

Seattle Department of Transportation

# WEST SEATTLE CORRIDOR BRIDGES REHABILITATION AND STRENGTHENING

Restoring Mobility, Economic Vitality, and Equity for the Puget Sound Region



Submitted to  
Build America Bureau  
Office of the Secretary of Transportation, USDOT  
FY 2021 INFRA Grant Application

Submitted by



**Seattle**  
Department of  
Transportation

## WEST SEATTLE BRIDGES PROJECT

### Basic Project Information

<b>What is the Project Name?</b>	<i>West Seattle Corridor Bridges Rehabilitation and Strengthening</i>
<b>Who is the Project Sponsor?</b>	<i>City of Seattle</i>
<b>Was an INFRA application for this project submitted previously?</b>	No

### Project Costs

<b>INFRA Request Amount</b>	\$21,600,000
<b>Estimated Federal funding (excluding INFRA)</b>	\$14,400,000
<b>Estimated non-Federal funding anticipated to be used in INFRA funded future project.</b>	\$18,820,000
<b>Future Eligible Project Cost (Sum of previous three rows)</b>	\$54,820,000
<b>Previously incurred project costs (if applicable)</b>	\$16,650,000
<b>Total Project Cost (Sum of ‘previous incurred’ and ‘future eligible’)</b>	\$71,470,000
<b>Are matching funds restricted to a specific project component? If so, which one?</b>	No

### Project Eligibility

<b>Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on National Highway Freight Network (NHFN)?</b>	Approximately \$11.39 million (21% of estimated future eligible project costs) will be spent on components of the project currently located on the NHFN.
<b>Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on the National Highway System (NHS)?</b>	All future eligible project costs will be spent on components of project currently located on the NHS.
<b>Approximately how much of the estimated future eligible project costs will be spent on components constituting railway-highway grade crossing or grade separation projects?</b>	0%
<b>Approximately how much of the estimated future eligible project costs will be spent on components constituting intermodal or freight rail projects, or freight projects within the boundaries of a public or private freight rail, water (including ports), or intermodal facility?</b>	Approximately \$11.39 million (21% of estimated future eligible project costs) will be spent on components constituting intermodal freight facilities.

### Project Location

<b>State in which project is located</b>	Washington
<b>Small or large project</b>	Small project

<b>Urbanized Area in which project is located, if applicable</b>	Seattle, WA
<b>Population of Urbanized Area (According to 2010 Census)</b>	3,059,393
<b>Is the project located (entirely or partially) in Federally designated community development zone?</b>	Yes. The project is partially located in an Opportunity Zone (ID #: 53033009300)
<b>Is the project currently programmed in the:</b>	The Project has been included in the 2021 – 2024 STIP as Project Number: SEA-236. It is programmatically included in our state and regional LRTPs. As an emergency project, it is not included in the state freight plan.
- <b>TIP</b>	
- <b>STIP</b>	
- <b>MPO Long Range Transportation Plan</b>	
- <b>State Long Range Transportation Plan</b>	
- <b>State Freight Plan</b>	



# CITY OF SEATTLE

March 15, 2021

The Honorable Pete Buttigieg, Secretary  
U.S. Department of Transportation  
1200 New Jersey Avenue SE  
Washington, DC 20590

Re: City of Seattle West Seattle Bridges Grant Application

Secretary Buttigieg:

The City of Seattle is proud to present the West Seattle Bridges Project for consideration for an Infrastructure for Rebuilding America (INFRA) grant. The sudden and unexpected closure of the West Seattle High-Rise Bridge is a locally declared civil emergency and restoring this bridge – the busiest local street within our city – far exceeds local revenues and typical grant programs.

Restoring the West Seattle High-Rise Bridge to full capacity is critical to the Seattle region's ability to recover from the COVID-19 pandemic. Before accelerated structural cracking forced the City of Seattle to suddenly close the bridge to traffic on March 23, 2020, it was carrying more than 84,000 cars and trucks, along with 25,000 bus riders, every weekday. It connected one-sixth of Seattle's population and numerous small businesses with downtown Seattle, Qualified Opportunity Zones, Port of Seattle terminals, freight rail yards, industrial businesses, King County's largest manufacturing and industrial center, and the national highway system.

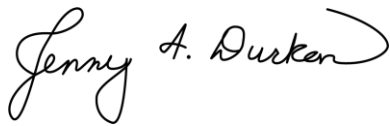
The good news is that we have a plan to repair and reopen the high bridge and are moving forward with the rehabilitation project to ensure this regional connection can be safely restored as soon as possible, targeting a re-opening date as soon as mid-2022. The repair project will also ensure the structural resilience of the parallel movable West Seattle Low Bridge, maintaining its primary role as a connection for freight and industrial traffic – a connection critical to the ongoing Northwest Seaport Alliance Terminal 5 expansion project that sits adjacent to the West Seattle Bridges. Terminal 5 and adjacent seaport terminals are designed to serve as a trade conduit for 13 states, supporting 28,000 jobs and \$8.7 billion per year in business output.

Restoring the high bridge to full traffic and transit capacity will also remove traffic detours in place since the closure. The neighborhoods directly impacted by those detours are home to our region's highest concentrations of people of color, including indigenous, immigrant, and refugee populations and now have significantly increased traffic on local streets during the

bridge closure. This has added pollution to communities who already experience greater health, public safety, and economic disparities, including higher rates of asthma and lower rates for life expectancy compared with the rest of the Puget Sound region.

The City of Seattle has already prioritized \$100 million in local funding for the projected \$175 million program and begun engineering work that would allow the repairs to proceed immediately with the infusion of the requested INFRA grant funds for construction. Grant funding for this important safety project is essential to meeting our aggressive timeline and restoring mobility for our residents and all travelers in the region. For the above-stated reasons, we greatly appreciate the US Department of Transportation consideration of this application for INFRA funding to repair and reopen the West Seattle High Bridge and we humbly await your positive response.

Sincerely,



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Mayor Jenny A. Durkan



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Council President Lorena González



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Councilmember Lisa Herbold



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Councilmember Debora Juarez



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Councilmember Andrew J. Lewis



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Councilmember Tammy J. Morales



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Councilmember Teresa Mosqueda



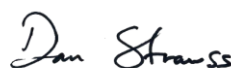
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Councilmember Kshama Sawant



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Councilmember Alex Pedersen



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Councilmember Dan Strauss

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- A: Benefit-Cost Analysis Technical Memorandum and Excel Model
- B: Letters of Support

## 1. PROJECT DESCRIPTION

The Seattle Department of Transportation (SDOT) requests \$21.6 million in INFRA grant funding for the **West Seattle Corridor Bridges Rehabilitation and Strengthening** project – also called the West Seattle Bridges project – a rehabilitation effort to reopen the nationally significant West Seattle High-Rise Bridge (high bridge). The high bridge, which typically carried 84,000 vehicles daily, closed suddenly and unexpectedly in March 2020 due to rapidly growing cracks in the concrete structure. The closure has been devastating for the quality of life and economic opportunity of tens of thousands of Seattle residents and businesses. Livelihoods are disrupted for those who relied on the bridge and detour routes disproportionately affect historically underrepresented communities. The negative impacts of the closure accrue very quickly with each day that the bridge remains closed.

Since March 2020, SDOT has stabilized and monitored the bridge, developed and deployed a mobility plan, engaged the public (with a particular focus on historically underserved communities), and worked closely with businesses and other stakeholders in determining the bridge’s future. SDOT has developed a detailed plan to reopen the high bridge and fortify the adjacent Spokane Street Swing Bridge, another critical access route to West Seattle and the Port of Seattle.

The West Seattle Bridges project will rehabilitate the high bridge to restore full service, reconnecting the West Seattle community to the jobs and opportunities beyond their neighborhood, and removing the detour routes that have negatively affected multiple neighborhoods on both sides of the Duwamish Waterway. The project will also make repairs to the Spokane Street Swing Bridge (the “low bridge”), which runs parallel to, and in the shadow of, the high bridge. The low bridge has served as a city lifeline for emergency responders, transit riders, and freight vehicles during the high bridge closure. After the high bridge closure, SDOT discovered that the low bridge, which offers the most direct access from the freeways to cargo terminals and other industry on the west side of the Duwamish River, also requires rehabilitation. If critical repairs are not made to this bridge by the end of 2022, it will have to be load posted for freight and transit vehicles. This restriction would have a significant impact on cargo facilities west of the Duwamish River and throughout the greater Duwamish area, to the detriment of the region’s economy. The sooner SDOT can repair the bridge, the less the impact on freight mobility, the cheaper the cost of rehabilitation, the lower future maintenance costs, and the longer the life of the bridge.

The urgency of these two combined projects cannot be overstated. As SDOT’s application will demonstrate, the swift

*Figure 1: The West Seattle High Bridge (closed to traffic) and the Spokane Street Swing Bridge*





completion of the West Seattle Bridges project will restore mobility and quality of life for residents; enhance access to jobs and opportunity; protect the role that freight plays in the economy of the region, state, and nation; rectify racial inequities related to the ongoing detours caused by the high bridge's closure and the low bridge's restrictions; and enhance resiliency through the construction of innovative seismic monitoring features of the new bridge. The West Seattle Bridges project benefits are illustrated below.

The West Seattle Bridges Project will provide the following key benefits to the West Seattle community and the entire Puget Sound Region

**1 Restore Mobility** to tens of thousands of West Seattle residents who have been cut off from jobs and opportunities. Reopening the West Seattle Bridge and eliminating lengthy detours results in a **benefit-cost ratio of 5.38**.

**2 Preserve the Freight Economy** for businesses and workers across the region and the nation. Eliminating the risk of load-posting the Spokane Street bridge will ensure that the Port of Seattle remains a home to **thousands of union jobs**.

**3 Promote Racial Equity and Environmental Justice** for marginalized neighborhoods that have borne the brunt of roadway detours, absorbing approximately **128,000 tons of greenhouse gas emissions** into their communities since the West Seattle Bridge has been closed.

**4 Innovation and Resiliency** are at the core of this project, and all SDOT efforts: from structural health monitoring technologies that enhance safety, to the innovative Priority Hire Program which has identified **5,800 construction workers** living in areas impacted by the bridge closure that will be prioritized for employment on the project.



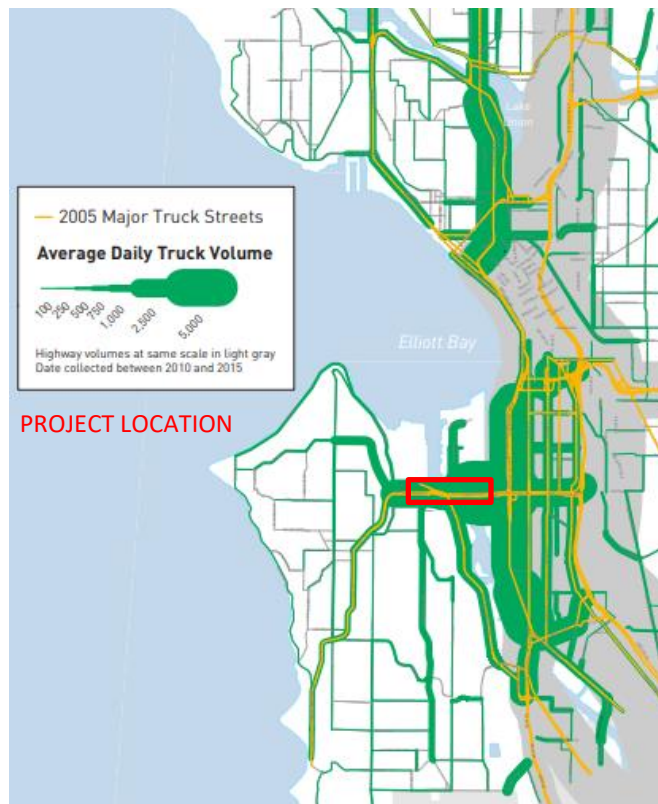
## Project Background & Context

The West Seattle community is surrounded by water on three sides, and during the early development of Seattle and its suburbs, West Seattle was a relatively remote and isolated peninsula. Two major bridges across the Duwamish River were constructed in the 1980s and early 1990s – adjacent but filling very different roles – and they transformed the West Seattle community into one of downtown Seattle’s closest and most accessible neighborhoods. Downtown Seattle and West Seattle were separated by roughly a two-mile drive on a controlled-access, freeway-like facility. The local economy boomed, and West Seattle became one of Seattle’s largest and most thriving neighborhoods, with 80,000 to 100,000 residents enjoying direct access to the region’s largest job center. The West Seattle High-Rise Bridge (completed in 1984) served as a flyover for commuters and longer trips. The Spokane Street Swing Bridge (completed in 1991) was able to offer direct access to several major seaport terminals underneath and faced minimal traffic impacts from the huge volumes of commuters that would need to cross the Duwamish River at this location. However, in March 2020, cracking in the high bridge caused its immediate closure to protect public safety. This abrupt and unplanned closure, without contingency plans for handling the massive traffic volumes, has been disastrous for the West Seattle community and the Northwest economy overall. Moreover, routine inspections of the low bridge show that it will soon face a very similar fate: closed to its primary users, with few to no alternatives for accessing the seaport.

Since the high bridge links the West Seattle community to downtown Seattle, Interstate 5 (I-5), State Route 99, and nearly any other destination throughout the Seattle region, the seven-lane bridge typically carried 84,000 cars and trucks and nearly 20,000 bus riders each day - and these numbers had been increasing rapidly. It operated much more like a regional freeway than a typical local road, and it was by far the busiest local road within the City of Seattle. The low bridge, prior to the pandemic, carried more typical traffic volumes for a local arterial with approximately 11,000 trips per day, but many of these trips were heavy trucks that feed one of the Northwest region’s primary economic engines. As the adjacent map shows, these two bridges combined carried more freight vehicles than any other roadway in the city.

The impact of the high bridge’s closure was immediate and disastrous. Alternative routes from West Seattle to I-5 have added an average of 14 – 20 minutes to the typical resident’s commute and separated West Seattle businesses from their customers and employees. Compounding the problem, the closure’s detour routes carrying West Seattle traffic to I-5 and downtown Seattle run predominantly through marginalized communities such as Georgetown and SODO (South of Downtown), straining the capacity of the existing transportation network for

Figure 2: Average Daily Truck Volumes on Seattle Roadways



Source: Seattle Freight Master Plan. September 2016

these residents, while also introducing an unhealthy level of air pollutants into their communities. Given SDOT's strong, progressive policies on promoting racial equity and removing obstacles to opportunity in all departmental work, mitigating the impact of these detour routes by restoring bridge access is of primary importance to the West Seattle Bridges project.

Although private automobiles are required to detour approximately five miles south to reach I-5 and the rest of Seattle, freight vehicles, public transit (buses), emergency vehicles, and people walking and biking can currently still use the low bridge (Figure 3) to access West Seattle and the Port of Seattle on Harbor Island.

*Figure 3: Pedestrians, cyclists, transit, and permitted vehicles may use the Spokane Street Swing Bridge.*



Serving as the remaining lifeline to West Seattle and the Port of Seattle, the low bridge offers critical access for nearly 1,000 freight vehicles each day, as well as people bicycling and walking. Like the high bridge, it is now at risk of closure. In summer 2020, routine inspections and load rating for compliance with the FAST Act revealed localized shear strength issues on the low bridge. These issues, if unaddressed, would limit the types and number of vehicles that could be carried by the bridge. As such, the City of Seattle has currently restricted local use of the bridge and committed to the United States Federal Highway Administration (FHWA) to close or load-limit the low bridge beginning in 2023 if it is not rehabilitated by then.

#### What the INFRA Funds Will Support

SDOT has already undertaken a [series of critical stabilization efforts on the high bridge](#), including the installation of carbon fiber reinforced polymer (CFRP) sheets, epoxy injections of cracks, and external post-tensioning in the bridge's center span (Figure 4),

*Figure 4: Newly installed post-tensioning cables and brackets in the high bridge*



where cracking was concentrated. This Phase 1 rehabilitation work was completed in December 2020 (funded completely by SDOT at a cost of more than \$22 million) and served as an immediate measure to stabilize the bridge and prevent any further structural deterioration while preparing for Phase 2, the rehabilitation project the INFRA funds will support. SDOT has also installed an [intelligent monitoring system](#) to collect data and monitor any additional cracking or movement of the bridge.

INFRA grant funding will support the following primary components of the West Seattle Bridges project:

1. Rehabilitation of the West Seattle High-Rise Bridge, which will:
  - Install additional external post-tensioning tendons and both internal and external carbon fiber reinforced polymer (CFRP), which will augment the Phase 1 stabilization measures installed in 2020, permitting traffic to be restored to the corridor.
  - Jet grout the soils around one of the piers on the east side of the Duwamish Waterway (Pier 18), which will mitigate against liquefaction-induced soil-structure interaction issues, improving the bridge's seismic resiliency.
2. Rehabilitation of the Spokane Street Swing Bridge, which will:
  - Install CFRP sheets on the inside and outside faces of the bridge box girder
3. Holistic bridge corridor improvements, which will include replacement of damaged bridge decks, expansion joints, barrier segments, and seismic restrainers.

### **Addressing a Transportation Crisis While Laying the Foundation for Mobility, Equity, and Economic Vitality for Generations to Come**

SDOT has worked assiduously over the past year to respond to this emergency, stabilize the high bridge, provide for and communicate alternative travel options to residents and businesses, and engage with communities and stakeholder groups. Under a general contractor/construction manager (GC/CM) contract, SDOT will procure a contractor in spring 2021 to aid in finalizing the design of the West Seattle Bridges project.

With INFRA grant funding, construction of the rehabilitation measures is expected to begin in the fourth quarter of 2021 and continue through the fall of 2022. As described in Section 5.6 – *Performance and Accountability*, SDOT is committed to meeting the construction start and end date milestones.

As a further demonstration of SDOT's commitment to the West Seattle Bridges project, the agency will contribute \$18.82 million in local match funds and \$14.40 million in other federal funds to account for 60.6% of all future eligible project costs. This sum does not include additional program costs that are estimated to approach approximately \$104 million to cover the costs of a myriad of past and future items, including:

- \$37 million for [Reconnect West Seattle](#) capital costs<sup>1</sup>
- \$20 million in emergency repairs
- \$10 million in high bridge replacement planning
- \$14 million in program development
- \$23 million in other expenses

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<sup>1</sup> Reconnect West Seattle has been a joint effort over the past year with several neighborhoods to improve traffic management and traffic operations, provide safe detour routes, and restore mobility as much as possible for West Seattle and surrounding communities.

Ultimately, SDOT believes this crucial project represents a modest request for a nationally significant and critically important infrastructure rehabilitation that will reconnect isolated communities, advance SDOT's equity goals, sustain economic growth, and promote infrastructure resiliency.

## The West Seattle Bridges Project is an ideal INFRA Project



### On the NHFN

The project is on the NHFN, and serves a seaport facility



### Serves Freight

Approximately 1,000 freight vehicles use the low bridge each day, making it one of the busiest freight routes in Seattle



### Opportunity Zone

The project lies within an Opportunity Zone



### Non-Motorized Users

Restoring service to the high bridge will reduce conflicts and improve safety for people biking and walking



### Shovel Ready

SDOT is ready to begin construction by the end of 2021



### Leveraging Federal Funds

SDOT is contributing 34% of the total project costs from local, non-federal sources, on top of more than \$100 million local dollars already spent to address this challenge

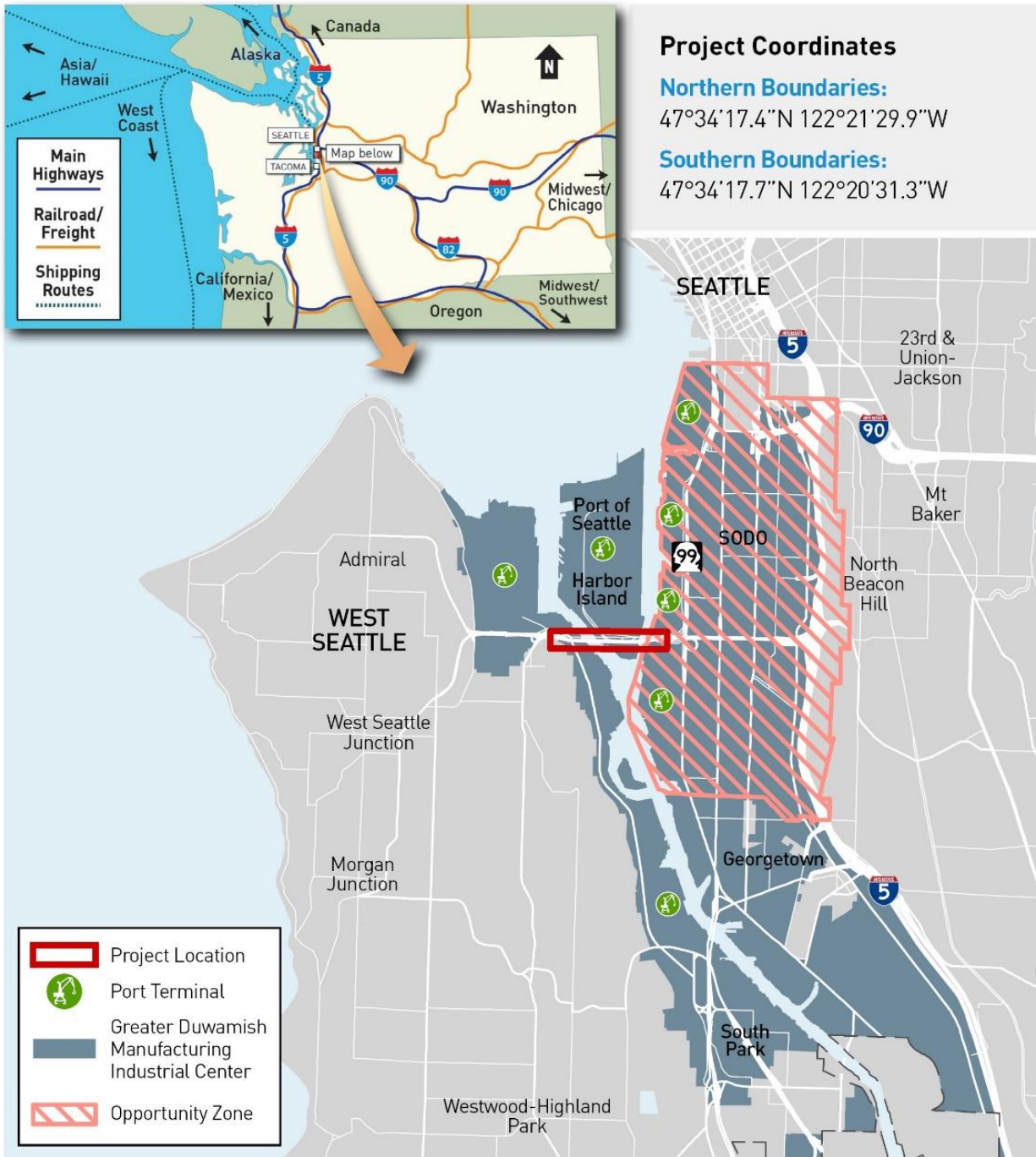
## 2. PROJECT LOCATION

The West Seattle Bridges project is located within the Seattle, Washington Urbanized Area (UZA) in the 7<sup>th</sup> Congressional District. The Seattle UZA had a 2010 Decennial Census population of 3,059,393 and 1,010 UZA square miles. Within the UZA, the City of Seattle has a population of 608,600 in 2010, which grew by 23% to 747,300, in 2019.<sup>2</sup> The project is completely contained within two Seattle Census tracts: tract 93 and tract 99. Tract 93 is a designated opportunity zone.

The high and low bridges span the Duwamish Waterway within the Greater Duwamish Manufacturing Industrial Center (MIC) - immediately southwest of Downtown Seattle. The MIC includes 12 Northwest Seaport Alliance (NWSA) facilities, such as Terminal 18 on Harbor Island and Terminal 5 west of the Duwamish River, as well as a federally designated Opportunity Zone. Together these bridges create a

<sup>2</sup> Washington State Office of Financial Management, [April 1, 2019 Population of Cities, Towns and Counties](#)

vital link between densely populated West Seattle and the opportunities that lie beyond the neighborhood.



### 3. PROJECT PARTIES

This INFRA project exemplifies a coordinated effort by the City of Seattle, Port of Seattle, Washington State Department of Transportation (WSDOT), King County, and the Puget Sound Regional Council (PSRC) to reconnect the West Seattle community to the jobs and opportunities beyond their neighborhood, ensure continued freight access, and remove the detour routes that have affected multiple neighborhoods, many representing underserved communities, on both sides of the Duwamish Waterway.

#### Project Sponsor

**The Seattle Department of Transportation (SDOT)** will lead the INFRA Project. SDOT is responsible for the operation and maintenance of the City's transportation systems, including roads, bridges, and other roadway structures; signals; transit; traffic control; and right-of-way permitting. The agency is funded primarily by general taxes supplemented by fees, partnership funding, and a voter-approved property tax called the [Levy to Move Seattle](#). SDOT's 2019 budget was \$609 million.

SDOT has a long history of delivering successful capital projects, including the [South Lander Street Grade Separation and Railroad Safety Project](#), which received federal FASTLANE funding in 2016, and was the first FASTLANE-funded project in the nation to start construction. SDOT has continually proven to be a good steward of federal funding and is well-versed in the reporting requirements associated with federal grants.

SDOT is also responsible for implementing a landmark Vision Zero program, with a goal of zero traffic deaths and serious injuries by 2030. This INFRA project is an important component of SDOT's multimodal improvements to eliminate fatalities through the Vision Zero initiative.

#### Project Partners

**Port of Seattle:** The Port of Seattle is a key stakeholder for the West Seattle Bridges project, which will support its tenants, customers, and employees.



**Northwest Seaport Alliance (NWSA):** Together with the Port of Tacoma, the Port of Seattle formed the NWSA in 2015, which operates 12 facilities within the Duwamish Manufacturing/Industrial Center (MIC). The low bridge is the primary egress and entrance to many of these facilities.



**Washington State Department of Transportation (WSDOT):** WSDOT serves as the lead environmental review agency for the State and works closely with SDOT to complete all required environmental reviews and approvals.



**King County:** King County has a population of approximately 2.2 million, making it the 12<sup>th</sup>-largest county in the United States. As part of King County, the City of Seattle and SDOT work closely to ensure the goals laid out in the County [Strategic Plan](#) are met. These goals include justice, safety, health and human potential, economic growth, the built environment, and environmental sustainability.



**Puget Sound Regional Council (PSRC):** PSRC has been instrumental in securing federal funds for roadway projects throughout Seattle and will apply \$14.4 million of these funds to this INFRA project.



### Project Supporters

From the inception of the West Seattle Bridges project, when the high bridge closed in March of 2020, SDOT has been committed to engaging the community and stakeholders at multiple levels. The community is a project partner in every sense. Beginning with a comprehensive public outreach campaign and formation of a Community Task Force, and now developing and deploying project-specific racial equity toolkits (described in detail in Section 5.3), SDOT has centered the voices of residents and bridge users in the West Seattle Bridges project.

More than 50 letters of support (attached as Appendix B) have been received for the West Seattle Bridges. Some of the organizations who provided letters are listed here below.

#### *Business and Civic Groups*

- Seattle Metropolitan Chamber of Commerce
- Washington Maritime Federation
- Pacific Merchant Shipping Association
- Seattle Marine Business Coalition
- Alaska Marine Lines
- Lynden Incorporated
- Association of Washington Business
- Downtown Seattle Association
- Challenge Seattle
- Climate Pledge Arena

#### *Project Neighbors & Community Groups*

- West Duwamish Greenbelt Trails
- West Seattle Junction Association
- West Seattle Transportation Coalition
- Fountleroy Community Association
- Highland Park Improvement Club
- Highland Park Action Coalition
- SODO Business Improvement Area
- Morgan Community Association
- South Park Senior Center
- Rotary Club of Seattle
- Only in South Park

## 4. GRANT FUNDS, SOURCES AND USES OF PROJECT FUNDS

The total project cost for the West Seattle Bridges project is \$71.47 million, including previously incurred design and pre-construction costs. This total does not include additional expenses incurred and paid by the City of Seattle for activities such as bridge stabilization, planning, community outreach, and maintenance of traffic.

The total future eligible project cost for the West Seattle Bridges INFRA grant project is \$54.82 million, consisting entirely of construction-related expenses. SDOT is requesting \$21.6 million in INFRA grant funding to complete the West Seattle Bridges project. This represents 40% of the future eligible project cost. Federal funding for the project includes INFRA funds and federal dollars disbursed by the PSRC.

Table 1 presents a breakdown of the total project costs by construction item, and bridge location. Table 2 presents a breakdown by funding source.

All future eligible work on the West Seattle Bridges project is expected to occur entirely in the year 2022, so costs are shown in 2022 dollars.



Table 1: West Seattle Bridges Total Project Cost, and Future Eligible Project Costs

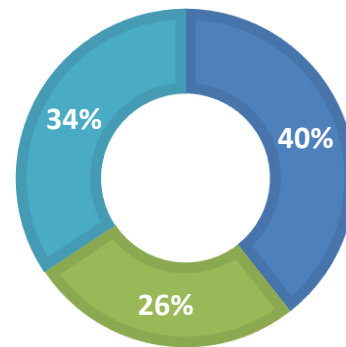
Phase	Cost Item	High-Bridge	Low-Bridge	Total
<b>Construction</b>	Carbon Fiber-Reinforced Polymers	\$10.70	\$5.90	\$16.60
	Post-Tensioning	\$5.50	\$0	\$5.50
	Ground Improvement	\$13.92	\$0	\$13.92
	Corridor Improvements	\$2.50	\$2.60	\$5.10
	Contingency	\$7.50	\$1.64	\$9.14
	Other (Site Work, Access, Platforms & Lighting, etc.)	\$3.31	\$1.25	\$4.56
<b>Construction Subtotal (Future Eligible Costs)</b>		<b>\$43.43</b>	<b>\$11.39</b>	<b>\$54.82</b>
<b>Design</b>	Design Engineering & Project Management	\$5.63	\$2.04	\$7.67
	Construction Administration	\$6.76	\$1.47	\$8.23
	Right-of-Way	\$0.75	\$0	\$0.75
	Management Contingency	\$0.00	\$0.00	\$0.00
<b>Design Subtotal</b>		<b>\$13.14</b>	<b>\$3.51</b>	<b>\$16.65</b>
<b>Total Project Costs</b>		<b>\$56.57</b>	<b>\$14.90</b>	<b>\$71.47</b>

Table 2: West Seattle Bridges Project Funding by Source

Source	Funding Amount (\$ millions)	Percent of Total
INFRA Grant	21.6	40%
Other Federal	14.4	26%
Local Funds	18.82	34%

### WEST SEATTLE BRIDGES PROJECT FUNDING SPLIT

■ INFRA ■ Other Federal ■ Local Funds



## 5. MERIT CRITERIA

### 5.1 Support for National or Regional Economic Vitality

By reopening the high bridge and strengthening the low bridge, the West Seattle Bridges project will create unmatched economic benefits and contribute substantially to the economic vitality of the region and the nation, which has been damaged by the high bridge's closure for more than a year.

A benefit-cost analysis (BCA) was conducted per the benefit-cost methodology outlined by USDOT in the 2021 Benefit-Cost Analysis Guidance for Discretionary Grant Programs. The analysis period corresponds to 22 years and includes two years of design and construction and 20 years of benefits after operations begin in 2023.

The capital cost for this project is calculated as \$70.6 million in undiscounted 2019 base year dollars. At a 7% real discount rate, these costs are \$58.6 million in 2019 dollars. Operations and maintenance costs in the "Build" scenario are projected to average \$1 million per year in undiscounted 2019 dollars over the analysis period. Over the entire 20-year operations period, these costs accumulate to a cost of \$20.1 million in undiscounted 2019 dollars, or \$8.7 million when discounted at 7%. Finally, rehabilitation and replacement costs are expected to total \$19.2 million in 2019 dollars over this same period, or \$8.7 million when discounted at 7%.

The project is expected to generate \$315.4 million in 2019 dollars in discounted benefits using a 7% discount rate. The repair and replacement of the West Seattle High-Rise Bridge and Spokane Street Swing Bridge along with the planned roadway improvements will restore traffic connectivity to the businesses and communities in West Seattle and reduce traffic congestion throughout the residential neighborhoods in South and West Seattle. These improvements lead to an overall project Net Present Value of \$256.8 million and a Benefit-Cost Ratio (BCR) of 5.38. As such, the project is expected to generate economic benefits that substantially outweigh its costs. Despite the extreme urgency of this project, SDOT and its partners conducted an extensive alternatives analysis with BCRs calculated for each option, which helped to ensure a remarkably cost-effective project that minimizes the need for federal aid as well as the burden on city and state resources. Bridge replacement options were estimated to cost approximately \$370 million, in addition to the community impacts that would result from a much longer closure.

The overall project benefit matrix can be seen in Table 3. As this table shows, travel time savings for freight trucks, personal vehicles, and transit users produce the greatest quantified benefits, illustrating the project's focus on facilitating economic competitiveness and improving connectivity for businesses and residents in the area. The travel time savings include in-vehicle travel time savings for truck drivers, drivers and passengers of personal vehicles, and bus transit users. A reduction in travel time translates into more time available for work, leisure, or other activities.

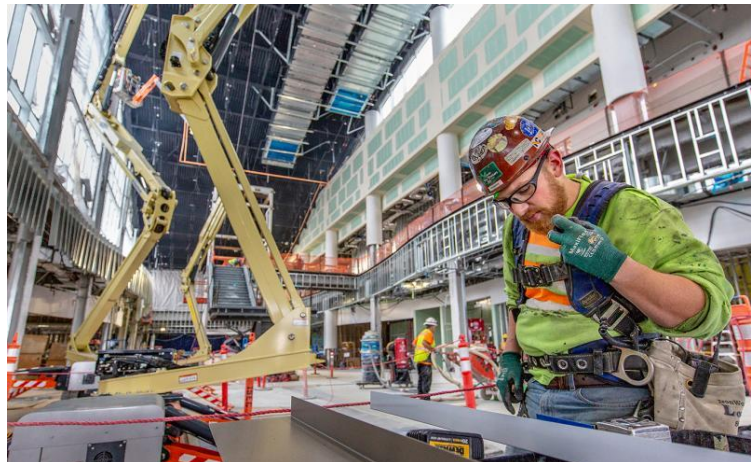
Table 3: Project Impacts and Benefits Summary, Monetary Values in Millions of Discounted 2019 Dollars

Merit Criteria	Benefit	Monetized Value (with 7% Discount Rate)
<b>Economic Competitiveness</b>	Travel Time Savings (Auto)	\$213.2
	Travel Time Savings (Truck)	\$69.3
	Travel Time Savings (Transit)	\$152.6
	Vehicle O&M Cost Savings (Auto)	(\$192.5)
	Vehicle O&M Cost Savings (Truck)	\$32.5
<b>Climate Change</b>	Emissions Reduction	\$28.6
<b>State of Good Repair</b>	Avoided Pavement Damage	\$4.4
<b>Environmental Vitality</b>	Noise Reduction	\$0.6
<b>Residual Value</b>	Extended life of the Asset	\$7.5
<b>Change in O&amp;M and R&amp;R</b>	Incremental Maintenance of the Improved Assets	(\$0.8)
<b>Total Benefits</b>		<b>\$315.4</b>
<b>Total Capital Costs</b>		<b>\$58.6</b>
<b>Benefit-Cost Ratio</b>		<b>5.38</b>

Note: Parentheses indicate a negative calculated value considered as a disbenefit

### Creating and Sustaining Quality Jobs for Seattleites

In addition to the economic vitality benefits quantified in the BCA, the West Seattle Bridges project directly contributes to the preservation and creation of union jobs in transportation and freight sectors as well as the steel manufacturing and ship building industries. SDOT, together with local partners, have long nurtured the Port of Seattle and freight sectors of the local and regional economy, prioritizing projects that provide safe and reliable access for the movement of goods and commuters.



[Source: Port of Seattle](#)

Freight is critical to bringing goods to market and supporting the day-to-day needs of local businesses and industries, but it's also a critical sector itself. In fact, 40% of all jobs in Washington State are tied to freight-related activity.<sup>3</sup> These approximately 900,000 jobs are located throughout the Puget Sound region, span a wide variety of freight-dependent sectors including agriculture, forestry, construction, and manufacturing, and contribute a regional domestic output of \$91.9 billion.<sup>4</sup>

<sup>3</sup> [City of Seattle Freight Master Plan](#). September 2016. Page 2.

<sup>4</sup> [Washington State Freight Mobility Plan](#). 2014. Page 7.

Together with the Port of Tacoma, the Port of Seattle recently formed the NWSA, a marine cargo operating partnership. As previously stated, the NWSA operates 12 facilities within the Duwamish MIC, all of which are impacted by detours and congestion due to the bridge closure. The NWSA is the fifth-largest container port in the U.S. by volume, and terminals in the Duwamish MIC support approximately 48,000 jobs. The Duwamish MIC also hosts the fourth largest warehousing and distribution center in the country. NWSA employment tends to be predominantly union jobs, including longshoremen, crane/yard gangs, gate clerks, yard staff, and mechanics/service personnel.

The Port of Seattle has a long history of working with organized labor that support its mission to create economic vitality in the Puget Sound region, including use of a [Project Labor Agreement \(PLA\)](#) on specific major works projects since 1999. The Port of Seattle prioritizes in hiring locally and has created the Priority Hire Program to support access to good family-wage jobs for qualified construction workers living in Economically Distressed Areas of King, Pierce, and Snohomish counties. As a longtime proponent of unionized labor, the Port of Seattle currently has contracts with 22 local unions including the International Association of Machinists, International Brotherhood of Teamsters, and International Longshore & Warehouse Union.

Port of Seattle workers, and every business in the region that relies on the movement of goods through the port, could face significant economic impacts if the low bridge is not repaired, which would require it to be load-posted or closed. INFRA grant funding for the West Seattle Bridges project will support local Seattle workers, and allow businesses in Washington to grow and remain competitive in local, regional, national, and global economies.

### Freight Mobility – Supporting the Local, Regional, and National Economy

As a designated segment of the [Primary Highway Freight System](#), the low bridge plays a vital role in the freight supply chain that is tied to the regional and national economy. The current high bridge closure forces many additional trips onto the low bridge, including buses, emergency vehicles, and longer-distance truck trips. NWSA facilities on the West side of the Duwamish are an essential part of what comprises the NWSA gateway, and any longer-term disruptions in accessibility could have an impact on the competitiveness of our gateway.

This is particularly true starting in January 2022 as the NWSA is poised to open one of the country’s most modern and efficient container terminals capable of handling ultra-large container ships. The NWSA’s customers are dependent on both imports as well as empty containers that can be used to export products made or grown in the Pacific Northwest and the Midwest. The NWSA’s Terminal 5 project allows the NWSA to expand its cargo-handling capabilities to remain globally competitive and grow our



Source: City of Seattle Freight Master Plan, 2016

local and national economy. If load limits were imposed on the low bridge, the impacts would be felt within the Duwamish MIC and throughout the regional, national, and global economies.

In 2019 the NWSA shipped 28.7 million metric tons of cargo (import and export). The top five exports by volume were oil seeds (22%) prepared foodstuffs (15%), wood pulp (9%), vegetables (6%), and wood products (6%). Japan, South Korea, and China were the largest recipient of these exports, receiving more than 50% of all containers by volume. As the main means of entrance and egress to Terminal 5 and Harbor Island, low bridge carries more freight than any other roadway in the city – approximately 1,000 to 1,500 trucks per day, with some estimates showing more than 2,000 per day with planned improvements to Terminal 5.

### Cargo Growth expected at Terminal 5

[Project improvements](#) began in late 2019 and include upgrades to facility power supply. These improvements enabled the use of shore power, upland improvements within the storage zone, and berth deepening to accommodate larger container ships. When project construction is complete, the projected 2050 freight capacity will increase from an estimated 5.3 million “twenty-foot equivalent units” (TEUs) to 7.0 million TEUs.<sup>5</sup> It also will enable vessels calling at Terminal 5 to plug into clean hydro-electric shore power, eliminating the need to run on-ship diesel aggregates to power a vessel at berth.



This innovative project will secure NWSA’s place among national and international peer ports. Between 2012 and 2017, the Alliance’s share of container cargo fell from 43.7% to 39.5% while the competing ports of Vancouver and Prince Rupert in Canada saw an increase in container cargo.

One contributing factor in the shift to Canadian ports is the major investment made by these ports in developing new, state-of-the-art terminal and roadway infrastructure geared towards ultra-large

<sup>5</sup> <https://www.nwseaportalliance.com/about-us/planning/terminal-5-improvements>

vessels. Thus, port site improvements that will result from project construction will allow the Port of Seattle to remain competitive in a global industry.

### Freight Industry and Communities of Concern

The high bridge closure significantly impacts the movement of traffic throughout the region, with near- and long-term economic impacts on the NWSA, the Port of Seattle, and industry along the Duwamish River. An extended closure of the high bridge, or any closure of the low bridge, would generate additional negative impacts that will likely disproportionately affect the trucking community serving NWSA facilities. Most truck drivers work for smaller companies or are independent operators who have fewer resources to weather financial impacts according to a survey of truckers serving the Port of Seattle. In fact, 81% of truck drivers hauling cargo to/from the Port of Seattle are independent owner-operators, many of whom associate with minority communities.

Using the change in freight vehicle-hours traveled and the value of time for freight truck drivers, SDOT estimated that the annual economic cost resulting from high bridge closure-related travel delays would be between \$0.7 and \$1.2 million per year. Adding the impact of the overall shipment costs would bring the total annual costs to approximately \$3 to \$4 million. Also adding the highly variable impacts of travel time reliability, real-world effects could potentially double this cost range. These do not include travel delays for non-freight vehicles traveling through the project area.

*Table 4: Economic impact of high bridge closure until late 2022 based on IMPLAN analysis.*

Economic Impact Outputs (2023 to 2042)	Output Values
Total Economic Output in Study Area w/o Project (nominal \$)	\$1,292,443,000,000
Total Industry Employment in Study Area w/o Project (total job-years)	3,627,709
Estimated Total Economic Output Impacted by Freight Delays (nominal \$)	\$44,931,000,000
Average Annual Economic Output Impacted by Freight Delay (nominal \$)	\$2,246,530,643
Average Annual Impacted Economic Output per Freight Vehicle-Hour (nominal \$)	\$395.86
Estimated Total Employment Impacted by Freight Delays	146,526
Average Annual Employment Impacted by Freight Delay	7,326
Percentage of Annual Industry Employment in Study Area Affected by Freight Delays	9.5%
Estimated Total Change in Freight Vehicle-Hours	5,675,099
Annualized Change in Freight Vehicle-Hours	283,755
<b>Total Economic Cost of Travel Delays (at \$30.80/hour) (nominal \$)</b>	<b>\$174,793,050</b>
<b>Annualized Economic Cost of Travel Delays (at \$30.80/hour) (nominal \$)</b>	<b>\$8,739,652</b>

These impacts on the individuals supporting the freight industry are just those associated with the high bridge closure. Any closure of the low bridge would have an additional dramatic affect on independent owner-operator truck drivers from minority communities expecting to move containers to and from Terminal 5.

## 5.2 Climate Change and Environmental Justice Impacts

SDOT has a deep commitment to environmental justice (EJ) and to designing and delivering projects that consider climate change impacts. The West Seattle Bridges project in particular has considered climate change and EJ in its extensive planning and outreach work, as well as through the project investments that will mitigate the ongoing EJ impacts that are affecting marginalized communities.

The West Seattle Bridges project has incorporated environmental justice measures into all elements of the program, considering environmental justice during planning efforts and developing and implementing strategies to mitigate those impacts.

### Planning and Policy

The City of Seattle developed a [Climate Action Plan](#) in 2013 that laid out a series of aggressive policies and goals for reducing emissions and preparing for climate change. In 2018, Seattle Mayor Jenny A. Durkan released an updated [Seattle Climate Action Strategy](#) that provided a renewed set of strategies for achieving the city's climate goals, including promoting mode shift from automobiles to transit by providing more choices for moving about the city, including biking and walking. The West Seattle Bridges project is an example of one such effort to expand the range of travel modes that the West Seattle community can access in commuting to jobs and other destinations.

SDOT is engaged in other important EJ planning efforts including the following:

#### **[Title VI Environmental Justice Initiatives](#)**

SDOT strives to engage EJ communities to ensure equal access and involvement in transportation decision-making processes. Examples of this include the "Move Seattle Levy Prioritization Assessment" currently underway, the development and use of a "Race and Social Equity Index," and the "Equitable Development Community Indicators Report."

#### **[Move Seattle Levy Prioritization Assessment](#)**

In November 2015, voters approved the nine-year, \$930 million Move Seattle Levy Prioritization Assessment, which provides funding to improve safety for all travelers, maintain streets and bridges, and invest in reliable, affordable travel options for a growing city. This assessment includes applying the Race and Social Equity Index to assess project locations and investments as a prioritization criterion for potential levy-funded projects. The levy assessment is working closely with the Levy Oversight Committee as part of this work, including assessing the use of the Race and Social Equity Index combining race, ethnicity, health, and socioeconomic factors in areas where minorities make up relatively large portions of the neighborhoods assessed.

For the West Seattle Bridges project, planning efforts that screened for EJ began in the first phase of the project and included an equity-focused Cost-Benefit Analysis. EJ continues to be a focus of mitigation efforts, as the closure has unduly impact underserved communities.

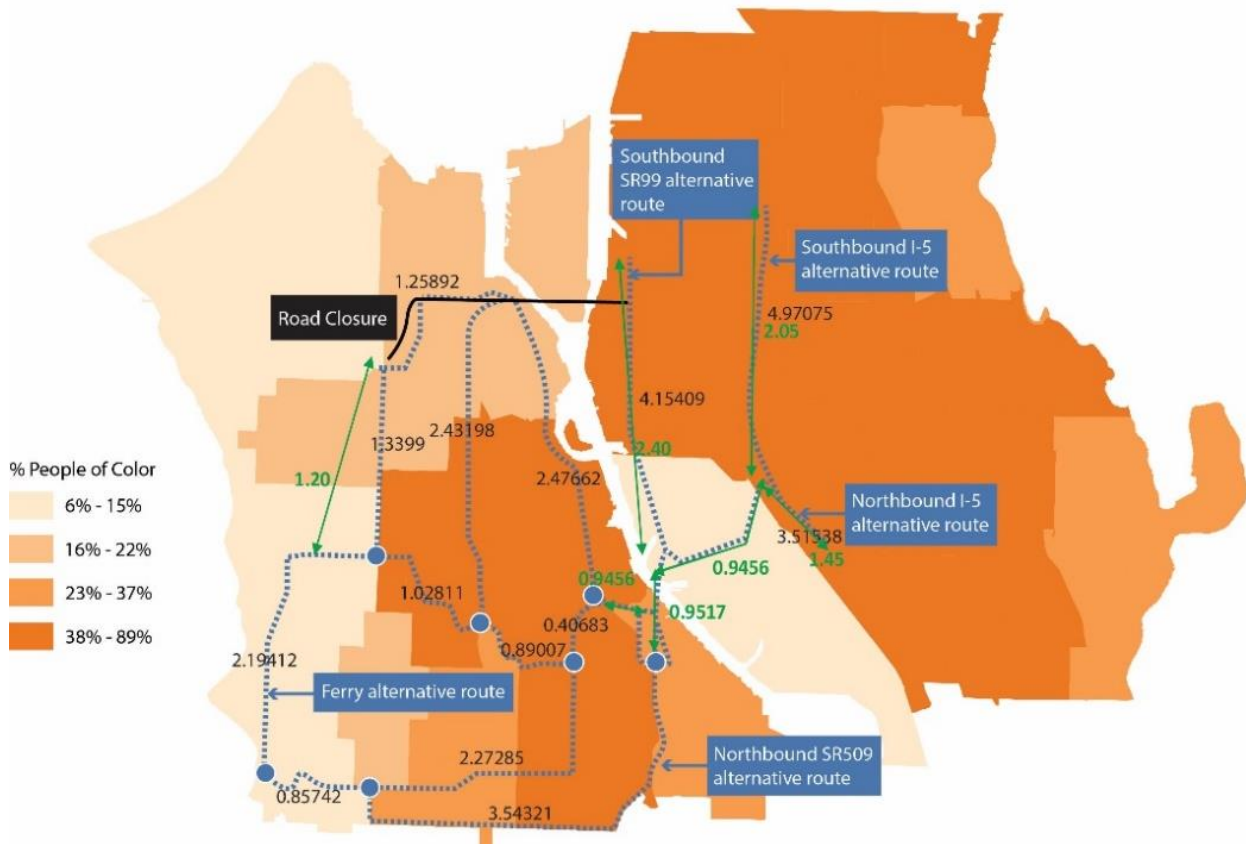
#### **[A Design Solution to Mitigate Environmental Impacts](#)**

The longer the high bridge remains closed, the greater the impacts – both to the environment and to the vulnerable populations that are most affected by reroutes and increased vehicle miles traveled. Massive air quality impacts accrue from diverted traffic and increased congestion. It is estimated that the high bridge closure is increasing travel distance by 354 million miles between 2020 and 2022. As a result, it is estimated that the high bridge closure will increase greenhouse gas emissions by approximately 128,000 tons.



The continued closure of the high bridge causes increased vehicular traffic using detour routes through marginalized communities. As of October 2020, 59% of the high bridge’s current diversion routes are through communities with high representation of people of color (23% to 89% of community population). As shown in Figure 5, some diversion routes pass entirely through communities of color. Overall, these communities are currently disproportionately impacted by the bridge closure and the congestion and air pollution impacts from associated detour routes.

Figure 5: West Seattle high bridge closure detour routes and percentage of people of color by census tract



The change in traffic patterns result in social externalities for neighborhood residents and local businesses. For example, the detour route over the First Avenue South Bridge diverts road traffic through three of four neighborhoods with the lowest median household income in the project area. This results in increased environmental and social impacts from the increase in passenger and truck traffic. In the long term, the accumulation of these impacts could result in undesirable impacts on personal health, the degradation of the environment and physical infrastructure, decreased effectiveness of social services, and stagnant growth in property values. Any low bridge closure or further restrictions would further exacerbate the impacts on these strained communities.

Furthermore, by choosing to rehabilitate the high bridge, the City of Seattle chose to reduce environmental impacts due to the extended closure and to prevent the environmental impacts and in-water work that demolition and construction of a new bridge would have entailed.

Although the project will not contribute to a modal shift from auto to transit, due to the fact that automobiles are currently detoured off of the high and low bridges, the project will certainly contribute



to enhanced transit reliability and reduced travel times as a result of moving buses off of the low bridge and back to the high bridge, where they benefit from the use of dedicated bus lanes.

### 5.3 Racial Equity and Barriers to Opportunity

As described in the previous section, the West Seattle Bridges project will rectify a serious and ongoing EJ issue that has exacerbated racial inequities for the marginalized communities most impacted by the closure of the West Seattle Bridge and the vehicle detours that it has created. In addition to the EJ measures previously described, SDOT and the City of Seattle have a number of ongoing planning initiatives and policies that aim to advance racial equity and help communities overcome barriers to opportunity. Several of these indicatives are described below and have been applied directly to the West Seattle Bridges project.

#### Planning and Policy Initiatives

Seattle is dedicated to addressing racial equity and barriers to opportunity at a systemic level. The vision of the [Seattle Race and Social Justice Initiative \(RSJI\)](#) is to eliminate racial inequity in the community. This includes adopting policies and implementing processes in transportation infrastructure programs that seek to end individual racism, institutional racism, and structural racism. In addition, SDOT's [Office of Equity and Economic Inclusion \(OEEI\)](#) is responsible for leading the strategic vision and leadership in the planning, promotion, and advancement of equity and diversity, and leads SDOT to measurable improvements. OEEI promotes and upholds equity at SDOT through a variety of avenues, including: internal advocacy, partnership with the SDOT Change Team, the portfolios of Women or Minority-owned Business Enterprise (WMBE), the Contracting Equity, Race and Social Justice Initiative, EEO, and Title VI. OEEI is located in the SDOT Director's Office.



#### *Racial Equity Toolkit*

The [Racial Equity Toolkit \(RET\)](#) was developed as part of the RSJI to eliminate racial inequity in the community. To do this requires ending individual racism, institutional racism, and structural racism. The RET lays out a process and a set of questions to guide the development, implementation, and evaluation of policies, initiatives, programs, and budget issues to address the impacts on racial equity.

RETs are in process for the West Seattle Bridges project's Mobility Action Plan and a number of other related projects. These RETs draw upon data from survey results, and focus groups conducted by the Department of Neighborhoods. The RET process currently underway includes 10 weeks of RET/equity sessions to ensure RET goals align and that project managers and other team members are aware of implicit bias and other issues. The process's objective is to help project managers and decision-makers to identify equity outcomes, share knowledge, and unearth new opportunities to minimize harm, among other goals.

#### *Other Efforts to Address Barriers to Opportunity*

The City of Seattle is committed to removing barriers to opportunity for women- and minority-owned businesses and subcontractors. It is the City of Seattle's goal to achieve and maintain parity in the city's

contracting practices to create a state of equitable distribution for those firms that have been historically underutilized and implement tools, policies, and programs to promote those values.

SDOT's Title VI initiatives focus on inclusion, and include executive orders such as [Executive Order 2019-06: Economic Inclusion and Contracting Equity](#), with provisions that go beyond federal and state WMBE goals.

### *Project Outreach for Equity and Inclusion*

A foundational element of SDOT's racial equity efforts around the West Seattle Bridges project and the impact that the high bridge's closure has had on the community is the substantial outreach that SDOT has conducted with communities in the area, including the marginalized communities that have been most affected.

The [West Seattle Bridge Community Task Force](#), which ensures many voices and concerns of the community are heard and advocated for, come from all over West Seattle and the Duwamish Valley. Members include neighborhood group representatives from the Junction to Georgetown to South Park to Highland Park to SODO, which are some of the neighborhoods that are the most impacted by detour routes as well as the most historically underserved neighborhoods in the project area. Community members are joined on the Task Force by elected officials, West Seattle businesses, and industrial and maritime businesses and their workers.

Since it first started meeting in June, Task Force members have helped ensure transparency, clear communication, and broad community engagement to advise decisionmakers on everything from whether to repair or replace the bridge, to prioritizing funds dedicated to mitigate traffic impacts and improve safety on detour routes.

This equity-focused outreach and public engagement has made a special effort to reach communities currently not served by traditional English-language media and government-run web platforms. Early in the project, the team prioritized media trusted by underserved communities as well as the top seven languages spoken throughout the impacted region. When possible, messages and event information are translated into the following languages: Spanish, Somali, Oromo, Vietnamese, Chinese (traditional), Korean, and Khmer.

In November 2020, the communications team translated videos and SDOT's press releases, and connected directly with multicultural media outlets. Some specific engagement efforts included a multilingual campaign for residents to avoid traveling by automobile over the low bridge or face a \$75 fine (shown in the below images), as well as town halls, advertisements and interviews with multicultural media outlets.

Altogether, SDOT’s total investment in outreach activities related to the West Seattle Bridges project, and under the banner of racial equity and overcoming barriers to opportunity, has exceeded \$1 million, with an expectation to spend more than \$6 million more on these efforts in 2021 and 2022 before the project is complete.

### A Significant Project Investment to Break Down Barriers to Opportunity

Within the West Seattle peninsula and in South Seattle, the range of median household incomes and the demographic characteristics of their approximately 20

neighborhoods illustrate the diversity of affected populations. Compared to the median household income in Seattle, the median household income in neighborhoods around the high bridge range from 47% (below the city average) in South Park to 21% (above the city average) in Alki Beach.

As noted in Figure 5, congestion and associated emissions as a result of detour routes for the closed high bridge disproportionately affect Georgetown and South Park, two of the city’s historically underserved black, Indigenous, and people of color (BIPOC) communities. The lack of viable commute routes has the greatest impact on lower-income workers who are not able to telecommute. These workers also may not be able to rely on transit due to shift work, leaving them no commute options aside from a long and extremely congested detour route.

In addition, the detour routes and changes in road congestion resulting from the high bridge’s closure could affect the supply chains of businesses operating in and around the West Seattle area, potentially resulting in long-term closures or reduced operations, specifically in the Duwamish valley. Negative impacts will likely disproportionately impact smaller businesses and independent operators who have less resources to mitigate the financial impacts from a long-term closure.

The West Seattle Bridges project, by restoring such a critical community connection, represents a substantial investment in overcoming barriers to opportunity for the marginalized residents that are most impacted by this infrastructure failure.

## 5.4 Leveraging of Federal Funding

SDOT’s funding proposal shows INFRA funds as approximately 39.4% of future eligible costs, and the total federal share as approximately 65.7% of future eligible costs. By choosing to rehabilitate rather than replace the high bridge, the plan for returning the bridges to full service is remarkably cost-effective and is expected to greatly reduce the amount of federal aid required. SDOT is committed to constructing the West Seattle Bridges project and have earmarked 34.3% of future eligible costs to come



from local funding sources including taxes, fees and charges for service, the city’s general fund, and local bonds backed by Real Estate Excise Tax (RET). This local match demonstrates Seattle’s dedication to maintaining public assets in a state of good repair while continuing to build out a system that improves safety for all travelers and helps keep people and goods moving.

The Levy to Move Seattle \$930 million transportation plan (approved in November 2015) provides roughly 30% of the city’s transportation budget, paid for through property tax revenue, and replaces the nine-year, \$365 million “Bridging the Gap” levy approved by voters in 2006. Because property tax revenue has remained relatively stable through the COVID-19 pandemic, projects for which levy funding was earmarked have been mostly unaffected.



## 5.5 Potential for Innovation

The West Seattle Bridges project contributes to each of the three areas of innovation that are identified as USDOT goals.

### 5.5.1 Innovation Area #1: Innovative Technology

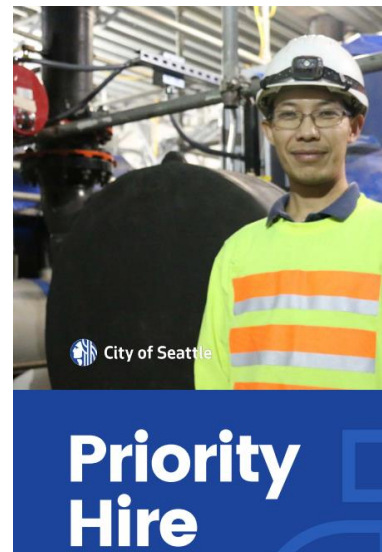
SDOT has deployed multiple innovative technologies as part of the stabilization of the high bridge. The rehabilitation scope for the high and low bridge will include an innovative **structural health monitoring instrumentation (SHMI) system** to measure real-time bridge movements and deformations. Bridges are living, “breathing” facilities that continuously react to environmental conditions such as temperature changes, solar radiation levels, humidity, and wind, etc. The high bridge’s SHMI system allows engineers to analyze the steady-state nature of the bridges to calibrate the analytical models based on the existing cracking.

The SHMI command center measures movements during construction so they can be compared relative to analytically predicted movements. The SHMI system has been in place since May 2020, and the bridge’s behavior during stabilization helped inform the decision to replace or rehabilitate the high bridge. The monitoring system’s alarms are set at specific thresholds and alert construction teams to stop work and get to a safe place if bridge movement reaches lower threshold levels, or immediately notify emergency responders at higher threshold levels.

The SHMI systems utilized included a series of string pots, and a shape array. As the project progresses, these systems will be enhanced with a fiber optic system to serve as a bridge asset management tool for the in-service structure.

### 5.5.2 Innovation Area #2: Innovative Project Delivery

Seattle’s [Priority Hire Program](#) is an innovative project delivery strategy that prioritizes the hiring of local workers living in economically distressed communities. Since 2016, the City of Seattle has invested \$3.2 million in recruitment, training, and support services for workers living in economically distressed ZIP codes. The West



Seattle Bridges project will be the latest construction project to utilize the program, and staff estimate that approximately 5,800 construction workers live in areas impacted by the closure of the West Seattle High-Rise Bridge. The jobs created by the project are estimated to result in wages totaling between \$600,000 and \$900,000.

Additionally, the contract approach SDOT is taking (GC/CM) engages the contractor earlier in the project, during the design phase. Traditionally, a contractor is selected once the design is complete, and there is minimal interaction between the construction and design teams. With GC/CM, SDOT is bringing the contractor on much earlier during design, and when the designer and contractor work collaboratively, there are more ways to ensure schedule predictability, such as:

- Early contractor input allows SDOT to design and construct early temporary installations like work platforms that will facilitate construction of permanent elements.
- Early contractor input enables the design and procurement of long-lead time items like post-tensioning and CFRP.

### 5.5.3 Innovation Area #3: Innovative Financing

SDOT is actively seeking innovative financing for the project in the form of a private-sector contribution from the Port of Seattle.

## 5.6 Performance and Accountability

### 5.6.1 Lifecycle Costs

Lifecycle costs for the West Seattle Bridges project are estimated to include both routine annual Operating and Maintenance Costs (O&M) and incremental periodic Repair and Rehabilitation Costs (R&R). O&M costs with completion of the West Seattle Bridges project are anticipated to be \$1.02 million per year in 2020 dollars consisting of maintenance, annual inspections, structural health monitoring instrumentation (SHMI), and drainage. R&R costs with completion of the Spokane Street Swing Bridge project are anticipated to be \$4 million in 2026 for hydraulic drive systems replacement and \$150,000 every 10 years for ultra-violet (UV) rays protective coating. R&R costs with completion of the West Seattle High-Rise Bridge project are anticipated to be \$14.5 million in 2032 for foundation strengthening and \$300,000 every 10 years for UV protective coating.

The City of Seattle will manage ongoing O&M costs after initial construction. The city has a [robust asset management program](#) in place for maintenance and preservation activities, including long-term condition forecasting and optimization modeling to meet federal performance monitoring requirements and industry best practices. SDOT maintains an interactive [Asset Web Map](#), which is updated weekly to reflect the existing conditions of the city's assets and to aid in timely repairs and maintenance. In fact, SDOT's proactive asset management approach is credited with having recognized the structural damage of the West Seattle High-Rise Bridge early, allowing time to stabilize the bridge and avoid a more-serious safety incident.

Although not federally required, SDOT is drafting its initial Transportation Asset Management Plan (TAMP). TAMP development reinforces SDOT's commitment toward a strategic approach that helps balance finite resources and increasing asset needs to ensure that transportation assets are receiving the right treatment at the right time. SDOT uses a data driven, risk-based approach to ensure future performance. SDOT is committed to managing its assets in a sustainable manner to ensure that the condition of the current infrastructure is in the same or better condition for future generations. SDOT

continues to implement key strategies to support the city's Climate Action Plan established in 2013 and updated in 2018.

### **5.6.2 Accountability Measure**

SDOT is pleased to commit to one of the USDOT accountability measures, subject to the return of 10% of the awarded funds. We are confident that construction on the West Seattle Bridges project will begin before the end of June 2022 and will reach substantial completion by the end of 2022. As detailed in Section 0, the project schedule anticipates construction beginning in fall 2021, which is the period SDOT fully expects to achieve. For the purposes of establishing an accountability measure for the INFRA grant funds, SDOT believes that June 2022 is a prudent deadline that can accommodate any unforeseen delays, while still delivering this important project to the community in a timely fashion.

## **6. PROJECT READINESS**

### **6.1 Technical Feasibility**

The West Seattle Bridges project was developed to 30% design in February 2021. The cost estimate for the project described in this application is based on the 30% design and includes a 10% design contingency, a 10% construction contingency, and a 10% risk allowance. Contingencies will be updated as design work progresses. The project follows City of Seattle requirements, and a Basis of Design document captures standards that were followed.

#### **6.1.1 Engineering and Design Studies and Activities**

The West Seattle Bridges project is an extension of Phase 1 stabilization services, constructed between June and December 2020. SDOT conducted detailed structural analyses and calculations to release construction documents. In addition, significant field reconnaissance has been conducted, including near daily bridge inspections, and non-destructive testing. A monitoring system has been set up to correlate the structural analysis findings to actual measured behavior. A multi-discipline cost-benefit analysis has been conducted to support the decision to further rehabilitate the bridge. Most recently, the Phase 2 rehabilitation analysis and design calculations have been conducted, which has yielded a high degree of confidence in the 30% design documents developed to-date.

#### **6.1.2 Design Criteria**

The project will comply with all current American Association of State Highway Transportation Officials (AASHTO) design provisions including all state-of-the-art seismic provisions. The design also complies with the FHWA's Bridge Seismic Retrofitting Guidelines.

#### **6.1.3 Basis for the Cost Estimate**

The project construction cost is estimated to be \$54.82 million; \$43.43 million for the high bridge and \$11.39 million for the low bridge. This estimate is inclusive of a 10% design contingency, a 10% construction contingency, and a 10% risk allowance. The Phase II rehabilitation work is essentially an extension of the Phase I stabilization work just completed. The cost estimate is based on the cost to deliver the Phase I stabilization work.

#### **6.1.4 Detailed Statement of Work**

The project will include rehabilitating the two bridges, low and high, that connect West Seattle to the rest of Seattle over the Duwamish Waterway. The rehabilitation will include installation of external post-tensioning and application of CFRP. These rehabilitation elements serve to remove gravity load

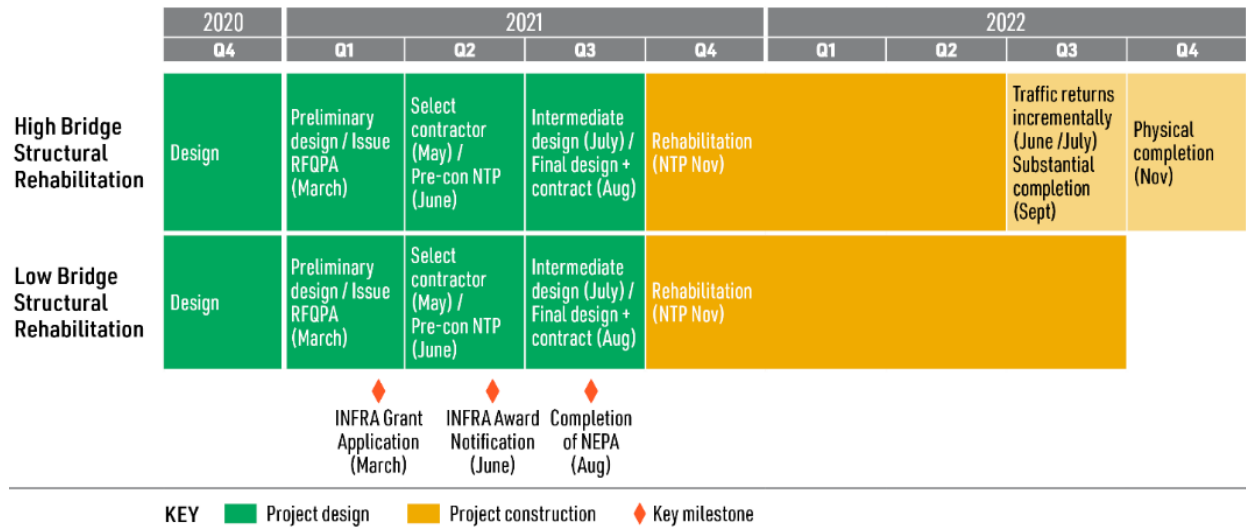
deficiencies and improve the bridge’s seismic resiliency. For the high bridge, ground improvement measures will further enhance the bridge’s seismic resiliency by mitigating against liquefaction-induced lateral spreading. Liquefaction is commonly seen in Duwamish-area soils during earthquakes and resultant lateral spreading can lead to bridge failure. Major maintenance activities will be performed to repair components that have been subjected to everyday wear-and-tear for the past 30+ years.

## 6.2 Project Schedule

The West Seattle Bridges project is “shovel-ready” and prepared to begin construction before the end of 2021. Seattle Mayor Jenny A. Durkan’s decision to rehabilitate the bridge in late November 2020 commenced immediate design of the bridge rehabilitation, together with the development of an aggressive yet achievable schedule to return the bridge to service as soon as possible. The hallmark of this INFRA proposal is its urgency and priority for Seattle, the metropolitan region, and State of Washington. SDOT and its partners have moved as quickly as possible to stabilize the structure so as to preserve various options for repair or replacement, review all the viable options from a BCA perspective, and proceed with engineering design on the preferred alternative. SDOT is committed to obligating INFRA funds and putting that money to work with the same urgency and priority and look for opportunities to work though the schedule and timing with INFRA. Project milestones are shown on the schedule presented in Figure 6.

Noteworthy schedule milestones include the completion of procurement in June 2021, NEPA in August 2021, PS&E in September 2021, and construction taking place between December 2021 and October 2022, with the high re-opening for service and the low bridge rehabilitated by the end of 2022.

Figure 6: West Seattle Bridges INFRA Project Schedule



## 6.3 Required Approvals & NEPA

### Environmental Permits and Reviews

All state and local approvals are expected to be received between October and November of 2021 - in time for construction to commence in December 2021. NEPA activities are expected to commence in

March 2021, with anticipated completion in August 2021, encompassing all Section 106 and Endangered Species Act approvals. The West Seattle Bridges project will qualify for a Categorical Exclusion under 23 CFR 77.1.117 C (28). No other federal approvals or permits are required. The West Seattle Bridges project has been programmed in the STIP as of March 2021, as Project Number: SEA-236. It is programmatically included in our state and regional LRTPs.

## 6.4 Assessment of Project Risks and Mitigation Strategies

SDOT has developed a detailed project risk matrix to identify and plan for project risks and mitigation measures. The risks and mitigation strategies that are most relevant for the INFRA grant project are as follows:

Risk	Description	Mitigation Strategy
Public/Political	Public/political/media scrutiny of the project raises issues during design or construction	Ensure full transparency and no surprises approach to design and construction
Schedule	If project stakeholders are not well informed as the project proceeds, then design decisions will be in jeopardy and project delays could occur.	Meet with the key stakeholders, including the community task force throughout the process to keep the stakeholders informed and updated on when key decisions or input from them is required.

## 7. SMALL PROJECT REQUIREMENTS

The Seattle Bridges Project is in a single state with a total project cost under \$100 million; therefore, it is a small project for purposes of the INFRA grant program. The project qualifies for award as a small project since it is cost-effective and has a positive effect on mobility in Washington and the Northwest US region. These requirements are met as shown in the table below:

Small Project Requirement	Project Elements
Project Cost Effectiveness	Yes. Cost-effectiveness is demonstrated in Section 5.1 and the Benefit-Cost Analysis Report attached to this application as Appendix A.
Does the project generate mobility benefits such that it has a positive effect on mobility in Washington and the Northwest US region	Yes. Statewide and regional mobility benefits are demonstrated in Section 1 and Section 5.1 of the project narrative.