small number of new trips across the Murray Morgan bridge. The through traffic would mix with terminal-related traffic on E 11th Street and Port of Tacoma Road:



Similarly, a widening of the Lincoln Avenue bridge would attract significant additional commuter traffic and a higher number of trucks than the E 11th Street corridor. Most of these trips are through trips, with only a small number of trips destined for locations north of Lincoln Avenue:

Project 2 – Lincoln Bridge Widening

Volume Change: *Morning Peak Hour Avg. (6 to 9 AM)*

Traffic Volume Difference = Scenario 2 Traffic – Baseline Traffic

Green: Increase Red: Decrease

2040 All Vehicle Volumes

2040 Heavy Truck Volumes

Change in AM Traffic with Bridge Widening

20

These results led to the development of concepts for improvements focused on the intersection of Portland and Lincoln Avenues, to both improve access for port-bound trucks and avoid increasing through traffic that could potentially conflict with Port/NWSA-related truck traffic, on the northern half of the GCP.

D. ADDITIONAL INFORMATION ON THE EVALUATION MATRIX

The following provides additional information on the application of the evaluation criteria for the bridge replacement/expansion projects:

East 11th Street Bridge Replacement	Total Score	Measure	Comments	Individual Scores	Rating	Scoring (# of points awarded)		
Mobility, Access & Reliability		How does the project improve freight mobility and access to the Tideflats?	Decreases travel time for trucks only somewhat due to location on north end of GCP	1	Decrease Travel Time (Some, Little, None)	2	1	0
		Does it improve reliability?	Increases reliability only soemwhat, trucks still need to use Portland Ave because they can't cross the Murray Morgan Bridge, so there is no significant improvement to reliability	1	Increases options for routing to/from major POT/NWSA destinations (Yes, No)	1	0	n/a
Safety & Resiliency		Does the project improve a potential safety issue?	Reduces safety issue for small section of the Tideflats	1	Eliminate, Reduce, Neutral	2	1	0
		Does it improve resiliency of the system?	Does improve system resiliency significantly by adding a river crossing that currently does not	2	High, Med, Low	2	1	0
State of Repair		Does the project repair/rehabilitate a road or bridge in a way that makes it	New bridge would last for decades	1	Yes; No	1	0	n/a
Sustainability		Will the project reduce greenhouse gas emissions or support Zero Emissions infrastructure?	Would reduce greenhouse gases some by reducing congestion on other corridors	1	Average Potential; Low Potential; Not Likely	2	1	0
Implementation Timeframe		What is the timeframe for implementation?	Long lead time. Per City bridge engineer: even if started now, would take a minimum of 8 years to complete.	0	< 3 years; 3-6 years; 6+ years	2	1	0
Cost Analysis		What is its relative cost?	Current cost estimate is at $280m if completed within 8-10 years	0	General Cost Magnitude (High, Med, Low)	0	1	2
		How many truck trips does it carry?	Model indicates that about 120 trucks per hour would use the bridge during the morning, and about 80 per hour at midday in 2040 but these truck trips are through trips.	1	Number of Port Trucks (High, Med, Low)	2	1	0
		What is the opportunity cost? What other project(s) could be funded instead?	The high cost of the bridge would make it difficult to fund other larger projects in the Tideflats for the timeframe it takes to develop, solicit grant funds, and construct the project.The project would draw through traffic to the GCP, which is not in POT/NWSA's interest. A loop ramp would encroach on terminal property, presumably leading to loss of cargo and loss of lease revenue due to the smaller footprint.	0	Degree of Impact on Other Projects (High, Med, Low)	0	1	2
Partnership Opportunity		How important is the project to our partners?	Due to the location of the project on the north end of the GCP the project would benefit almost exclusively the Port/NWSA, and, to a much lesser extent the City of Tacoma.	0	Directly benefits partners; Somewhat benefits; Does not directly benefit partners	2	1	0

Lincoln Ave Widening	Total Score	Measure	Comments	Individual Scores	Rating	Scoring (# of points awarded)		
Mobility, Access & Reliability	●	How does the project improve freight mobility and access to the Tideflats?	Decreases travel time for trucks accessing the GCP via the corridor.	2	Decrease Travel Time (Some, Little, None)	2	1	0
		Does it improve reliability?	Improves reliability somewhat because corridor is less congested	1	Increases options for routing to/from major POT/NWSA destinations (Yes, No)	1	0	n/a
Safety & Resiliency	◒	Does the project improve a potential safety issue?	Reduces safety issue by improving capacity and reliability of the corridor--adds about 2 minutes to egress times when compared to th E 11th St Bridge	1	Eliminate, Reduce, Neutral	2	1	0
		Does it improve resiliency of the system?	Some, not as much as a new crossing	1	High, Med, Low	2	1	0
State of Good Repair	●	Does the project repair/rehabilitate a road or bridge in a way that makes it last?	Existing bridge would remain, with existing life expectency.	1	Yes; No	1	0	n/a
Sustainability	●	Will the project reduce greenhouse gas emissions or support Zero Emissions infrastructure?	Would reduce greenhouse gases by reducing congestion in the corridor	2	Average Potential; Low Potential; Not Likely	2	1	0
Implementation Timeframe	○	What is the timeframe for implementation?	This project is not on anyone's plans	0	< 3 years; 3-6 years; 6+ years	2	1	0
Cost analysis	◒	What is its relative cost?	The cost of expaning roadway capacity has not been estimated, but would be high due to utilities on the north side, and the need to remove portions of the levey on the south side.	0	General Cost Magnitude (High, Med, Low)	0	1	2
		How many truck trips does it carry?	Model indicates that about 120 trucks per hour would use the bridge during the morning, and about 40 per hour at midday in 2040, with some of these trucks staying on the GCP.	2	Number of Port Trucks (High, Med, Low)	2	1	0
		What is the opportunity cost? What other project(s) could be funded instead?	The high cost of the bridge would make it difficult to fund other larger projects in the Tideflats for the timeframe it takes to develop, solicit grant funds, and construct the project.The project would draw through traffic to the GCP, which is not in POT/NWSA's interest.	0	Degree of Impact on Other Projects (High, Med, Low)	0	1	2
Partnership Opportunities	◒	How important is the project to our partners?	Due to the location of the project it would benefit almost exclusively the Port/NWSA, and, to a somewhat lesser extent the City of Tacoma.	1	Directly benefits partners; Somewhat benefits; Does not directly benefit partners	2	1	0

Fishing Wars Memorial Bridge	Total Score	Measure	Comments	Individual Scores	Rating	Scoring (# of points awarded)		
Mobility, Access & Reliability		How does the project improve freight mobility and access to the Tideflats?	Project decreases travel times for loaded trucks that currently cannot use the bridge and serves both the GCP and the Blair Peninsulas	1	Decrease Travel Time (Some, Little, None)	2	1	0
		Does it improve reliability?	Improves reliability somewhat by adding a routing option for some trucks.	1	Increases options for routing to/from major POT/NWSA destinations (Yes, No)	1	0	n/a
Safety & Resiliency		Does the project improve a potential safety issue?	The bridge is rated deficient and has load limit of 20 tons.	2	Eliminate, Reduce, Neutral	2	1	0
		Does it improve resiliency of the system?	High because it would improve a high capacity corridor.	2	High, Med, Low	2	1	0
State of Good Repair		Does the project repair/rehabilitate a road or bridge in a way that makes it last?	New bridge would last for decades	1	Yes; No	1	0	n/a
Sustainability		Will the project reduce greenhouse gas emissions or support Zero Emissions infrastructure?	Bridge would draw more additional traffic and congestion	0	Average Potential; Low Potential; Not Likely	2	1	0
Implementation Timeframe		What is the timeframe for implementation?	The bridge is currently unfunded, but the city has started working on the development of a funding strategy and the data required for competitive grant applications.	0	< 3 years; 3-6 years; 6+ years	2	1	0
Cost analysis		What is its relative cost?	Current cost estimate is at $280m if completed within 8-10 years	0	General Cost Magnitude (High, Med, Low)	0	1	2
		How many truck trips does it carry?	We did not model the change to truck traffic on the bridge	2	Number of Port Trucks (High, Med, Low)	2	1	0
		What is the opportunity cost? What other project(s) could be funded instead?	The high cost of the bridge would make it difficult to fund other larger projects in the Tideflats for the timeframe it takes to develop, solicit grant funds, and construct the project.	0	Degree of Impact on Other Projects (High, Med, Low)	0	1	2
Partnership Opportunities		How important is the project to our partners?	Tacoma, Fife and the Puyallup Tribe of Indians all have a keen interest in replacing the bridge	1	Directly benefits partners; Somewhat benefits; Does not directly benefit partners	2	1	0

E. UPDATED PROJECT COSTS

The following provides recent cost estimates for projects that were included in the analysis, as available.

Project	Target Completion	Cost Estimate
I-5 POT Road Interchange Phases 2 & 2B	2025/27	$ 84m*
SR-167 Puget Sound Gateway	2028	$ 1.2b
East 11th Street Bridge and Viaduct	TBD	$ 280m**
Fishing Wars Memorial Bridge	TBD	$ 280m**
Portland Ave Freight Access Improvements	2028	$ 4,36m
54th/SR-509/Taylor Way intersection	TBD	$ 825k*

*Current construction cost estimate for remaining project elements.
**Recent staff cost estimates not yet included in the CIP.)