

DELIVERY ASSESSMENT

Center City Connector

Prepared for: Seattle Department of Transportation

October 31, 2023



TABLE OF CONTENTS

1	Background and Purpose	4	3	Cost and Schedule Assessment	26
1.1	Purpose of the Delivery Assessment	4	3.1	Cost Assessment.....	26
1.1.1	<i>The Seattle Streetcar System - Summary, Background and Characteristics of Significance to the Delivery Assessment</i>	4	3.1.1	<i>Cost Assessment Methodology</i>	26
1.1.2	<i>Project Development - Small Starts Evaluation and Project Benefits</i>	4	3.1.2	<i>Project Cost Assessment</i>	29
1.1.3	<i>The Connector - Environmental Review</i>	5	3.2	Delivery Method	30
1.1.4	<i>The 2018 Project</i>	5	3.3	Schedule Assessment	31
1.1.5	<i>Key Project Challenges and Decision to Pause the Project</i>	6	3.3.1	<i>Schedule Assessment Methodology</i>	31
1.1.6	<i>The 2019 Vehicle/Project Interface Report and the KPMG Report</i>	6	3.3.2	<i>Schedule Projections by Scenario</i>	34
			3.3.2.1	<i>Design-Bid-Build</i>	34
			3.3.2.2	<i>Design-Build-Equip</i>	34
			3.4	Residual Risk and Opportunity Summary	35
2	Risk and Opportunity Assessment	8	4	Appendices	36
2.1	Changed Conditions and Requirements Affecting the Project	8	(A)	Design Option - Pioneer Square	
2.1.1	<i>General Escalation and Construction Escalation</i>	8	(B)	Traction Power Substation Location Options	
2.1.2	<i>Streetcar Design Vehicle</i>	8	(C)	Evaluation Of Station, Alignment & Interim Storage Options	
2.1.3	<i>Operational Plans and Practices</i>	9	(D)	Pertinent Updates To City Standard Plans & Specifications	
2.1.4	<i>Traction Power Issues and Opportunities</i>	10	(E)	SLU OMF Expansion Options – Evaluation	
2.1.5	<i>Potential for Expanded Use of Battery Propulsion</i>	11	(F)	SLU OMF Expansion Options – Renderings	
2.1.6	<i>Areaways</i>	12	(G)	Cost Assessment Detail	
2.1.7	<i>Jackson Street Roadway Structures</i>	12	(H)	Schedule Analysis: Design-Bid-Build Project Delivery	
2.1.8	<i>Public Agency Capital Improvements and Plans</i>	14	(I)	Schedule Analysis: Design-Bid-Equip Project Delivery	
2.1.8.1	<i>Sound Transit West Seattle and Ballard Link Extensions</i>	14			
2.1.8.2	<i>City Capital Improvement Projects in the Project Corridor</i>	16			
2.1.9	<i>Updates to City Standard Plans and Specifications</i>	16			
2.1.10	<i>Utilities in the Project Corridor</i>	16			
2.1.11	<i>Private Development Activity</i>	19			
2.1.12	<i>Board and Commission Approvals</i>	19			
2.1.13	<i>Stakeholder Engagement and Business/Property Owner Coordination</i>	19			
2.1.14	<i>Transit Operations on the Stewart/Olive Couplet</i>	20			
2.2	Options for Expansion of the SLU Operations and Maintenance Facility	24			
2.2.1	<i>Background - SLU OMF Expansion Plans (2018 Project)</i>	24			
2.2.2	<i>Expansion Options Addressing the Landmark Status</i>	24			



皇酒家
RESTAURANT

FAMILY

R SQUARE STN

406



1 / BACKGROUND AND PURPOSE

1.1 Purpose of the Delivery Assessment

The purpose of this delivery assessment is to inform decision making by the Seattle Department of Transportation (SDOT), the Mayor, the City Council, the Federal Transit Administration, the Puget Sound Regional Council, and King County Metro related to funding and implementation of the Center City Connector project, also known as the “Culture Connector” or “C3” (the Project). To inform decision making, the delivery assessment aims to:

- Identify potential solutions to previously identified project challenges;
- Identify changed conditions and requirements affecting the project;
- Identify risks and opportunities affecting cost and schedule, and
- Establish a new baseline cost and schedule estimate that incorporates appropriate contingencies.

1.1.1 The Seattle Streetcar System - Summary, Background and Characteristics of Significance to the Delivery Assessment

The City of Seattle, through its Department of Transportation, has developed two streetcar lines, which it operates through an interlocal agreement with King County METRO Transit. The South Lake Union Streetcar (SLU) line opened in 2007, providing connections between downtown Seattle and the Denny Triangle and South Lake Union neighborhoods along a 1.25-mile alignment. The First Hill Streetcar line (FHS) opened in 2016, providing connections between the Pioneer Square, Chinatown/International District, Central District, Yesler Terrace, First Hill and Capitol Hill neighborhoods along a 2.5-mile alignment.

Each of the lines is supported by an Operations and Maintenance Facility (OMF); four streetcar vehicles are currently stored and maintained at the SLU OMF, which has a capacity for five vehicles in its current configuration, and six streetcar vehicles are stored and maintained at the FHS OMF, which has a capacity for eight vehicles in its current configuration.

A notable and unusual characteristic of the operating environment for the SLU and FHS lines is the presence of King County Metro’s Electric Trolleybus system crossing or running parallel to portions of the alignment. On the SLU line, where the overhead

contact systems (OCS) of the streetcar and trolleybus cross, special crossing hardware was installed, and the streetcar is powered conventionally through the overhead contact system. On the FHS line, the interfaces of the bus and streetcar overhead contact systems were too extensive to be addressed through crossing hardware, so the FHS fleet is served by vehicles with On-Board Energy Storage Systems that provide battery power for streetcar propulsion on portions of the FHS alignment.

Other notable characteristics of the FHS alignment include steep grades (9%) on short segments of the alignment, and operation across bridges that were constructed in the early 20th century, which required strengthening to accommodate the streetcar loads.

1.1.2 Project Development - Small Starts Evaluation and Project Benefits

Plans to connect these lines through Seattle’s center city were formalized as early as 2008 in a Streetcar Network Plan endorsed by the City Council, and project development began in 2012. The project development phase culminated in the completion of an evaluation and rating process for the FTA “Small Starts” Capital Investment Grant (CIG) funding process. In its September 2015 submittal to the FTA, SDOT provided a summary of the merit of the project as well as detailed evaluation of how the project would address the FTA rating criteria, which include: Mobility Improvements, Cost Effectiveness, Congestion Relief, Land Use, Economic Development, and Environmental Benefits. SDOT noted that:

The 1.2 mile project will provide mobility through the core of downtown, serving major event and visitor destinations, employment centers, a growing residential population, and areas of significant development. The project will provide affordable and convenient transportation access to employment, services, and housing located within Seattle’s Center City and last-mile connections from regional transit services. The project also provides a critical linkage to leverage the existing South Lake Union Streetcar.... and First Hill Streetcar....creating a 5-mile system serving the broader Center City....(and) will improve accessibility to regional transit hubs while meeting the growing demand for local circulation and last-mile trips downtown.

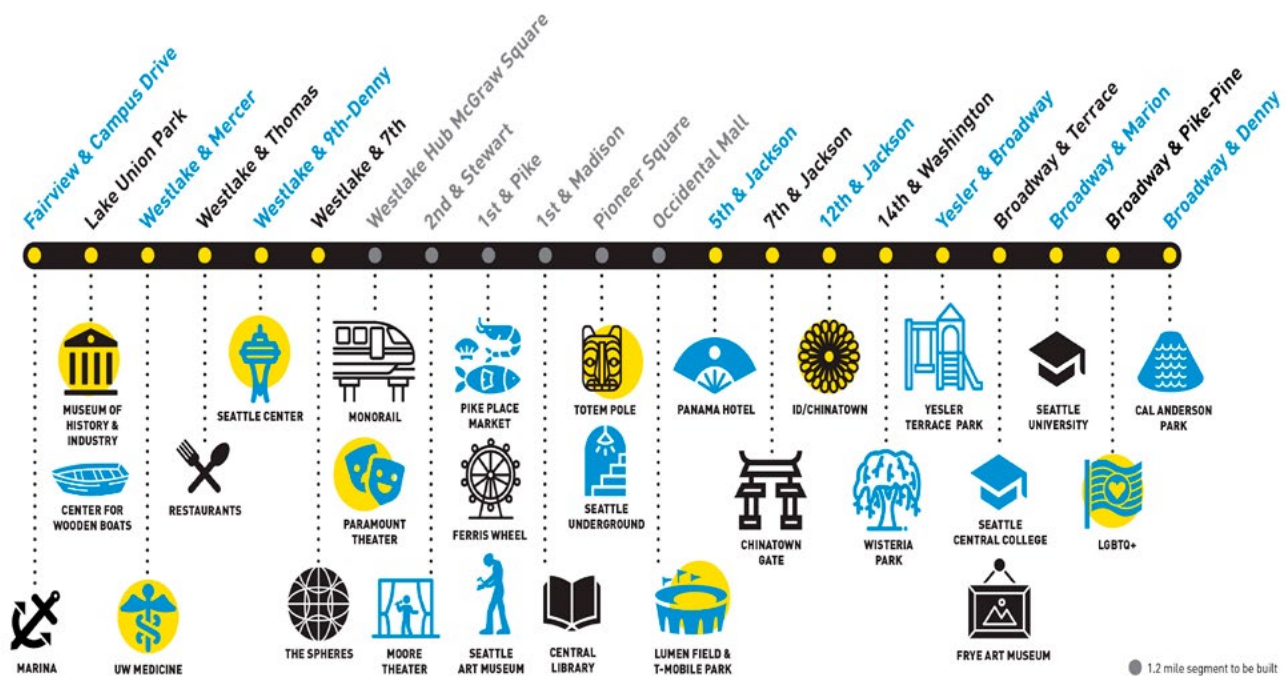


FIG. 1.1.2: Existing and Proposed Streetcar Stops Envisioned as a “Culture Connector”

Key features of the Project as proposed in the Small Starts evaluation included:

- Operation of the streetcar in an “exclusive guideway” (transit-only lanes) on First Avenue;
- A service plan allowing for very frequent service, and the purchase of ten additional streetcars to support the service plan; and
- Expansion of the SLU OMF, including expanding the yard to provide additional streetcar vehicle storage and construction of the “SLU OMF Annex” to provide facilities accommodating additional staff, parts and equipment.

³Small Starts are now projects with a total estimated project cost of less than \$400,000,000 and that are seeking CIG funding of less than \$150,000,000. New Starts are projects with a total estimated project cost of \$400,000,000 or more or that are seeking CIG funding of \$150,000,000 or more.

1.1.3 The Connector - Environmental Review

An Environmental Assessment was completed in March 2016 during the design phase of the 2018 Project, resulting in a Finding of No Significant Impact (FONSI) issued by the FTA in February 2017.

1.1.4 Project Status as of 2018

By 2018, design of the advanced utility relocations and the mainline track and civil components of the project had advanced through final design and had been issued for bid at the time of a decision to pause the project. The utility relocations and upgrades to be built in advance of the mainline track and civil construction were bid as two separate Advanced Utilities Packages,

AUP 1 and AUP 2. Each of these packages had been advertised for bid and awarded for construction. Most of the AUP1 project scope had been constructed (from Jackson street to Columbia Street). Four bids had been submitted for the mainline track and civil package, but that package was not awarded. An expansion of the SLU OMF to add vehicle storage capacity and an annex to accommodate additional staff and spare parts, had advanced to 100% design but had not been issued for bid. In addition, a streetcar vehicle procurement process had been completed and a contract for ten streetcar vehicles had been awarded to CAF USA in July 2017 (The CAF USA vehicle contract was terminated in September 2019). Additional project development activities that had been completed by SDOT included receipt of a Letter of No Prejudice (LONP) from FTA for up \$1.3M in costs for early rail procurement (February 2018), and progress through much of the FTA’s Project Management Oversight (PMOC) process, including completion of risk review and readiness to enter in to grant agreement.

The advanced state of design and procurement of the project by 2018 provides a well-informed baseline for the scope, schedule and cost of the project should it be resumed, although some aspects of the project scope and design would likely be revised to reflect changed conditions. Therefore, this assessment refers to “the 2018 project” as a shorthand for all of the elements of the project that were significantly advanced by 2018.

1.1.5 Key Project Challenges and Decision to Pause the Project

Although the low bid received for the mainline track and civil package was within 5% of the Engineer's Estimate, several project challenges were identified that presented significant risks:

The vehicle procurement had been conducted as a parallel effort to the design of the streetcar infrastructure, without sufficient coordination between the two. After award of the vehicle contract, SDOT identified conflicts between the configuration of the new streetcar vehicles procured for the 2018 project, the existing Seattle Streetcar infrastructure, and the design of the 2018 project infrastructure—referred to broadly as “Vehicle/Project Interface” issues. These included conflicts between the vehicle length and configuration and the design of some of the existing SLU and FHS passenger platforms; conflicts with existing OMF infrastructure; and heavier streetcars that would likely require further strengthening of the bridges crossed by the FHS line (known as the Jackson Street Structures). These streetcar/infrastructure issues were assessed in the 2019 report, “Vehicle/Project Interface Analysis.”

In addition to the vehicle/project interface issues, SDOT had growing concerns in 2018 about the potential impact of the streetcar loading, or the construction of the streetcar, on “areaways,” which are building basement areas that extend beneath sidewalks, supported by a “street wall.” By 2019, SDOT had posted restrictions limiting the gross vehicle weight for vehicles traveling along First Avenue in Pioneer Square to 10,000 lbs. The 2018 Project design had assumed that structural retrofit of the areaways was a long-term issue for the City to address over time and independently of the Project, but SDOT began revisiting this assumption in 2018.

Finally, as the SLU OMF Annex project advanced through the City's permitting process, the issue of the eligibility of an existing structure on the site for designation as a Seattle Landmark came to the fore. Subsequently the ‘Bricklayer's Building,” which was proposed to be demolished to accommodate the increased vehicle storage capacity necessary to the 2018 Project, was designated by the Seattle Landmarks Board. This called into question the ability to move forward with the SLU OMF Annex project as designed; Landmark status does not in and of itself

preclude demolition, but Board approval would be required for demolition or major alterations to the building. Additionally, the SLU OMF Annex project as designed would not provide on-site parking for streetcar operations and maintenance staff, and options to address staff parking needs were still in development at the time of the project pause.

Taken together, the vehicle/project interface issues, areaway issues, and project cost and funding concerns led the City to pause the project; the contract for the construction of the mainline project scope was not awarded after bid; the AUP-1 utilities contract was terminated after completion of the scope between Jackson and Columbia streets; and the AUP-2 contract was terminated prior to the start of construction.

1.1.6 The 2019 Vehicle/Project Interface Report and the KPMG Report

In 2019, SDOT completed a study of the vehicle/project interface issues, with the goal of identifying the scope and cost of changes to the 2018 Project, and/or to existing SLU and FHS infrastructure, that would be needed to accommodate the CAF streetcar vehicles (including some recommended changes to the SLU OMF lead track and yard tracks). This report provided planning-level cost estimates, some of which were carried forward to inform the Delivery Assessment. In addition, the City commissioned an independent streetcar cost review by KPMG, which included estimates of various soft costs and start-up costs that have also been carried forward to inform the Delivery Assessment. Both of these studies assumed the CAF vehicle as design vehicle for the project.



301

Seattle
Cancer Care
Alliance

Fred Hutch - Seattle Children's - UW Medicine



2 / RISK AND OPPORTUNITY ASSESSMENT

2.1 Changed Conditions and Requirements Affecting the Project

The risk and opportunity assessment identifies changes to conditions (such as new and planned public or private development projects) or requirements (such as updated design and construction standards) that could impact the project. Some of these impacts could require changes that would increase the cost of the project (and are therefore categorized as “risks”), while others might provide an opportunity to make changes that could reduce the capital or operating costs of the project (and are therefore characterized as “opportunities.”)

2.1.1 General Escalation and Construction Escalation

Since the pause of the 2018 project, there has been general price inflation in the economy, including a period of rapid price escalation, and construction price escalation within the region. These changed conditions are discussed further in [Section 3](#).

2.1.2 Streetcar Design Vehicle

As noted in [Section 1](#), conflict between the configuration of the new streetcar vehicles procured for the 2018 project, the existing Seattle Streetcar infrastructure, and the design of the 2018 project infrastructure was a key project challenge contributing to the decision to pause the project. If the project is resumed, SDOT can establish criteria for the streetcar vehicle that will avoid or minimize such conflicts. Therefore this Assessment includes identification of the “Streetcar Design Vehicle,” identifying the key criteria for the configuration of the new streetcar vehicles to be assumed in the conceptual development and design of the project (see Table 2.1 below).

The weight of the streetcar vehicles, as well as the spacing of the streetcar “bogies” or “trucks” and distribution of the weight to the axles and wheels of the streetcars, is a critical design consideration for the Seattle Streetcar because of the presence of structures in the corridor that are over 100 years old. The structures that support Jackson Street above the BNSF mainline railroad were strengthened to accommodate operation of the existing streetcar fleet. However, the manufacturer of the current fleet is no longer in business, and vehicles that are currently available in the market are heavier and have higher “axle loads.” From the rail car manufacturing industry perspective, a ten-car order is a small order that will not motivate a manufacturer to develop a completely custom car at a reasonable price. SDOT has initiated an evaluation of the Jackson Street Structures, which will include consideration of future streetcar needs, as discussed in [Section 2.1.7](#) below.

The Risk and Opportunity Summary presented in Section 3.4 discusses a possible implementation option for the Project that would allow the Jackson Street structures to be addressed as a separate project phase. The FTA New Starts/Small Starts process allows agencies to propose a Minimum Operable Segment (MOS), noting “The purpose of selecting the MOS is to identify a segment of the Locally Preferred Alternative that provides the most cost-effective solution with the greatest benefits for the project. The MOS must be able to function as a stand-alone project and not be dependent on any future segments being constructed.”

Using this implementation tool available for FTA funded projects, SDOT could propose to construct the C3/ Culture Connector project, and initially operate an MOS with service from South Lake Union to Pioneer Square and transfers to existing First Hill Streetcar service. The existing streetcars would operate on the First Hill line, to a passenger platform west of the structures (platform location and configuration options are discussed in Appendix A and Appendix C, but generally in the vicinity of the existing FHS Occidental/Jackson platform). The new streetcars would operate from South Lake Union through the center city to the same passenger platform in Pioneer Square, where passengers could transfer between the lines. Many trips-such as from Lake Union Park to Pike Place Market-would be served without a transfer, while others would require a transfer in this interim configuration.

If the MOS were defined in this way, SDOT could pursue deck replacement or other improvements to the Jackson Street structures as an independent project. Although the Jackson Street structures project would still need to be completed before the full Connector operation plan could be implemented, building the MOS first would allow for

a project funding plan more similar to that envisioned at the time of the 2018 Project. To develop the MOS, SDOT would need to complete ridership forecasting for the MOS operating plan and re-validate the project evaluation criteria that were applied to FTA's initial evaluation of the project.

Table 2.1 Recommended Streetcar Design Vehicle
Streetcar Vehicle Configuration & Performance Criteria

Category	Item	Design Interface Issues	Recommended Design Vehicle Assumption for Delivery Assessment
Carbody Dimensions	Vehicle Length	Compatibility with existing SLU and FHS platforms; compatibility with OMF maintenance pit and track layout for storage capacity	Up to 72'
	Vehicle Width	Compatibility with SLU, FHS and proposed C3 platforms and clearance envelope	2450 mm/96 inches
	Floor height above Top of Rail at AWO - Low Floor Section	Compatibility with SLU, FHS and proposed C3 platform heights	12" Platform Height at Boarding Zone (with Load Leveling or Internal Ramp)
Weight	Axle Loading	Structures - Jackson and Areaways	Not specified at this time; see additional discussion below.
Design & Performance Criteria	Operation on Wireless Segments	Potential to expand wireless operation/eliminate more OCS and possibly TPSS	On-Board Energy Storage System shall provide capability to extend existing wireless operating segments to include First Avenue NB and Stewart Street WB.
	OESS-Charging	Compatibility with operating plan including layover time at termini.	Specify rate of charge and time to charge OESS consistent with operating assumptions
	Compliance with ADA/Interface Requirements	Compatibility with 10" platform height on SLU and FHS OR alternatives to meet ADA/Interface Requirements**	Require load leveling* or floor height 12" above top of rail with internal ramp.
Interoperability - Maintenance	Component Access	Compatibility with SLU and FHS OMF	Components shall be accessible for maintenance without substantial modification of the maintenance pits or mezzanine platforms of the SLU and FHS OMF. Maintenance access shall not require a "wide pit."

* "Load leveling" is a hydraulic system that adjusts the height the streetcar floor height to a fixed distance from the top of the rails, even as the weight of passenger loads on the streetcar changes.

** The SLU and FHS platform heights range from 9.5" to 10" and use bridge plates to meet ADA. Because bridge plates are not a preferred method of accommodation and can impact operations and maintenance, SDOT may want to phase bridge plates out over time, and make adjustments to platform heights, to 12", at boarding zones to work with a load-leveling system or a vehicle with internal ramps.

2.1.3 Operational Plans and Practices

The 2018 project assumed an operational plan that was to feature two overlapping service “loops:”

- One loop would operate from the FHS terminus at Capitol Hill Station through the existing FHS alignment and continue on to a turnback at Republican Street in South Lake Union;
- A second loop would operate from the SLU terminus at Fred Hutchinson Cancer Research Center station in South Lake Union and continue through South Lake Union and the center city to the existing turnout and crossover at 7th and Jackson in the Chinatown-International District.



FIG. 2.1.3: Hub Operating Map Plan

The perceived advantage of this proposed operating plan was that service could be provided at very frequent intervals where the two loops overlapped within the center city. For example, if ten-minute headways (service intervals) were provided on each loop, streetcars would arrive every five minutes in the overlapping service area.

However, the operator of the Seattle Streetcar, King County Metro Transit, analyzed this service plan and determined that the overlapping loops would be difficult to manage and would likely be less efficient than operating a single loop throughout the entire alignment of the completed project. Therefore, the “single loop” operating plan is assumed for the Project going forward. The single loop offers some additional benefits with respect to streetcar traction power design that are discussed further in sections 2.1.4 and 2.1.5 below.

2.1.4 Traction Power Issues and Opportunities - Substations

Background-Streetcar Traction Power

Streetcars are a type of light rail vehicle that is powered by electric “traction motors.” Traditionally the power

for the electric motors has been delivered through an overhead contact system (OCS) copper wires supported by strain poles, span wires, cantilevered arms, and other specialty hardware, and powered by Traction Power Substations (TPSS), which transform AC electrical current from the municipal electrical network to 750v DC current. More recently, on-board energy storage systems (OESS) such as lithium-ion batteries have been introduced to provide the ability for streetcars to operate “off-wire” for some segments of the streetcar line; this technology has been implemented on the FHS and is planned for the Project.

Together, the OCS, TPSS, OESS and other elements are referred to as a “Traction Electrification System,” which must be designed to provide a safe and adequate power supply to operate the streetcar system as planned. Systems engineers perform a “load flow” analysis to simulate the electrical loads that streetcar operations will demand, incorporating various contingency situations, such as the temporary unavailability of any of the TPSS within a given electrical “section” of the streetcar line. A separate analysis of the capabilities of the OESS is performed to determine which sections of the streetcar line can be operated “off-wire” and therefore will not require traction electrification to be supplied by TPSS and delivered by OCS.

In a dense urban environment like that of the Project, identifying suitable locations for the TPSS (typically, metal buildings of about 15’ by 20’) and OCS poles (similar to poles supporting bus trolley wires, traffic signals and street lighting) is a design challenge. For the 2018 Project, resolution of these design challenges included a proposed underground TPSS at the site of McGraw Square (Between Stewart and Olive at Westlake Avenue) and underground traction power conduits to connect the TPSS to the OCS on First Avenue. This proved to be an expensive element of the Project.

For the 2018 project, a traction power load flow analysis was performed based on the 2018 Operating Plan assumption of a two-loop operation. This analysis identified the need to provide additional traction power capacity to support the operation of additional vehicles, particularly to the existing SLU segment, which is currently served by just two TPSS (providing less power and redundancy than would be required to provide more frequent service on SLU). In addition, traction power would have to be delivered to the on-wire operating segment of First Avenue (from Columbia

Street to Stewart Street). Ultimately, the 2018 Project included:

- Off-wire operating segments, powered by the OESS, for operations westbound from Stewart Street (east of Third Avenue) southbound to the Occidental/Jackson platform; for operations northbound on First Avenue between Jackson Street and the Columbia/Cherry platform; and for operations eastbound on Stewart Street to northbound at the 6th/Westlake platform.
- An underground substation was proposed in the 2018 Project, at McGraw Square (Westlake Avenue between Olive and Stewart streets). This design required an extensive underground traction power cable and ductbank system to deliver power to the northbound wired operating segment on First Avenue. These underground facilities were anticipated to present operations and maintenance challenges and may have required limiting activities at McGraw Square to ensure that the vaults would be accessible at all times. In addition, the design presented potential conflicts with plaza improvements planned by the developer of private property adjacent to McGraw Square.

Traction Power Issues & Opportunities: TPSS Location Opportunities



Seneca Street West of First Avenue

As an alternative to the McGraw Square location, several options for TPSS locations have been identified as summarized in [Appendix B](#). The most promising option is to install a pre-fabricated TPSS on Seneca Street, west of First Avenue, where the removal of the Seneca Street

off-ramp from the former Alaskan Way Viaduct has created some available space within the right-of-way.

This location would allow for a short feeder duct run to a new feeder pole on First Avenue, which could feed the First Avenue OCS section. Additionally, this location could likely provide power to the OCS segment that begins at Stewart Street, by extending the OCS above the southbound to eastbound track, at a height providing an “air gap” between the Streetcar

OCS and King County Metro Trolleybus OCS. The cost assessment in Section 3 incorporates the assumption that the McGraw Street TPSS would be deleted from the design and the Seneca Street TPSS would be added to the design, at a cost savings in the range of \$2 million.

2.1.5 Traction Power Issues & Opportunities: Potential for Expanded Use of Battery Propulsion

As discussed above in [Section 1.1.1](#) and [2.1.4](#), the Project includes off-wire operating segments in which an On-Board Energy Storage System (batteries) would power the streetcar, similar to the off-wire segments which have been in operation on the FHS line since 2016 (see Figure below).

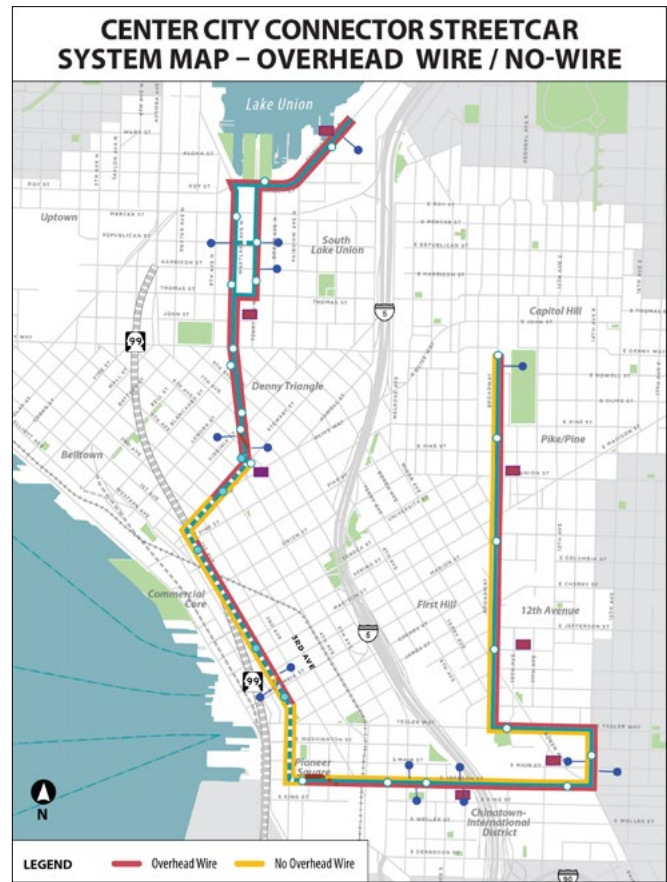


FIG. 2.1.4: OCS System Map Wire / No-Wire

The design of the 2018 Project was informed by an Overhead Contact System Infrastructure Options Report that was completed in 2014, prior to the start of FHS operations, and by the “two loop” operating plan. There is potential to expand the off-wire operating segments of the Project, given SDOT now has seven years of operating experience with streetcar vehicles

using OESS, and the proposed single-loop operating plan which would provide additional “on-wire” charging time for streetcars as they operate through the existing on-wire SLU line, before re-entering an off-wire segment with a full charge.

Although the viability of an extended off-wire segment would need to be validated further prior to incorporating this approach into the design of the Project, if the concept is validated there will be an opportunity to make all of First Avenue, and Seneca Street east of Third Avenue, an off-wire operating segment. In this scenario, the Seneca Street TPSS would not be implemented, but an additional TPSS would be installed at John Street to provide additional power to the SLU segment. There would be an additional savings in the range of \$2 million associated with this change.

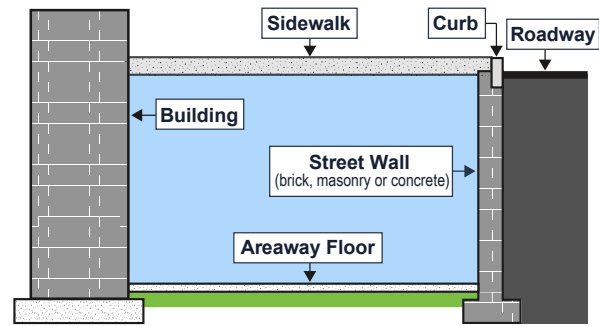


Example of Charging Station

To provide for contingency operations for a scenario in which the battery state of charge for a given streetcar vehicle were to fall below acceptable levels within the off-wire segment, charging stations could be installed at one or more of the stations along First Avenue, using low-cost technology that has been developed in recent years for uses such as charging electric cars.

These small chargers could be accommodated on the streetcar platforms, and would be fed by the platform electrical systems already incorporated into the design of the 2018 Project (including Seattle City Light service cabinets with meters). Rather than charging via a plug, the DC charging current would be fed to a copper charging bar suspended over the streetcar track, and charging would occur via the streetcar pantograph.

2.1.6 Areaways



Areaways are spaces that exist under sidewalks and between the roadway and the adjacent building. In 2018, SDOT conducted a structural analysis of the underground areaways in Pioneer Square. This analysis identified areaway structural vulnerabilities; in general, the areaway foundation walls have deteriorated over time and need repair. Areaways are also present in other locations in the Project corridor. There are a variety of streetwall types, ages, and conditions, which informs the cost and allowances assumptions that are discussed in [Section 3.1](#).

In 2019, SDOT introduced weight restrictions on travel and parking/loading in the curb lanes of First Avenue in Pioneer Square to reduce the risk of structural failure. Vehicles over 10,000 pounds are restricted to traveling in the inside lanes on 1st Ave from Marion St to Railroad Way S and right turns have been restricted. Commercial vehicle load zones have been relocated to curb spaces without a vulnerable areaway.

These weight restrictions could impact the constructability of the Project, as construction equipment typically used for roadway and transit construction exceeds these weight limits. For this reason, the cost and schedule assessments presented in [Section 3](#) assume that structural retrofits of the areaways in Pioneer Square would need to be completed prior to construction of the streetcar track and related roadway and drainage construction. (Most utility relocations proposed in Pioneer Square were completed in 2017/2018 as part of AUP1 prior to the pause of the 2018 Project.)

2.1.7 Jackson Street Roadway Structures

Several blocks of Jackson Street, between 2nd Avenue Extension and 4th Avenue South, is comprised of bridge structures that span the mainline BNSF railway that carries freight and Amtrak passenger trains through downtown Seattle. The South Jackson Street



corridor serves as one of downtown Seattle’s essential east/west connections, bridging the neighborhoods of Pioneer Square and Chinatown/International District. South Jackson Street also fronts one of Seattle’s major multi-modal transportation hubs, bringing together buses from King County Metro and private operators, light rail and passenger service from Sound Transit and Amtrak, the First Hill Streetcar, and BNSF freight trains. SDOT has initiated the “2nd Ave Ext S & S Jackson St West Bridges Replacement Planning” study to identify bridge rehabilitation and replacement options. Planning for the future of these structures is needed because of their age and condition, independent of the streetcar Project.

As noted in Section 2.1.2, these structures date from the early 20th century, and were retrofitted in 2013/14 to accommodate the existing streetcar vehicles that operate on the FHS line. Although the new streetcar vehicles for the Project have yet to be procured, the expectation is that the structural loads associated with the new, heavier vehicles will require further strengthening or upgrades to the structures. SDOT commissioned diagnostic load tests of a section of the structures in 2022. To inform this Delivery Assessment, SDOT subsequently commissioned an evaluation of structural performance under loading conditions for several representative streetcar vehicles, utilizing the

field-calibrated model from the tested section of this structure.

The results of this evaluation indicate that replacement of the bridge deck may be required to accommodate heavier future streetcar vehicles (operating in mixed traffic with cars, buses, etc.). Given SDOT has initiated a broader study of the bridge rehabilitation and replacement options, deck replacement is not likely to proceed independently of a broader long term solution for these bridges. The cost assessment in Section 3.1 incorporates an allowance for the cost of deck replacement that was derived from other SDOT deck replacement projects. However, this estimate is effectively a placeholder for future bridge projects that may differ significantly in scope and cost from the deck replacement.

2.1.8 Public Agency Capital Improvements and Plans

2.1.8.1 Sound Transit West Seattle and Ballard Link Extensions

Sound Transit (ST) has advanced project development for the expansion of the regional light rail system including the [West Seattle and Ballard Link Extensions](#). ST published a Draft Environmental Impact Statement in January 2022 and the ST Board approved preferred alternatives and other alternatives to be studied in the Final Environmental Impact Statement for the West Seattle Link Extension in July 2022 and for the Ballard Link Extension (BLE) in March 2023. Several of the BLE alternatives have the potential for impacts both to the existing Seattle Streetcar lines and to the proposed Connector. In the Chinatown/International District (CID) Segment, the BLE will cross beneath the existing First Hill Streetcar line at Jackson Street in the vicinity of 4th and 5th Avenues S; depending on the horizontal and vertical alignment of the new transit tunnel and stations, BLE could impact SDOT's Jackson Street structures and the streetcar ([ST, WSBLE DEIS, Chapter 3, Transportation Environment and Consequences, Table 3-29. Key Construction Roadway Closures – Chinatown International District Segment](#)). In the Downtown Segment, the preferred alternative is a Tunnel alignment generally under 5th Avenue and Westlake Avenue, with a Denny Station under Westlake Avenue between Denny Way and Lenora Street. Construction of the preferred “Denny Shifted North” Station would require an estimated 4-year closure of Westlake Avenue to Streetcar operations north of Lenora Street as well as demolition/removals impacting the infrastructure of the South Lake Union line ([ST, WSBLE DEIS, Chapter 3, Transportation Environment and Consequences, Table 3-30. Key Construction Roadway Closures – Downtown Segment](#)). If the Connector begins or completes construction prior to the completion of the BLE in these areas of interface, the ability to operate the Seattle Streetcar as a single line could be impacted. Therefore, this assessment identifies options for operating interim service on portions of the streetcar system not impacted by construction of the light rail extensions, including options for temporary or permanent infrastructure that may be required to support the interim service plans.

Station and Track Options for Interim Service During Construction of the BLE Denny Station

If the Connector is completed prior to completion of the BLE Denny Station, SDOT would likely seek to operate streetcar service south of the Denny Station closure area; the service would extend from the Denny Triangle

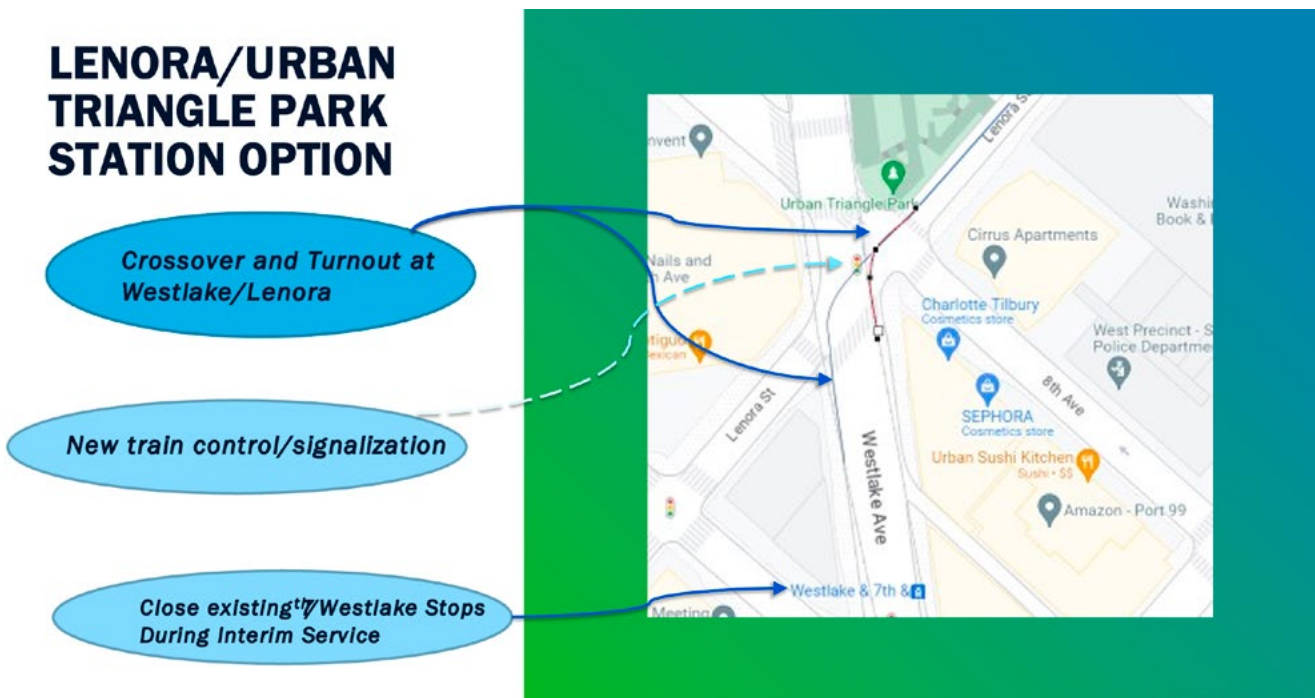


FIG. 2.1.8-A: Lenora/Urban Triangle Park Station Option

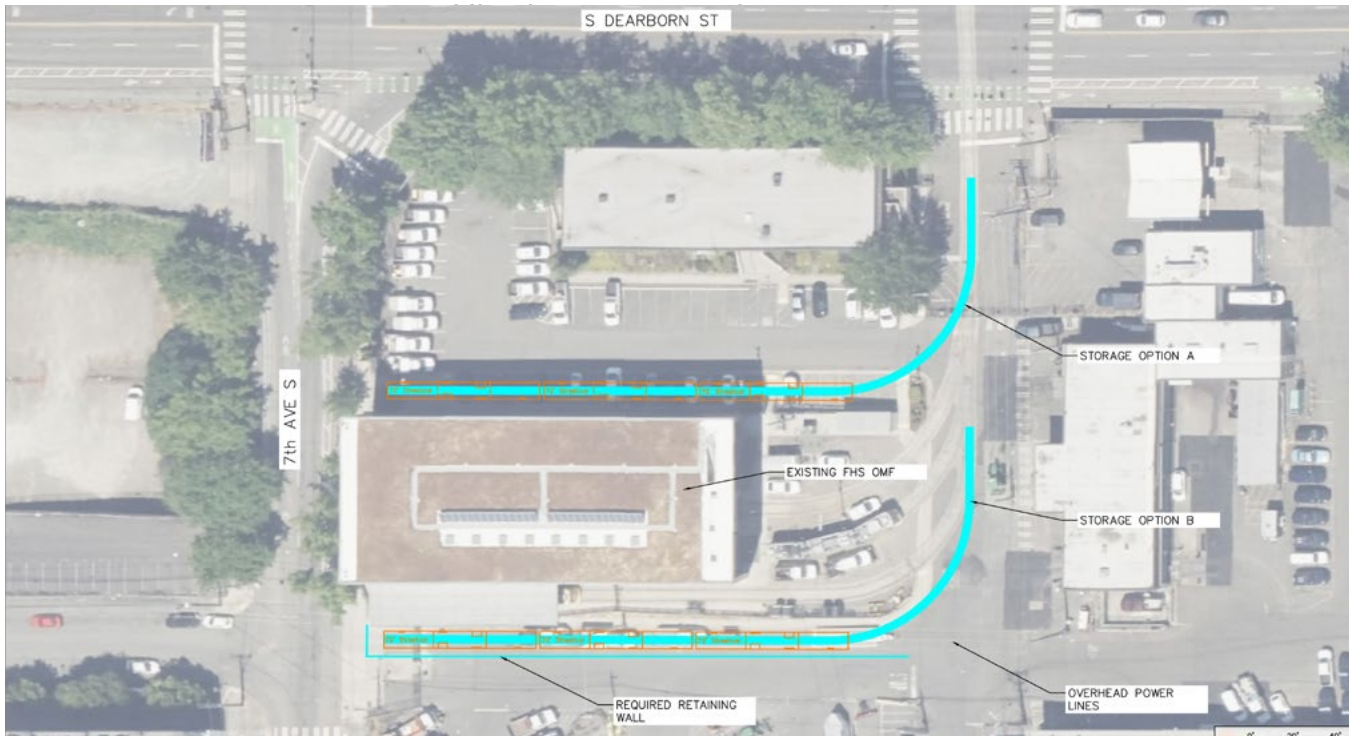


FIG. 2.1.8-B: Additional Storage Track or Tracks at FHS OMF

Vehicle Storage and Maintenance Options for Interim Service During Construction of the BLE Denny Station

The closure of Westlake Avenue during construction of the BLE Station would cut off access to the SLU OMF for streetcars operating south of the Westlake closure. To operate the interim service plan, an interim plan for vehicle storage and maintenance would also be required.

At SDOT's request, King County Metro performed a preliminary analysis of the operating requirements of the interim service to the Denny Triangle, and estimates that a fleet of 13 vehicles would be required to support the operation at an eight-minute headway, or 11 vehicles at a 10.5 minute headway. As currently configured, the FHS OMF can accommodate storage of up to eight streetcars. Therefore, storage for an additional 3 to 5 vehicles beyond those that could be accommodated at the existing FHS OMF would be required to support an interim service plan. Three options for vehicles storage and maintenance during the Westlake Avenue closure were developed conceptually for this Assessment:

- **Additional Vehicle Storage and Maintenance at the FHS OMF:** This option would construct an additional storage track or tracks at the FHS OMF, as shown in Figure 2.1.8-B. All of the vehicle storage and maintenance required to support the interim service plan would be conducted at the FHS OMF. The cost to design and construct the additional storage is estimated at approximately \$3.5 M (for storage of three additional vehicles) to \$4.3 M (for storage of up to six additional vehicles) as further discussed in Section 3, Cost and Schedule Assessment.
- **Interim Storage On the Alignment/Maintenance at the FHS OMF:** This option would identify locations for vehicle storage on exclusive track segments of the mainline alignment of the streetcar system, with vehicle maintenance performed at the FHS OMF during the interim service period. This option would require security to prevent vandalism/damage to the streetcars, which may add \$2 to \$3 M to the total cost of providing the interim service assuming a four-year duration (or \$4M to \$6M for an eight year duration).
- **Construction of New Lead Track to the SLU OMF:** This option would construct a new lead track to bypass the Westlake Closure and provide access to the SLU OMF, as shown in Figure 2.1.8-C. The cost to design and

construct the interim lead track is estimated at approximately \$16 M, as further discussed in Section 3, Cost and Schedule Assessment.

Options for Interim Service During Construction of the BLE CID Segment/Potential Closure of S Jackson Street

Some of the options under consideration for the BLE Chinatown International District segment are assumed to require a two-year closure of S Jackson Street between 2nd Avenue Extension and 5th Avenue S. The existing FHS line includes a switch and crossover at 6th Avenue S which allows for an operation in which the streetcar platform east of 5th Ave S on S Jackson Street to serve as an interim terminus. In addition, the 2018 project included a crossover at the Cherry/Columbia platform on First Avenue. Therefore, an interim service plan featuring two separate lines, one operating from 5th Ave S to Capitol Hill Station and another operating from Cherry and Columbia streets in Pioneer Square to South Lake Union at Fairview Avenue and Yale Street, would be feasible without modification to the 2018 project, assuming this closure did not coincide with a closure of Westlake Avenue.

Options for Interim Service East and West of the Jackson Street Structures

If the Connector is completed prior to the BLE, it is possible that improvements to the Jackson Street structures to accommodate the new streetcar fleet (deck replacement, as discussed further in [Section 2.1.7](#)) may be deferred until after completion of BLE (if the BLE construction could limit the useful life of improvements completed prior to the BLE). In this scenario, an interim service plan that limits streetcar operations crossing the Jackson structures to the existing fleet, with transfers in Pioneer Square to service operating west of the Jackson structures using the new fleet, could be provided. Several options for the location and configuration of a streetcar station platform and crossover tracks to support this interim service plan were developed conceptually for this Assessment, as shown in Figures 1 and 2. The options include:

2.1.8.2 City Capital Improvement Projects in the Project Corridor

City projects that have been completed, are in construction, or are planned for construction in the Project corridor include the Waterfront Seattle

Program-Pioneer Square East-West Pedestrian Streets; the Madison Bus Rapid Transit Project; the Two-Way Columbia Transit Improvements; Pike/Pine Corridor Improvements and Third Avenue Arterial Asphalt and Concrete (AAC) paving project. None of these projects are expected to change conditions in a way that would present risks for the Project. SDOT's AAC program identifies the need to repave 1st Avenue, which presents an opportunity to supplement Project funding with AAC program funds. Similar funding arrangements were implemented to fund repaving of the general purpose lanes of S. Jackson Street via the First Hill Streetcar project contract.

2.1.9 Updates to City Standard Plans and Specifications

The 2018 Project was designed to meet the City standard plans and specifications as well as Seattle City Light and Seattle Public Utilities standards and requirements, that were in effect at the time. There have been subsequent updates adopted by the City; therefore the 2018 Project plans would need to be updated to meeting current standards prior to being issued for construction. [Appendix D](#) identifies the updates to standards that are anticipated to have some impact on the project design. The incremental costs of design and construction, which are minor, have been incorporated into the Cost Assessment (section 3).

2.1.10 Utilities in the Project Corridor

Transportation is the principle use of City streets (as established under Washington law and the Seattle Municipal Code). SDOT issues permits allowing utilities to operate in City streets, subject to potential requirement to relocate. SDOT can direct utilities to relocate at their own expense when required for transportation improvements. As a practical matter, relocation of utilities is expensive and disruptive. SDOT tries to avoid or minimize utility impacts through the design of its projects, and coordinates with utility owners to identify any planned upgrades to utility infrastructure that could be completed in advance of or as part of the project.

City Utilities

Identification and resolution of utility conflicts, and the design of relocation and betterments to City-owned utilities, with the concurrence of Seattle City Light (SCL) and Seattle Public Utilities (SPU), was a major element of the design completed for the 2018 project. As noted in Section 1.1.4, the utility relocations and upgrades

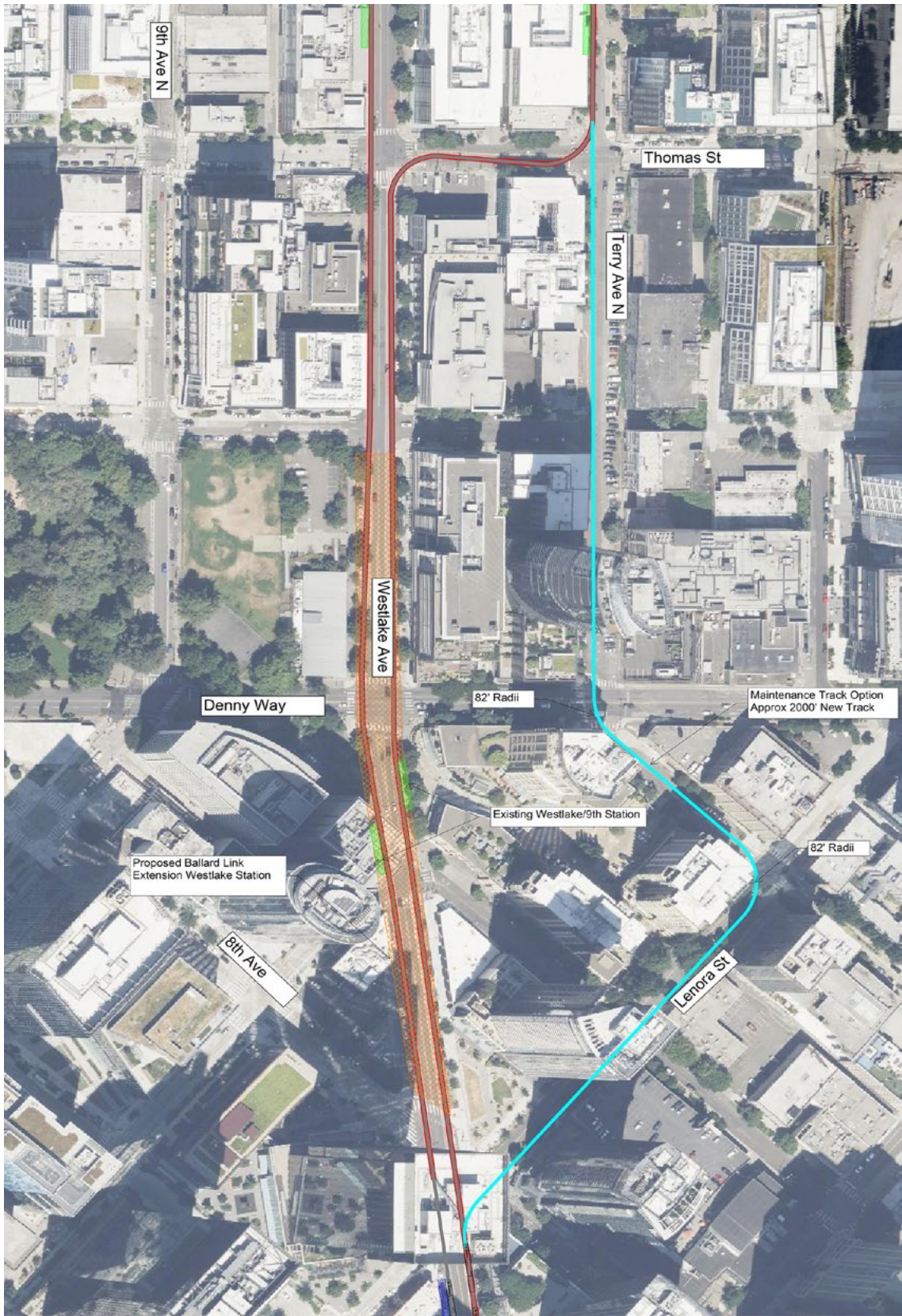


FIG. 2.1.8-C: SLU - Maintenance Access Track

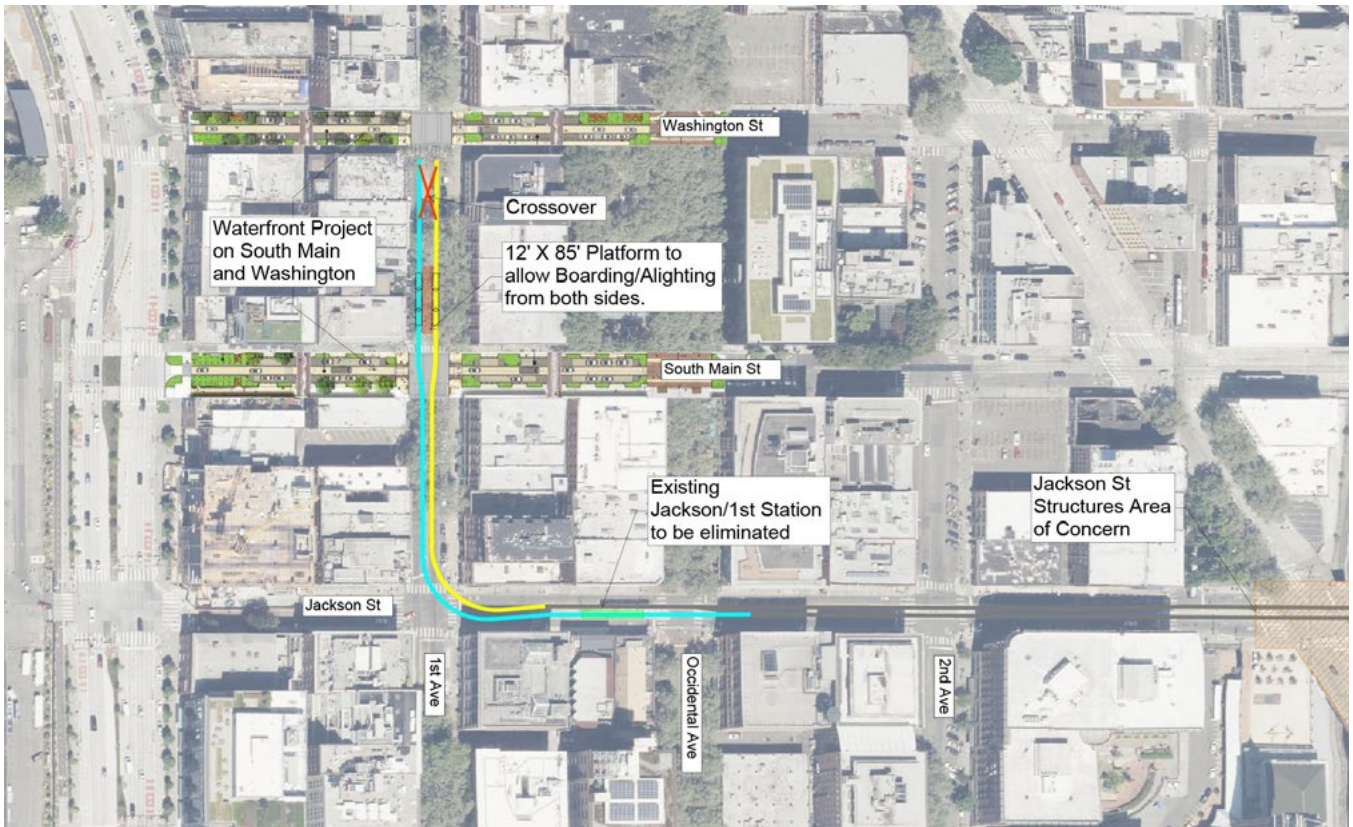


FIG. 2.1.8-E: Interim Transfer Option 2

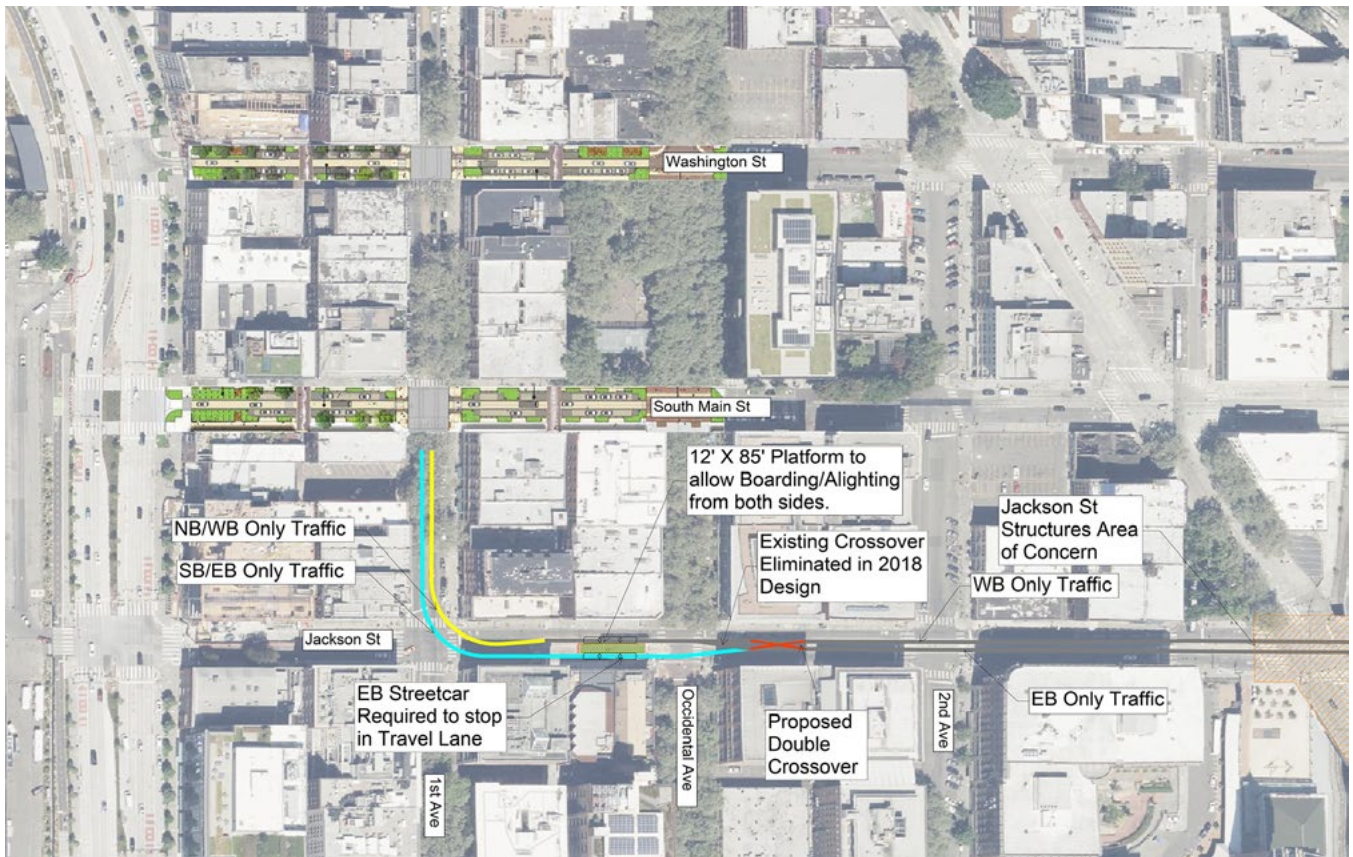


FIG. 2.1.8-D: Interim Transfer Option 1

to be built in advance of the mainline track and civil construction were bid as two separate Advanced Utilities Packages, AUP 1 and AUP 2. Each of these packages had been advertised for bid and awarded for construction. Most of the AUP1 project scope had been constructed (from Jackson street to Columbia Street). For this Assessment, SDOT queried SCL and SPU to determine if there were any significant planned changes to their utility networks in the project corridor. Neither SCL nor SPU has identified significant planned changes. Therefore, assuming no significant changes to the mainline track alignment, a new project could advance by validating and updating the AUP1 and AUP2 packages, with minor additional design work to incorporate updates to SCL Construction Standards and applicable City Standard Plans & Specifications. SPU has indicated they may want to update the condition assessment of their sewer infrastructure, which could lead to changes in the repair type/method for some of their sewer infrastructure.

Private Utilities

Privately owned utilities in the project corridor include gas (owned by Puget Sound Energy), telecommunications (multiple owners), and steam (owned by CenTrio). SDOT coordinated with these private utilities during design of the 2018 Project, working with them to identify areas of potential conflict and providing notice directing them to relocate their utilities in advance of Project construction, as applicable. It is anticipated that the required private utility relocations would be substantially similar as those identified for the 2018 project. Private utility relocations can pose a schedule risk to the project. The schedules in Section 3 assume a strategy of notifying the private utilities of the requirement to relocate as soon as local funding for the project is committed, and assuming the relocations may take up to 1.5 years in the schedule.

2.1.11 Private Development Activity

Kilroy is planning to redevelop several properties in downtown Seattle known as the Vance Blocks, including the parcel immediately adjacent to McGraw Square and the existing downtown terminus of the SLU line. Kilroy has proposed to make significant improvements to the McGraw Square which they would integrate with the design of their adjacent frontage improvements. The McGraw Square Traction Power Substation proposed in the 2018 Project would conflict with preferred

elements of these redevelopment plans; alternative TPSS locations are discussed in [Section 2.1.4](#).

2.1.12 Board and Commission Approvals

The design of the 2018 Project reflected the input and outcomes from several cycles of review by City Boards and Commissions with jurisdiction over certain project elements, including the Seattle Design Commission, the Pioneer Square Preservation Board, and the Pike Place Market Historical Commission. To the extent that the Project were to move forward with a design substantially similar to the 2018 Project design, it is likely that similar approvals, or additions to existing approvals, can be obtained within the project schedule assumptions and, to the extent any changes to the design are required, that those could be accommodated within the estimating allowances included in the Cost Assessment. However, because these Boards and Commissions are effectively third parties, there remains some risk to Project scope, cost and schedule.

Elements of the project that are subject to approvals by the City's Landmarks Preservation Board (LPB) were still under review or in progress at the time the project was paused. Therefore, there is considerable uncertainty associated with scope within LPB jurisdiction. This is primarily related to expansion of the SLU OMF, which is addressed in Section 2.2 below. The 2018 Project also assumed some eyebolt attachments to landmarked buildings for support of the Overhead Contact System. An allowance for the possibility that these attachments may not be approved, and instead special OCS pole foundations within areaways could be required, is included in the Cost Assessment.

2.1.13 Stakeholder Engagement and Business/Property Owner Coordination

Engagement with stakeholders, including businesses and property owners along the Project corridor, informed the design of the 2018 Project. If the Project is resumed, SDOT will re-engage with these stakeholders. Some core elements of the project such as the transit-only designation of lanes on First Avenue and changes to curb space that re-allocate many parking and loading zones as needed for the re-channelization of First Avenue, are not expected to change. Strategies for supporting businesses and

minimizing impacts during construction would be developed during the design phase and inform construction phases, staging and maintenance of traffic plans.

2.1.14 Transit Operations on the Stewart/Olive Couplet

The Stewart/Olive couplet is important to transit operations in downtown Seattle; several Community Transit and King County Metro bus routes operate in this couplet of one-way streets that provide access from Interstate 5 to the 2nd, 3rd and 4th Avenue transit corridors. Planning and design of the 2018 Project gave considerable attention to the potential impacts of streetcar operations on bus transit, and some alignment options were eliminated from consideration because of concerns about impacts to bus transit. One of the conditions in the Project corridor that is changing is the extent of bus transit operating in the Stewart/Olive couplet. As Sound Transit completes light rail extensions north of downtown Seattle, Community Transit revises its service plans to provide feeder service to the light rail system. This changed condition presents opportunities to re-evaluate alignment and station locations in this couplet, with potential benefits including cost and risk reduction and improved reliability of streetcar operations.

The primary risks to streetcar operations presented by the 2018 design on the Stewart/Olive couplet are; the potential for the "receiving lane" on Stewart between Westlake and Fifth Avenue to be blocked by traffic that has not cleared the intersection at Fifth Avenue before the streetcar begins its turn from Westlake avenue; lower operating speeds necessitated by the reverse curves at 4th/Olive; and traffic/signaling operational challenges presented by the contra-flow streetcar lane on Stewart Street. The reverse curves were designed as two 82' radius curves, with spirals and no tangent segment between the curves. Operations through the tight reverse curves may generate additional noise and result in increased wear and tear on the vehicles.

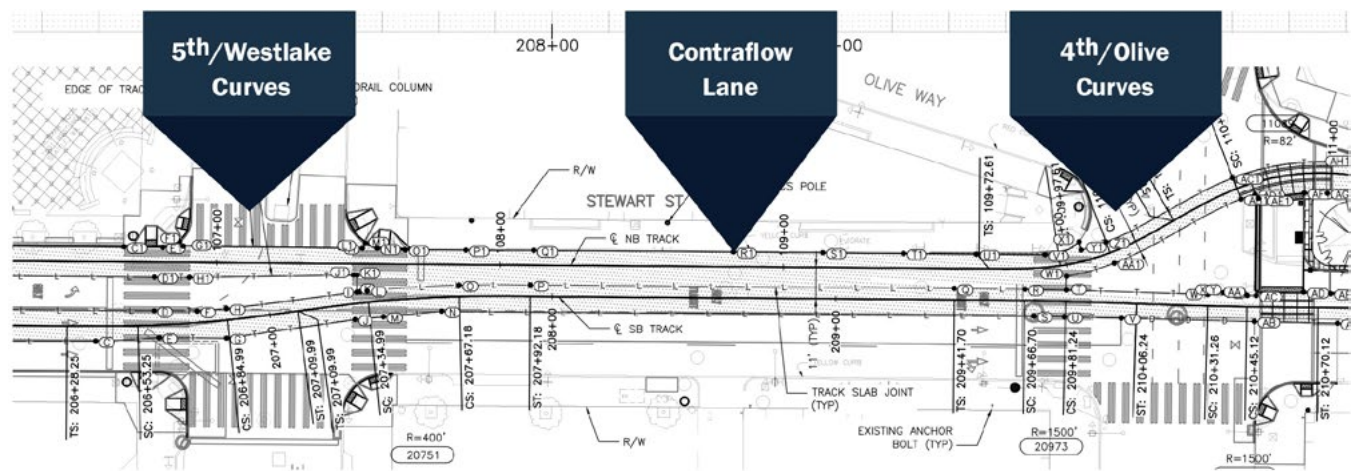


FIG. 2.1.14-A: Design and operational issues in the Olive/Stewart couplet

Potential cost savings associated with the modifications to the 2018 alignment include the elimination of up to four curves, the potential to utilize existing infrastructure including the Westlake/Olive station and existing track, and the potential reduction in impacts to the areaways surrounding the Times Square Building.

Given these risks and the changed conditions, SDOT may wish to re-evaluate the alignment and station locations in the Olive/Stewart couplet, including consideration of the scenarios described below and in Figures 2.1.14-B-E.

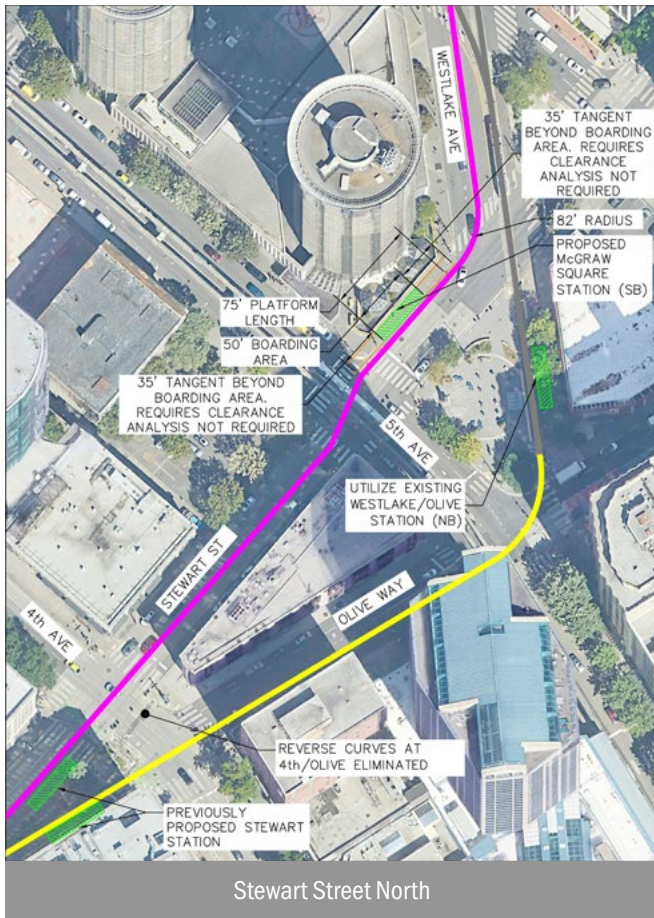


FIG. 2.1.14-B: Stewart Street North

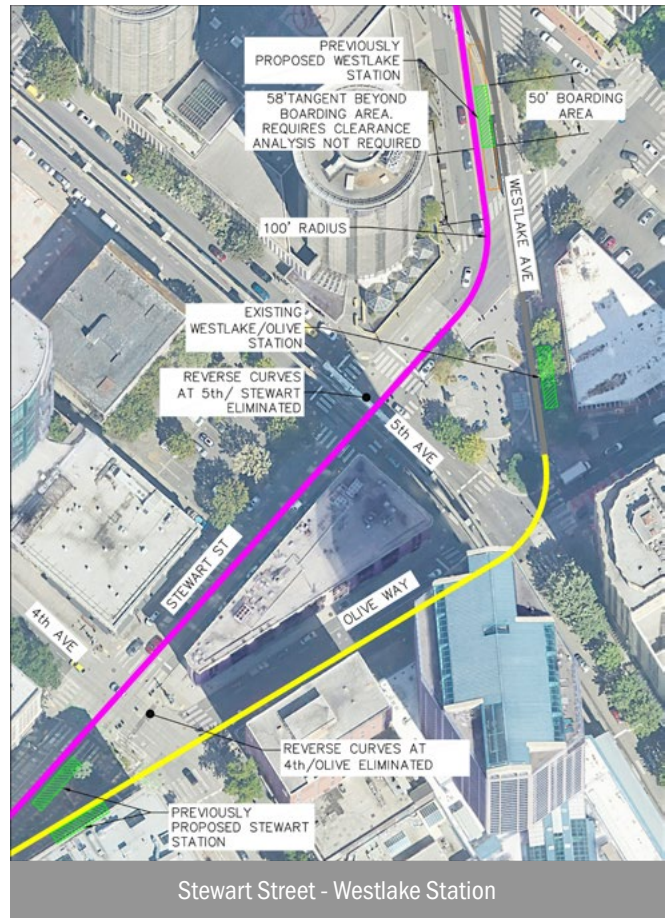


FIG. 2.1.14-C: Stewart Street - Westlake Station

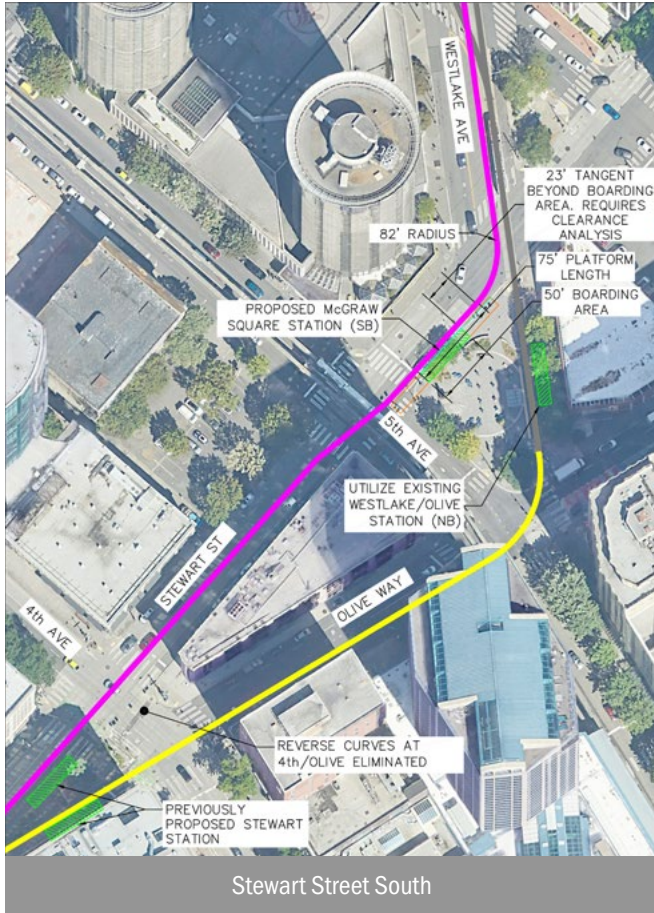


FIG. 2.1.14-D: Stewart Street South

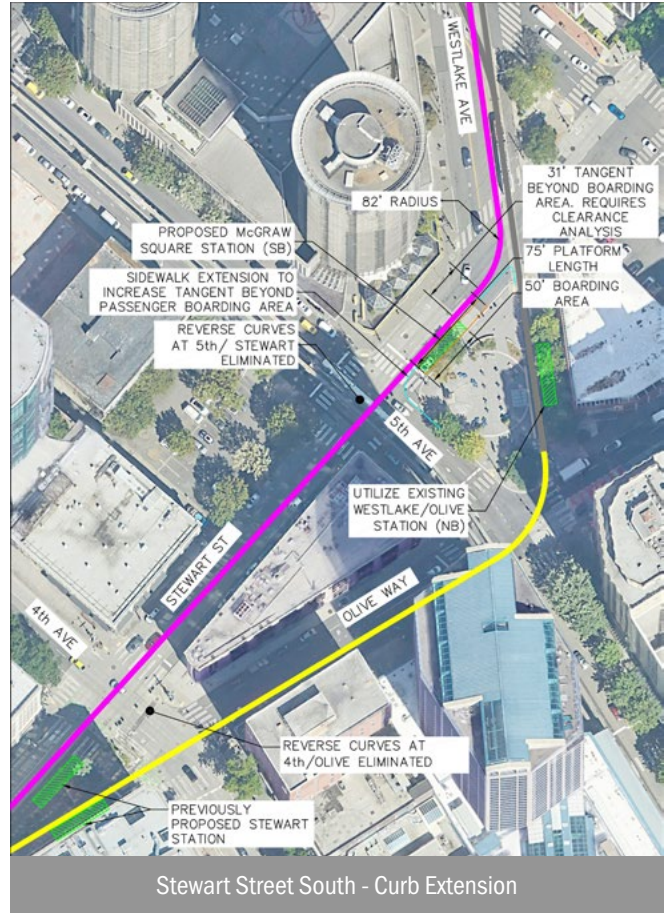


FIG. 2.1.14-E: Stewart Street South - Curb Extension

Table 2.1.14: Stewart/Olive Couplet Options Evaluation

Option Name	Station Summary	Eliminates Reverse Curves at 4th/Olive	Eliminates Reverse Curves at 5th/Westlake	Eliminates Contra-Flow Streetcar Operations	Tangent adjacent to Boarding Area*	Allows for Dedicated Transit ROW on Stewart St
Scenario 1: Stewart Street South	Utilize the existing Westlake/Olive station for outbound streetcars, the inbound streetcars would be served by a station on the southeast side of Stewart street at McGraw Square Park	Yes	No	Yes	23'	Yes
Scenario 2: Stewart Street South - Curb Extension	Similar to Scenario 1, the curb in this scenario is extended into Stewart street to improve alignment geometry	Yes	Yes	Yes	31'	No**
Scenario 3: Stewart Street North	Utilize the existing Westlake/Olive station for outbound streetcars, the inbound streetcars would be served by a station on the Northwest side of Stewart street at McGraw Square Park	Yes	No	Yes	35'	Yes
Scenario 4: Stewart Street - Westlake Station	Construct the Westlake Station design in 2018 project	Yes	Yes	Yes	35'	Yes

*A minimum tangent length adjacent to the boarding area of 35' is desired to ensure no conflict with the platform. The shorter tangents will require further analysis to ensure feasibility.

** Streetcar would turn into left turn only lane on Stewart – signal timing improvements possible to alleviate operational concerns.

2.2 Options for Expansion of the SLU Operations and Maintenance Facility

2.2.1 Background - SLU OMF Expansion Plans (2018 Project)

To accommodate the operating plan for the Seattle Streetcar that is proposed as part of the Project, the Project includes expansion of the existing SLU Operations & Maintenance Facility on parcels that were acquired for that purpose as part of the SLU project. The 2018 Project had advanced design of the SLU OMF expansion to the 100% plan completion level. These plans included demolition of an existing structure on the site (the Bricklayer's Building); regrading of the site, expansion of the yard to provide additional streetcar vehicle storage capacity; and construction of an expansion to the existing SLU OMF building (aka the Annex) to provide additional space for operations and maintenance staff and for additional spare parts.

As part of the permitting process for the SLU OMF Annex project, SDOT was required by code to perform a historic preservation analysis of the Bricklayer's Building (as this is required as a prerequisite to approval of any buildings greater than 50 years old). Through this process, the Bricklayer's Building was designated a Seattle Landmark in November 2018. With this designation, any proposed demolition or alternation of the Bricklayer's Building would require an application, review and Certificate of Approval from the Seattle Landmarks Preservation Board (LPB).

Additionally, the SLU OMF Annex project as designed would not provide on-site parking for streetcar operations and maintenance staff, and options to address staff parking needs were still in development at the time of the project pause. The most viable option is anticipated to be a lease of parking spaces within walking distance of the site, which would become an operating cost of the project (and therefore is not included in the cost assessment as a capital cost).

2.2.2 Expansion Options Addressing the Landmark Status

The requirement for a Certificate of Approval from the LPB for changes to the existing Bricklayer's Building is a critical determining factor in the planned expansion of the SLU OMF and utilization of the vehicle storage yard. As part of this assessment, the design team identified six possible scenarios with distinct criteria for the preservation and alteration measures of the historic building. Each scenario was then analyzed using the November 2017 Annex design as a benchmark, a track layout designed to eliminate reverse curves, and a vehicle storage layout for a 72-foot vehicle length (see [Appendix E](#) for Comparison Matrix).

Based on the Landmarks Nomination report, it is assumed for the purposes of this study that the LPB defines the street-facing exterior elevations – the north and the west – as the most historically significant features of the building.

A preliminary meeting with the staff to the LPB took place on August 8, 2023 to get initial informal feedback on all six options as well as insight into the Board's interests and priorities and the Controls & Incentives negotiation process. Preliminary draft renderings for each option were presented to aid in visualization (see [Appendix F](#)). Some key takeaways from the meeting are as follows:

- The Board's priority mission is to preserve in place.
- Only the exterior of the building is designated as a landmark. Interior alterations imperceptible from the outside need no approval.
- The Controls & Incentives process is intended to be open and collaborative between the property owner and the Board. To that end, design submitted for LPB review must not be too advanced.

While the LPB review process would consider a range of options, for the purposes of this Assessment, the cost assessment in Section 3.1 assumes Option 2, Facade Preservation, will be the option that is incorporated into the project.



3 / COST AND SCHEDULE ASSESSMENT

3.1 Cost Assessment

3.1.1 Cost Assessment Methodology

The cost assessment considers:

- Cost information available from the 2018 Project – including construction bids received for construction of the two Advanced Utilities bid packages and the main “SDOT Streetcar” package for construction of the track, platforms, traction electrification system, and miscellaneous municipal construction (street and sidewalk improvements, drainage improvements, traffic signal improvements, etc.);
- Project risks identified previously, including those addressed in the 2019 Vehicle/Project Interface analysis and KPMG independent cost review;
- Changed conditions that present risks or opportunities, as described in [Section 2](#) of this assessment.

All of these elements of project cost were escalated to a common base year (2023), and SDOT allowances for design and construction soft costs, estimating allowances and construction contingencies were applied, after adjustment for the type and scale of the project (drawing on experience from similar recent projects such as the FTA-funded Madison Bus Rapid Transit Project). Costs were also escalated to the assumed mid-point of construction, to provide a planned year of expenditure estimate based on the project schedule assumptions described in [Section 3.3](#).

2018 Project Cost Basis

SDOT received four bids for the mainline SDOT Streetcar project scope in 2018; the two lowest bids were submitted by contractors with experience performing similar work in the Puget Sound region and considered responsive and responsible bids. Therefore, the low bid received in 2018, which was approximately 10% higher than the Engineer’s Estimate, was used as the cost basis for the mainline scope. (The “mainline project” scope includes the streetcar track, platforms, systems and the associated

municipal construction; other elements were issued or to be issued as separate bid packages.

The utilities scope was separately issued for bid and awarded as two advanced utilities packages for construction in 2017; these bid prices were also used as a cost basis for the utility scope.

The Operations & Maintenance Facility expansion was planned to be an additional construction package, but had not been issued for bid at the time of the project. The 2017 Engineer’s Estimate for 100% Design of the OMF informed new estimates for the concepts identified in [Section 2.2](#).

Cost Escalation

Costs from the 2018 Project, 2017 OMF Engineer’s Estimate, 2019 Vehicle/Project Interface Analysis, and KPMG report were escalated to 2023 using CPI escalation rates that SDOT applies to its cost estimates (compounded). SDOT also maintains data from bids received on a variety of capital projects to inform their Engineer’s Estimates. The 5-year trends from this data shows that escalation in bid prices for most common bid items has been significantly lower than the Consumer Price Index (CPI) rates. However, because there are streetcar-specific bid items that are not reflected in these trends, the CPI rates were applied when escalating from the 2018 Project cost basis. Regional forecasted escalation rates were also applied in escalating costs from the current year (2023) to the mid-point of construction.

Allowances - Design (Validation Scope)

Most of the 2018 project scope is proposed to be retained with minimal change. The cost assessment assumes the validation effort would be approximately 30% of a typical design effort (which extends from 10% to 100% of design completion), and applies the SDOT standard allowance for design (13% consultant cost allowance) to the construction cost estimate for the 2018 scope, then adjusts to 30% of this total. The allowance for SDOT labor was also adjusted to reflect the validation effort, from the standard 9% allowance to a 7% allowance.

Allowances - Design (New and Modified Scope)

The cost assessment applies the SDOT standard allowance for design (13% consultant cost allowance and 9% SDOT labor cost allowance) to the “new and modified scope,” which includes the SLU OMF, traction power revisions, areaways, and off-mainline work.

Allowances - Design Phase Contingency

SDOT’s standard 10% design phase contingency and 1% “Other” allowance were combined into a single design phase contingency (11%).

Allowances - Construction Soft Costs

The cost assessment applies allowances of 40% for SDOT staff and consultants providing construction management and administration. These allowances were informed by the experience of SDOT’s Madison BRT Project, which has similarities in its scope of work, oversight requirements associated with FTA funding, and location within Seattle’s Center City.

Allowances - Estimating

SDOT’s standard estimating allowances were added to the 2023 year of expenditure estimates, at percentages applicable for the phase of design that applies to cost items. For example, for new or modified scope elements identified in this assessment, a 40% estimating allowance is applied to reflect that these new elements are planning-level. Some exceptions to SDOT’s standard allowances include, increasing the estimating allowance for areaway retrofits to 50% to reflect the variety and complexity of existing conditions, and applying a 10% estimating allowance to the unchanged 2018 Project scope. SDOT would typically not add an estimating allowance to completed, ad-ready design, but an exception was made given some of the considerations discussed in section 2.1 that could not otherwise be quantified, such as the need to re-engage with stakeholders and abutting property owners/businesses.

Allowances - Contingency

A construction phase contingency (20%) was applied to all of the estimates/estimating allowances.

Rail/Owner - Furnished Items

The cost estimate includes the 2018 Engineer’s Estimate of \$1.8 M for Owner-Furnished Items including rail, traffic signal cabinets, and miscellaneous other equipment, escalated to 2023 and year-of-expenditure.

Vehicle Procurement, Safety Certification and Start-Up and Testing Costs

The cost assessment includes an estimate of the vehicle purchase contract that was derived from procurement planning that is currently underway at another streetcar entity, with 10% contingency that would allow for an increase in the number of vehicles purchased (from 10 to 11) if this is determined to be necessary to meet FTA standards for spare vehicle ratios. This estimate incorporates year of expenditure assumptions, so there is not a separate escalation applied to the vehicle procurement estimate.

The cost assessment also includes estimates for vehicle engineering support to SDOT and for safety certification, testing and operational start-up. These were drawn from the KPMG independent cost review.

SLU OMF Expansion Option

The cost assessment assumes the “Façade Preservation” (Option 2) discussed in [Section 2.2](#). There is no capital cost allowance for staff parking, as this is assumed to be leased parking to be included in the operating cost of the project.

Traction Power Options

The Delivery Assessment identifies opportunities to delete the McGraw Square underground TPSS and ductbank and three scenarios and assumes addition of a prefabricated, above-ground TPSS at Seneca Street west of First Avenue. Although additional options to reduce traction power costs are identified in Section 2.1.8, these require further study and are not assumed in the cost assessment.

Areaways

The assessment of the base project cost includes retrofit of Pioneer Square areaways/street walls, as well as two areaways in the Olive/Stewart corridor where the streetcar trackway would be close enough to the areaways to increase the structural load to the street walls, Although the Pioneer Square retrofits are

expected to be required at some point, independent of the Project, completing them as a concurrent, non-project activity will allow construction of the core Project scope to proceed without risks or restrictions associated with the potential for failure of the street walls. The cost assessment identifies these in the SDOT Structures subcategory as they are associated with an existing structural repair/replacement backlog, independent of the Project.

Jackson Street Structures

Based on diagnostic modeling of representative streetcar vehicles, it is anticipated that that deck replacement would likely be required to accommodate the structural loads of new streetcar vehicles. These structures have already been strengthened to accommodate the existing streetcar vehicles, which are smaller and lighter than those known to be available in the current rail vehicle market

To allow for the likelihood that significant improvement to these structures would be required before new streetcar vehicles could operate across the structures, the cost assessment identifies a cost allowance for replacement of the bridge decks on the Jackson Street structures; this is an allowance based on SDOT experience with deck replacement, and is not informed by any project-specific design. A 50% estimating allowance was applied to this line item. SDOT has initiated a planning study to evaluate rehabilitation and replacement of these structures, with recommendations anticipated by the end of 2024; the recommended options may differ from the deck replacement option assumed in this assessment.

City Utility Costs

Relocation and upgrades to City utilities necessitated by or related to transportation improvements are funded through utility capital improvement programs. These costs are not included in the base project scope in the cost assessment, but are separately identified for capital planning purposes. The cost assessment escalates the costs of awarded bid packages from 2017/2018, less the scope that was completed prior to the pause of the project.

3.1.2 Project Cost Assessment

TABLE 3.1 SUMMARY - ALL PROGRAM ELEMENTS

Item	Cost Assessment (Current Year \$)	Cost Assessment (Year of Expenditure \$)
SDOT Streetcar Core Project Subtotal	\$246,000,000	\$269,000,000
Repair/Replace Deficient Structures Subtotal	\$90,000,000	\$98,000,000
City Utility Relocations & Betterments Subtotal	\$74,000,000	\$78,000,000

TABLE 3.2 SUMMARY OF PROGRAM ELEMENTS BY PHASE AND POTENTIAL FUNDING SOURCES

Item	Phase	Potential Sources
Core Streetcar Project	Core Project	City & Federal Funds
Repair Deficient Areaway Streetwalls	Core Project or Phased	City & Federal Funds
Repair/Replace Jackson Street Bridges (Bridge Deck)	Phased	City & Federal Funds
City Utility Relocations & Betterments	Early Works or Core Project	SPU/SCL Revenues

TABLE 3.3 PROGRAM ELEMENTS BY PHASE, DURATION AND COST

Item	Phase	Duration (Years)	Cost Assessment (Current Year \$)
Design & Environmental Review	Design-In Advance of Core Project		\$17,300,000
Streetcar		1.5	\$10,400,000
Areaways		1.5	\$6,900,000
Construction & Startup-Core Streetcar Project Elements	Core Project		\$235,800,000
Streetcar Track, Power, Stations, Roadway		2	\$133,400,000
Operations & Maintenance Facility Expansion at SLU		1	\$15,900,000
Streetcar Vehicle Design, Manufacturing, Testing & Startup		4.5	\$86,500,000
Repair/Replace Deficient Structures	Phased		\$83,100,000
Jackson Street Bridges	Concurrent with Core Project	TBD	\$38,400,000
Areaway Street Walls		1	\$44,700,000
Utility Relocations & Upgrades	Early Works & Concurrent with Core Project		\$74,300,000
SPU/SCL		1	\$74,300,000

3.2 Delivery Method

Advanced Utilities

Utility relocations and betterments can be completed as independent bid packages. This approach can be beneficial as the utility design may be completed earlier than other project elements, and constructing this work in advance of the streetcar elements decouples any schedule risks that may be associated with the underground utility work from the streetcar construction contract. SDOT was proceeding on this basis prior to the project pause in 2018, and it is assumed that advanced utilities would be part of the delivery strategy for a resumed project, regardless of the delivery method selected for the streetcar and OMF scope.

Design-Bid-Build

The traditional delivery method for public works construction is Design-Bid-Build; the public agency project owner (in this case SDOT) completes the design and advertises a bid package of plans, specifications and general conditions for competitive bidding by contractors. The advantage of this method is that the owner has control of all design decisions. This is beneficial for municipal construction where the requirements and preferences of the public asset owners are typically tailored to their specific urban environment and governance structure; for example, in Seattle there are various boards and commissions with oversight and approval authority over elements of the design. The disadvantage is, there is less constructability input into the design (although SDOT staff and consultants with construction experience can provide constructability input). Additionally, because vehicle procurement and integrated testing of the vehicles and infrastructure is a significant element of a streetcar project, the owner retains considerable coordination responsibilities.

Design-Build-Equip

Design-Build-Equip is a variant of the Design-Build alternative delivery method. In Design-Build delivery, the owner develops the design sufficiently to identify any definitive requirements, and also develops project requirements and performance criteria that the Design-Builder must follow in completing the design. Design-Build-Equip adds the provision of equipment—in this case, the streetcar vehicles—to the Design-Builder's responsibilities. The advantage

of this approach is the Design-Builder is responsible for delivering a project that successfully integrates the vehicles and infrastructure. The disadvantage of this approach is that some degree of design control is transferred from the owner to the Design-Builder; this is challenging in the context of a project that is subject to extensive ongoing input from stakeholders, Boards and Commissions. SDOT could seek to tailor the delivery method such that the level of design completion reflected in the procurement documents is greater than typical, leaving the Design-Builder responsible primarily for the final details of track, platform and systems design that are most closely related to the operation of the streetcar vehicles. A challenge for SDOT would be lack of experience with Design-Build procurement.

GC/CM

General Contractor/Construction Manager (GC/CM) is an alternative delivery method in which the owner selects a GC/CM during the design phase through a best-value evaluation that considers the qualifications, project approach as well as a fixed fee to be applied as a percentage of the construction cost. The GC/CM provides constructability and value engineering input during the design phase, negotiates a price for the work, and then manages all subcontracting in addition to self-performing some of the work (typically between 30 and 50%). The owner continues to manage the design to 100% completion. SDOT used the GC/CM method for the SLU and FHS lines. The primary advantage of GC/CM is the ability to select a highly qualified contractor. A disadvantage is the lack of competitive bidding for the self-performed work. Typically, a GC/CM is selected as early as possible in the design process, such as at 30% design, to maximize the potential for constructability and value engineering input. Given much of the project has already advanced to 100% design, there is likely less potential for design input, but SDOT could still consider GC/CM given the specialized nature of urban rail transit work and the importance of contractor qualifications. Alternatively, SDOT can include robust qualification requirements in the bid documents for Design-Bid-Build delivery.

3.3 Schedule Assessment

3.3.1 Schedule Assessment Methodology

A schedule was developed using the Critical Path Method in Primavera P6. Inputs included schedules developed for the 2018 Project; lessons learned from SLU and FHS projects and other relevant projects; and workshops with SDOT staff. These schedules are intended to represent the earliest possible delivery of the Project, and incorporate assumptions about funding and authorization that would support the earliest delivery path.

Activities were grouped into the following categories:

- Funding & Authorization
- Environmental Review & Permitting
- Procurement
- Design
- Utility Relocation
- Streetcar Construction (Mainline, OMF, and Off-Mainline)
- Rolling Stock
- Testing & Startup

Key Schedule Assumptions by Activity Category

Funding and Authorization

The schedule was developed with the assumption that the Project will be funded with a combination of local and Federal grant sources. While the funding and financing plan for the project may continue to evolve, for scheduling



purposes it was assumed that local and federal funding approvals would be required at two project phases:

Phase 1: The first phase, authorizing SDOT to initiate design, environmental review, and engineering support for rolling stock procurement, could be funded in the City's 2024 or 2025 Budget and Capital Improvement Program (to be adopted November 2023 or 2024), and would include Federal grant funds to be reprogrammed with the approval of the Puget Sound Regional Council. The Phase 1 activities would support an ongoing review by the FTA of project readiness, leading up to the execution of the Capital Investment Grant agreement, and would also provide the information that the City Council would need to authorize Phase 2 of the project through budget and legislative actions.

Phase 2: The second phase would authorize SDOT to proceed with all remaining project activities (including construction, rolling stock procurement, testing and start-up), and would be funded either in a future City Budget cycle (assumed to be the 2025 or 2026 Budget and Capital Improvement Program, adopted in November 2024 or 2025). The schedule assumes that vehicle procurement could begin upon this City authorization, while award of major construction contracts would be preceded by execution of a Capital Investment Grant Agreement between SDOT and the Federal Transit Administration (FTA) (assumed to be executed when the design of the project is close to completion [approximately May 2025 or 2026]).

Environmental Review and Permitting

An Environmental Assessment (EA) following the requirements of the National Environmental Policy Act (NEPA) and culminating in a Finding of No Significant Impact by the FTA, was completed for the 2018 Project. The schedules developed for this Assessment assume that a Supplemental EA will be required to incorporate new information and design changes into the FONSI. An alternative to a Supplemental EA, Re-evaluation, is expected to have a similar timeframe, but would not require a public comment period. The schedule assumes that preparation of the Supplemental EA can begin upon completion of preliminary design (30% design completion milestone).

The schedule identifies the following local permits to be obtained:

- Landmarks Preservation Board Incentives & Controls Agreement (OMF)

- Seattle Design Commission Review
- Master Use Permit (OMF)
- Pioneer Square Preservation Board Certificate of Approval
- Pike Place Market Historical Commission Certificate of Approval
- Building Permit (OMF)

The permitting process for these local permits is informed by the progression of the design. Items 1 through 3 are assumed to begin with the start of detailed design; items 4 and 5 are assumed to begin with the start of final design; and item 6 is assumed to begin with the completion of the 100% design milestone (running concurrent with the development of Issue for Bid documents).

Design

The schedules developed for this Assessment assume that much of the 2018 project design "Existing Design" could be advanced to a new bid package through a "design validation" process on an accelerated schedule, while "New and Modified" project elements would progress through a traditional design process. The schedules for validation of the 2018 design and for preliminary engineering of new and modified project elements would be similar, allowing for a complete project cost estimate, informed by a 90/100% engineer's estimate for the "existing" project elements and a preliminary engineering engineer's estimate for the new and revised project elements, to be assembled in advance of the Phase 2 funding decisions.

Utility Relocation

The 2018 Project incorporated the design of new utility infrastructure to avoid or minimize conflicts with the streetcar infrastructure and to make planned upgrades to utility infrastructure. The utility relocations were developed as separate bid packages, and a portion of the utility scope (generally, on First Avenue from S Jackson Street to Columbia Street) was constructed. To complete the project, the balance of the utility scope would be constructed in advance of track construction, in any given block or multi-block segment. This work could be completed either as a separately bid utility construction package, or incorporated into the bid package for construction of the streetcar infrastructure. These delivery options for the utility scope would be available for both Design-Bid-Build and Design-Build delivery.

In addition to the relocation of City utilities, private utilities such as gas (Puget Sound Energy), Steam (CenTrio) and telecommunications, which are located in City streets subject to SDOT Street Use permits, would need to relocate at their own expense in advance of construction of the streetcar infrastructure.

Streetcar Construction (Mainline, OMF, and Off-Mainline)

The streetcar infrastructure scope of work is comprised of three categories of work:

- Mainline “SDOT Streetcar” scope which extends from S Jackson at Occidental Avenue S to 6th Avenue and Denny Way, includes track, station platforms, traction power and overhead contact systems, train signalization, traffic signal modifications, as well as any reconstruction of general municipal infrastructure within this mainline project area.
- OMF scope includes new construction and modifications to the existing SLU OMF at Fairview Avenue N and Harrison Street, including any track and overhead contact system construction or modification in the vicinity of the OMF
- Off-Mainline scope includes any work that is not within the mainline project area or OMF project area, such as deck replacement on the Jackson Street structures and any platform modifications that may be needed to accommodate the new streetcar vehicles. A turnback track proposed at Republican Street between Terry Avenue N and Westlake Avenue N, or an alternative turnback design option, may also be included in the Off-Mainline scope.

Each of these categories of work could be incorporated into a single construction package.

The schedule for the Mainline and OMF work is shown in the schedules developed for this Assessment; it is assumed that Off-Mainline work can be completed within the total duration of the Mainline and OMF work and is not on the critical path.

The schedule for the Mainline work was developed based on the project manual (general conditions) issued for bid with the 2018 Project as well as the conceptual schedule developed for the 2018 project, which was in turn informed by the as-built duration for similar scopes of work on the FHS project. Additional anticipated constraints, such as a construction

moratorium during the 2026 World Cup events in Seattle, will also be incorporated.

Rolling Stock

The Rolling Stock activity category consists of all of the sub-activities necessary to develop vehicle technical specifications, develop and issue vehicle procurement documents, select a manufacturer, review design submittals, manufacture the vehicles, inspect the vehicles during the manufacturing process, take delivery of vehicles, test them and accept them. The schedule was developed assuming a full vehicle procurement process; however, SDOT may have an opportunity to purchase vehicles by “piggybacking” on vehicle procurements initiated by other streetcar entities in the U.S., which may reduce some of the durations related to procurement, design review, and initial acceptance testing, but may also extend some of the manufacturing and delivery durations.

Testing and Startup

The Testing and Startup activity category includes all of the sub-activities necessary to certify conformance of the infrastructure and vehicles with the safety certification plan; perform integrated testing of the vehicles and infrastructure; hire and train operations and maintenance staff; complete training and drills required for safety certification; provide public information; operate pre-revenue service without passengers; and plan and execute a grand opening event.

The schedule developed for this assessment assumes that these activities begin with substantial completion of the Mainline work, and progress with completion other predecessors as applicable to the particular activity, such as completion of the OMF and Off-Mainline work and delivery and acceptance of new streetcar vehicles.

3.3.2 Schedule Projections by Scenario

3.3.2.1 Design-Bid-Build

The project schedule, assuming a design-bid-build delivery method and advanced utilities packages, is presented at several activity levels using the critical path method, as well as in a longest path view, in [Appendix G](#). The funding and authorization assumptions are critical to this schedule. If those milestones are achieved, manufacturing and delivery of the new streetcars becomes the critical path for the schedule, and there is considerable float available in the construction schedule.

The Delivery Assessment does not present a separate schedule for the GC/CM alternative project delivery method. However, it is expected that the schedule for GC/CM delivery would be very similar to Design-Bid-Build delivery. Some additional Procurement activities would be added for selection of the GC/CM.

3.3.2.2 Design-Build-Equip

The project schedule, assuming a design-build-equip delivery method and advanced utilities packages, is presented at several activity levels using the critical path method, as well as in a longest path view, in [Appendix H](#). The project schedule is expected to be similar between the two delivery methods; the primary reason for considering Design-Build-Equip delivery would be to shift responsibility for integration of the vehicle and infrastructure from SDOT to the design-builder.

3.4 Residual Risk and Opportunity Summary

In addition to the risks and opportunities that were incorporated into the cost assessment, there are risks and opportunities that are not assumed as part of the baseline cost but could be realized. These are summarized below.

Residual Risk and Opportunity Summary

■ Risk / ● Opportunity	Cost Estimate or Range	Risk/ Opportunity Range	Description of Risk or Opportunity
■ SLU OMF - Partial Demolition Option	\$5,600,000	Medium	If the Landmarks Preservation Board does not approve the Façade Preservation option, there will be an incremental cost. (Risk)
● Expanded Off - Wire Operations	\$(1,656,000)	High	If the potential for expanded off-wire operations is validated, costs for Overhead Contact System scope will be significantly reduced. (Opportunity)
● Olive/Stewart Alignment & Station Modifications	(\$4,000,000) to (\$6,000,000)	Medium	If an Olive eastbound alignment is viable, the existing McGraw Square station can be retained with minor modifications, and trackwork would be simplified. (Opportunity)
■ Additional TPSS - John Street	\$4,480,000	Low	An additional TPSS is unlikely to be needed in addition to Seneca Street TPSS, but if there are challenges to the overhead connection from First to Stewart (above Metro OCS), or if a new Load Flow Analysis indicates Seneca to John spacing is too great, this would be the alternative solution. (Risk)
● Minimum Operable Segment	\$(38,400,000)	Medium	The FTA New Starts/Small Starts process allows agencies to propose a Minimum Operable Segment, noting "The purpose of selecting the MOS is to identify a segment of the Locally Preferred Alternative that provides the most cost-effective solution with the greatest benefits for the project. The MOS must be able to function as a stand-alone project and not be dependent on any future segments being constructed." SDOT could propose to construct the C3/Culture Connector project, and initially operate an MOS with service from South Lake Union to Pioneer Square and transfers to existing First Hill Streetcar service. If the MOS were defined in this way, SDOT could pursue deck replacement or other improvements to the Jackson Street Structures as an independent project. Although the Jackson Street Structures project would still need to be completed before the full Connector operation plan could be implemented, building the MOS first would allow for a project funding plan more similar to that envisioned at the time of the 2018 Project. To develop the MOS, SDOT would need to complete ridership forecasting for the MOS operating plan and re-validate the project evaluation criteria that were applied to FTA's initial evaluation of the project.
● Main/Washington Pedestrianization Concept	\$(5,000,000)	Medium	If Main to Washington is pedestrianized, there is a potential reduction in the extent of areaway retrofit (Opportunity)
● Jackson to Yesler Pedestrianization Concept	\$(13,100,000) to \$(17,100,000)	Low	If Jackson to Yesler is pedestrianized, there is a potential reduction in the extent of areaway retrofit. (Opportunity)
■ OMF Staff Parking	TBD	Low	Staff parking for operations and maintenance is assumed to be provided via lease, to be included in the operating budget. If a capital solution were necessary, there would be additional right-of-way and construction costs.

4 / LIST OF APPENDICES

APPENDIX A

Design Option - Pioneer Square

APPENDIX B

Traction Power Substation Location Options

APPENDIX C

Evaluation of Station, Alignment & Interim Storage Options

APPENDIX D

Pertinent Updates to City Standard Plans & Specifications

APPENDIX E

SLU OMF Expansion Options - Evaluation Matrix

APPENDIX F

SLU OMF Expansion Options - Renderings

APPENDIX G

Cost Assessment Detail

APPENDIX H

Schedule Analysis: Design-Bid-Build Project Delivery

APPENDIX I

Schedule Analysis: Design-Build-Equip Project Delivery





APPENDIX A

DESIGN OPTION - PIONEER SQUARE

A Design Option Related to Structures Risks: Pioneer Square Pedestrianization Concept

As discussed in Section 2.1.5, the condition of areaways in Pioneer Square presents a project challenge that could comprise a significant part of the program cost and schedule, even if completed as a concurrent, non-project activity. The Delivery Assessment identifies preliminary concepts for pedestrianization of a segment of First Avenue in Pioneer Square as a design option that may present opportunities to address this challenge. Additionally, this design option may present an opportunity to complement the City's Waterfront Seattle program, which includes pedestrian improvements in Pioneer Square.

The Delivery Assessment identifies urban design and traffic considerations associated with this preliminary exploration of a pedestrianization concept, each of which would need further study, collaboration with the Alliance for Pioneer Square, and public/stakeholder input during the design and environmental impact phase of a resumed Project.

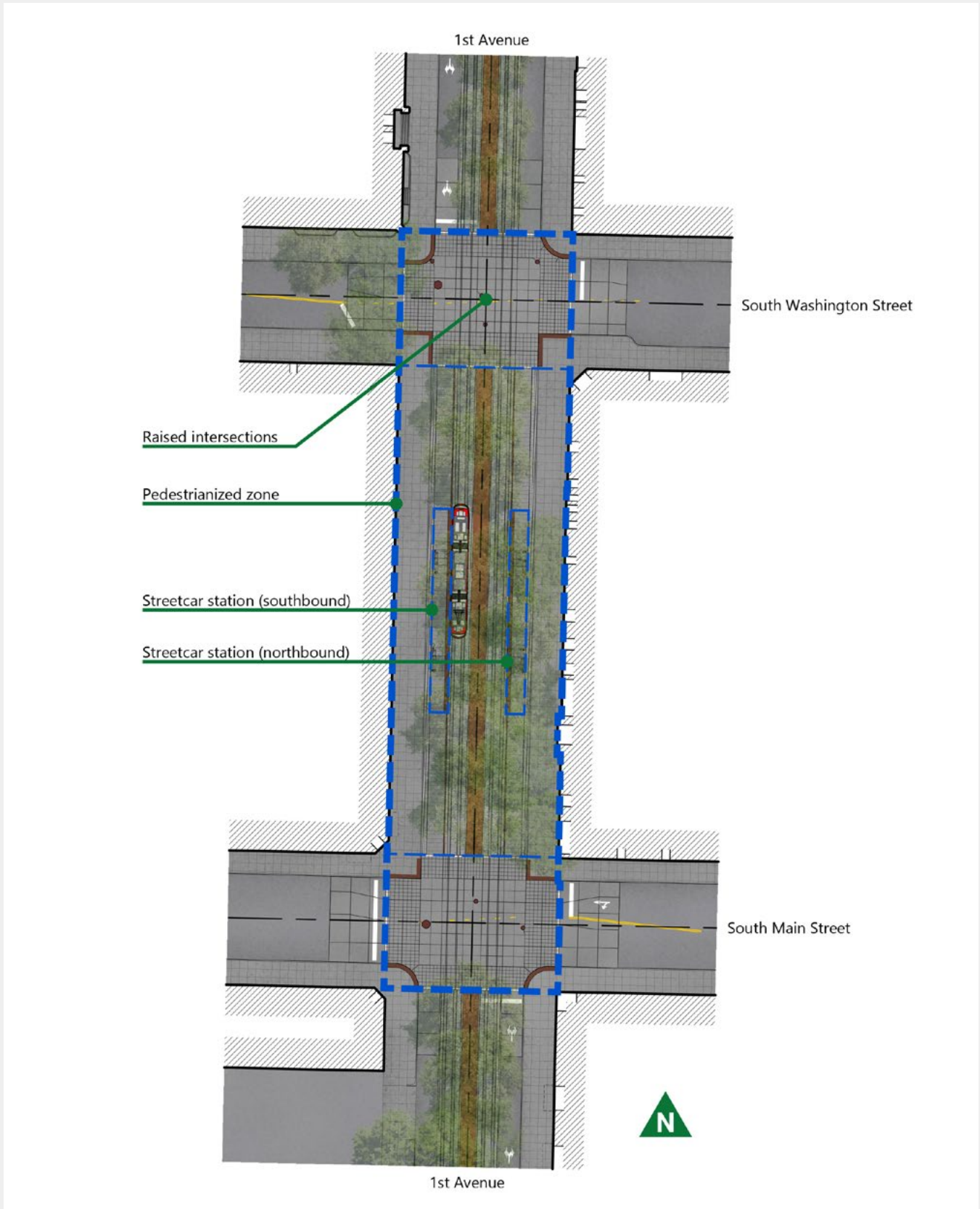
A-1: Urban Design Concepts

As a starting point for consideration of the potential for pedestrianization, the Delivery Assessment identifies preliminary urban design concepts. Design Option 1 envisions a one-block transit and pedestrian street on First Avenue between Main and Washington Streets; Design Option 2 extends the transit and pedestrian designation to two blocks, from Main Street to Yesler Way; and Design Option 3 would extend the designation to four blocks, extending from Jackson to Cherry Streets. For each of these options, the left lane of travel adjacent to the median would be designated transit-only streetcar and potentially bus. The right curb lane would be converted to pedestrian space. General purpose traffic on east-west streets would continue through the intersections of First Avenue. Each of the concepts identifies the potential for a streetcar station in the Main to Washington block, which would be in lieu of the stations at Occidental/Jackson and Columbia/Cherry that were proposed in the 2018 Project. The advantages of this station location are that it would be more centrally located within Pioneer Square; would complement the Waterfront Seattle East-West Pedestrian Streets project on Main and Washington Streets; and would provide better stop spacing that could improve operational performance of the streetcar; however, the transit/pedestrian designations could also be implemented without a station at this location.

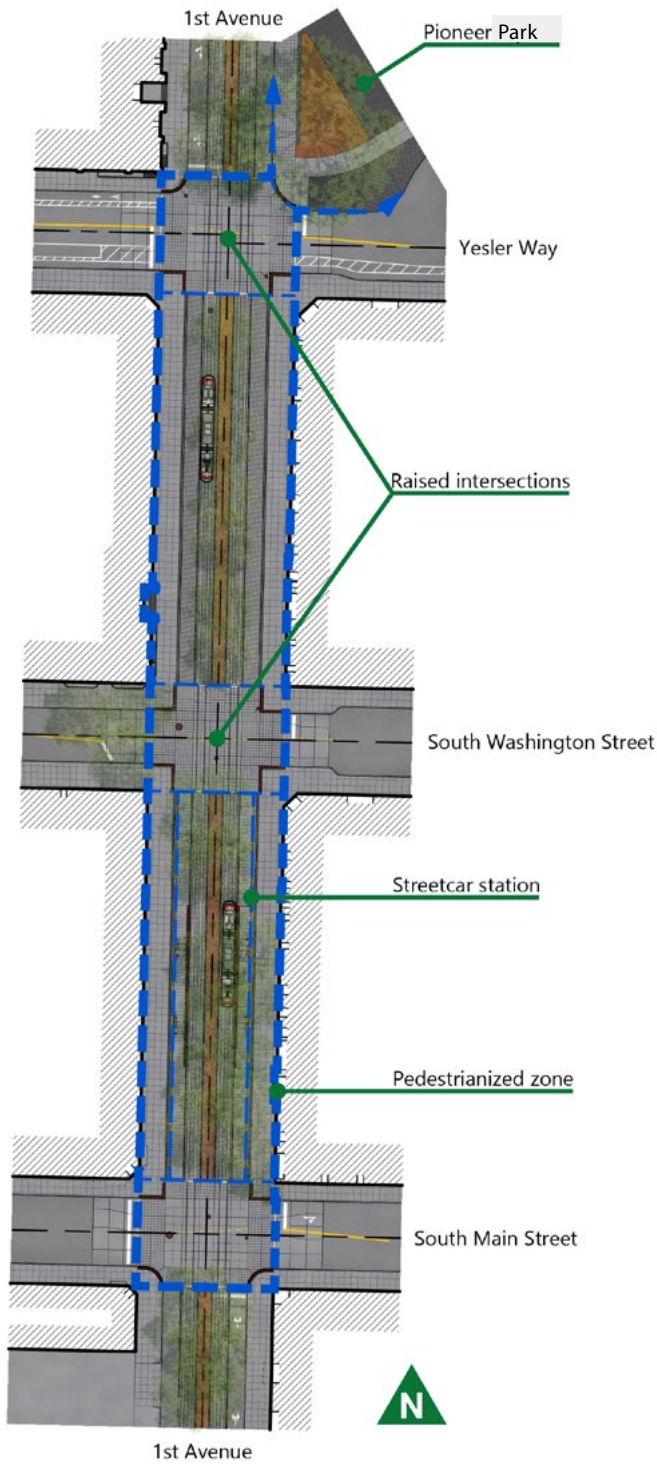


FIGURE A-1: Potential Cross Section at Main to Washington with Streetcar Stop

Design Option 1: Main to Washington Streets



Design Option 2: Main Street to Yesler Way



Design Option 3: Jackson to Cherry Streets

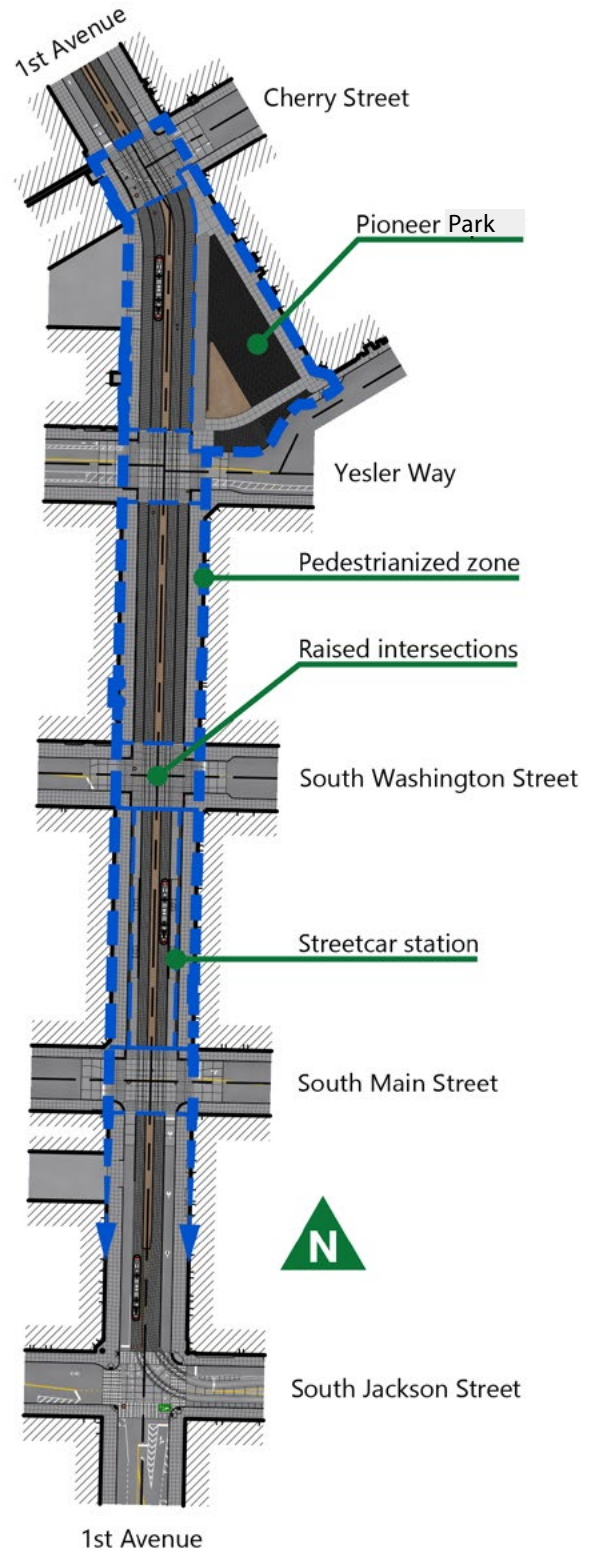




FIGURE A-1-A: Rendering of Potential Design Concept with Streetcar Station and Main/Washington (Looking north from S Main Street)

A-2: Preliminary Traffic Analysis

Pedestrianization of a portion of First Avenue would result in some re-distribution of traffic, with potential impacts to levels of service on other streets within the Center City. The concept would require further traffic analysis, stakeholder outreach, and environmental review.

For the purposes of the is Delivery Assessment, a preliminary approximation of vehicular level of service (LOS) was developed to illustrate traffic operation considerations based on the estimated average weekday traffic (AWDT) for each scenario (see **Figure A-2-A**).

At the planning level of analysis, east-west streets are anticipated to have sufficient capacity (LOS A-C) to handle the redistribution of traffic except for Yesler Way and S Jackson Street which are significant east-west routes. Yesler Way may perform at a LOS D and LOS E for Scenarios 1-2 and Scenario 3, respectively. S Jackson Street may operate at a LOS E for all scenarios. Both Yesler Way and Jackson Street were estimated to operate at a LOS D for the baseline conditions. If SDOT advances further study of these design options, the study should include a new data collection effort and the development of an area-wide model that can further estimate the redistribution of traffic to parallel streets within the study area as well as overall impacts to center city traffic operations.

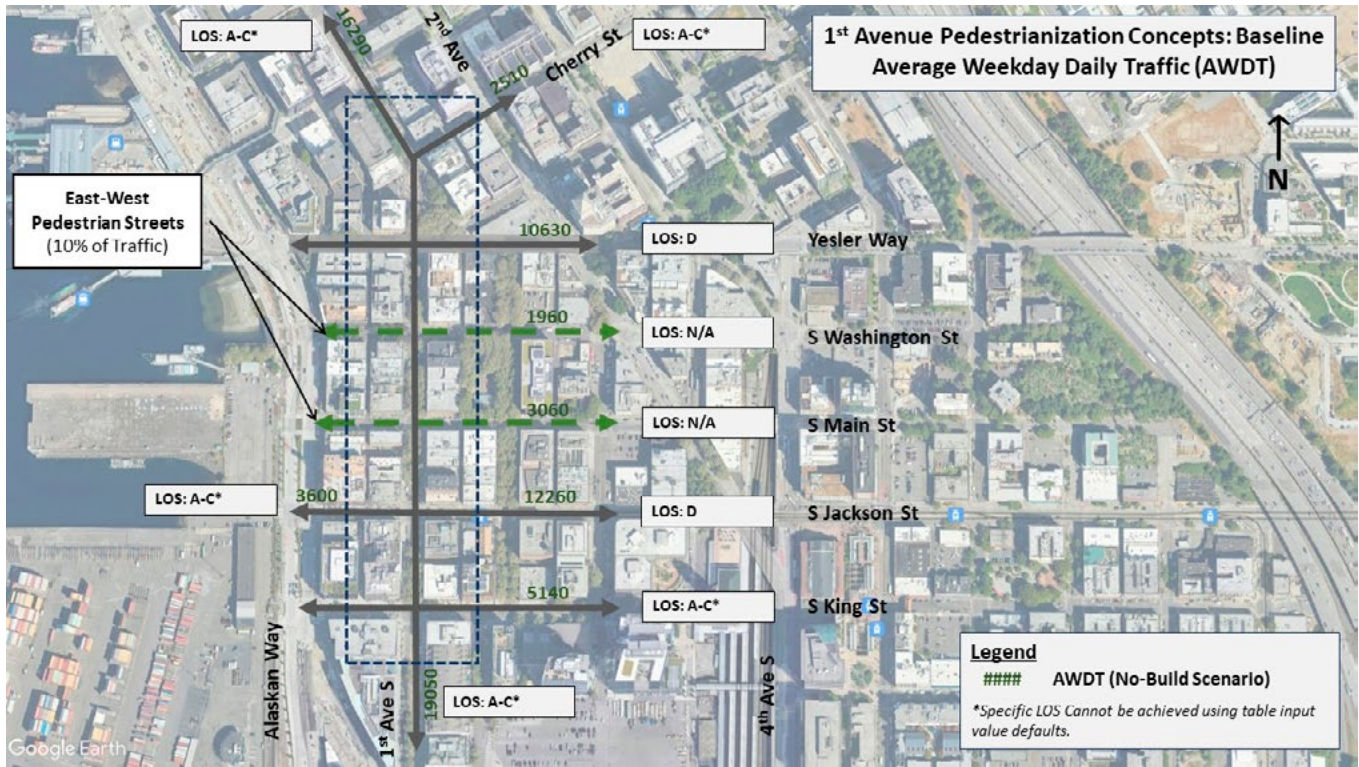


FIGURE A-2-A: 1st Avenue Pedestrianization Concepts: Baseline Average Weekday Daily Traffic

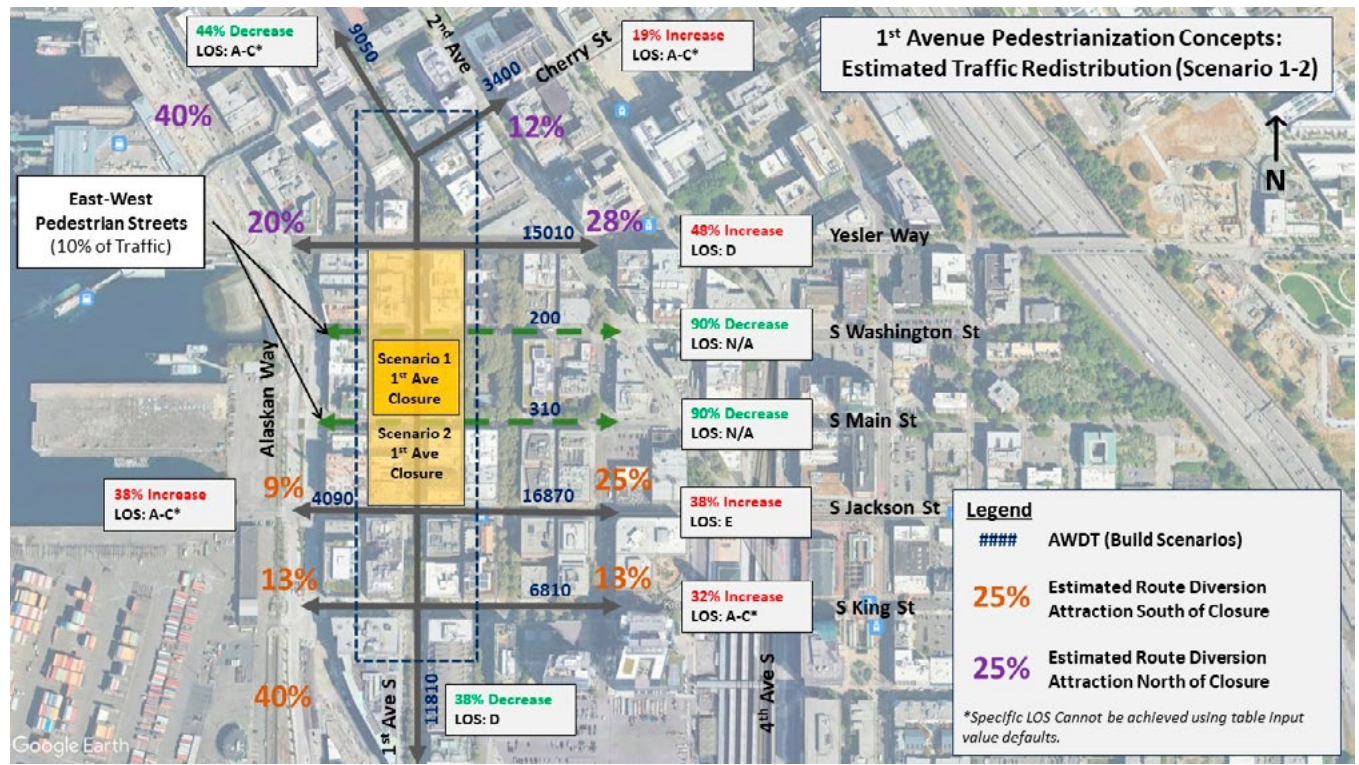


FIGURE A-2-B: 1st Avenue Pedestrianization Concepts: Estimated Traffic Redistribution (Scenario 1-2)

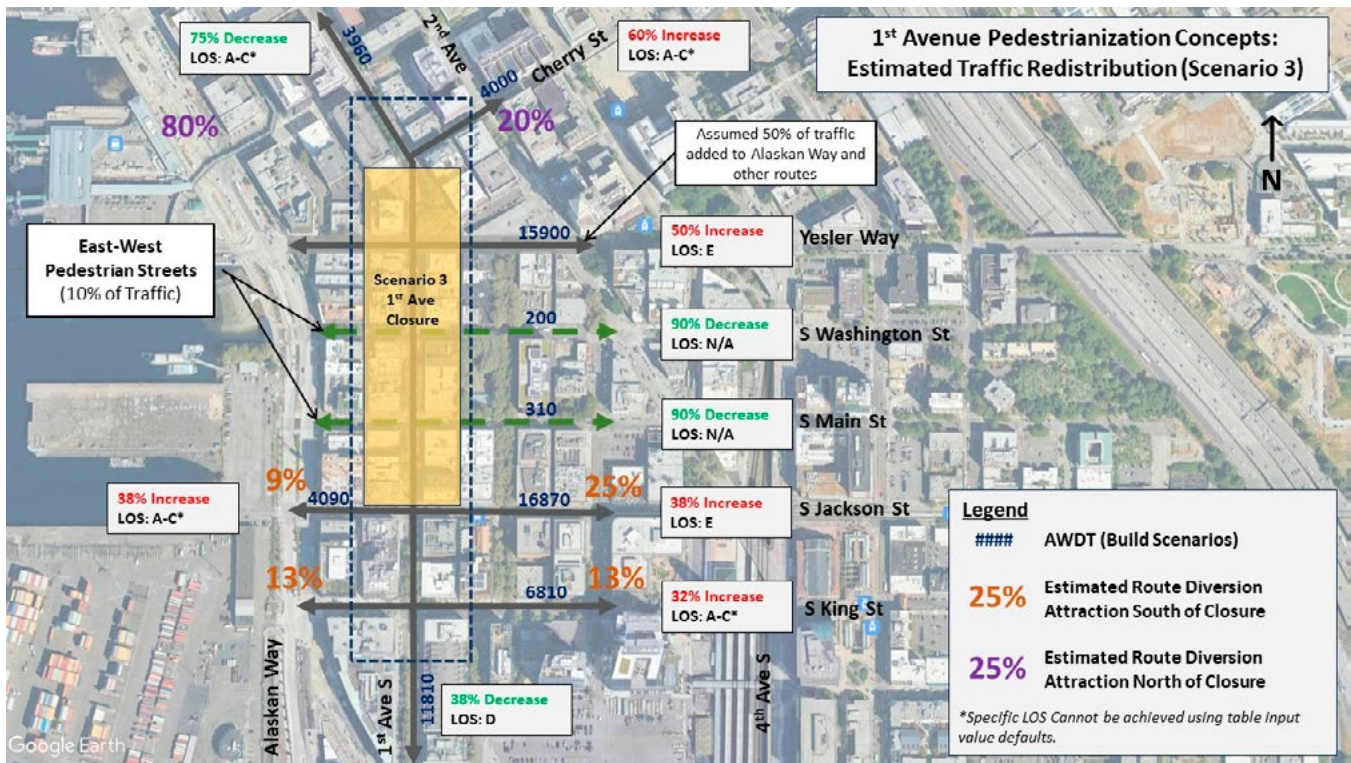


FIGURE A-2-C: 1st Avenue Pedestrianization Concepts: Estimated Traffic Redistribution (Scenario 3)

Methodology

Traffic data was extracted from the City of Seattle’s Open Data Portal, using data collected between 2015 to 2019. The volumes were projected to a 2023 analysis year, using a 1.3% annual growth rate; which mirrors the growth rate applied in prior Project traffic analysis as referenced in the Center City Connector Transportation Technical Report.

Due to the limited data available, the estimated volume changes are expected to vary significantly, and a more detailed study with a consistent data collection is recommended.

Three scenarios for First Avenue Pedestrianization were analyzed:

Scenario 1: One-Block Closure (Main to Washington)

Scenario 2: Two-Block Closure (Main to Yesler)

Scenario 3: Four-Block from Jackson to Cherry

Through the City’s [Pioneer Square East-West Pedestrian Streets project](#), Washington and Main streets will be converted into Woonerf-like streets

with features such as a single lane of travel, tabled intersections, and curbsless design that would reduce the vehicular capacity of those streets which were added to adjacent parallel streets. Thus, these two streets would not attract significant volumes from 1st Avenue to divert around the closure. In addition to the Pioneer Square project, a short segment of Yesler Way was currently closed permanently between Alaskan Way to Western Avenue.

The initial step for the analysis was to develop estimated route diversion attraction distributions based on the three scenarios and the anticipated Pioneer Square East-West Pedestrian Streets project. Unique distributions were developed for East/West streets north of the closure and south of the closure. Scenarios 1 and 2 are assumed to have similar distribution patterns as S Washington Street and S Main Street are part of the pedestrian street project which is assumed for the purpose of this analysis to have 10 percent of capacity. In addition, both Yesler Way, east of Western Avenue, and S Jackson Street are to be accessible for both scenarios. For Scenario 3, the route distribution south of the closure is assumed to

be similar to Scenarios 1 and 2 as the closure remains just north of S Jackson Street. Unique route diversion distributions for Scenario 3 were developed for possible E/W routes north of the closure as it eliminates North/South access to Yesler Way from 1st Avenue.

Distribution percentages were estimated based on the traffic demand based on the average weekday daily traffic (AWDT). Additional assumptions for the methodology include the following::

- Overall Assumptions
 - The East-West Pedestrian Streets will assume 10% of existing traffic.
 - Level of Service (LOS) is not provided for S Washington Street and S Main Street due to them being converted to pedestrian streets as well as other streets where data was not found.
- Scenario 1-2 Assumptions:
 - Alaskan Way is assumed to absorb approximately 40% of traffic from 1st Avenue both north and south of the closure.
- Scenario 3 Assumptions:
 - With the closure extending north of Yesler Way, which is a major east-west route, 80 percent of traffic is assumed to be absorbed by Alaskan Way and other routes north of the outlined area.
 - Yesler Way would gain additional traffic from both Alaskan Way and 2nd Avenue for travelers desiring to go east. It was assumed out of the 80% that 50% would utilize Yesler Way.

An approximation of vehicular level of service (LOS) was developed to illustrate the traffic operational context associated with each scenario, based on the estimated AWDT. These LOS approximations were derived from a generalized service volume tool developed by the Florida Department of Transportation. The “urban center” typology from this tool was applied, with reduction factors appropriate to First Avenue, such as the two-lane configuration with no left-turn lanes.

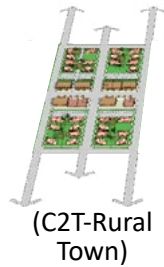
The results of this traffic analysis indicate that the east-west routes within the vicinity of the proposed block closures may see an increase upwards of 30% in average weekday daily traffic. For Scenario 3, Yesler Way is estimated to see approximately a 50% increase

in daily traffic. As anticipated with the construction of the east-west pedestrian streets along S Washington and S Main St, a significant decrease will occur. A decrease of at least 38% along 1st Avenue is also estimated.

The east-west streets are expected to be impacted by the redistribution of traffic. Yesler Way may perform at a LOS D and LOS E for Scenarios 1-2 and Scenario 3, respectively. S Jackson Street may operate at a LOS E for all scenarios. Both Yesler Way and Jackson Street were estimated to operate at a LOS D for the baseline conditions.

C2T, C4, C5, & C6

Motor Vehicle Arterial Generalized Service Volume Tables



Peak Hour Directional

	B	C	D	E
1 Lane	*	720	940	**
2 Lane	*	1,140	1,640	**
3 Lane	*	2,120	2,510	**

Peak Hour Two-Way

	B	C	D	E
2 Lane	*	1,310	1,710	**
4 Lane	*	2,070	2,980	**
6 Lane	*	3,850	4,560	**

AADT

	B	C	D	E
2 Lane	*	13,800	18,000	**
4 Lane	*	21,800	31,400	**
6 Lane	*	40,500	48,000	**



	B	C	D	E
1 Lane	*	*	870	1,190
2 Lane	*	1,210	1,790	2,020
3 Lane	*	2,210	2,810	2,990
4 Lane	*	2,590	3,310	3,510

	B	C	D	E
2 Lane	*	*	1,580	2,160
4 Lane	*	2,200	3,250	3,670
6 Lane	*	4,020	5,110	5,440
8 Lane	*	4,710	6,020	6,380

	B	C	D	E
2 Lane	*	*	17,600	24,000
4 Lane	*	24,400	36,100	40,800
6 Lane	*	44,700	56,800	60,400
8 Lane	*	52,300	66,900	70,900



	B	C	D	E
1 Lane	*	*	690	1,080
2 Lane	*	1,290	1,900	2,130
3 Lane	*	1,410	2,670	3,110
4 Lane	*	2,910	3,560	3,640

	B	C	D	E
2 Lane	*	*	1,250	1,960
4 Lane	*	2,350	3,450	3,870
6 Lane	*	2,560	4,850	5,650
8 Lane	*	5,290	6,470	6,620

	B	C	D	E
2 Lane	*	*	13,900	21,800
4 Lane	*	26,100	38,300	43,000
6 Lane	*	28,400	53,900	62,800
8 Lane	*	58,800	71,900	73,600



	B	C	D	E
1 Lane	*	***	790	1,030
2 Lane	*	***	1,490	1,920
3 Lane	*	***	2,730	2,940
4 Lane	*	***	3,250	3,490

	B	C	D	E
2 Lane	*	***	1,440	1,870
4 Lane	*	***	2,710	3,490
6 Lane	*	***	4,960	5,350
8 Lane	*	***	5,910	6,350

	B	C	D	E
2 Lane	*	***	16,000	20,800
4 Lane	*	***	30,100	38,800
6 Lane	*	***	55,100	59,400
8 Lane	*	***	65,700	70,600

Adjustment Factors

The peak hour directional service volumes should be adjusted by multiplying by 1.2 for one-way facilities
 The AADT service volumes should be adjusted by multiplying 0.6 for one way facilities 2 Lane Divided
 Roadway with an Exclusive Left Turn Lane(s): Multiply by 1.05
 2 lane Undivided Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.80

Exclusive right turn lane(s): Multiply by 1.05
 Multilane Undivided Roadway with an Exclusive Left Turn Lane(s): Multiply by 0.95
 Multilane Roadway with No Exclusive Left Turn Lane(s): Multiply by 0.75
 Non-State Signalized Roadway: Multiply by 0.90

This table does not constitute a standard and should be used only for general planning applications. The table should not be used for corridor or intersection design, where more refined techniques exist.
 * Cannot be achieved using table input value defaults.
 ** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached.

FIGURE A-2-D: FDOT Generalized Service Volume Tables



APPENDIX B

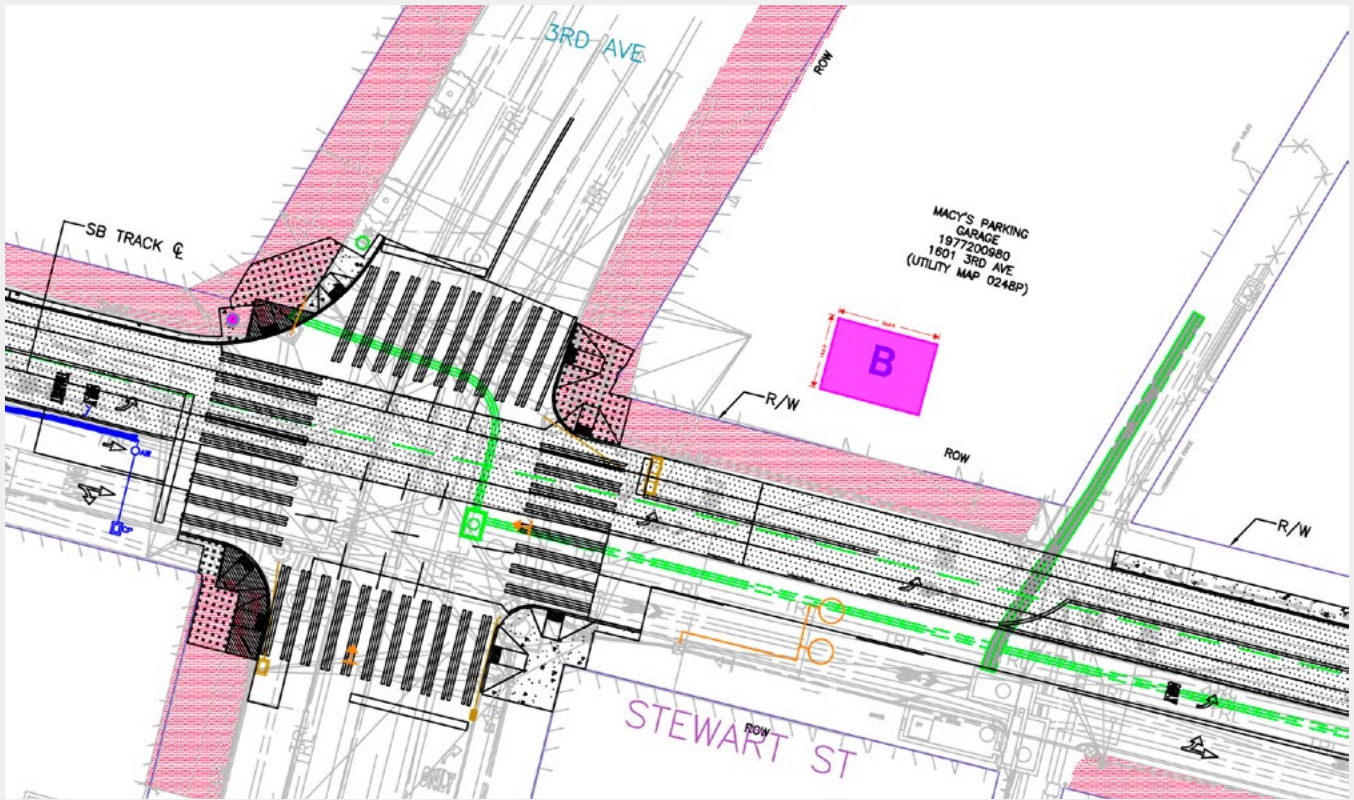
TRACTION POWER
SUBSTATION LOCATION
OPTIONS

Traction Power Substation Location Options

To provide alternatives to the underground Traction Power Substation (TPSS) that was proposed in the design of the 2018 Project, the Delivery Assessment identifies several options for TPSS locations. Option A is the recommended option and is included in the cost assessment in Section 3. Several of the options identified below would require acquisition of private property easements, which would be challenging, but is not unprecedented for TPSS in dense urban settings.



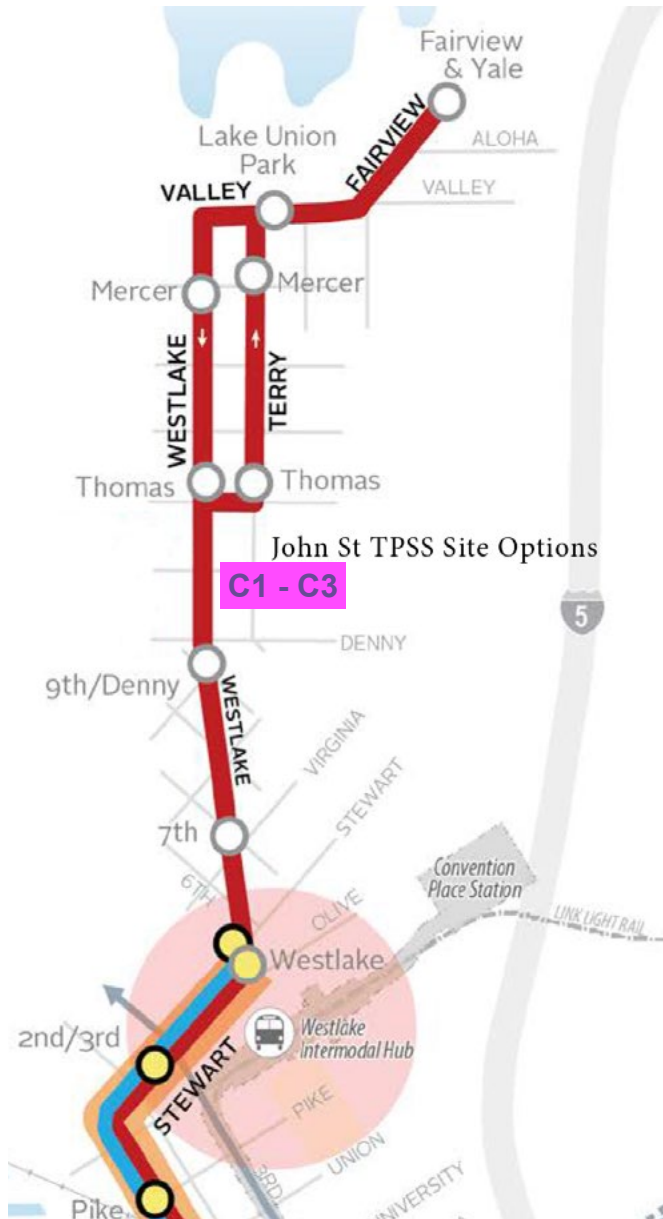
TPSS Option B



Alternate B - Macy's Parking Garage



TPSS Option C



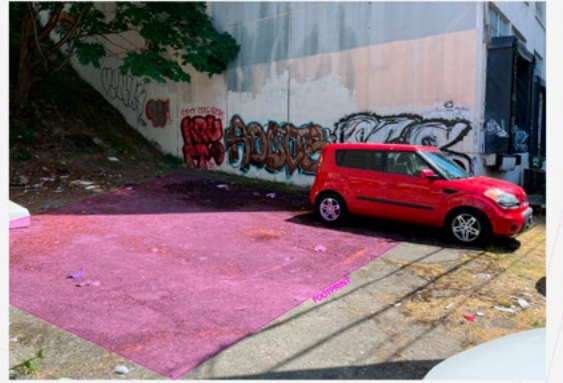
Alternate C - Additional Infrastructure at John Street Site



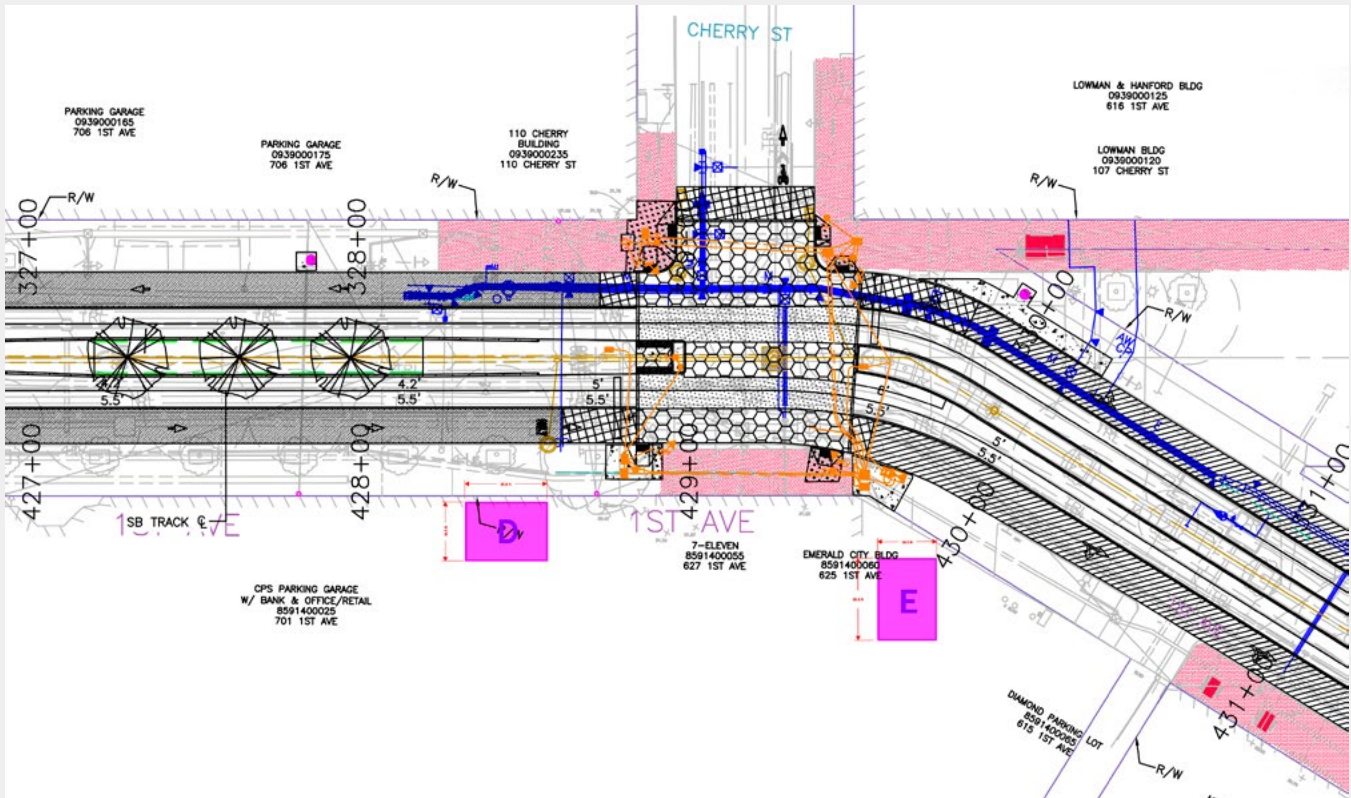
Alternate C1 - Expand at Existing Site



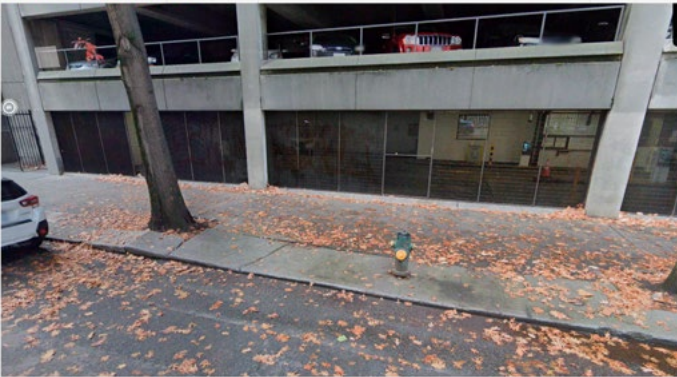
Alternate C2 - Adjacent Site in ROW Between Buildings



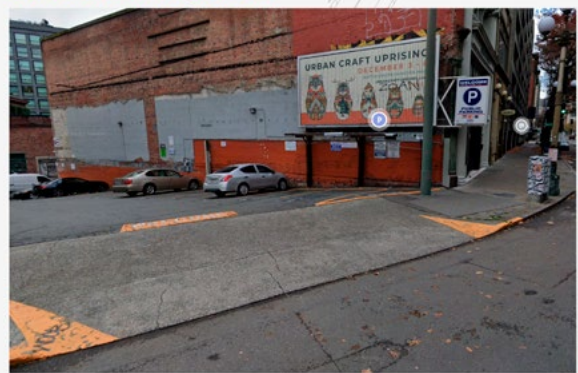
TPSS Option D & E



Alternate D - CPS Parking Garage



Alternate E - Diamond Parking Surface Lot





APPENDIX C

**EVALUATION OF STATION,
ALIGNMENT & INTERIM
STORAGE OPTIONS**

Jackson St Options

Option #	Summary	Streetcar Operations	Transfer Operations	Traffic Operations	Urban Design Considerations	Traction Power Considerations	Notes
1	Construct 12' X 85' Platform in location of existing platform to allow Boarding/ Alighting from both sides.	FHS/C3 streetcars alight then run beyond the station to turnback and board running in the opposite direction. Allowing for dedicated EB/WB boarding locations. FHS Streetcars would have to make the turn on to 1st before turnback. EB streetcar is required to stop in travel lane, necessitating the streetcar to run beyond the station to perform turnback.	Transfers made on same platform, streetcar operations dictate efficiency of transfer.	Requires EB Streetcars to stop in traffic/ block only thru lane.	Allows re-use of existing station.	This location already served by FHS OCS/TPSS; can serve as a charging location .	Requires turnback to occur on the mainline beyond the station.
2	Relocate stop to 1st/ Washington, construct 12' X 85' Platform to allow Boarding/ Alighting from both sides.	Two Operating Options: 1. Each streetcar alights then run beyond the station to turnback. Allowing for dedicated EB/WB boarding locations. FHS Streetcars would have to make the turn on to 1st before turnback. 2. FHS/ C3 Streetcars would Alight/Board and Turnback in the same location. Streetcars from both lines can be parked in the station concurrently.	Transfers made on same platform, streetcar operations dictate efficiency of transfer.	Streetcars on 1st will be in dedicated ROW, Existing Jackson/ 1st Streetcar station can be removed to provide additional dedicated streetcar ROW, reducing impact on traffic operations.	Potential impact to median trees. Could be mitigated with pedestrianization of 1st street with ability to add trees in the current parking lane.	If an extended off-wire zone is implemented, a charging station maybe required at the platform (or extension of OCS from Occidental/ Jackson.	1. Relocates station further north, impacting previous station spacing. 2. Potential to eliminate Columbia Station"
3	Construct two separate 10X85' platforms east and west of occidental. Boarding/ Alighting occurs on the north side of both stations.	FHS/C3 Streetcars would Alight/Board and Turnback in the same location. Streetcars from both lines can be parked in the station concurrently. Crossover is located on 1st, potentially complicating operations for the turn on to Jackson St.	Transfers require change of platforms to continue in direction of travel	Does not present major deviation from current traffic operations.	Expands footprint of stations along Jackson St	This location already served by FHS OCS/TPSS; can serve as a charging location .	Future EB Streetcars would be required to stop in traffic/ block only thru lane
4	Construct single 10'X170' platform between occidental and first	FHS/C3 Streetcars would Alight/Board and Turnback in the same location. Streetcars from both lines can be parked in the station concurrently. Crossovers are located on Jackson St. reducing the distance 2-way traffic is required on a single track.	Transfers are made on same platform, can be made to waiting streetcar.	Does not present major deviation from current traffic operations.	Expands footprint of stations along Jackson St	This location already served by FHS OCS/TPSS; can serve as a charging location .	1. Allows for simpler transfer's compared to option 3. 2. Future EB Streetcars would be required to stop in traffic/ block only thru lane

Westlake/Denny Way Options

In the vicinity of Westlake Avenue and Denny Way, Sound Transit has proposed a tunnel station for its Link Light Rail System and anticipates that construction of the station will require full closure of Westlake Avenue at Denny for an extended duration.

Ballard Link Extension: Denny & Westlake - Draft EIS DT-1 Location

Option #	Summary	Block Length	Existing Lane Type	Streetcar Storage on block	Notes	Compatibility with Maintenance Options
1	New Station at Lenora/ Westlake - East	310' - With Midblock Alley	Transit/Right Turn Lane	Could fit 2 75' Streetcars	Northernmost station location	Compatible with all options
2	New Station at Lenora/ Westlake - West	220'	Mixed Traffic	No storage in mixed traffic lanes	Requires lane dedication for 2-way streetcar traffic	Compatible with all options
3	Utilize Existing 7th/ Westlake NB Station	310' - With Midblock Alley	Transit/Right Turn Lane	Could fit 2 75' Streetcars	Located on same block as existing station	Compatible with all options
4	Utilize Existing 7th/ Westlake SB Station	109'	Mixed Traffic	No storage in mixed traffic lanes	Southernmost station location Requires lane dedication for 2-way streetcar traffic	Incompatible with Maintenance Options 2 and 4

Ballard Link Extension: Denny & Westlake - Shifted West Location

Option #	Summary	Block Length	Existing Lane Type	Streetcar Storage on block	Notes	Compatibility with Maintenance Options
1	New Station at 8th/ Westlake - East	300'	Transit/Right Turn Lane	Could fit 3 75' Streetcars		Compatible with all options
2	New Station at 8th/ Westlake - West	280'	Transit/Right Turn Lane	Could fit 3 75' Streetcars		Compatible with all options
3	Utilize Existing 9th/ Westlake SB Station	100'	Transit/Right Turn Lane	Could fit 1 75' Streetcar	May not be feasible depending on construction limits	Compatible with all options
4	Utilize Existing 7th/ Westlake NB Station	310' - With Midblock Alley	Transit/Right Turn Lane	Could fit 2 75' Streetcars	Southernmost station location Requires lane dedication for 2-way streetcar traffic	Incompatible with Maintenance Options 2 and 4

Maintenance Access Options

Option #	Summary	Track Length	# of Turns	Track Complexity	Notes
1	Terry Ave/Lenora St	2000	3	Straight connection to exiting SLU track, Steep Cross Slope at Denny Way will require major reconstruction, Steep grades on Lenora/Terry	Provides some potential for long-term improvement of operations by routing NB streetcars on Terry Ave
2	Thomas St/9th Ave/8th Ave	2250	4	Straight connection to exiting SLU track, Requires track crossing	
3	John St/9th Ave/8th Ave	1750	5	Tight Turn at Westlake/John St	
4	John St/9th Ave	1300	4		Likely Requires new ROW, In conflict with existing 9th/Westlake SB platform
5	Phase The Jackson St and Westlake/Denny closures and streetcar maintenance operations could be carried out at the FHS Maintenance facility with upgrades required to the Maintenance facility and Interim Vehicle Storage to be addressed.				



APPENDIX D

**PERTINENT UPDATES TO
CITY STANDARD PLANS &
SPECIFICATIONS**

2017 to 2020 Std Plan Comparison - Noted Revisions

Std Plan No.	Std Plan Name	Revision Description	Possible Cost Implication	Cost Type	ROM Estimated Cost	Estimated likelihood of cost impact	ROM Estimated Cost Notes
314a	Fire Hydrant Locations and Clearances	Revised Standard Plan graphics and notes to clarify clearance requirements for fire hydrant locations near curb ramp	Possible minor redesign of hydrant locations	Design	\$50,000	High	ROM Design Estimate
314b	Clearances for Typical Water Service Vaults	Water service vaults offset requirements updated	Possible minor redesign of vault locations	Design	\$50,000	High	ROM Design Estimate
340a / 340b	2" Blow Off Type A/B	Revised Standard Plan to include an additional Valve Box located above the isolation valve, where the watermain connects to the copper pipe leading to the blow off assembly.	Added cost to blowoffs	Construction	\$10,000	High	Could not locate AUP2 EE
401	Residential Pavement Sections	Thicker (8" vs. 6") required concrete pavement on residential streets, added 6" of mineral agg base	Likely none as this project does not include residential streets	Construction	\$0	Low	
422f	Curb Ramp Details	Revised to allow for clear space to fall within extended face of curb	Possible redesign of curb ramps and many intersections	Design	Combined below	High	
424a	Expandable Tree Pit Detail	Revision of Tree Pits to add Flexible Porous Surface Treatment	Added cost of Flexible Porous Surface Treatment.	Construction	\$10,000	High	11 total new trees in EE. Add \$500 per tree
430a / 430b	Driveway	Redesigned driveways. Added 6" mineral aggregate.	Possible minor redesign of driveways details. Added aggregate.	Design/ Construction	\$10,000	High	160 SY of 8" Driveway per EE. Small aggregate quantity increase, small potential for design time.
541a	Traffic Signal Pole Foundation	Revision to signal pole foundation rebar schedule - each pole fdn needs to be designed rather than std depths. Light poles must also now meet SCL standards.	Likely redesign of signal pole foundations. Designers need to confirm foundation depths and that poles meet SCL standard.	Design	\$100,000	High	ROM Design Estimate
543a / 543b / 550a	Street Light Pole Foundations	Revised to clarify concrete collar requirements and add shrubbery and foliage planting clearance note. - 2' shrubbery offset from SCL facilities	Possible minor landscaping revisions	Design	\$50,000	High	ROM Design Estimate

2020 to 2023 Std Plan Comparison - Noted Revisions

Std Plan No.	Std Plan Name	Revision Description	Possible Cost Implication	Cost Type	ROM Estimated Cost	Estimated Likelihood of Cost Impact	ROM Estimated Cost Notes
260a	Inlet / Catch Basin Location & Installation	Added note: castings in crosswalk must be ADA accessible	Design review of castings within crosswalks	Design	\$25,000	High	ROM Design Estimate
302	Watermain Setback Requirement for C.I. Lead Joint and D.I. Slip Joint Pipe	New Std Plan noting watermain offsets/setbacks	Design review of watermain offsets. Possible redesign of watermain if offsets are not met.	Design	\$50,000	Medium	ROM Design Estimate
403	Roadway Cement Concrete Alley Pavements	6" mineral Aggregate base added to concrete alley detail	Possible addition of aggregate base for alley pavement, if applicable to this project	Construction	\$0	Low	
410/411	Type 410 Curb	6" mineral Aggregate base added to curb and gutter / curb detail	Addition of aggregate base under curb	Construction	\$10,000	High	3910 LF of Curb, 1.5' wide, 6" depth = 109CY = 164TN @\$50/TN
422a - 422h	Curb Ramp	Revisions to curb ramp details	Possible redesign of some curb ramps, MEF revision. Possible issues with 422g ramps. 422h detectible warning location updated.	Design	\$125,000	High	ROM Design Estimate
700 Series	Pavement Markings	Revisions to miscellaneous pavement marking nomenclature	Review and update drawings for new pavement marking nomenclature	Design	\$25,000	High	ROM Design Estimate
780	Cross Bike Pavement Marking	New Std Plan	Review cross bikes on project and design to match standard plan	Design	\$25,000	High	ROM Design Estimate

Possible Future Std Plan or Policy Updates (Based on 6/15/23 Meeting with Abner Gallardo)

Std Plan No.	Std Plan Name	Revision Description	Possible Cost Implication	Cost Type	ROM Estimated Cost	Estimated Likelihood of Cost Impact	ROM Estimated Cost Notes
NA	NA	Trolley OCS Poles to meet SDOT Stds rather than KCM		Design	\$25,000	Medium	ROM Design Estimate
NA	NA	OCS Eyebolts to meet SDOT Stds rather than KCM		Design	\$10,000	Medium	ROM Design Estimate
NA	NA	Copper interconnects will be changing to fiber		Design/Construction	\$135,000	Medium	Estimate \$5k added per intersection (17 signalized intersections per EE) Plus design time (\$50k)
NA	NA	Signals will no longer be side mounted		Design	\$50,000	Medium	ROM Design Estimate
NA	NA	Larger street designation signs		Design/Construction	\$5,000	Medium	

2017 to 2020 Std Specification Comparison - Noted Revisions

Std Spec Ref.	Revision Description	Possible Cost Implication	Cost Type	ROM Estimated Cost	Estimated Likelihood of Cost Impact
1-03.3(4)	Added Social Equity Plan requirement	Cost to create the report	Administrative	\$25,000	High

2020 to 2023 Std Specification Comparison - Noted Revisions

Std Spec Ref.	Revision Description	Possible Cost Implication	Cost Type	ROM Estimated Cost	Estimated Likelihood of Cost Impact
Executive Order 2023-03	Each trees removed as a part of this project must be replaced with a minimum of three trees	Addition of ~7 trees	Design/Construction	\$60,000	High



APPENDIX E

SLU OMF EXPANSION OPTIONS EVALUATION

Option 1: Demolition

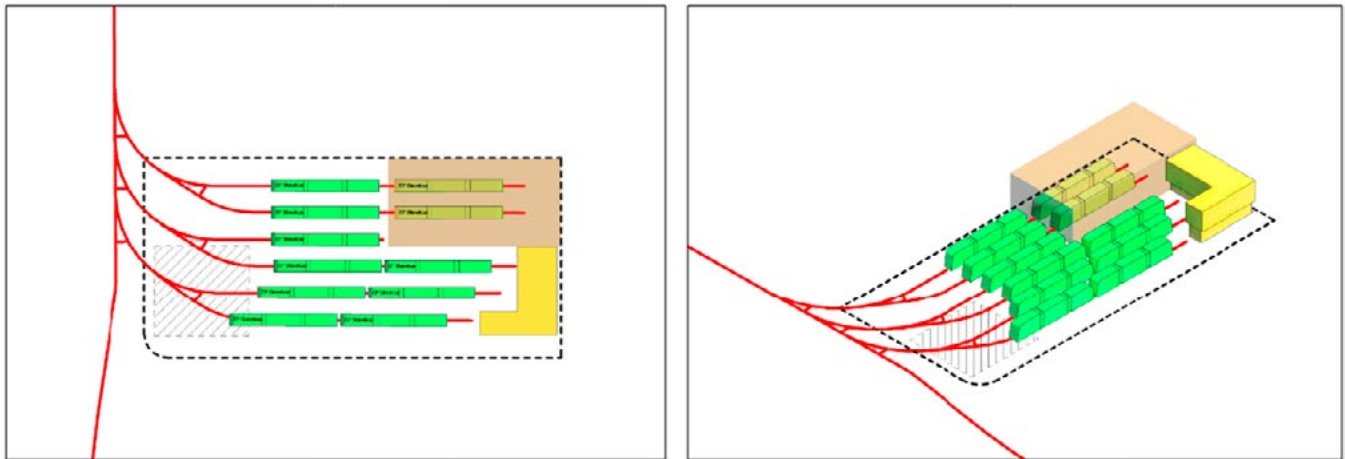


FIG. 1.1: 2D and 3D site diagrams w/ Bricklayers Bldg demolished

This is the least restrictive scenario as it allows the possibility for complete removal of the Bricklayers Building, as was the assumption on which the 2017 OMF annex design was founded. Therefore there is no significant change required for the design beyond factors unrelated to the existing building and are applicable to all scenarios (i.e. regulatory updates, program requirement changes, cost increases, etc.).

With the full width of the north end of the site available, the proposed track layout can be optimized for efficient movement of streetcars with flexibility to address programmatic needs for the new streetcars. Yard capacity is for (9) streetcar vehicles with an additional (2) inside the existing OMF, for a total of (11) stored streetcar vehicles. Spacing between streetcar vehicles is 2 feet, and minimum spacing between tracks where vehicles are stored is 17 feet. In addition, the yard

has storage capacity and access for (4) non-revenue vehicles (i.e. light trucks and/or SUV's for Operations).

In the preliminary meeting with LPB staff, feedback indicates that given that the Board's priority mission is to preserve in place, a demolition option would typically only be approved with a determination of no feasible alternative under Sections 106 and 4(f) of the National Historic Preservation Act. As such, this places approval for this option at the low probability end of the scale.

Option 2: Facade Preservation

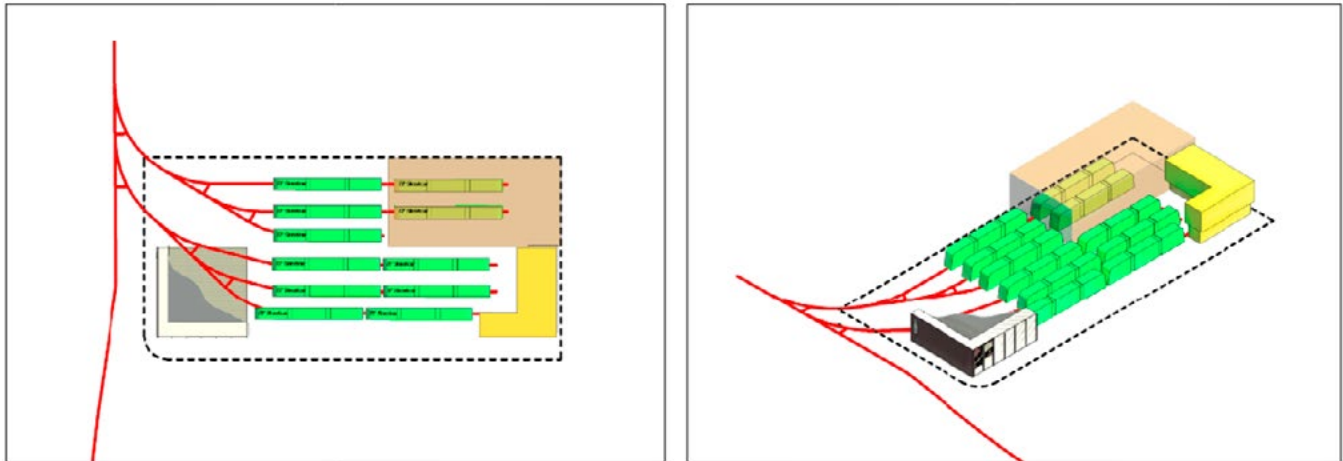


FIG. 2.1: 2D & 3D site diagrams w/ Bricklayers Bldg north & west facades preserved

This scenario presumes that the LPB defines only the north and west elevations of the Bricklayers Building as critical for preservation and does not restrict changes to remainder of the building. In response, the proposed alteration to the building removes all but these elements, leaving an architectural folly that, detached from the building context, is more akin to a monument that is arguably as effective (if not more) at highlighting the landmark's historical significance. Along Fairview Avenue, preservation of the west elevation includes the exterior stair and ground and upper level passageways behind the terra cotta screen. A new structural system will be required to adequately support the remaining "freestanding" elements (i.e. external braces, cantilever wall, etc.). The existing basement portion below the track footprint would be demoed and filled in.

With regards to the yard, this solution allows for an efficient (9)-streetcar vehicle storage layout (plus (2) in the existing OMF) with flexibility to address programmatic needs to serve the new streetcars. The 2017 OMF annex design can remain without major modifications. Minimum spacing between streetcar vehicles is 2 feet, and minimum spacing between tracks where vehicles are stored is 14 feet. While there is potential capacity for storage of and access for (4) non-revenue vehicles, the footprint for the Bricklayers preserved façade presents some site constraints.

In the preliminary meeting, LPB staff confirmed that precedents for approval of façade-only preservation have mostly been driven by the need for major remediation. That said, there are measures that may

strengthen the case for this option. One would be to include a physical expression of the original building mass to the remaining form as an acknowledgment of its history. Another would be to incorporate a program for public use that serves community interests. Given the prime location in a mixed-use neighborhood and the newfound attention the unusual building form can garner, this option has viability, whether for commercial/retail use, as an exhibition space for SDOT community outreach, or as a public outdoor pavilion. Adoption of this idea to draw public engagement must be such that security for the OMF and yard is not compromised, with the preserved façade becoming part of a continuous impermeable perimeter around the facility.

Option 3: Raise / Reuse

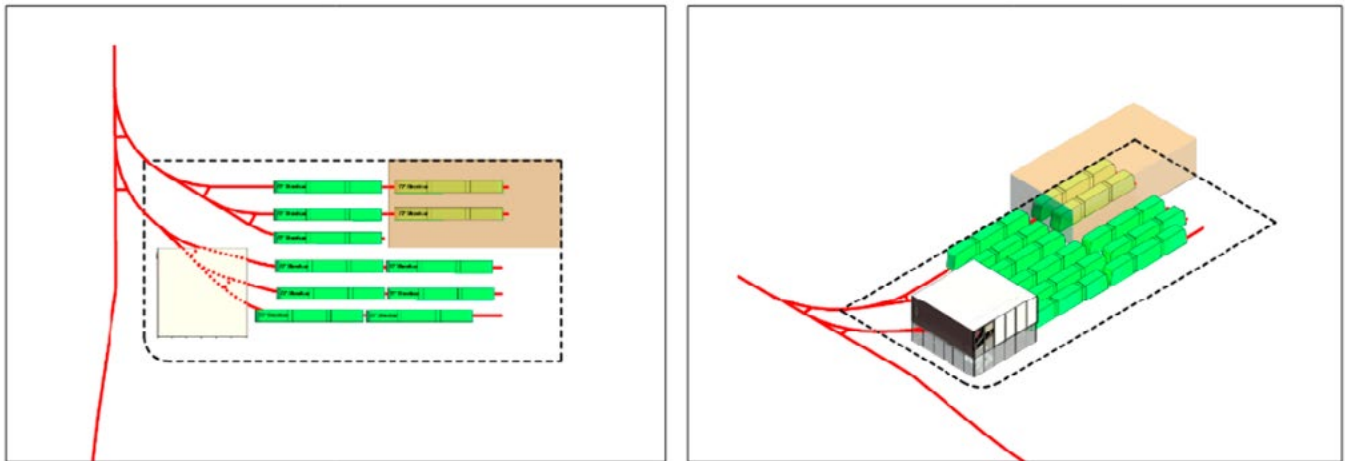


FIG. 3.1: 2D & 3D site diagrams w/ Bricklayers Bldg raised & reused for OMF expansion

In this scenario, it is assumed that the LPB will require that the entire above-ground Bricklayers Building is “preserved” but may allow some alternative interpretations of what constitutes “in place.” The proposed modification is then to elevate the above-ground portion of the Bricklayers Building to gain sufficient vertical clearance for the streetcar vehicles at grade. In this scheme, the ground level of the building will be gutted and partially opened up to effectively be part of the track yard with vehicles able to pass through below the upper level. Because the remaining occupiable floor area is not sufficient to accommodate the entire 2017 Annex program, OMF operations will have to be divided between this building’s upper level for staff support space, and the existing OMF for maintenance and storage. Structurally, the existing foundation (and basement) will likely need to be removed and replaced with a new foundation. A new ground level structural system will also be required for the approximately 6 additional feet of height. As with all options wherein occupiable building space is proposed to be preserved, structural and architectural retrofit will be necessary for code compliance as described in greater detail under Option 6, that of complete preservation. Suffice it to say that this scenario will require a complete redesign of the OMF expansion from the 2017 plans.

In the best case, this track yard can be configured as efficiently and optimally as for Option 1, as though there were no Bricklayers Building to contend with. More likely, it will need to weave around the ground level structural system. Storage capacity will be the

same with (9) streetcar vehicles in the yard and (2) in the existing OMF for a total of (11). Minimum spacing is at 2 feet between streetcar vehicles and 14 feet between tracks where vehicles are stored. Constrained storage capacity and access for (4) non-revenue vehicles may be feasible on site.

In the preliminary meeting with LPB staff, initial feedback to this proposed solution was less than favorable. Contrary to the assumed premise, the proposed modification was deemed too extreme with no appreciable preservation value. That said, the Board also recommended providing evidence during the Controls and Incentives process that all options were considered and explored. Thus, while this option is unlikely to be approved, its inclusion may benefit the overall discussion and the Board’s perception of the viability of the other options.

Option 4: Partial Demolition

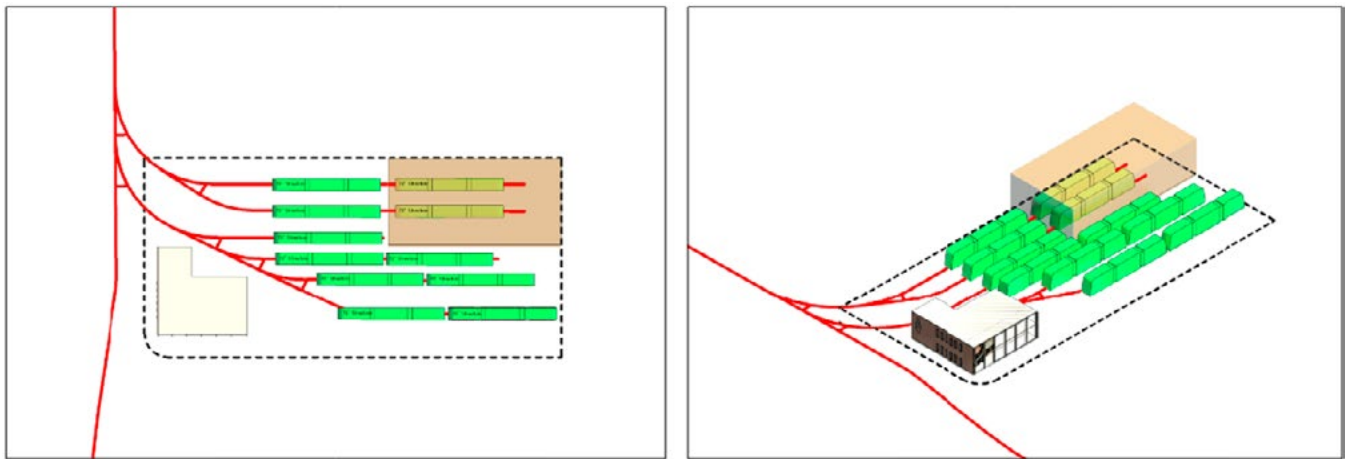


FIG. 4.1: 2D & 3D site diagrams w/ Bricklayers Bldg partially demolished & reused for OMF expansion

Under this scenario, a portion of the southeast corner of the Bricklayers Building facing the interior of the lot is proposed to be removed. The portion of the south façade to be removed is a solid brick façade with no openings or adornment, visible only on the approach from the south on Fairview Ave. Architecturally plain entries and windows comprise the portion of the east façade to be removed, visible only from the alley bordering the lot on the east. The east elevation in general is “back of house,” with utility equipment mounted on a pad adjacent to an unusable entry and overhead power lines anchored directly to the brick façade.

As with Option 3, the 2017 Annex design is superseded by a repurposing of the Bricklayers Building, necessitating a complete redesign. While the demolished quadrant of the building sidesteps the north-south interior loadbearing wall, the alteration will require some structural retrofit, in addition to code-driven upgrades (see Option 6 for more detailed information). Some vertical circulation and a plumbing core will be removed, likely requiring replacement elsewhere. Figures 4.2 and 4.3 demonstrate a possible configuration for the 2017 OMF annex program within the building’s reduced footprint.

This alteration crucially serves to relieve the track yard pinch point between the two existing buildings on the site and allows (9) streetcar vehicles to be stored straight and parallel in the yard (with an additional (2) in the existing OMF), making for an acceptable, layout for streetcar movement. Minimum spacing between streetcar vehicles remains at 2 feet, and minimum

spacing between tracks where vehicles are stored is at 11 feet. Constrained storage capacity and access for (4) non-revenue vehicles may be feasible.

In the preliminary meeting with LPB staff, initial feedback suggested that considering the deliberate and conservative selection of the portion to be removed, it is highly probable that this solution may be considered by the Board to qualify as a preservation and therefore approved.

Option 5: Relocate / Reuse

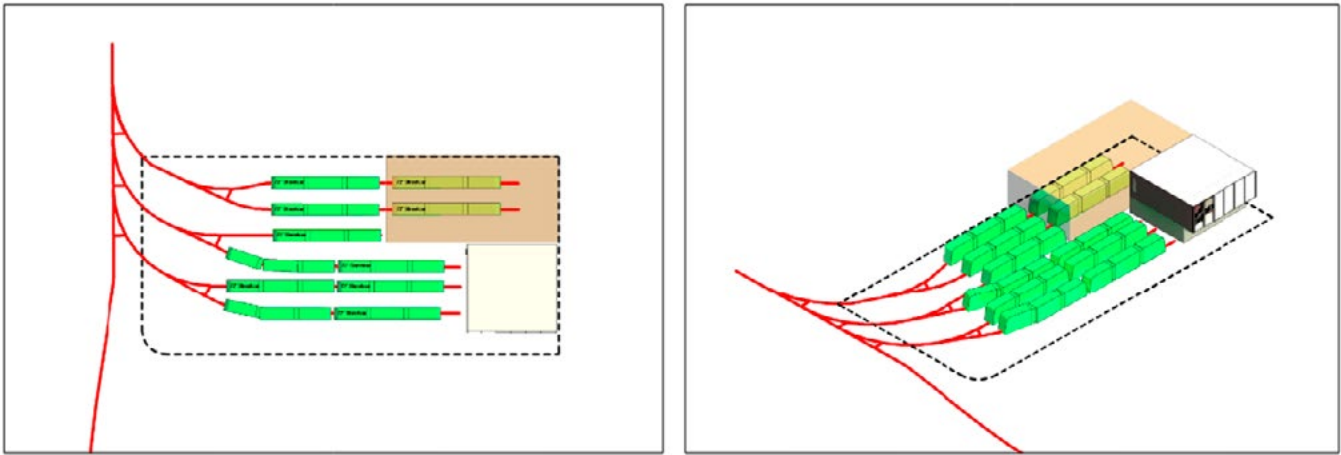


FIG. 5.1: 2D & 3D site diagrams w/ Bricklayers Bldg relocated & reused for OMF expansion

In this scenario, the proposed modification is to detach and relocate the two upper levels of the building to the southwest corner of the lot adjacent to the existing OMF, literally supplanting the 2017 Annex design and thereby necessitating a complete redesign. The remaining basement will be filled and abandoned in place. A new foundation will be required at the new location to receive the relocated building and the existing structure would require additional retrofits to bring it up to code. Modification of the east elevation will be required where openings now abut the existing OMF. Other architectural and structural scope will be similar to other options that involve the Bricklayers Building being retrofitted as the new OMF expansion. Figure 5.2 demonstrates that the ground and upper level floor areas can sufficiently accommodate the 2017 Annex program (see [Figure 4.2](#)).

Because the Bricklayers Building footprint is larger than that of the 2017 Annex, the track yard is more constricted than under Option 1, in which the building is removed completely. While yard capacity is the same at (9) streetcar vehicles in the yard and (2) in the existing OMF for a total of (11), some streetcar vehicles must be stored on a curve, which adds constraints. Nevertheless, with the full width of the site open to access from Harrison, an efficient layout for movement of the streetcar vehicles is attainable. Minimum spacing between streetcar vehicles is 2 feet, and minimum spacing between tracks where vehicles are

stored is 11 feet. In addition, (4) non-revenue vehicles may access and be stored on the site.

LPB staff feedback from the preliminary meeting suggested that the straightforward nature of this modification ensures that this option would at least merit discussion during the Controls and Incentives process. While it succeeds on its face in preserving the building exterior, the removal from its original corner location does not keep it in place and further, specifically decontextualizes its most significant features (north and west facades), a result the LPB may ultimately find unacceptable.

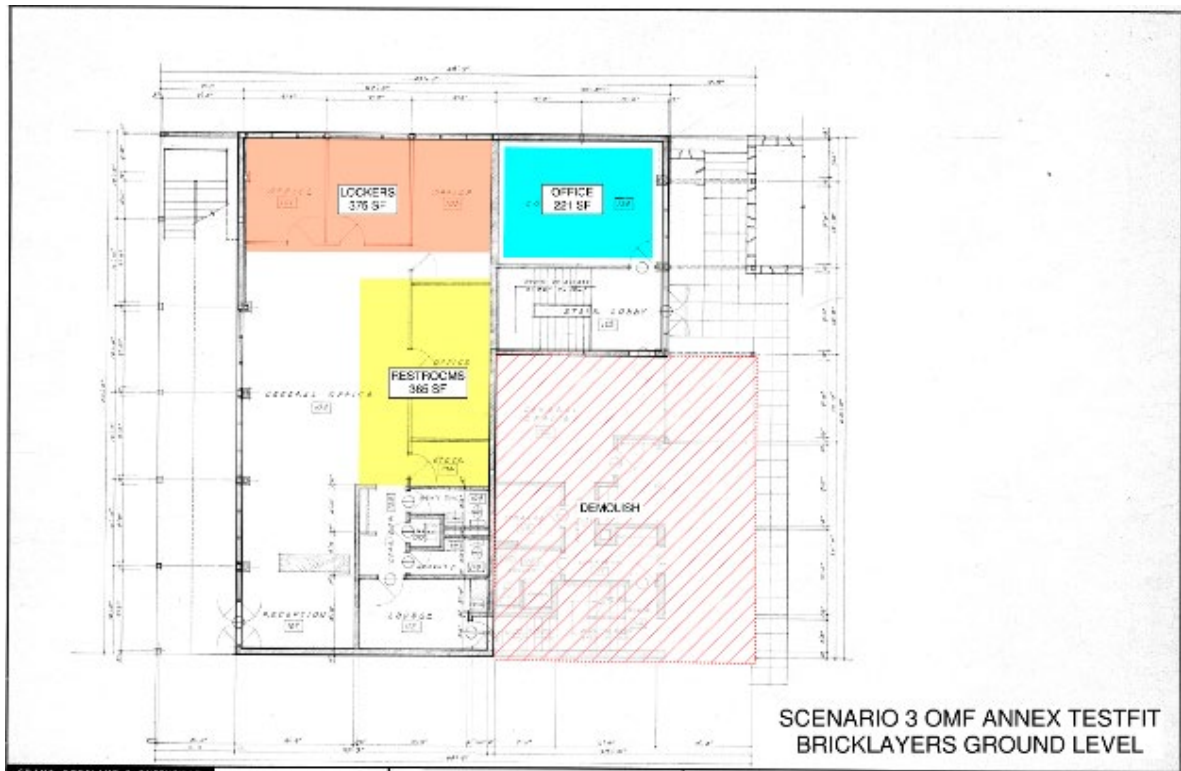
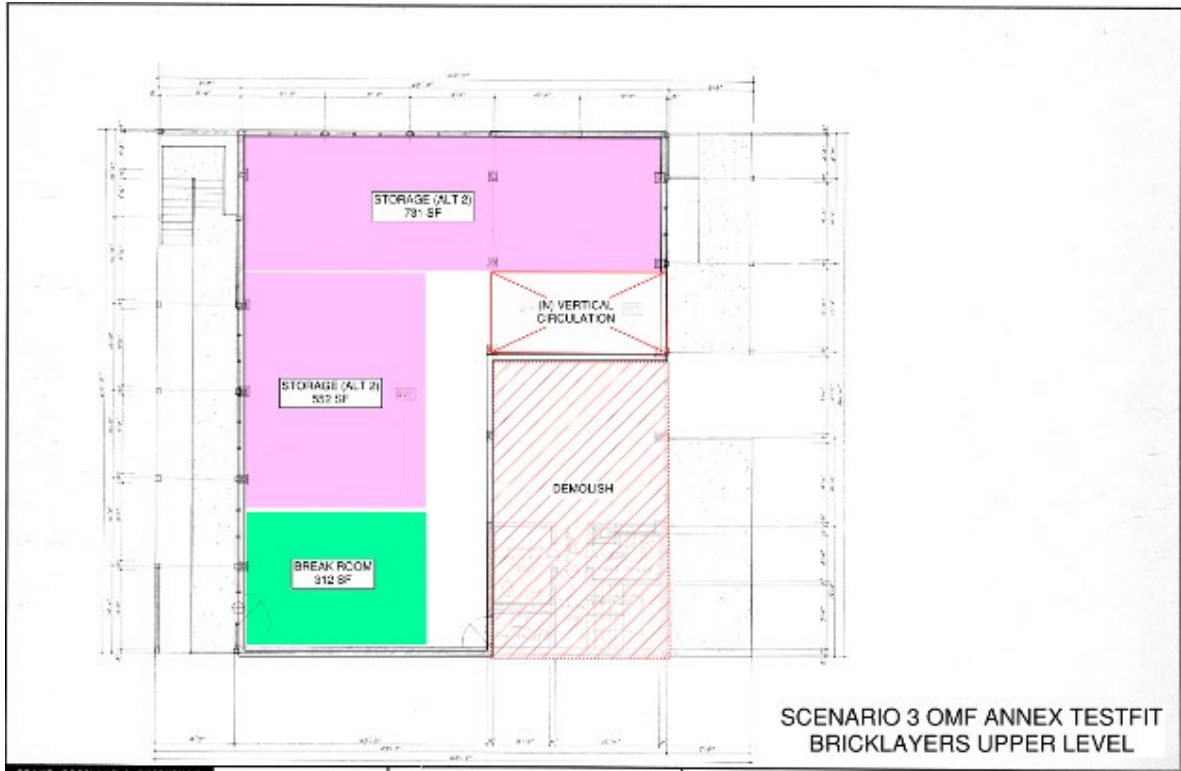


FIG. 4.3: 2017 Annex program configured in reduced Bricklayers Bldg

Option 6: Preserve / Reuse

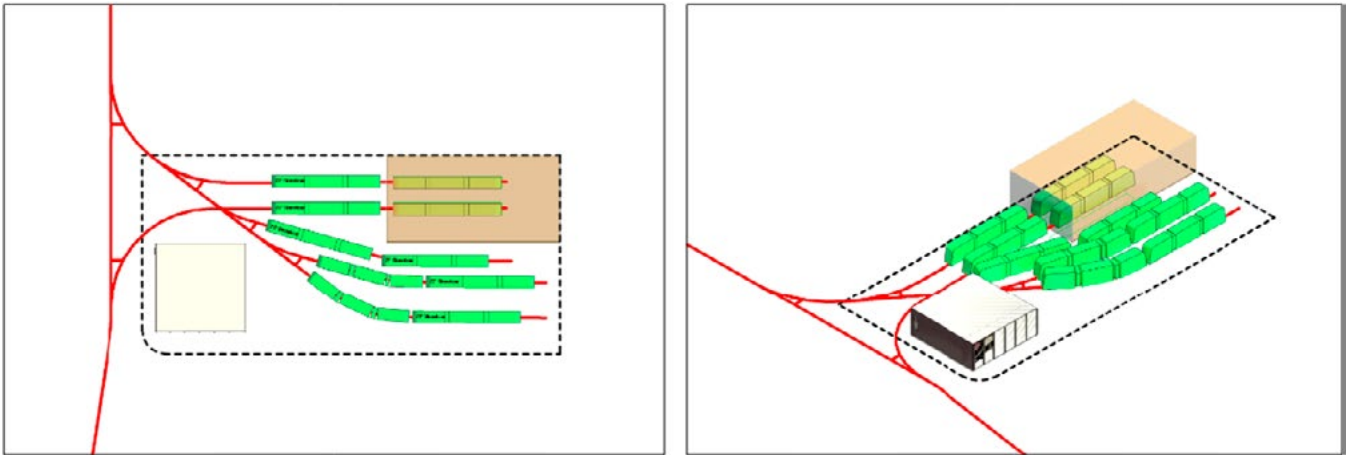


FIG. 6.1: 2D & 3D site diagrams w/ Bricklayers Bldg preserved & reused for OMF expansion

This scenario assumes that the entirety of the existing building exterior would remain in place. Under these constraints, the Bricklayers Building will be rehabilitated to serve as the new OMF expansion. This scenario therefore requires a complete redesign of the OMF expansion from the 2017 plans.

Figure 6.2 shows one example of how the 2017 Annex program (see [Figure 4.2](#)) can be configured within the building's existing footprint with room to spare while keeping its primary structure, vertical circulation elements, and plumbing and utility spaces largely intact. Storage at track level can be accommodated at basement level, leaving the entire upper level still unprogrammed and available for further expansion. As with all options involving reuse of the existing building, some new elements, such as an elevator and accessible restrooms, additional egress, and structural investigation and possible intervention will be required to bring the building up to current code. Included in the latter are:

- Reinforcement of existing lateral system, or addition of new one (internal braces or moment frames)
- Reinforcement of existing roof and anchorage to walls
- Check of existing gravity elements and reinforce as needed

- Check of existing basement/retaining walls and reinforce as needed (shotcrete or cast-in-place)
- Thus, the repurposing of the building appears readily feasible, fulfilling both the OMF Annex's programmatic requirements and the LPB's preservation interests.

The track yard, on the other hand, is another story. Only (8) streetcar vehicles can be stored at one time in the yard with an additional (2) inside the existing OMF, for a total of (10) streetcar vehicles. Minimum spacing between streetcar vehicles is held at 2 feet, and minimum spacing between tracks where vehicles are stored is 11 feet. Access and storage for (4) non-revenue vehicles are feasible though constrained. But while the numbers are not remarkably different from the other options, the yard configuration in Figure 6.1 is obviously and objectively deficient. Tracks will need to thread through a pinch point between the two existing buildings on the lot (a condition that Option 4 specifically addresses). The vehicle layout is kinked and cramped with some stored on a curve and will most certainly pose challenges to maneuverability and efficiency, with little tolerance for operational errors or equipment failure. The unworkability of yard operations renders this option non-viable for SDOT.

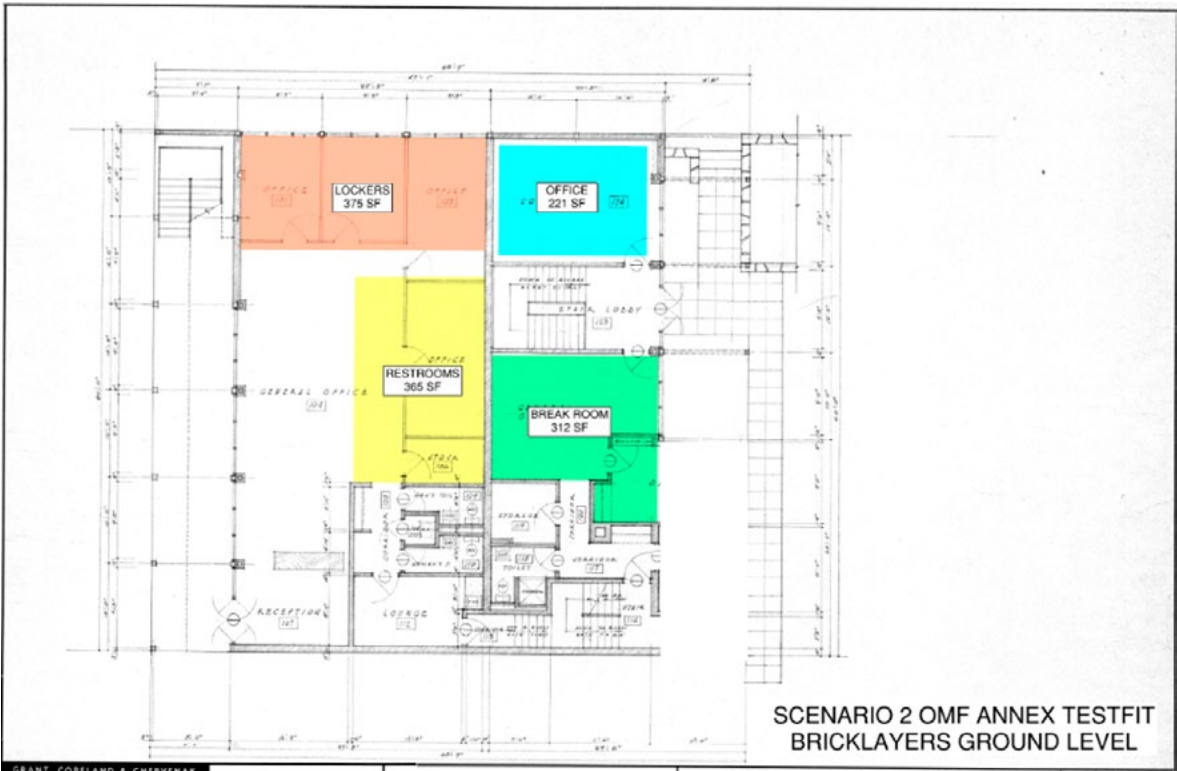
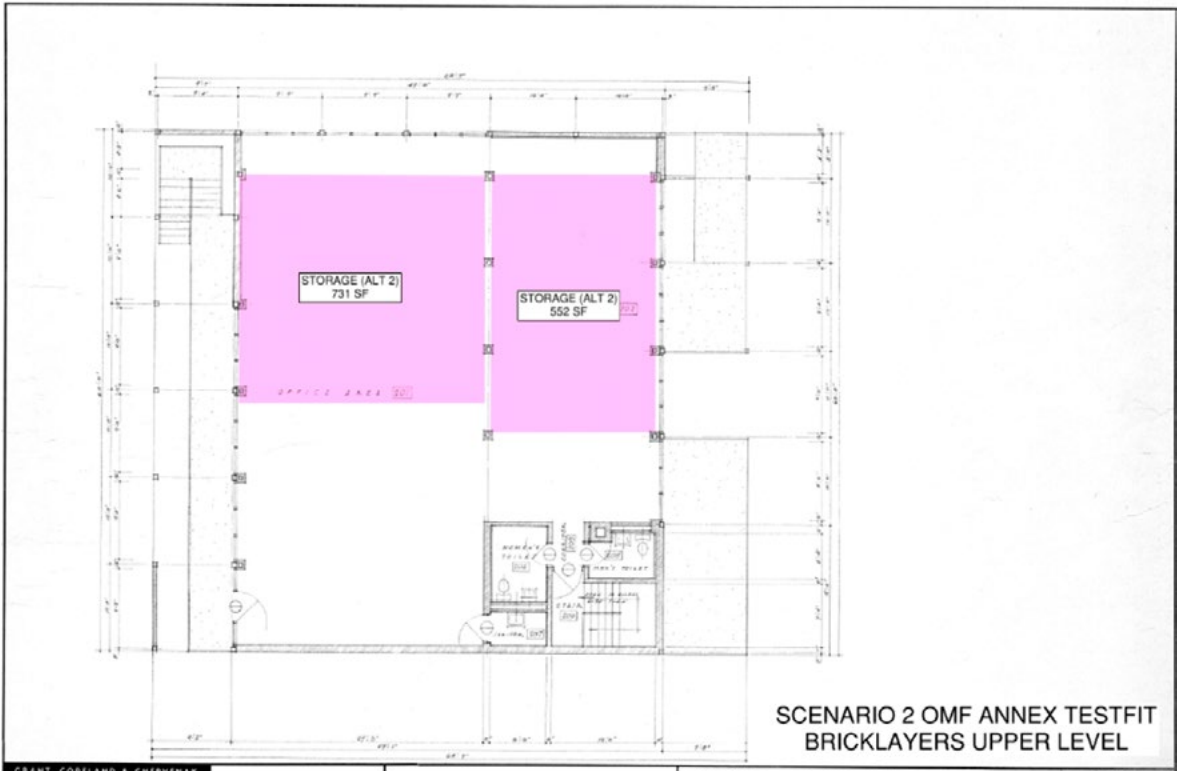


FIG. 5.2: 2017 Annex program configured in Bricklayers Bldg Ground & Upper Levels

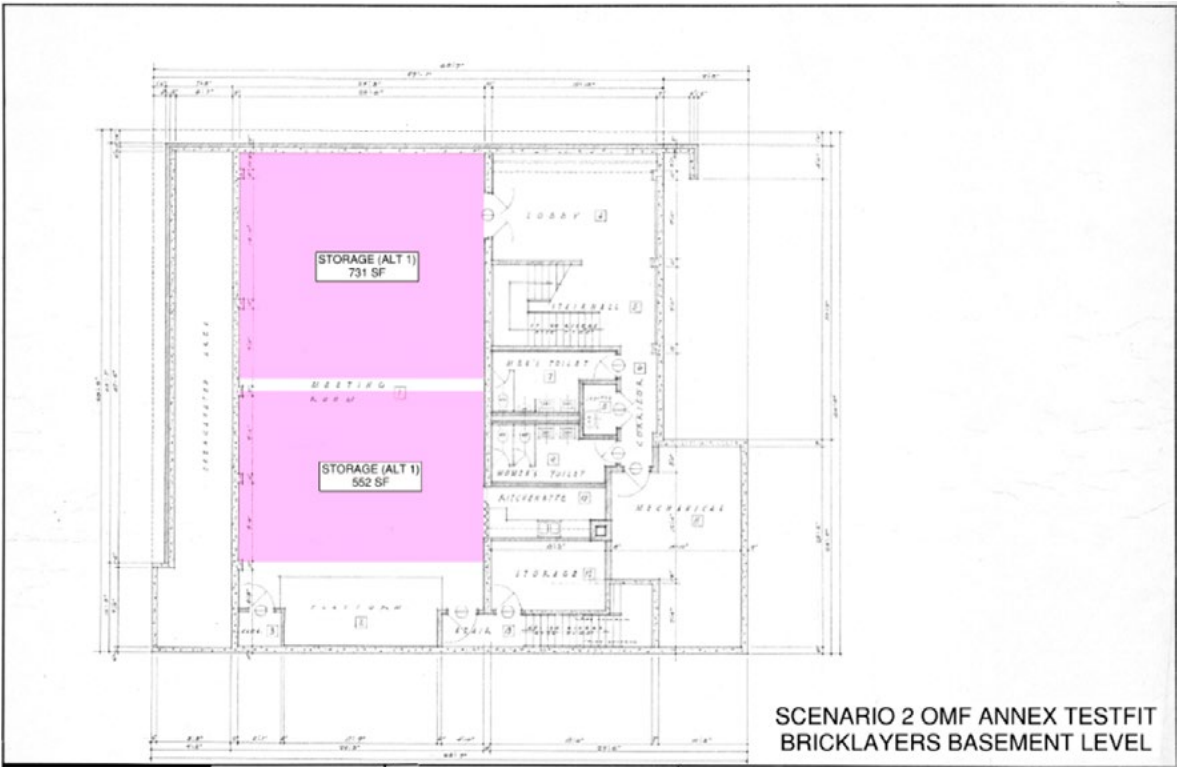
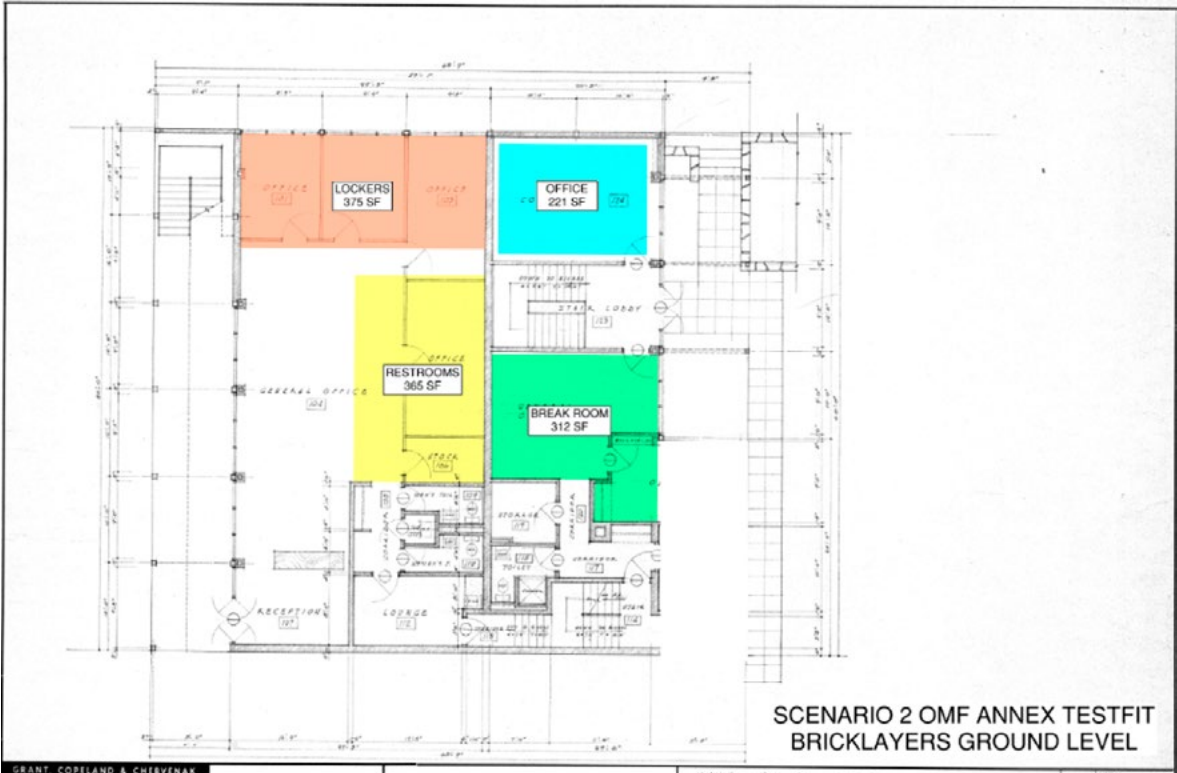


FIG.6.2: 2017 Annex program configured in Bricklayers Bldg Basement and Ground Levels

C3 OMF Expansion Scenarios

8/2/2023

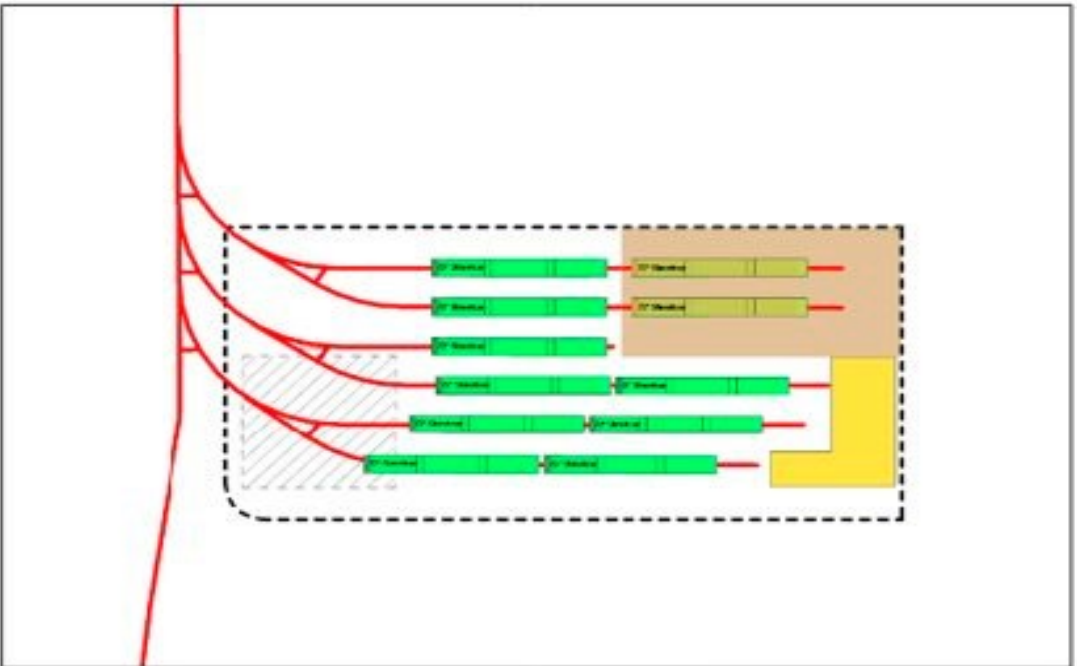
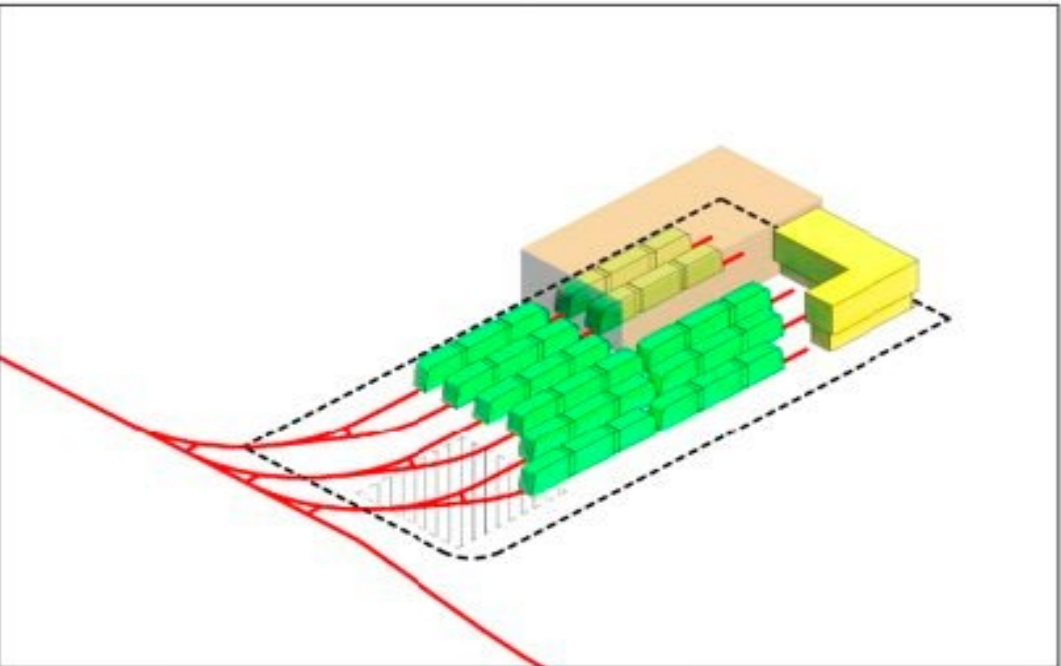
	Track Yard									Facilities						Allowances		Notes / Issues			
	Vehicle			Track						Bricklayers Building				2017 OMF Annex			Sitework				
	Length (ft)	Min Spacing (ft)	Capacity	Min Spacing (ft)	Track Length (lf)	Track Cost per lf	# Turnouts	Cost per Turnout	Cost	Partial Demo / Removal per sf	Renovation / Retrofit per sf	New Construct per sf	Other	Cost	2017 Annex Design	2017 Annex Cost	Escalation to 2023		% of Total Improvement		
																				1,125	562,500
1 Demolition																		\$	9,386,572		
\$ 9,386,572	72	2	11	17	1,535	\$ 1,726,875	6	\$ 3,375,000	\$ 5,101,875	\$ 200,000	\$ -	\$ -	\$ -	\$ 200,000	No change	\$ 1,905,447	\$ 2,858,171	\$ 1,226,526	Key Considerations PROS: <ul style="list-style-type: none"> Storage capacity of 11 streetcars Storage capacity and access for 4 "Non-Revenue Vehicles" (Pickups/SUVs for Operations) Efficient layout for movement of streetcars Flexibility to address programmatic needs of new streetcars OMF Expansion adjacent to existing OMF Options for Historic Features Documentation Lowest cost CONS: <ul style="list-style-type: none"> Demolition of Bricklayers Building 		
																					

Image Source: Site Diagrams_All.pdf

C3 OMF Expansion Scenarios

8/2/2023

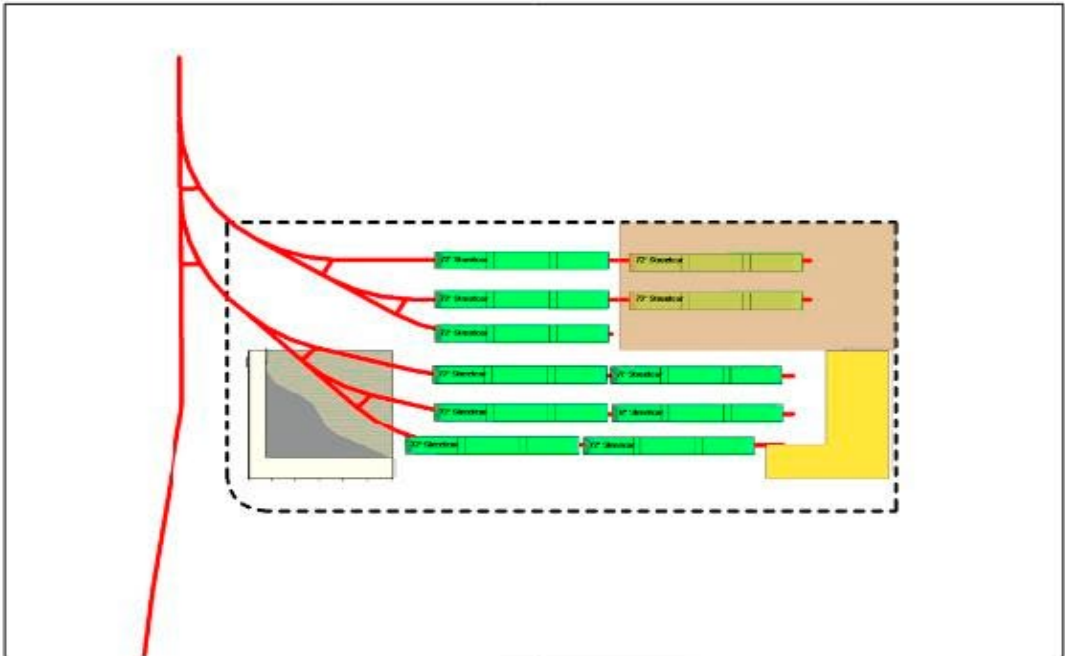
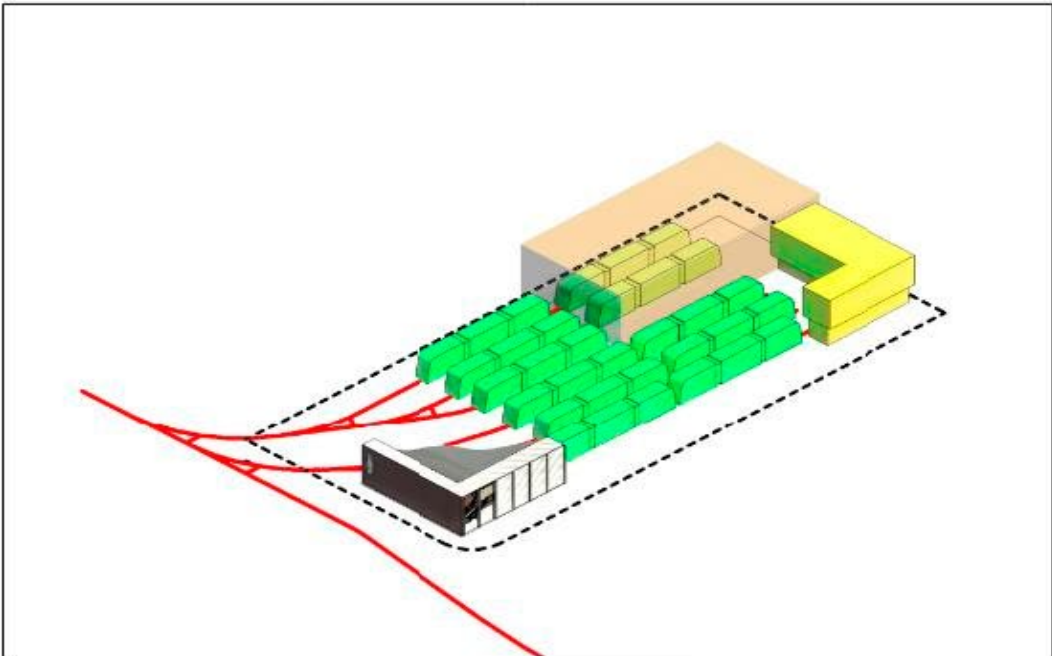
	Track Yard									Facilities						Allowances		Notes / Issues	
	Vehicle			Track						Bricklayers Building				2017 OMF Annex			Sitework		
	Length (ft)	Min Spacing (ft)	Capacity	Min Spacing (ft)	Track Length (lf)	Track Cost per lf	# Turnouts	Cost per Turnout	Cost	Partial Demo / Removal per sf	Renovation / Retrofit per sf	New Construct per sf	Other	Cost	2017 Annex Design	2017 Annex Cost	Escalation to 2023		% of Total Improvement
					\$ 1,125			\$ 562,500		\$ 125	\$ 1,100	\$ 1,000					50%	20%	
2 Façade Preservation																			\$ 10,600,105
\$ 10,600,105	72	2	11	14	1,412	\$ 1,588,500	6	\$ 3,375,000	\$ 4,963,500	\$ 1,011,750	\$ -	\$ -	\$ -	\$ 1,011,750	No change	\$ 1,905,447	\$ 2,858,171	\$ 1,766,684	
																			<p>Key Considerations</p> <p>PROS:</p> <ul style="list-style-type: none"> Storage capacity of 11 streetcars Efficient layout for movement of streetcars Flexibility to address programmatic needs of new streetcars OMF Expansion adjacent to existing OMF Preserves key architectural features and siting <p>CONS:</p> <ul style="list-style-type: none"> Site constraints on storage/access for 4 NRVs \$1.2M incremental Cost

Image Source: Site Diagrams_All.pdf

C3 OMF Expansion Scenarios

8/2/2023

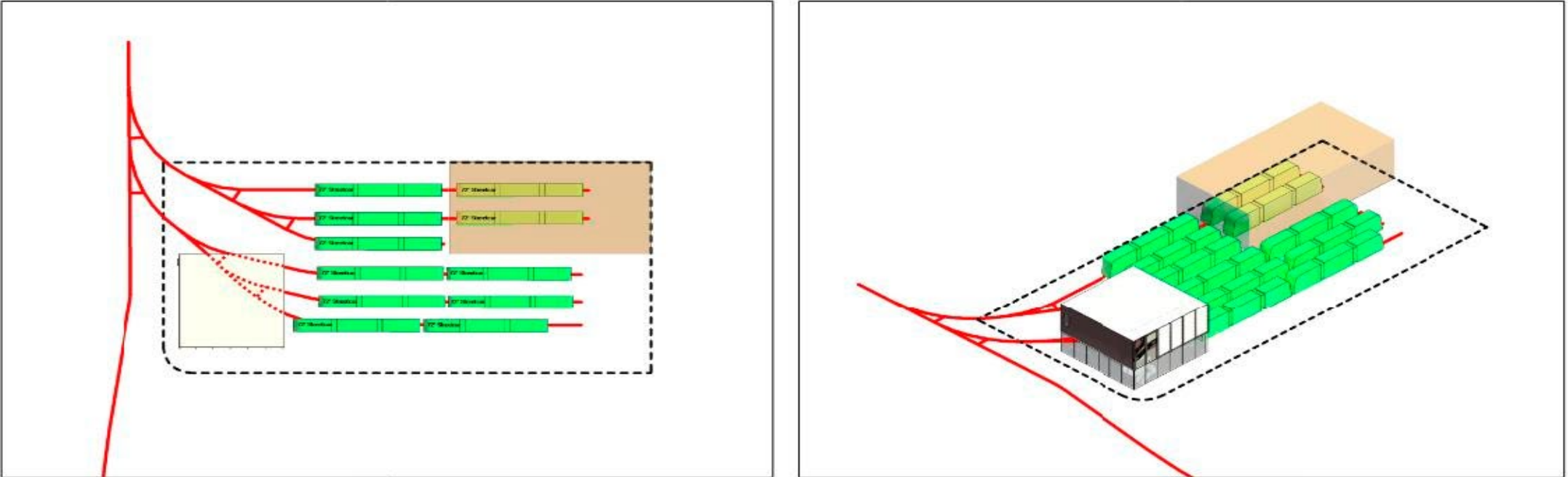
	Track Yard									Facilities						Allowances			Notes / Issues
	Vehicle			Track						Bricklayers Building				2017 OMF Annex			Sitework		
	Length (ft)	Min Spacing (ft)	Capacity	Min Spacing (ft)	Track Length (lf)	Track Cost per lf	# Turnouts	Cost per Turnout	Cost	Partial Demo / Removal per sf	Renovation / Retrofit per sf	New Construct per sf	Other	Cost	2017 Annex Design	2017 Annex Cost	Escalation to 2023	% of Total Improvement	
					\$ 1,125			\$ 562,500		\$ 125	\$ 1,100	\$ 1,000					50%	20%	
3 Raise / Reuse																			\$ 15,589,650
\$ 15,589,650	72	2	11	14	1,427	\$ 1,605,375	6	\$ 3,375,000	\$ 4,980,375	\$ 365,000	\$ 2,992,000	\$ 4,254,000	\$ 400,000	\$ 8,011,000	Redesign	\$ -	\$ -	\$ 2,598,275	
																			<p>Key Considerations</p> <p>PROS:</p> <ul style="list-style-type: none"> Storage capacity of 11 streetcars Efficient layout for movement of streetcars Flexibility to address programmatic needs of new streetcars Retains above-grade historic features and siting <p>CONS:</p> <ul style="list-style-type: none"> \$6.2M Incremental Cost Complex and risky construction Site constraints on storage/access for 4 NRVs Usable area in Bricklayers Building for OMF Expansion for staff only, excludes storage Disconnected from existing OMF

Image Source: Site Diagrams_All.pdf

C3 OMF Expansion Scenarios

8/2/2023

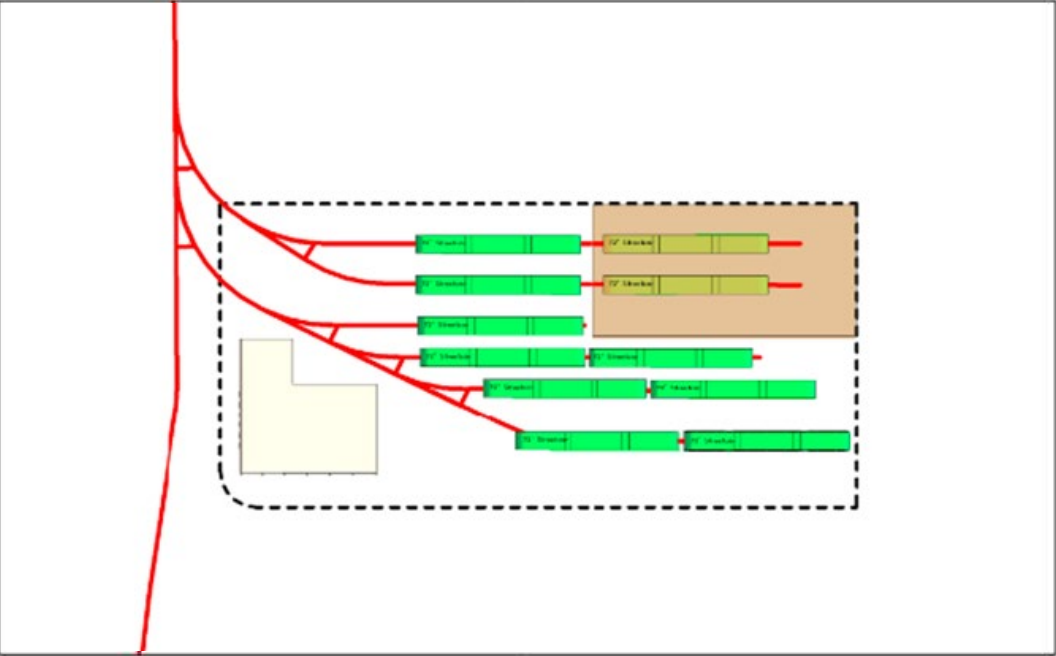
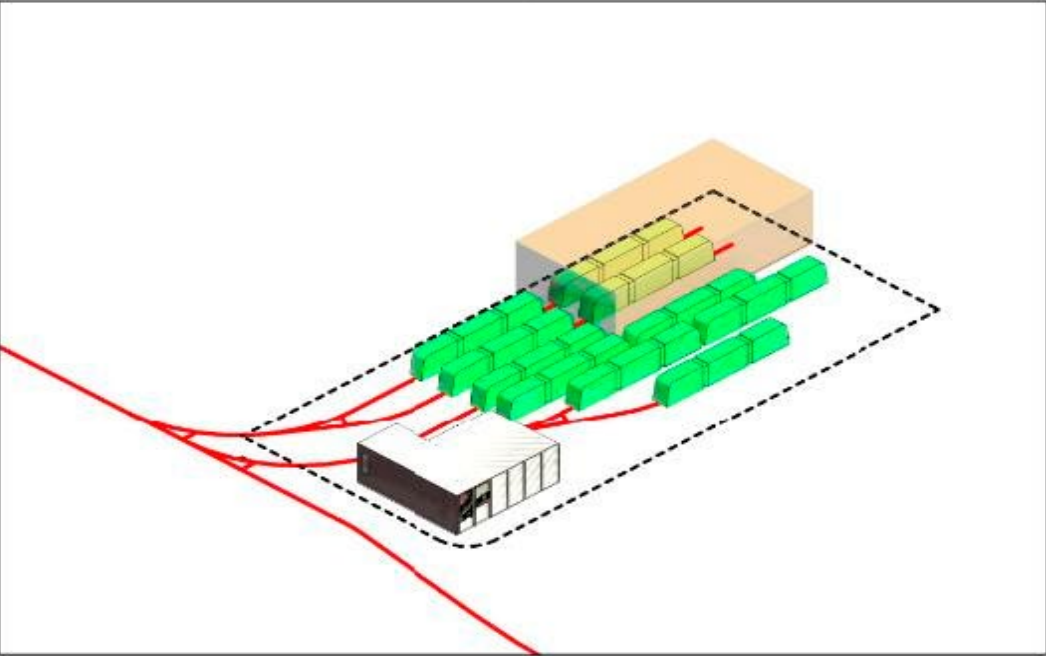
	Track Yard									Facilities						Allowances		Notes / Issues	
	Vehicle			Track						Bricklayers Building				2017 OMF Annex			Sitework		
	Length (ft)	Min Spacing (ft)	Capacity	Min Spacing (ft)	Track Length (lf)	Track Cost per lf	# Turnouts	Cost per Turnout	Cost	Partial Demo / Removal per sf	Renovation / Retrofit per sf	New Construct per sf	Other	Cost	2017 Annex Design	2017 Annex Cost	Escalation to 2023		% of Total Improvement
					\$ 1,125		\$ 562,500		\$ 125	\$ 1,100	\$ 1,000						50%	20%	
4 Partial Demolition																		\$ 15,583,710	
\$ 15,583,710	72	2	11	11	1,367	\$ 1,537,875	6	\$ 3,375,000	\$ 4,912,875	\$ 260,250	\$ 7,813,300	\$ -	\$ -	\$ 8,073,550	Redesign	\$ -	\$ -	\$ 2,597,285	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  </div> <div style="width: 45%;">  </div> </div>																			<p>Key Considerations</p> <p>PROS:</p> <ul style="list-style-type: none"> Storage capacity of 11 streetcars Acceptable layout for movement of streetcars Flexibility to address programmatic needs of new streetcars Preserves most important architectural features <p>CONS:</p> <ul style="list-style-type: none"> \$6.2M Incremental Cost Site constraints on storage/access for 4 NRVs OMF Expansion remote from existing

Image Source: Site Diagrams_All.pdf

C3 OMF Expansion Scenarios

8/2/2023

	Track Yard									Facilities						Allowances		Notes / Issues	
	Vehicle			Track						Bricklayers Building				2017 OMF Annex			Sitework		
	Length (ft)	Min Spacing (ft)	Capacity	Min Spacing (ft)	Track Length (lf)	Track Cost per lf	# Turnouts	Cost per Turnout	Cost	Partial Demo / Removal per sf	Renovation / Retrofit per sf	New Construct per sf	Other	Cost	2017 Annex Design	2017 Annex Cost	Escalation to 2023		% of Total Improvement
					\$ 1,125		\$ 562,500		\$ 125	\$ 1,100	\$ 1,000						50%	20%	
5 Relocate / Reuse																			\$ 16,431,300
\$ 16,431,300	72	2	11	11	1,490	\$ 1,676,250	6	\$ 3,375,000	\$ 5,051,250	\$ 200,000	\$ 6,891,500	\$ 1,000,000	\$ 550,000	\$ 8,641,500	Redesign	\$ -	\$ -	\$ 2,738,550	
																			<p>Key Considerations</p> <p>PROS:</p> <ul style="list-style-type: none"> Storage capacity of 11 streetcars Storage capacity and access for 4 NRVs Efficient layout for movement of streetcars OMF Expansion adjacent to existing Preserves most important architectural features <p>CONS:</p> <ul style="list-style-type: none"> \$7M Incremental Cost No flexibility to address programmatic needs of new streetcars Changes Bricklayers Building siting: removes context and reduces visibility

Image Source: Site Diagrams_All.pdf

C3 OMF Expansion Scenarios

8/2/2023

	Track Yard									Facilities						Allowances			Notes / Issues	
	Vehicle			Track						Bricklayers Building				2017 OMF Annex			Sitework			
	Length (ft)	Min Spacing (ft)	Capacity	Min Spacing (ft)	Track Length (lf)	Track Cost per lf	# Turnouts	Cost per Turnout	Cost	Partial Demo / Removal per sf	Renovation / Retrofit per sf	New Construct per sf	Other	Cost	2017 Annex Design	2017 Annex Cost	Escalation to 2023	% of Total Improvement		
					\$ 1,125		\$ 562,500		\$ 125	\$ 1,100	\$ 1,000						50%	20%		
6	Preserve/Reuse																		\$	15,248,350
\$	15,248,350	72	2	10	11	1,311	\$ 1,474,875	5	\$ 2,812,500	\$ 4,287,375	\$ -	\$ 10,103,500	\$ -	\$ -	\$ 10,103,500	Redesign	\$ -	\$ -	\$ 857,475	
	Key Considerations PROS: <ul style="list-style-type: none"> Storage capacity of 10 streetcars (absolute minimum) Retains Bricklayers Building (with interior modifications) CONS: <ul style="list-style-type: none"> Yard operations unacceptable Limited streetcar capacity \$5.8M incremental Cost Site constraints on storage/access for 4 NRVs OMF Expansion remote from existing OMF 																			

Image Source: Site Diagrams_All.pdf



APPENDIX F

SLU OMF EXPANSION OPTIONS-RENDERINGS

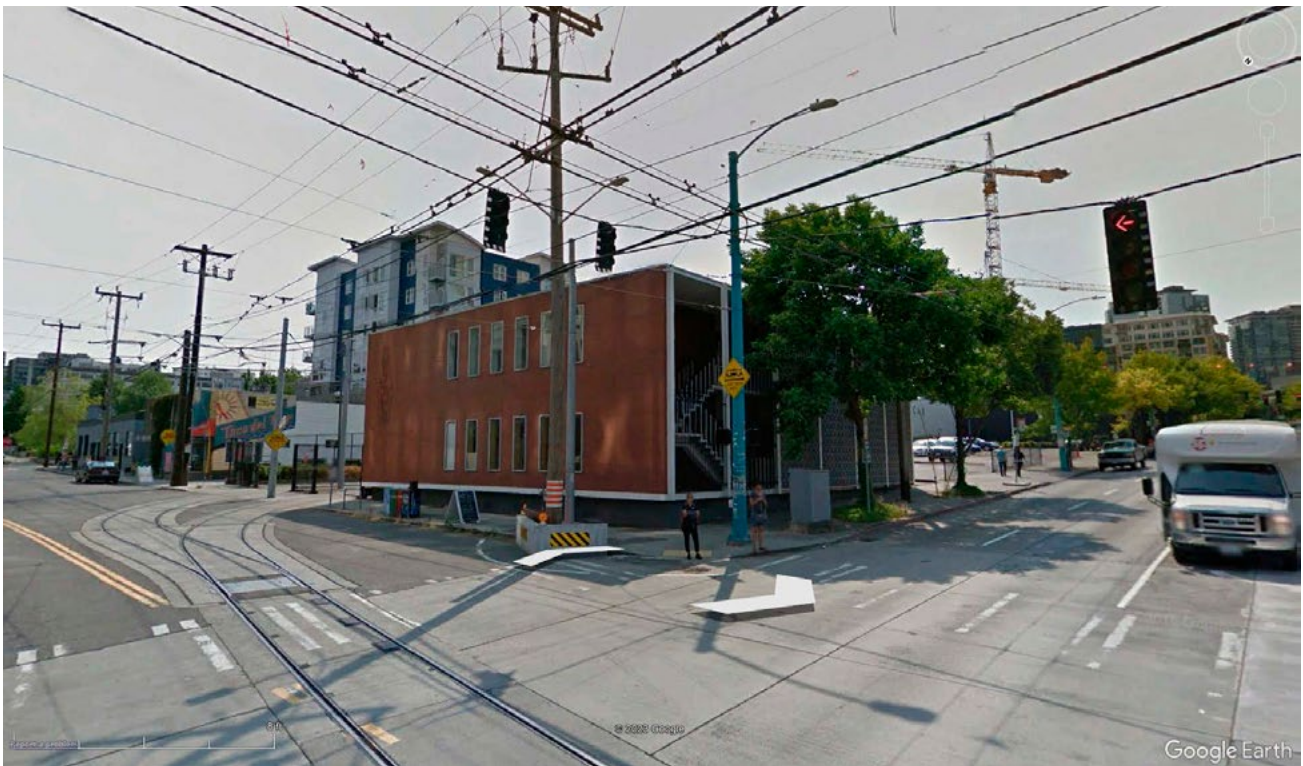
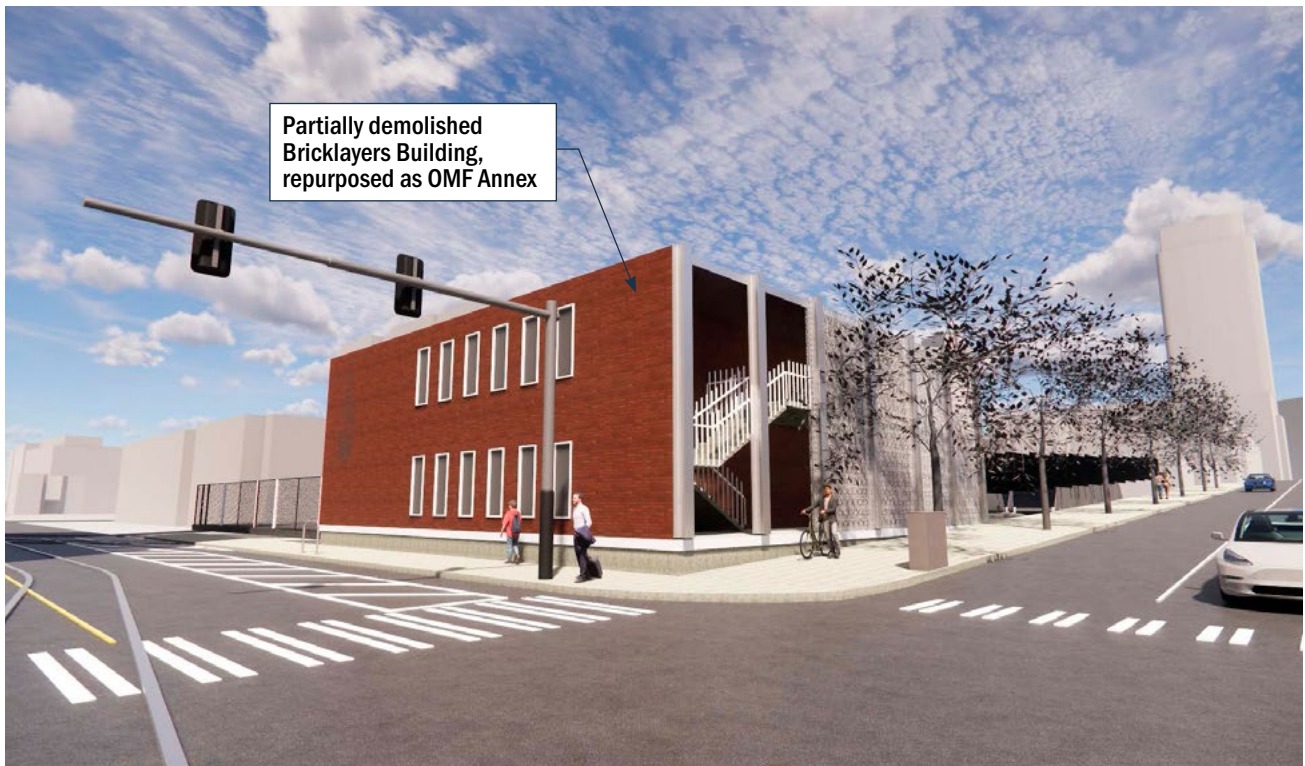


Image Source: Google Earth















APPENDIX G

COST ASSESSMENT DETAIL

Streetcar Delivery Assessment: Cost Assessment Detail

Item	2018 Cost Basis	2023 Estimate	Estimating Allowance	Contingency	Cost Assessment (Current Year \$)	Cost Assessment (Year of Expenditure \$)
Subtotal: 2018 Project As Bid	\$50,720,000	\$65,195,000	\$6,519,100	\$12,923,000	\$84,637,000	\$96,282,000
Low Bid	\$52,436,000	\$67,400,000	\$6,740,000	\$13,480,000	\$87,620,000	\$99,675,000
Owner-Furnished Items (Including Rail)	\$1,800,000	\$2,314,000	\$231,000	\$347,000	\$2,892,000	\$3,290,000
Delete McGraw TPSS & TP Ductbank	\$(3,516,000)	\$(4,519,000)	\$(451,900)	\$(904,000)	\$(5,875,000)	\$(6,683,000)
Subtotal: New & Modified Scope Elements		\$14,416,000	\$4,681,400	\$2,883,000	\$21,980,400	\$25,005,000
OMF Annex & Façade Preservation		\$10,600,000	\$3,180,000	\$2,120,000	\$15,900,000	\$18,088,000
Platform & Tail Track Modifications (SLU/FHS)	\$448,000	\$576,000	\$230,400.00	\$115,000	\$921,400	\$1,048,000
Allowance for Updates to City Standard Plans and Specs		\$190,000	\$76,000	\$38,000	\$304,000	\$346,000
Add TPSS at Seneca St.	\$2,178,000	\$2,800,000	\$1,120,000	\$560,000	\$4,480,000	\$5,096,000
OCS - Allowance for Areaway Poles in Lieu of Building Attachments		\$250,000	\$75,000	\$50,000	\$375,000	\$427,000
Areaways - 1st Ave Pioneer Square & Olive/Stewart		\$19,109,000	\$9,554,500	\$3,822,000	\$32,485,500	\$36,955,000
Subtotal: Jackson Street Structures-Deck Replacement		\$15,360,000	\$6,144,000	\$3,072,000	\$24,576,000	\$27,957,000
Roll-Up: SDOT Construction Contract & Contingency		\$114,080,000	\$26,899,000	\$22,700,000	\$163,679,000	\$186,199,000
Subtotal: Design Phase Soft Costs (Streetcar)		\$10,366,000			\$10,366,000	\$10,729,000
Validate 2018 Design (Consultant)		\$2,741,000			\$2,741,000	\$2,837,000
New & Modified Scope (Consultant)		\$2,483,000			\$2,483,000	\$2,570,000
SDOT-Loaded Labor (Validation)-3 FTE		\$2,000,000			\$2,000,000	\$2,070,000
SDOT Loaded Labor (New/Modified)		\$2,200,000			\$2,200,000	\$2,277,000
Design Phase Contingency		\$942,000			\$942,000	\$975,000
Subtotal: Design Phase Soft Costs (Areaways)		\$6,936,600			\$6,936,600	\$7,178,600
Areaways (Consultant)		\$3,726,000			\$3,726,000	\$3,856,000
SDDOT Loaded Labor (Areaways)		\$2,580,000			\$2,580,000	\$2,670,000
Design Phase Contingency		\$630,600			\$630,600	\$652,600
Subtotal: Design Phase Soft Costs (Jackson Structures)		\$5,203,968			\$5,203,968	\$5,203,880
Jackson Structures (Consultant)		\$2,795,520			\$2,795,520	\$2,893,520
SDDOT Loaded Labor (Jackson Structures)		\$1,935,360			\$1,935,360	\$2,003,360
Design Phase Contingency		\$473,088			\$473,088	\$490,088
Subtotal: Construction Phase Soft Costs (Streetcar)		\$42,647,000			\$42,647,000	\$48,939,000
SDOT Labor Construction Administration (Streetcar)		\$10,662,000			\$10,662,000	\$12,235,000
SDOT Consultant PM/CM (Streetcar)		\$31,985,000			\$31,985,000	\$36,704,000
Subtotal: Construction Phase Soft Costs (Areaways)		\$12,215,400			\$12,215,400	\$12,277,400
SDOT Labor Construction Administration (Areaways)		\$2,866,350			\$2,866,350	\$2,866,350
SDOT Consultant PM/CM (Areaways)		\$8,599,050			\$8,599,050	\$8,599,050
ROW (Construction Easements-Areaways)		\$750,000			\$750,000	\$812,000
Subtotal: Construction Phase Soft Costs (Jackson Structures)		\$8,601,000			\$8,601,000	\$8,601,000
SDOT Labor Construction Administration (Jackson Structures)		\$2,150,000			\$2,150,000	\$2,150,000
SDOT Consultant PM/CM (Jackson Structures)		\$6,451,000			\$6,451,000	\$6,451,000
Subtotal: Vehicle Purchase Contract		\$68,000,000	NA	\$6,800,000	\$74,800,000	\$74,800,000
Subtotal: Fleet, Safety Certification & Startup		\$11,735,000			\$11,735,000	\$13,306,000
Vehicle Engineering Consultant	\$3,800,000	\$4,884,000			\$4,884,000	\$4,884,000
SDOT Staff-Vehicle Procurement (0.5 FTE/year, 2026-30)		\$1,584,000			\$1,584,000	\$1,758,000
SDOT Safety Certification & Testing (0.5 FTE/Year, 2026-30)		\$1,584,000			\$1,584,000	\$1,758,000
Contracted Services (Metro Startup Costs including OCS)	\$2,865,000	\$3,683,000		\$736,600	\$3,683,000	\$4,906,000
SDOT Streetcar Total					\$246,165,400	\$269,061,000
SDOT Structures Total					\$90,018,380	\$98,172,880
SDOT Streetcar & Structures Total				\$30,236,600	\$336,183,868	\$367,233,880
Utilities Soft Costs - Design (Validation)		\$4,405,000			\$4,405,000	\$4,405,000
Utilities Soft Costs - Construction		\$16,453,000			\$16,453,000	\$16,453,000
Utilities Construction	\$32,000,000	\$41,132,000	\$4,113,200	\$8,226,400	\$53,471,600	\$57,183,400
City Utilities Total					\$74,329,600	\$78,041,400
All Project-Related Elements Summary					\$410,513,380	\$445,275,280



APPENDIX H

**SCHEDULE ANALYSIS:
DESIGN-BID-BUILD
PROJECT DELIVERY**

Activity ID	Activity Name	Planned Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06						Seattle Streetcar																																							
Funding & Authorization						Funding & Authorization																																							
Phase 1						Phase 1																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	30-Sep-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
FA-270	C3 Delivery Assessment Final Report	30d	01-Sep-23 A	31-Oct-23	384d	C3 Delivery Assessment Final Report																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
Phase 2						Phase 2																																							
FA-280	LOE - Funding Options Development, Review, and Approval	186d	26-May-25	27-Nov-25	0d	LOE - Funding Options Development, Review, and Approval																																							
FA-220	Phase 2 Funding Authorization	0d		27-Nov-25*	0d	Phase 2 Funding Authorization																																							
FA-130	LOE - PMOC Risk, Readiness Reviews	184d	28-Nov-25	30-May-26	565d	LOE - PMOC Risk, Readiness Reviews																																							
FA-170	LOE - Capital Investment Grant (CIG) Execution	184d	28-Nov-25	30-May-26	565d	LOE - Capital Investment Grant (CIG) Execution																																							
Environmental Review and Permitting						Environmental Review and Permitting																																							
Procurement						Procurement																																							
PR-100	Develop Procurement Materials - NEPA & Permitting/Approvals	56d	20-Sep-24	14-Nov-24	926d	Develop Procurement Materials - NEPA & Permitting/Approvals																																							
PR-110	Advertise RFQ - NEPA & Permitting/Approvals	34d	15-Nov-24	18-Dec-24	926d	Advertise RFQ - NEPA & Permitting/Approvals																																							
PR-120	Review SOQs and select preferred vendor - NEPA & Permitting/Approvals	42d	19-Dec-24	29-Jan-25	926d	Review SOQs and select preferred vendor - NEPA & Permitting/Approvals																																							
PR-130	Negotiate and execute contract - NEPA & Permitting/Approvals	60d	30-Jan-25	30-Mar-25	926d	Negotiate and execute contract - NEPA & Permitting/Approvals																																							
PR-140	NTP NEPA & Permitting/Approvals	0d	31-Mar-25		926d	NTP NEPA & Permitting/Approvals																																							
Supplemental Environmental Assessment						Supplemental Environmental Assessment																																							
PA-100	Draft Supplemental Environmental Assessment	120d	04-Aug-25	01-Dec-25	800d	Draft Supplemental Environmental Assessment																																							
PA-110	EA Public Comment	42d	02-Dec-25	12-Jan-26	800d	EA Public Comment																																							
PA-120	FTA Approved EA	0d		26-Jan-26	800d	FTA Approved EA																																							
Updated FONSI						Updated FONSI																																							
PA-130	Draft FONSI	60d	27-Jan-26	27-Mar-26	800d	Draft FONSI																																							
PA-140	FTA FONSI Review and Approval	56d	28-Mar-26	22-May-26	800d	FTA FONSI Review and Approval																																							
PA-150	FTA Signed FONSI	0d		22-May-26	800d	FTA Signed FONSI																																							
Other Permits and Approvals						Other Permits and Approvals																																							
PA-160	Landmarks Preservation Board Incentives & Controls Agreement (OMF)	90d	04-Aug-25	01-Nov-25	1181d	Landmarks Preservation Board Incentives & Controls Agreement (OMF)																																							
PA-170	Seattle Design Commission Review	90d	04-Aug-25	01-Nov-25	775d	Seattle Design Commission Review																																							
PA-180	Master Use Permit (OMF)	120d	04-Aug-25	01-Dec-25	1151d	Master Use Permit (OMF)																																							
PA-190	Pioneer Square Preservation Board Certificate of Approval	90d	01-Jan-26	31-Mar-26	2004d	Pioneer Square Preservation Board Certificate of Approval																																							
PA-200	Pike Place Market Historical Commission Certificate of Approval	90d	01-Jan-26	31-Mar-26	2004d	Pike Place Market Historical Commission Certificate of Approval																																							
PA-210	Building Permit (OMF)	90d	31-May-26	28-Aug-26	1854d	Building Permit (OMF)																																							
Design						Design																																							
Procurement						Procurement																																							
PR-150	Develop Procurement Materials - Civil Design	56d	20-Sep-24	14-Nov-24	0d	Develop Procurement Materials - Civil Design																																							
PR-160	Advertise RFQ - Civil Design	28d	15-Nov-24	12-Dec-24	0d	Advertise RFQ - Civil Design																																							
PR-170	Review SOQs and select preferred firm - Civil Design	24d	13-Dec-24	05-Jan-25	0d	Review SOQs and select preferred firm - Civil Design																																							
PR-180	Negotiate and execute contract - Civil Design	60d	06-Jan-25	06-Mar-25	0d	Negotiate and execute contract - Civil Design																																							
PR-190	NTP Civil Design	0d	07-Mar-25		0d	NTP Civil Design																																							
Existing Design						Existing Design																																							
DS-180	Design Validation & 90% Design Submittal - Utilities	150d	07-Mar-25	03-Aug-25	116d	Design Validation & 90% Design Submittal - Utilities																																							
DS-190	Design Validation & 90% Design Submittal - Mainline Track & Civil	150d	07-Mar-25	03-Aug-25	116d	Design Validation & 90% Design Submittal - Mainline Track & Civil																																							
DS-230	Design Criteria (with NTP Design)	60d	07-Mar-25	05-May-25	0d	Design Criteria (with NTP Design)																																							
DS-210	Final Design - IFB Set (Utilities)	60d	04-Aug-25	02-Oct-25	682d	Final Design - IFB Set (Utilities)																																							
DS-200	Final Design - IFB Set (Utilities) (final resolution of comments)	60d	03-Oct-25	01-Dec-25	682d	Final Design - IFB Set (Utilities) (final resolution of comments)																																							
New and Revised Project Elements						New and Revised Project Elements																																							
DS-100	Preliminary Design - 0%-30% Design with Engineer's Estimate	120d	07-Mar-25	04-Jul-25	146d	Preliminary Design - 0%-30% Design with Engineer's Estimate																																							
DS-110	Preliminary Design - 0%-30% City Review and Comments	30d	05-Jul-25	03-Aug-25	565d	Preliminary Design - 0%-30% City Review and Comments																																							
DS-120	Detailed Design - 30%-60%	120d	04-Aug-25	01-Dec-25	565d	Detailed Design - 30%-60%																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 4

Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Planned Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
	Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06	3068d	01-Feb-23 A	24-Dec-31	0d	Seattle Streetcar																																							
	Funding & Authorization	1034d	01-Feb-23 A	30-May-26	565d	Funding & Authorization																																							
	Environmental Review and Permitting	708d	20-Sep-24	28-Aug-26	1854d	Environmental Review and Permitting																																							
	Design	708d	20-Sep-24	28-Aug-26	565d	Design																																							
	Utility Construction	608d	28-Nov-25	28-Jul-27	1447d	Utility Construction																																							
	Streetcar Construction	1341d	28-Nov-25	30-Jul-29	787d	Streetcar Construction																																							
	Rolling Stock	2334d	06-May-25	25-Sep-31	0d	Rolling Stock																																							
	Startup & Integrated Testing	1791d	29-Jan-27	24-Dec-31	0d	Startup & Integrated Testing																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

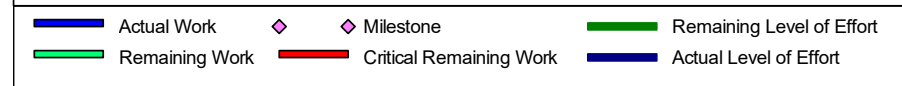
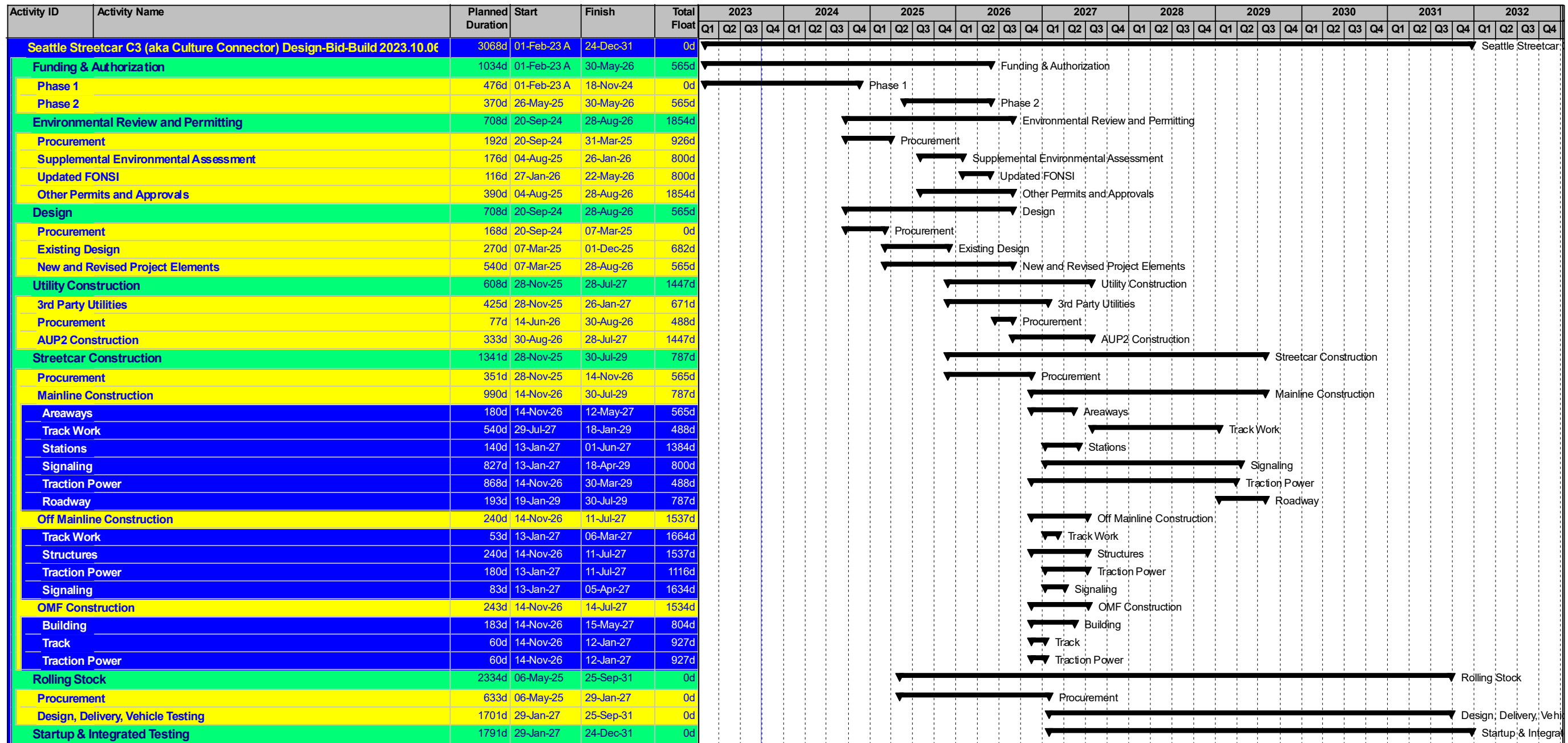
Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Planned Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
	Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06	3068d	01-Feb-23 A	24-Dec-31	0d	Seattle Streetcar																																							
	Funding & Authorization	1034d	01-Feb-23 A	30-May-26	565d	Funding & Authorization																																							
	Phase 1	476d	01-Feb-23 A	18-Nov-24	0d	Phase 1																																							
	Phase 2	370d	26-May-25	30-May-26	565d	Phase 2																																							
	Environmental Review and Permitting	708d	20-Sep-24	28-Aug-26	1854d	Environmental Review and Permitting																																							
	Procurement	192d	20-Sep-24	31-Mar-25	926d	Procurement																																							
	Supplemental Environmental Assessment	176d	04-Aug-25	26-Jan-26	800d	Supplemental Environmental Assessment																																							
	Updated FONSI	116d	27-Jan-26	22-May-26	800d	Updated FONSI																																							
	Other Permits and Approvals	390d	04-Aug-25	28-Aug-26	1854d	Other Permits and Approvals																																							
	Design	708d	20-Sep-24	28-Aug-26	565d	Design																																							
	Procurement	168d	20-Sep-24	07-Mar-25	0d	Procurement																																							
	Existing Design	270d	07-Mar-25	01-Dec-25	682d	Existing Design																																							
	New and Revised Project Elements	540d	07-Mar-25	28-Aug-26	565d	New and Revised Project Elements																																							
	Utility Construction	608d	28-Nov-25	28-Jul-27	1447d	Utility Construction																																							
	3rd Party Utilities	425d	28-Nov-25	26-Jan-27	671d	3rd Party Utilities																																							
	Procurement	77d	14-Jun-26	30-Aug-26	488d	Procurement																																							
	AUP2 Construction	333d	30-Aug-26	28-Jul-27	1447d	AUP2 Construction																																							
	Streetcar Construction	1341d	28-Nov-25	30-Jul-29	787d	Streetcar Construction																																							
	Procurement	351d	28-Nov-25	14-Nov-26	565d	Procurement																																							
	Mainline Construction	990d	14-Nov-26	30-Jul-29	787d	Mainline Construction																																							
	Off Mainline Construction	240d	14-Nov-26	11-Jul-27	1537d	Off Mainline Construction																																							
	OMF Construction	243d	14-Nov-26	14-Jul-27	1534d	OMF Construction																																							
	Rolling Stock	2334d	06-May-25	25-Sep-31	0d	Rolling Stock																																							
	Procurement	633d	06-May-25	29-Jan-27	0d	Procurement																																							
	Design, Delivery, Vehicle Testing	1701d	29-Jan-27	25-Sep-31	0d	Design, Delivery, Vehicle Testing																																							
	Startup & Integrated Testing	1791d	29-Jan-27	24-Dec-31	0d	Startup & Integrated Testing																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

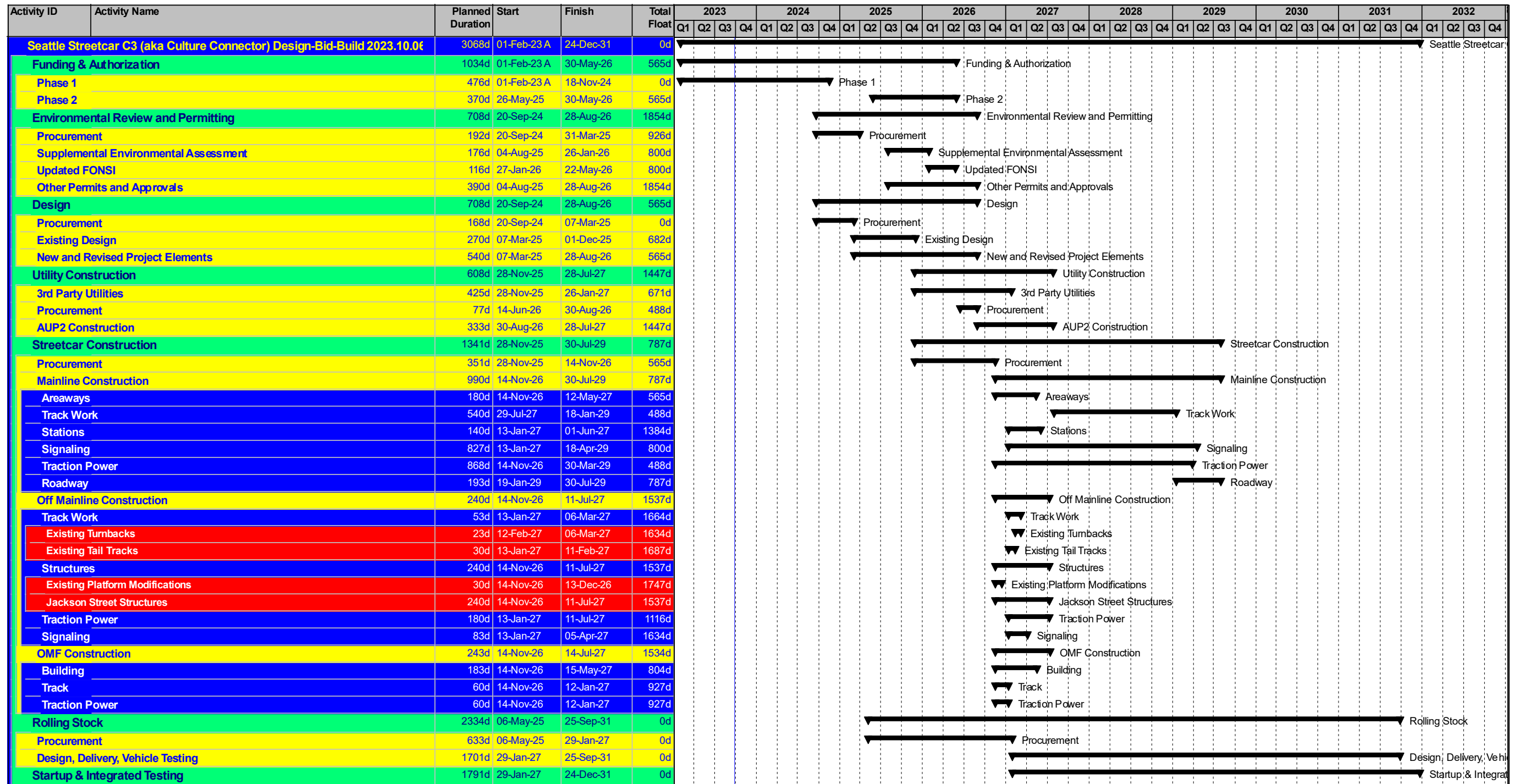
09-Oct-23
Page 1 of 1

Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS



09-Oct-23
Page 1 of 1

Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS



█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

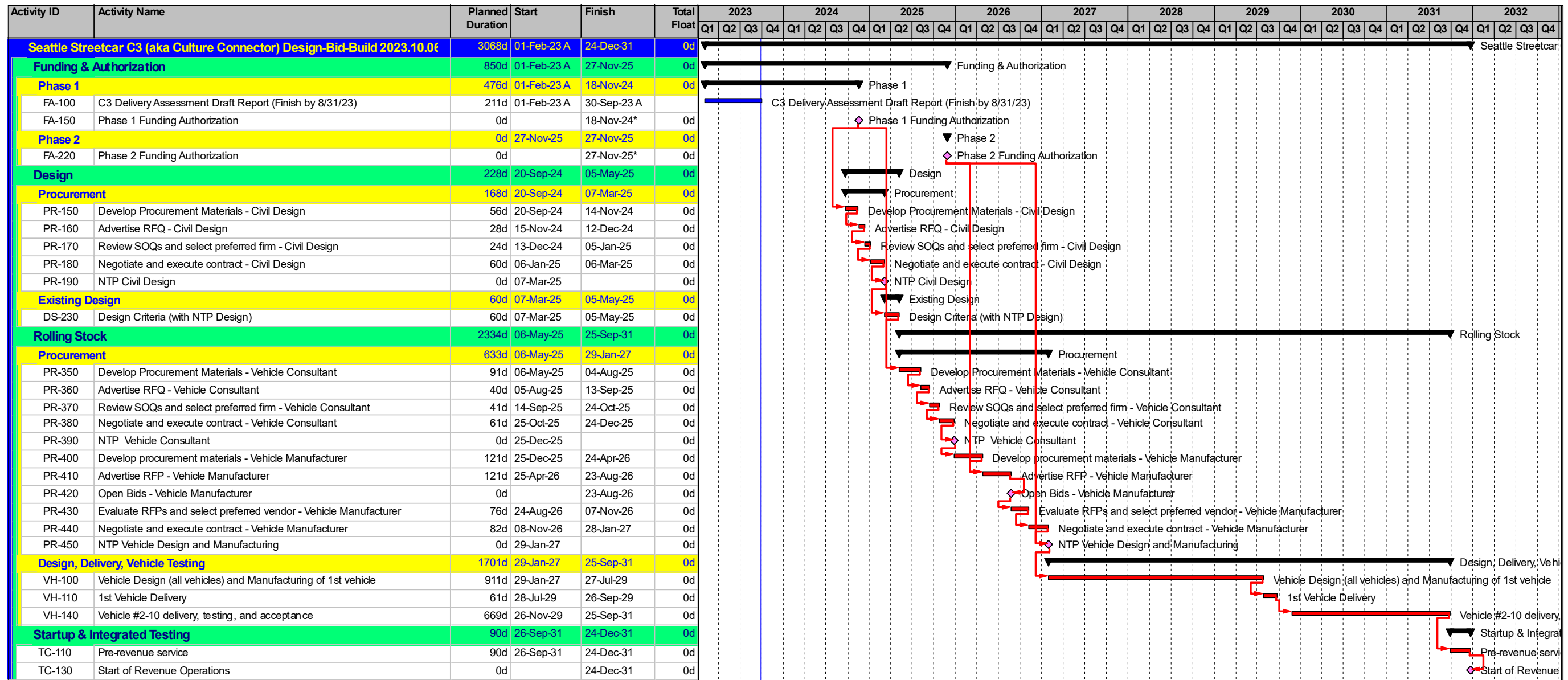
Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Planned Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06		3068d	01-Feb-23 A	24-Dec-31	0d	Seattle Streetcar																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	30-Sep-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
PR-150	Develop Procurement Materials - Civil Design	56d	20-Sep-24	14-Nov-24	0d	Develop Procurement Materials - Civil Design																																							
PR-160	Advertise RFQ - Civil Design	28d	15-Nov-24	12-Dec-24	0d	Advertise RFQ - Civil Design																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
PR-170	Review SOQs and select preferred firm - Civil Design	24d	13-Dec-24	05-Jan-25	0d	Review SOQs and select preferred firm - Civil Design																																							
PR-180	Negotiate and execute contract - Civil Design	60d	06-Jan-25	06-Mar-25	0d	Negotiate and execute contract - Civil Design																																							
PR-190	NTP Civil Design	0d	07-Mar-25		0d	NTP Civil Design																																							
DS-230	Design Criteria (with NTP Design)	60d	07-Mar-25	05-May-25	0d	Design Criteria (with NTP Design)																																							
PR-350	Develop Procurement Materials - Vehicle Consultant	91d	06-May-25	04-Aug-25	0d	Develop Procurement Materials - Vehicle Consultant																																							
PR-360	Advertise RFQ - Vehicle Consultant	40d	05-Aug-25	13-Sep-25	0d	Advertise RFQ - Vehicle Consultant																																							
PR-370	Review SOQs and select preferred firm - Vehicle Consultant	41d	14-Sep-25	24-Oct-25	0d	Review SOQs and select preferred firm - Vehicle Consultant																																							
PR-380	Negotiate and execute contract - Vehicle Consultant	61d	25-Oct-25	24-Dec-25	0d	Negotiate and execute contract - Vehicle Consultant																																							
FA-220	Phase 2 Funding Authorization	0d		27-Nov-25*	0d	Phase 2 Funding Authorization																																							
PR-390	NTP Vehicle Consultant	0d	25-Dec-25		0d	NTP Vehicle Consultant																																							
PR-400	Develop procurement materials - Vehicle Manufacturer	121d	25-Dec-25	24-Apr-26	0d	Develop procurement materials - Vehicle Manufacturer																																							
PR-410	Advertise RFP - Vehicle Manufacturer	121d	25-Apr-26	23-Aug-26	0d	Advertise RFP - Vehicle Manufacturer																																							
PR-420	Open Bids - Vehicle Manufacturer	0d		23-Aug-26	0d	Open Bids - Vehicle Manufacturer																																							
PR-430	Evaluate RFPs and select preferred vendor - Vehicle Manufacturer	76d	24-Aug-26	07-Nov-26	0d	Evaluate RFPs and select preferred vendor - Vehicle Manufacturer																																							
PR-440	Negotiate and execute contract - Vehicle Manufacturer	82d	08-Nov-26	28-Jan-27	0d	Negotiate and execute contract - Vehicle Manufacturer																																							
PR-450	NTP Vehicle Design and Manufacturing	0d	29-Jan-27		0d	NTP Vehicle Design and Manufacturing																																							
VH-100	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle	911d	29-Jan-27	27-Jul-29	0d	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle																																							
VH-110	1st Vehicle Delivery	61d	28-Jul-29	26-Sep-29	0d	1st Vehicle Delivery																																							
VH-140	Vehicle #2-10 delivery, testing, and acceptance	669d	26-Nov-29	25-Sep-31	0d	Vehicle #2-10 delivery, testing, and acceptance																																							
TC-110	Pre-revenue service	90d	26-Sep-31	24-Dec-31	0d	Pre-revenue service																																							
TC-130	Start of Revenue Operations	0d		24-Dec-31	0d	Start of Revenue Operations																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS



█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Planned Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06						Seattle Streetcar																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	30-Sep-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
PR-150	Develop Procurement Materials - Civil Design	56d	20-Sep-24	14-Nov-24	0d	Develop Procurement Materials - Civil Design																																							
PR-160	Advertise RFQ - Civil Design	28d	15-Nov-24	12-Dec-24	0d	Advertise RFQ - Civil Design																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
PR-170	Review SOQs and select preferred firm - Civil Design	24d	13-Dec-24	05-Jan-25	0d	Review SOQs and select preferred firm - Civil Design																																							
PR-180	Negotiate and execute contract - Civil Design	60d	06-Jan-25	06-Mar-25	0d	Negotiate and execute contract - Civil Design																																							
PR-190	NTP Civil Design	0d	07-Mar-25		0d	NTP Civil Design																																							
DS-230	Design Criteria (with NTP Design)	60d	07-Mar-25	05-May-25	0d	Design Criteria (with NTP Design)																																							
PR-350	Develop Procurement Materials - Vehicle Consultant	91d	06-May-25	04-Aug-25	0d	Develop Procurement Materials - Vehicle Consultant																																							
PR-360	Advertise RFQ - Vehicle Consultant	40d	05-Aug-25	13-Sep-25	0d	Advertise RFQ - Vehicle Consultant																																							
PR-370	Review SOQs and select preferred firm - Vehicle Consultant	41d	14-Sep-25	24-Oct-25	0d	Review SOQs and select preferred firm - Vehicle Consultant																																							
PR-380	Negotiate and execute contract - Vehicle Consultant	61d	25-Oct-25	24-Dec-25	0d	Negotiate and execute contract - Vehicle Consultant																																							
FA-220	Phase 2 Funding Authorization	0d		27-Nov-25*	0d	Phase 2 Funding Authorization																																							
PR-200	Develop Procurement Materials - CM Consultant	56d	28-Nov-25	22-Jan-26	488d	Develop Procurement Materials - CM Consultant																																							
PR-390	NTP Vehicle Consultant	0d	25-Dec-25		0d	NTP Vehicle Consultant																																							
PR-400	Develop procurement materials - Vehicle Manufacturer	121d	25-Dec-25	24-Apr-26	0d	Develop procurement materials - Vehicle Manufacturer																																							
PR-210	Advertise RFQ - CM Consultant	40d	23-Jan-26	03-Mar-26	488d	Advertise RFQ - CM Consultant																																							
PR-220	Review SOQs and select preferred firm - CM Consultant	41d	04-Mar-26	13-Apr-26	488d	Review SOQs and select preferred firm - CM Consultant																																							
PR-230	Negotiate and execute contract - CM Consultant	61d	14-Apr-26	13-Jun-26	488d	Negotiate and execute contract - CM Consultant																																							
PR-410	Advertise RFP - Vehicle Manufacturer	121d	25-Apr-26	23-Aug-26	0d	Advertise RFP - Vehicle Manufacturer																																							
PR-240	NTP CM Consultant	0d	14-Jun-26		488d	NTP CM Consultant																																							
PR-300	Advertise for Construction Bids - AUP 2	40d	14-Jun-26	23-Jul-26	488d	Advertise for Construction Bids - AUP 2																																							
PR-310	Open bids - AUP 2	0d		23-Jul-26	488d	Open bids - AUP 2																																							
PR-320	Evaluate Bids and Issue Notice of Intent to Award - AUP 2	7d	24-Jul-26	30-Jul-26	488d	Evaluate Bids and Issue Notice of Intent to Award - AUP 2																																							
PR-330	Negotiate and execute contract - AUP 2	30d	31-Jul-26	29-Aug-26	488d	Negotiate and execute contract - AUP 2																																							
PR-420	Open Bids - Vehicle Manufacturer	0d		23-Aug-26	0d	Open Bids - Vehicle Manufacturer																																							
PR-430	Evaluate RFPs and select preferred vendor - Vehicle Manufacturer	76d	24-Aug-26	07-Nov-26	0d	Evaluate RFPs and select preferred vendor - Vehicle Manufacturer																																							
PR-340	NTP AUP 2 (Assuming not tied to FONSI)	0d	30-Aug-26		488d	NTP AUP 2 (Assuming not tied to FONSI)																																							
CN-200	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)	333d	30-Aug-26	28-Jul-27	488d	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)																																							
PR-440	Negotiate and execute contract - Vehicle Manufacturer	82d	08-Nov-26	28-Jan-27	0d	Negotiate and execute contract - Vehicle Manufacturer																																							
PR-450	NTP Vehicle Design and Manufacturing	0d	29-Jan-27		0d	NTP Vehicle Design and Manufacturing																																							
VH-100	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle	911d	29-Jan-27	27-Jul-29	0d	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle																																							
CN-100	Mainline Track Construction	540d	29-Jul-27	18-Jan-29	488d	Mainline Track Construction																																							
CN-740	Install Aspect Lights, Switches, and Signals	90d	19-Jan-29	18-Apr-29	800d	Install Aspect Lights, Switches, and Signals																																							
CN-110	Substantial Completion - Track	0d		18-Apr-29	800d	Substantial Completion - Track																																							
VH-110	1st Vehicle Delivery	61d	28-Jul-29	26-Sep-29	0d	1st Vehicle Delivery																																							
VH-140	Vehicle #2-10 delivery, testing, and acceptance	669d	26-Nov-29	25-Sep-31	0d	Vehicle #2-10 delivery, testing, and acceptance																																							
TC-110	Pre-revenue service	90d	26-Sep-31	24-Dec-31	0d	Pre-revenue service																																							
TC-130	Start of Revenue Operations	0d		24-Dec-31	0d	Start of Revenue																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Planned Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06						Seattle Streetcar																																							
Funding & Authorization						Funding & Authorization																																							
Phase 1						Phase 1																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	30-Sep-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
Phase 2						Phase 2																																							
FA-220	Phase 2 Funding Authorization	0d	27-Nov-25	27-Nov-25	0d	Phase 2 Funding Authorization																																							
Design						Design																																							
Procurement						Procurement																																							
PR-150	Develop Procurement Materials - Civil Design	56d	20-Sep-24	14-Nov-24	0d	Develop Procurement Materials - Civil Design																																							
PR-160	Advertise RFQ - Civil Design	28d	15-Nov-24	12-Dec-24	0d	Advertise RFQ - Civil Design																																							
PR-170	Review SOQs and select preferred firm - Civil Design	24d	13-Dec-24	05-Jan-25	0d	Review SOQs and select preferred firm - Civil Design																																							
PR-180	Negotiate and execute contract - Civil Design	60d	06-Jan-25	06-Mar-25	0d	Negotiate and execute contract - Civil Design																																							
PR-190	NTP Civil Design	0d	07-Mar-25		0d	NTP Civil Design																																							
Existing Design						Existing Design																																							
DS-230	Design Criteria (with NTP Design)	60d	07-Mar-25	05-May-25	0d	Design Criteria (with NTP Design)																																							
Utility Construction						Utility Construction																																							
Procurement						Procurement																																							
PR-300	Advertise for Construction Bids - AUP 2	40d	14-Jun-26	23-Jul-26	488d	Advertise for Construction Bids - AUP 2																																							
PR-310	Open bids - AUP 2	0d		23-Jul-26	488d	Open bids - AUP 2																																							
PR-320	Evaluate Bids and Issue Notice of Intent to Award - AUP 2	7d	24-Jul-26	30-Jul-26	488d	Evaluate Bids and Issue Notice of Intent to Award - AUP 2																																							
PR-330	Negotiate and execute contract - AUP 2	30d	31-Jul-26	29-Aug-26	488d	Negotiate and execute contract - AUP 2																																							
PR-340	NTP AUP 2 (Assuming not tied to FONSI)	0d	30-Aug-26		488d	NTP AUP 2 (Assuming not tied to FONSI)																																							
AUP2 Construction						AUP2 Construction																																							
CN-200	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)	333d	30-Aug-26	28-Jul-27	488d	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)																																							
Streetcar Construction						Streetcar Construction																																							
Procurement						Procurement																																							
PR-200	Develop Procurement Materials - CM Consultant	56d	28-Nov-25	22-Jan-26	488d	Develop Procurement Materials - CM Consultant																																							
PR-210	Advertise RFQ - CM Consultant	40d	23-Jan-26	03-Mar-26	488d	Advertise RFQ - CM Consultant																																							
PR-220	Review SOQs and select preferred firm - CM Consultant	41d	04-Mar-26	13-Apr-26	488d	Review SOQs and select preferred firm - CM Consultant																																							
PR-230	Negotiate and execute contract - CM Consultant	61d	14-Apr-26	13-Jun-26	488d	Negotiate and execute contract - CM Consultant																																							
PR-240	NTP CM Consultant	0d	14-Jun-26		488d	NTP CM Consultant																																							
Mainline Construction						Mainline Construction																																							
CN-110	Substantial Completion - Track	0d		18-Apr-29	800d	Substantial Completion - Track																																							
Track Work						Track Work																																							
CN-100	Mainline Track Construction	540d	29-Jul-27	18-Jan-29	488d	Mainline Track Construction																																							
Signaling						Signaling																																							
CN-740	Install Aspect Lights, Switches, and Signals	90d	19-Jan-29	18-Apr-29	800d	Install Aspect Lights, Switches, and Signals																																							
Rolling Stock						Rolling Stock																																							
Procurement						Procurement																																							
PR-350	Develop Procurement Materials - Vehicle Consultant	91d	06-May-25	04-Aug-25	0d	Develop Procurement Materials - Vehicle Consultant																																							
PR-360	Advertise RFQ - Vehicle Consultant	40d	05-Aug-25	13-Sep-25	0d	Advertise RFQ - Vehicle Consultant																																							
PR-370	Review SOQs and select preferred firm - Vehicle Consultant	41d	14-Sep-25	24-Oct-25	0d	Review SOQs and select preferred firm - Vehicle Consultant																																							
PR-380	Negotiate and execute contract - Vehicle Consultant	61d	25-Oct-25	24-Dec-25	0d	Negotiate and execute contract - Vehicle Consultant																																							
PR-390	NTP Vehicle Consultant	0d	25-Dec-25		0d	NTP Vehicle Consultant																																							
PR-400	Develop procurement materials - Vehicle Manufacturer	121d	25-Dec-25	24-Apr-26	0d	Develop procurement materials - Vehicle Manufacturer																																							
PR-410	Advertise RFP - Vehicle Manufacturer	121d	25-Apr-26	23-Aug-26	0d	Advertise RFP - Vehicle Manufacturer																																							
PR-420	Open Bids - Vehicle Manufacturer	0d		23-Aug-26	0d	Open Bids - Vehicle Manufacturer																																							
PR-430	Evaluate RFPs and select preferred vendor - Vehicle Manufacturer	76d	24-Aug-26	07-Nov-26	0d	Evaluate RFPs and select preferred vendor - Vehicle Manufacturer																																							
PR-440	Negotiate and execute contract - Vehicle Manufacturer	82d	08-Nov-26	28-Jan-27	0d	Negotiate and execute contract - Vehicle Manufacturer																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 2

Project = 14-034 DBB-6 Seattle Streetcar C3 (aka Culture Connector) Design-Bid-Build 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06						Seattle Streetcar C3 (aka Culture Connector)																																							
Funding & Authorization						Funding & Authorization																																							
Phase 1						Phase 1																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	31-Aug-23 A		C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
FA-150	Phase 1 Funding Authorization	0d	01-Feb-23 A	18-Nov-24*	0d	Phase 1 Funding Authorization																																							
Phase 2						Phase 2																																							
FA-220	Phase 2 Funding Authorization	0d	27-Nov-25	27-Nov-25	0d	Phase 2 Funding Authorization																																							
Utility Construction						Utility Construction																																							
Procurement						Procurement																																							
PR-300	Advertise for Construction Bids - AUP 2	40d	14-Jun-26	23-Jul-26	259d	Advertise for Construction Bids - AUP 2																																							
PR-310	Open bids - AUP 2	0d	14-Jun-26	23-Jul-26	259d	Open bids - AUP 2																																							
PR-320	Evaluate Bids and Issue Notice of Intent to Award - AUP 2	7d	24-Jul-26	30-Jul-26	259d	Evaluate Bids and Issue Notice of Intent to Award - AUP 2																																							
PR-330	Negotiate and execute contract - AUP 2	30d	31-Jul-26	29-Aug-26	259d	Negotiate and execute contract - AUP 2																																							
PR-340	NTP AUP 2 (Assuming not tied to FONSI)	0d	30-Aug-26		259d	NTP AUP 2 (Assuming not tied to FONSI)																																							
Construction						Construction																																							
CN-200	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)	333d	30-Aug-26	28-Jul-27	259d	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)																																							
Streetcar Construction						Streetcar Construction																																							
Procurement						Procurement																																							
PR-200	Develop Procurement Materials - CM Consultant	56d	28-Nov-25	22-Jan-26	0d	Develop Procurement Materials - CM Consultant																																							
PR-210	Advertise RFQ - CM Consultant	40d	23-Jan-26	03-Mar-26	0d	Advertise RFQ - CM Consultant																																							
PR-220	Review SOQs and select preferred firm - CM Consultant	41d	04-Mar-26	13-Apr-26	0d	Review SOQs and select preferred firm - CM Consultant																																							
PR-230	Negotiate and execute contract - CM Consultant	61d	14-Apr-26	13-Jun-26	0d	Negotiate and execute contract - CM Consultant																																							
PR-240	NTP CM Consultant	0d	14-Jun-26		0d	NTP CM Consultant																																							
PR-290	NTP 1 Design and Vehicle Procurement	0d	14-Jun-26		0d	NTP 1 Design and Vehicle Procurement																																							
Mainline						Mainline																																							
CN-110	Substantial Completion - Track	0d	29-Jul-27	18-Apr-29	571d	Substantial Completion - Track																																							
Track Work						Track Work																																							
CN-100	Mainline Track Construction	540d	29-Jul-27	18-Jan-29	259d	Mainline Track Construction																																							
Signaling						Signaling																																							
CN-740	Install Aspect Lights, Switches, and Signals	90d	19-Jan-29	18-Apr-29	571d	Install Aspect Lights, Switches, and Signals																																							
Rolling Stock						Rolling Stock																																							
Design, Delivery, Vehicle Testing						Design, Delivery, Vehicle Testing																																							
VH-100	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle	911d	14-Jun-26	10-Dec-28	0d	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle																																							
VH-110	1st Vehicle Delivery	61d	11-Dec-28	09-Feb-29	0d	1st Vehicle Delivery																																							
VH-140	Vehicle #2-10 delivery, testing, and acceptance	669d	11-Apr-29	08-Feb-31	0d	Vehicle #2-10 delivery, testing, and acceptance																																							
Startup & Testing						Startup & Testing																																							
TC-110	Pre-revenue service	90d	09-Feb-31	09-May-31	0d	Pre-revenue service																																							
TC-130	Start of Revenue Operations	0d	09-May-31	09-May-31	0d	Start of Revenue Operations																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

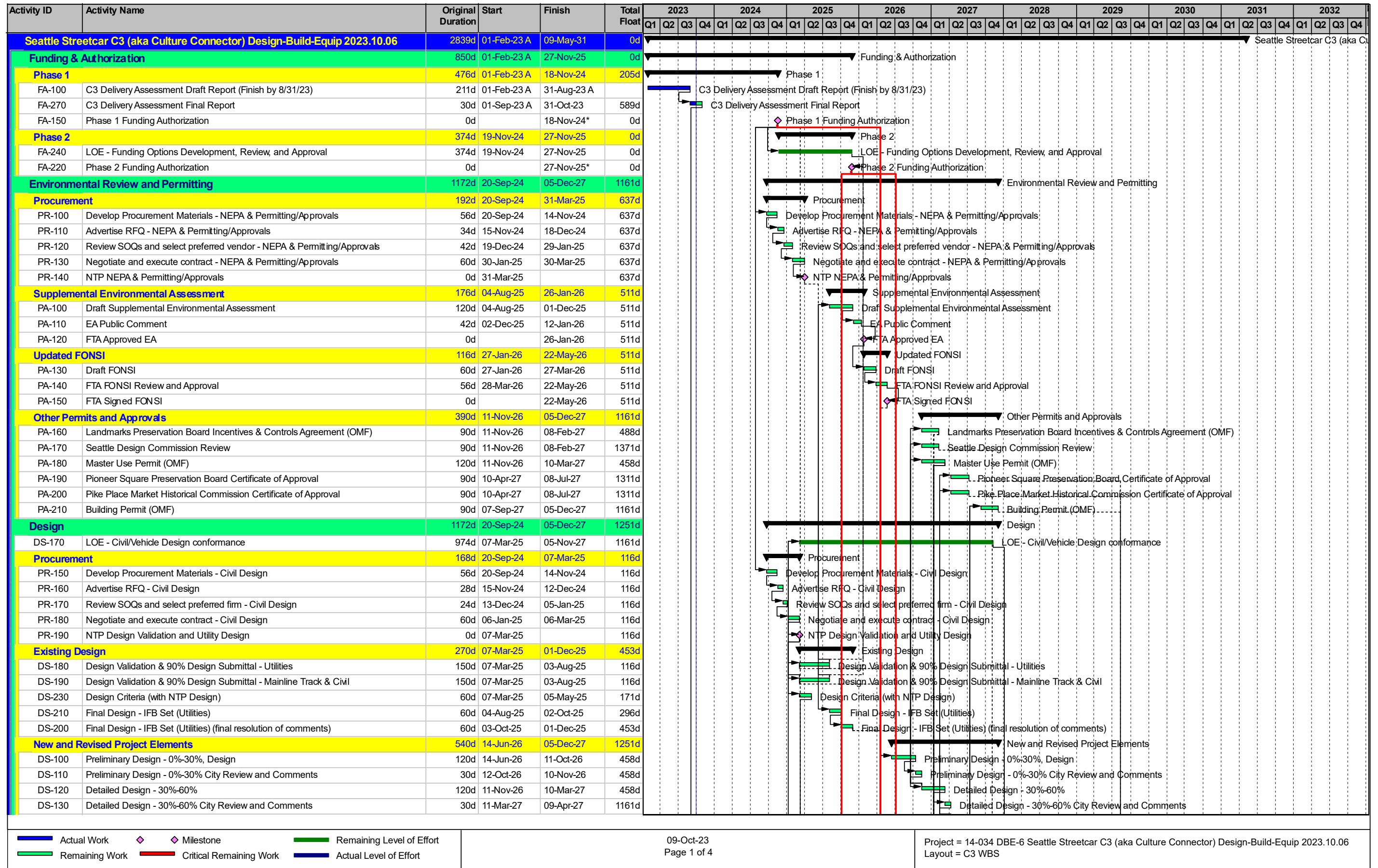
09-Oct-23
Page 1 of 1

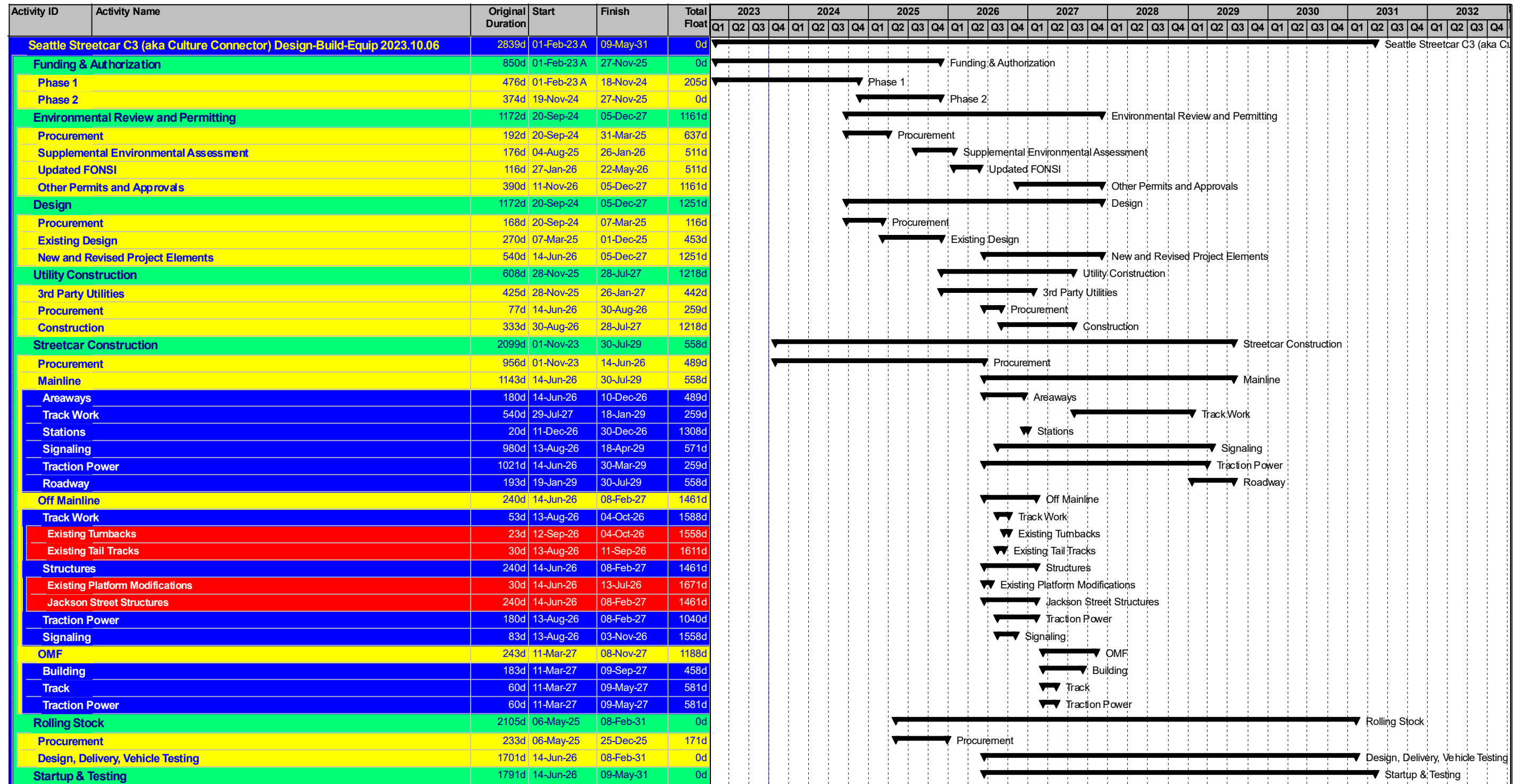
Project = 14-034 DBE-6 Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06
Layout = C3 WBS



APPENDIX I

**SCHEDULE ANALYSIS:
DESIGN-BUILD-EQUIP
PROJECT DELIVERY**





█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06						Seattle Streetcar C3 (aka Culture Connector)																																							
Funding & Authorization						Funding & Authorization																																							
Phase 1						Phase 1																																							
Phase 2						Phase 2																																							
Environmental Review and Permitting						Environmental Review and Permitting																																							
Procurement						Procurement																																							
Supplemental Environmental Assessment						Supplemental Environmental Assessment																																							
Updated FONSI						Updated FONSI																																							
Other Permits and Approvals						Other Permits and Approvals																																							
Design						Design																																							
Procurement						Procurement																																							
Existing Design						Existing Design																																							
New and Revised Project Elements						New and Revised Project Elements																																							
Utility Construction						Utility Construction																																							
3rd Party Utilities						3rd Party Utilities																																							
Procurement						Procurement																																							
Construction						Construction																																							
Streetcar Construction						Streetcar Construction																																							
Procurement						Procurement																																							
Mainline						Mainline																																							
Areaways						Areaways																																							
Track Work						Track Work																																							
Stations						Stations																																							
Signaling						Signaling																																							
Traction Power						Traction Power																																							
Roadway						Roadway																																							
Off Mainline						Off Mainline																																							
Track Work						Track Work																																							
Structures						Structures																																							
Traction Power						Traction Power																																							
Signaling						Signaling																																							
OMF						OMF																																							
Building						Building																																							
Track						Track																																							
Traction Power						Traction Power																																							
Rolling Stock						Rolling Stock																																							
Procurement						Procurement																																							
Design, Delivery, Vehicle Testing						Design, Delivery, Vehicle Testing																																							
Startup & Testing						Startup & Testing																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06						Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06																																							
Funding & Authorization						Funding & Authorization																																							
Phase 1						Phase 1																																							
Phase 2						Phase 2																																							
Environmental Review and Permitting						Environmental Review and Permitting																																							
Procurement						Procurement																																							
Supplemental Environmental Assessment						Supplemental Environmental Assessment																																							
Updated FONSI						Updated FONSI																																							
Other Permits and Approvals						Other Permits and Approvals																																							
Design						Design																																							
Procurement						Procurement																																							
Existing Design						Existing Design																																							
New and Revised Project Elements						New and Revised Project Elements																																							
Utility Construction						Utility Construction																																							
3rd Party Utilities						3rd Party Utilities																																							
Procurement						Procurement																																							
Construction						Construction																																							
Streetcar Construction						Streetcar Construction																																							
Procurement						Procurement																																							
Mainline						Mainline																																							
Off Mainline						Off Mainline																																							
OMF						OMF																																							
Rolling Stock						Rolling Stock																																							
Procurement						Procurement																																							
Design, Delivery, Vehicle Testing						Design, Delivery, Vehicle Testing																																							
Startup & Testing						Startup & Testing																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBE-6 Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
	Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06	2839d	01-Feb-23 A	09-May-31	0d	Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06																																							
	Funding & Authorization	850d	01-Feb-23 A	27-Nov-25	0d	Funding & Authorization																																							
	Environmental Review and Permitting	1172d	20-Sep-24	05-Dec-27	1161d	Environmental Review and Permitting																																							
	Design	1172d	20-Sep-24	05-Dec-27	1251d	Design																																							
	Utility Construction	608d	28-Nov-25	28-Jul-27	1218d	Utility Construction																																							
	Streetcar Construction	2099d	01-Nov-23	30-Jul-29	558d	Streetcar Construction																																							
	Rolling Stock	2105d	06-May-25	08-Feb-31	0d	Rolling Stock																																							
	Startup & Testing	1791d	14-Jun-26	09-May-31	0d	Startup & Testing																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBE-6 Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06						2839d	01-Feb-23 A	09-May-31	0d	Seattle Streetcar C3 (aka Culture Connector)																																			
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	31-Aug-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
FA-220	Phase 2 Funding Authorization	0d		27-Nov-25*	0d	Phase 2 Funding Authorization																																							
PR-200	Develop Procurement Materials - CM Consultant	56d	28-Nov-25	22-Jan-26	0d	Develop Procurement Materials - CM Consultant																																							
PR-210	Advertise RFQ - CM Consultant	40d	23-Jan-26	03-Mar-26	0d	Advertise RFQ - CM Consultant																																							
PR-220	Review SOQs and select preferred firm - CM Consultant	41d	04-Mar-26	13-Apr-26	0d	Review SOQs and select preferred firm - CM Consultant																																							
PR-230	Negotiate and execute contract - CM Consultant	61d	14-Apr-26	13-Jun-26	0d	Negotiate and execute contract - CM Consultant																																							
PR-240	NTP CM Consultant	0d	14-Jun-26		0d	NTP CM Consultant																																							
PR-290	NTP 1 Design and Vehicle Procurement	0d	14-Jun-26		0d	NTP 1 Design and Vehicle Procurement																																							
VH-100	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle	911d	14-Jun-26	10-Dec-28	0d	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle																																							
VH-110	1st Vehicle Delivery	61d	11-Dec-28	09-Feb-29	0d	1st Vehicle Delivery																																							
VH-140	Vehicle #2-10 delivery, testing, and acceptance	669d	11-Apr-29	08-Feb-31	0d	Vehicle #2-10 delivery, testing, and acceptance																																							
TC-110	Pre-revenue service	90d	09-Feb-31	09-May-31	0d	Pre-revenue service																																							
TC-130	Start of Revenue Operations	0d		09-May-31	0d	Start of Revenue Operations																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBE-6 Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06						Seattle Streetcar C3 (aka Culture Connector)																																							
Funding & Authorization						Funding & Authorization																																							
Phase 1						Phase 1																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	31-Aug-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
Phase 2						Phase 2																																							
FA-220	Phase 2 Funding Authorization	0d	27-Nov-25	27-Nov-25*	0d	Phase 2 Funding Authorization																																							
Streetcar Construction						Streetcar Construction																																							
Procurement						Procurement																																							
PR-200	Develop Procurement Materials - CM Consultant	56d	28-Nov-25	22-Jan-26	0d	Develop Procurement Materials - CM Consultant																																							
PR-210	Advertise RFQ - CM Consultant	40d	23-Jan-26	03-Mar-26	0d	Advertise RFQ - CM Consultant																																							
PR-220	Review SOQs and select preferred firm - CM Consultant	41d	04-Mar-26	13-Apr-26	0d	Review SOQs and select preferred firm - CM Consultant																																							
PR-230	Negotiate and execute contract - CM Consultant	61d	14-Apr-26	13-Jun-26	0d	Negotiate and execute contract - CM Consultant																																							
PR-240	NTP CM Consultant	0d	14-Jun-26		0d	NTP CM Consultant																																							
PR-290	NTP 1 Design and Vehicle Procurement	0d	14-Jun-26		0d	NTP 1 Design and Vehicle Procurement																																							
Rolling Stock						Rolling Stock																																							
Design, Delivery, Vehicle Testing						Design, Delivery, Vehicle Testing																																							
VH-100	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle	911d	14-Jun-26	10-Dec-28	0d	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle																																							
VH-110	1st Vehicle Delivery	61d	11-Dec-28	09-Feb-29	0d	1st Vehicle Delivery																																							
VH-140	Vehicle #2-10 delivery, testing, and acceptance	669d	11-Apr-29	08-Feb-31	0d	Vehicle #2-10 delivery, testing, and acceptance																																							
Startup & Testing						Startup & Testing																																							
TC-110	Pre-revenue service	90d	09-Feb-31	09-May-31	0d	Pre-revenue service																																							
TC-130	Start of Revenue Operations	0d		09-May-31	0d	Start of Revenue Operations																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBE-6 Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06						Seattle Streetcar C3 (aka Culture Connector)																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	31-Aug-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
FA-220	Phase 2 Funding Authorization	0d		27-Nov-25*	0d	Phase 2 Funding Authorization																																							
PR-200	Develop Procurement Materials - CM Consultant	56d	28-Nov-25	22-Jan-26	0d	Develop Procurement Materials - CM Consultant																																							
PR-210	Advertise RFQ - CM Consultant	40d	23-Jan-26	03-Mar-26	0d	Advertise RFQ - CM Consultant																																							
PR-220	Review SOQs and select preferred firm - CM Consultant	41d	04-Mar-26	13-Apr-26	0d	Review SOQs and select preferred firm - CM Consultant																																							
PR-230	Negotiate and execute contract - CM Consultant	61d	14-Apr-26	13-Jun-26	0d	Negotiate and execute contract - CM Consultant																																							
PR-240	NTP CM Consultant	0d	14-Jun-26		0d	NTP CM Consultant																																							
PR-290	NTP 1 Design and Vehicle Procurement	0d	14-Jun-26		0d	NTP 1 Design and Vehicle Procurement																																							
PR-300	Advertise for Construction Bids - AUP 2	40d	14-Jun-26	23-Jul-26	259d	Advertise for Construction Bids - AUP 2																																							
VH-100	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle	911d	14-Jun-26	10-Dec-28	0d	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle																																							
PR-310	Open bids - AUP 2	0d		23-Jul-26	259d	Open bids - AUP 2																																							
PR-320	Evaluate Bids and Issue Notice of Intent to Award - AUP 2	7d	24-Jul-26	30-Jul-26	259d	Evaluate Bids and Issue Notice of Intent to Award - AUP 2																																							
PR-330	Negotiate and execute contract - AUP 2	30d	31-Jul-26	29-Aug-26	259d	Negotiate and execute contract - AUP 2																																							
PR-340	NTP AUP 2 (Assuming not tied to FONSI)	0d	30-Aug-26		259d	NTP AUP 2 (Assuming not tied to FONSI)																																							
CN-200	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)	333d	30-Aug-26	28-Jul-27	259d	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)																																							
CN-100	Mainline Track Construction	540d	29-Jul-27	18-Jan-29	259d	Mainline Track Construction																																							
VH-110	1st Vehicle Delivery	61d	11-Dec-28	09-Feb-29	0d	1st Vehicle Delivery																																							
CN-740	Install Aspect Lights, Switches, and Signals	90d	19-Jan-29	18-Apr-29	571d	Install Aspect Lights, Switches, and Signals																																							
VH-140	Vehicle #2-10 delivery, testing, and acceptance	669d	11-Apr-29	08-Feb-31	0d	Vehicle #2-10 delivery, testing, and acceptance																																							
CN-110	Substantial Completion - Track	0d		18-Apr-29	571d	Substantial Completion - Track																																							
TC-110	Pre-revenue service	90d	09-Feb-31	09-May-31	0d	Pre-revenue service																																							
TC-130	Start of Revenue Operations	0d		09-May-31	0d	Start of Revenue Operations																																							

█ Actual Work ◆ Milestone █ Remaining Level of Effort
█ Remaining Work █ Critical Remaining Work █ Actual Level of Effort

09-Oct-23
Page 1 of 1

Project = 14-034 DBE-6 Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06
Layout = C3 WBS

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2023				2024				2025				2026				2027				2028				2029				2030				2031				2032			
						Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Seattle Streetcar C3 (aka Culture Connector) Design-Build-Equip 2023.10.06						Seattle Streetcar C3 (aka Culture Connector)																																							
Funding & Authorization						Funding & Authorization																																							
Phase 1						Phase 1																																							
FA-100	C3 Delivery Assessment Draft Report (Finish by 8/31/23)	211d	01-Feb-23 A	31-Aug-23 A	0d	C3 Delivery Assessment Draft Report (Finish by 8/31/23)																																							
FA-150	Phase 1 Funding Authorization	0d		18-Nov-24*	0d	Phase 1 Funding Authorization																																							
Phase 2						Phase 2																																							
FA-220	Phase 2 Funding Authorization	0d	27-Nov-25	27-Nov-25*	0d	Phase 2 Funding Authorization																																							
Utility Construction						Utility Construction																																							
Procurement						Procurement																																							
PR-300	Advertise for Construction Bids - AUP 2	40d	14-Jun-26	23-Jul-26	259d	Advertise for Construction Bids - AUP 2																																							
PR-310	Open bids - AUP 2	0d		23-Jul-26	259d	Open bids - AUP 2																																							
PR-320	Evaluate Bids and Issue Notice of Intent to Award - AUP 2	7d	24-Jul-26	30-Jul-26	259d	Evaluate Bids and Issue Notice of Intent to Award - AUP 2																																							
PR-330	Negotiate and execute contract - AUP 2	30d	31-Jul-26	29-Aug-26	259d	Negotiate and execute contract - AUP 2																																							
PR-340	NTP AUP 2 (Assuming not tied to FONSI)	0d	30-Aug-26		259d	NTP AUP 2 (Assuming not tied to FONSI)																																							
Construction						Construction																																							
CN-200	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)	333d	30-Aug-26	28-Jul-27	259d	AUP 2 Construction (Jackson St to Columbia St Utilities Already Completed)																																							
Streetcar Construction						Streetcar Construction																																							
Procurement						Procurement																																							
PR-200	Develop Procurement Materials - CM Consultant	56d	28-Nov-25	22-Jan-26	0d	Develop Procurement Materials - CM Consultant																																							
PR-210	Advertise RFQ - CM Consultant	40d	23-Jan-26	03-Mar-26	0d	Advertise RFQ - CM Consultant																																							
PR-220	Review SOQs and select preferred firm - CM Consultant	41d	04-Mar-26	13-Apr-26	0d	Review SOQs and select preferred firm - CM Consultant																																							
PR-230	Negotiate and execute contract - CM Consultant	61d	14-Apr-26	13-Jun-26	0d	Negotiate and execute contract - CM Consultant																																							
PR-240	NTP CM Consultant	0d	14-Jun-26		0d	NTP CM Consultant																																							
PR-290	NTP 1 Design and Vehicle Procurement	0d	14-Jun-26		0d	NTP 1 Design and Vehicle Procurement																																							
Mainline						Mainline																																							
CN-110	Substantial Completion - Track	0d		18-Apr-29	571d	Substantial Completion - Track																																							
Track Work						Track Work																																							
CN-100	Mainline Track Construction	540d	29-Jul-27	18-Jan-29	259d	Mainline Track Construction																																							
Signaling						Signaling																																							
CN-740	Install Aspect Lights, Switches, and Signals	90d	19-Jan-29	18-Apr-29	571d	Install Aspect Lights, Switches, and Signals																																							
Rolling Stock						Rolling Stock																																							
Design, Delivery, Vehicle Testing						Design, Delivery, Vehicle Testing																																							
VH-100	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle	911d	14-Jun-26	10-Dec-28	0d	Vehicle Design (all vehicles) and Manufacturing of 1st vehicle																																							
VH-110	1st Vehicle Delivery	61d	11-Dec-28	09-Feb-29	0d	1st Vehicle Delivery																																							
VH-140	Vehicle #2-10 delivery, testing, and acceptance	669d	11-Apr-29	08-Feb-31	0d	Vehicle #2-10 delivery, testing, and acceptance																																							
Startup & Testing						Startup & Testing																																							
TC-110	Pre-revenue service	90d	09-Feb-31	09-May-31	0d	Pre-revenue service																																							
TC-130	Start of Revenue Operations	0d		09-May-31	0d	Start of Revenue Operations																																							

█ Actual Work
 ◆ Milestone
 █ Remaining Level of Effort
█ Remaining Work
█ Critical Remaining Work
█ Actual Level of Effort



600 University Street, Suite 700
Seattle, WA 98101

www.parsons.com

© Copyright 2023 Parsons Corporation.
All Rights Reserved.