Seattle Department of Transportation

Memo

Date: 11/16/2020
To: Move Seattle Levy Oversight Committee
From: Matt Donahue, Interim Director Roadway Structures, Program Owner
Subject: Levy program 12, Bridge Seismic Concept Design Report results

Purpose: As Concept Design Reports have advanced for the Bridge Seismic Program, the estimated costs to complete the full scope of the 16 bridges in the Bridge Seismic Program exceed the programmed budget. The purpose of this document is to provide a recommendation to the Levy Oversight Committee (LOC) regarding how to meet the intent of the program as outlined by the Levy given the increase in costs from the previous conceptual cost estimates.

Action needed: Concurrence to implement the recommendation noted in this memo

Background: Each project in the Bridge Seismic Program starts with a Concept Design Report (CDR). The goal of the CDR is to analyze the structure to determine its seismic deficiencies as is; to make recommendations to SDOT for retrofit strategies to achieve the desired structural performance under seismic loading; and to analyze the structure with the retrofits adopted by SDOT to ensure that those retrofits will provide the desired level of service (e.g. bridge operational after a 100-year level event, bridge will not collapse after a 1000-year level event). The CDR also provides an engineering cost estimate for design and construction of the adopted retrofit strategies. The following table summarizes the programmed funding level and cost estimate for design and construction for each project, including cost to develop the CDR:

Table 1: All programmed bridges, cost estimate vs. original programmed budget

No.	Bridge	Programmed Amount (2016 + Contingency)[1]	Updated Cost Estimate for Design & Construction, Including CDR development (2020)[2]
1	SW Andover Pedestrian Bridge4	$1,023,626	$2,776,201
2	Ballard Bridge (Bascule)	$7,140,065	$32,449,070
3	Fremont Bridge (Bascule)	$7,116,560	$29,110,232
4	Admiral Way North Bridge[3]	$7,401,221	$15,465,788
5	Admiral Way South Bridge[3]	$3,700,606	
6	Delridge Pedestrian Bridge	$1,500,000	$3,338,544
7	15th Ave NW/Leary Way Bridge	$1,153,000	$4,637,350
8	15th Ave NE over 105th Ave NE	$3,421,423	$5,990,000
9	McGraw St Bridge	$6,320,460	$8,248,594

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No.	Bridge	Programmed Amount (2016 + Contingency)[1]	Updated Cost Estimate for Design & Construction, Including CDR development (2020)[2]
10	1st Ave over Argo RR Bridge	$3,947,795	$253,711,840
11	4th Ave over Argo RR Bridge	$3,947,795	$249,176,280
12	4th Ave S Bridge (Main St – Seattle Blvd)	$8,667,980	$109,496,422
13	N 41st St Pedestrian Bridge	$611,901	$2,956,078
14	Cowen Park Bridge[4]	$6,842,845	$6,584,934
15	W. Howe St Bridge[4]	$1,073,627	$4,193,933
16	8th Ave /133rd Ave Bridge[4,5]	$3,163,298	$2,691,045
	Total:	**$67,032,2024**	**$730,826,371**

[1] Includes contingency of 10-20% for each project through the 2018 Levy Assessment and Updated Workplan.
[2]Assumes 30% design contingency, 30% overall construction contingency, 4% inflation and 5% construction contingency for retrofits involving complex foundation improvements and/or in-water work
[3]Seismic work for Admiral Way N Bridge and Admiral Way S Bridge will be completed together as the bridges are currently tied together at the deck.
[4]Bridges either going out for bid in Q4 2020/Q1 2021 (Andover and 8th) or construction completed (Cowen and W. Howe).
[5]Grant funding awarded and included in total.

As shown in the above table, the deficit between programmed and estimated costs is approximately $663M. The largest cost increases stem from significant foundation retrofits that were not known to be needed to achieve retrofit performance goals until the CDR phase. These foundation retrofits are for bridges that are either over water (Fremont and Ballard Bridges) or over a railroad facility (1st and 4th /Argo Bridges and 4th Ave S Bridge) and significantly increase the cost risk for design and construction. Cost increases over the original programmed amount for other bridges are primarily due to scope clarity and evolution and update of construction costs through the CDR phase.

Bridges selected for the Bridge Seismic Program were chosen based on two criteria:

1) lack of seismic resiliency given the era of design of the original structure

2) wide distribution of project locations around the city from an equity standpoint

As can be seen from the list in Table 1, we propose removing the following bridges as the single project cost for retrofit of each those bridges exceeds the entire program amount:

- Bridge 10: 1st Ave over Argo RR Bridge (cost estimate $253.7M)
- Bridge 11: 4th Ave over Argo RR Bridge (cost estimate $249.2M)
- Bridge 12: 4th Ave S Bridge, Main St – Seattle Blvd (cost estimate $109.5M)

After factoring the two bridges already completed and removing the bridges bulleted above, 11 bridges remain. Considering this list and the main objective of the seismic retrofit program to improve seismic resiliency of our bridge to satisfy, to the maximum extent feasible, both the 100-yr and 1000-yr level

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events without exceeding the currently programmed $67M, we recommend the following 9 bridges advance through design and construction.

Table 2: Recommendations for remaining bridges

No.	Bridge	Cost Estimate Design & Construction, Including PDR development (2020)[2]	Recommendation
1	SW Andover Pedestrian Bridge4	$2,776,201	Proceed with retrofits
4	Admiral Way North Bridge[3]	$15,465,788	Proceed with retrofits
5	Admiral Way South Bridge[3]		Proceed with retrofits
6	Delridge Pedestrian Bridge	$3,338,544	Proceed with retrofits
7	15th Ave NW/Leary Way Bridge	$4,637,350	Proceed with retrofits
8	15th Ave NE over 105th Ave NE	$5,990,000	Proceed with retrofits
9	McGraw St Bridge	$8,248,594	Proceed with retrofits
13	N 41st St Pedestrian Bridge	$2,956,078	Proceed with retrofits
16	8th Ave /133rd Ave Bridge[4,5]	$2,691,045	Proceed with retrofits
	Total:	**$46,103,6006**	

[6] $10.7M has been allocated from the $67M program budget from Cowen Park Bridge and W Howe St Bridge projects.

This leaves a remainder of approximately $10.2M from the originally programmed amount that would first be used for additional contingency on the 9 remaining bridges in this program. If additional funding remained after work is completed, we could redistribute remaining funding to Levy program 11 Bridge Spot Repair in support of further bridge maintenance.

Recommendation
Proceed with seismic retrofits as identified in corresponding Project Definition Reports for the list of 9 bridges as shown in Table 2. Redistribute any surplus funding, if not needed to address realized contingency costs, to the Bridge Spot Repair program.

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